JOURNAL OF THE
AMERICAN
SCIENTIFIC
AFFILIATION

Evangelical Perspectives on Science and the Christian Faith

In this issue . . .

The Anthropic Principle

Interpreting Genesis 1

The Future of Supernaturalism

Teaching in Secular Colleges

"The fear of the Lord is the beginning of Wisdom." Psalm 111:10

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JOURNAL OF THE
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Exploring Relationships

"The purpose of the Affiliation is to explore any and every area relating Christian faith and science. The Journal ASA is one means by which the results of such exploration are made known for the benefit and criticism of the Christian Community and of the scientific community."

In this issue we have several major articles that explore the relations between science and Christian faith. John Templeton surveys the delicate balance "of the cosmological parameters of force, space, and time" with an overview of the anthropic principle and the complexity of the infinitesimal. Jim Neidhardt takes us further into the anthropic principle and some of its profound theological implications. To challenge our thinking on possible ways of interpreting science and the Scriptures, Conrad Hyers outlines an interpretation of Genesis that heavily emphasizes the cultural context through which God gave us His written word.

In the area of the social sciences, ethnologist George Jennings discusses the role of the supernatural in religion with special insight into the Muslim world he knows so well. Finally, Edward Habert, a Roman Catholic biologist, who teaches at a New York community college, discusses how he sees his role as a Christian in a secular college. Some of us with a strong Reformed background may not agree with all of the principles suggested here. However, all of us who teach in public colleges and universities need to be more assertive regarding our Christian faith as we try to avoid the pitfalls of "civil religion" on the one hand and a cowardly silence on the other. I hope Professor Habert stimulates us to think more seriously on this timely subject.

In conclusion, I want to draw your attention to the Letters section. Dick Bube has written an open letter to Inter-Varsity Christian Fellowship to express his dismay over the action of IVP in withdrawing the book, *Brave New People* by ASA member Gareth Jones. The real issue is not Professor Jones' views on therapeutic abortion; during the same period that IVP was being picketed by Pro-Life people in the U.S.A. they were being picketed by Pro-Abortion people in England—both groups were protesting the same book! The real issue is how do Christian organizations respond to militant criticism and blackmail techniques by self-appointed "defenders of the faith." Such blatantly unchristian tactics make a mockery of the gospel of Jesus Christ and His command that "By this shall all men know that you are my disciples that you love one another." We *must* speak out against the evils of our society but we must do it in accordance with the God-inspired principles of the New Testament. Christian publishers, as well as the Journal ASA, must have the freedom "to explore any and every area relating Christian faith and science."

God Reveals Himself in the Astronomical and in the Infinitesimal

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The revelation of God in the cosmos is seen not only in the magnitude and grandeur of the universe but also in the extent of its preparation for the advent of intelligent life. This preparation is evident not only in the delicate balancing of the cosmological parameters of force, space and time, but also in the enormous intricacy and capacity of the product, the human brain. People dominated by creative purpose were not created by purposeless chance.

The Notion of Design

The tracing of the superintelligent ordering of the universe was foundational to the writers of Scripture. Thus St. Paul wrote:

> For since the creation of the world, God's invisible qualities—his eternal power and divine nature—have been clearly seen being understood from what has been made. . . .[1]

The awesome world we survey with our eyes and ears and sift through our hands has been sensed alike by poet and philosopher. Elizabeth Barrett Browning captures it best when she writes:

> Earth's crammed with Heaven,
> And Every common bush afire with God;
> But only he who sees takes off his shoes.
> The rest sit round it and pluck blackberries. . . .[2]

It is, too, the special domain of astrophysicist and astronomer, some of whom, like Owen Gingerich at Harvard, see God's hand, and others, like Carl Sagan, choose to think of themselves a bit like Prometheus, stealing fire from the gods.

Some of the "fire" in Sagan's writing is illustrated by this brief passage from *Cosmos*:

> The surface of the Earth is the shore of the cosmic ocean. From it we have learned most of what we know. Recently, we have waded a little out to sea, enough to dampen our toes, or, at most, wet our ankles. The water seems inviting. The ocean calls. Some part of our being knows this is from where we came. We long to return. These aspirations are not, I think, irreverent, although they may trouble whatever gods may be.[3]

Contrary to Sagan's feelings, there are many in science today who find the exploration of space and the study of life it bears a positive act of reverence for the Designer. Harvard astrophysicist Owen Gingerich catches the essence of the beginning when he says in his Dwight lecture of 1982:

> During this past decade, knowledge of the world of the smallest possible sizes, the domain of particle physics, has been combined with astronomy to describe the universe in its opening stages. The physics ultimately fails as the nucleo-cosmologists push their calculations back to Time Zero, but they get pretty close to the beginning, to 10^{-43} second. At that point, at a second split so fine that no clock could measure it, the entire observable universe is compressed within the wavelike blur described by the uncertainty principle, so tiny and compact that it could pass through the eye of a needle. Not just this room, or the earth, or the solar system, but *the entire universe* squeezed into a dense dot of pure energy. And then comes the explosion. "There is no way to express that explosion" writes the poet Robinson Jeffers. "All that exists

> Roars into flame, the tortured fragments rush away
> from each other into all the sky, new universes
> Jewel the black breast of night; and far off the
> outer nebulae like charging spearmen again
> Invade emptiness."

It is an amazing picture, of pure and incredibly energetic light being transformed into matter, and leaving its vestiges behind—countless atoms and even more numerous photons of light generated in that mighty blast. . . .

> This is indeed a thrilling scenario, of all that exists roaring into flame and charging forth into emptiness. And its essential framework, of everything springing forth from that blinding flash, bears a striking resonance with those succinct words of Genesis 1:3: "And God said, Let there be light." Who could have guessed even a hundred years ago, not to mention two or three thousand years ago, that a scientific picture would emerge with electro-magnetic radiation as the starting point of creation! According to the NASA astrophysicist Robert Jastrow, the agnostic scientists should sit up and take notice, and even be a little worried. But let us look a little more carefully at the extent of the convergence. Both the contemporary scientific account and the age old Biblical account assume a beginning. The scientific account concerns only the transformation of everything that now is. It does not go beyond that, to the singularity when there was nothing and then suddenly the inconceivably energetic seed for the universe abruptly came into being. Here science seems up against a blank wall. In one memorable passage in his book, *God and the Astronomers*, Jastrow says: "At this moment it seems as though science will never be able to raise the curtain on the mystery of creation. For the scientist who has lived by his faith in the power of reason, the story ends like a bad dream. He has scaled the mountains of ignorance; he is about to conquer the highest peak; as he pulls himself over the final rock, he is greeted by a band of theologians who have been sitting there for centuries."[4]

It is tempting to add to Jastrow's story. Think of the excitement as our scientist climber explains his part—his interpretation—of the Biblical statement, "Let there be light" to the theologians. How much he has added! How stupendous the light-giving becomes when read out in astrophysical terms!!

Yet the mysteries of the cosmos are not restricted to that first cataclysmic moment. Similar feelings of awe and perplexity are expressed by biologists who have studied mechanisms for the origin of life. Just what sequence of events could have led by physio-chemical means to the advent of the first primitive cell? The improbabilities seem insurmountable without the creative guidance of the Designer—without the correct ordering of reactions and environmental factors exploiting the propensities designed into the stuff of life. It would seem more and more difficult to accept the opening phrase of Sagan's Cosmos, that "The Cosmos is all that is or ever was or ever will be."[5] You may choose to make God in your own image, but the data of science give you no solace in that lonesome choice. It would seem instead that the known Cosmos is only the beginning of a revelation of the size of God! Indeed, that band of theologians on the mountaintop have just begun their work.

The Anthropic Principle

But perhaps the most powerful recent source of support for design in the universe builds upon what has been called the "anthropic principle."[6] This principle, first described by Robert Dicke of Princeton in 1961, takes notice of the fact that this vast assemblage of cosmological evidence describes a universe which is peculiarly suited for the production of life. Dicke had been analyzing work done by P.A.M. Dirac in the 1930's in which he observed a curious numerical relationship between some so-called dimensionless numbers which are also very fundamental measures of force, time and mass. Dirac found a numerical value of 10^{-40} for the coupling strength of gravitational force, a value of 10^{40} for the age of the universe, and a value of 10^{80} for the mass of the universe and noted that they differed from each other by the integral power of the very large number 10^{40}. He proposed that the phenomenon was a manifestation of some unknown causal connection, a conclusion which satisfied most physicists, who then moved on to better things. But not Robert Dicke, who sought to explain the peculiar coincidence of these seemingly unrelated numbers. He suggested that the order of magnitude relationship between gravitational force and the mass of the universe could be explained on the basis of an effect of gravitational force of distant matter on the inertial mass of individual particles of the universe. However, this relationship, if valid, would be true in all eras of the history of the universe. Why, then, the relationship of these two parameters to the age of the universe? Dicke's conclusion was that the numerical value for the age of the universe is strongly constrained by the conditions necessary for the existence of man. That is, in an evolutionary universe originating in a "big bang" event, its age is not permitted to take one of an

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enormous range of values. Instead, it is somewhat limited by the biological requirements to be met for the appearance of man. For our evolution to proceed, there must be raw materials in the form of the elements carbon, oxygen and nitrogen, of which we are composed, yet the cosmologists describe the original fireball as containing only the lightest elements; hydrogen, helium and a little lithium. To go beyond this point, to set the stage for the advent of intelligent life, stars must be formed and then decayed in the form of supernovae to generate the heavier elements. And those elements must in turn be incorporated into a planet of a smaller star, our Sun, whose longevity is approximately 5 billion years and whose thermal characteristics assure us of moderate temperatures and the possibility of several billions more years of life before evolving into a red giant and finally engulfing our planet. Cosmologists can assign a minimum time for this evolutionary stage-setting for the advent of intelligent life on Earth and it is this figure which appears to correlate with the age of the universe and hence with the other cosmological parameters of force and mass.

Another way of describing the phenomenon is to say that the age of a universe inhabited by humans cannot be shorter than the age of the shortest-lived star, since the heavier elements of which we are made depend for their formation upon the conversion of a large, short-lived star into a supernova.

The most intriguing part of the picture is the way in which each of the cosmological parameters is delicately poised such that a slight chance would radically alter the nature of the cosmos, perhaps even excluding the possibility of human life. For example, as Henry Simmons[7] describes it in the March/April 1982 issue of *Mosaic,* a slight increase in the gravitational force would make all stars blue giants, producing heavier elements through supernova formation but having a lifetime of only a few tens of millions of years, too brief for the appearance of human life. If the gravitational force were slightly smaller, all stars would be hydrogen-burning dwarfs like our sun. Their lifetimes would be tens of billions of years, ample for the evolution of intelligent life, but there would be no source of the heavier elements essential for life as we know it. Simmons concludes:

> Thus the value of the gravitational coupling seems precisely poised to permit the evolution of a particular universe. This universe must contain short-lived metal-scattering, blue-giant stars; long lived, evenly burning, slowly turning stars such as the sun; and observers.

The same delicate balance is seen in other fundamental physical constants of our universe. The strong force which holds the atomic nucleus together, compensating for the powerful repulsion of the like-charged protons, is necessary for the formation of the heavier elements. A slight weakening and the universe would consist only of hydrogen. Equally narrow limits of variation are essential for electromagnetic force, for the ratio of the masses of the electron and proton, and for the weak force mediating interatomic binding. Dicke has also remarked on the crucial nature of the rate of expansion of the universe as follows:

> If the rate of expansion in the early universe were only one part in 10^{14} smaller, the universe would have recollapsed before it would have formed stars and galaxies. And if this expansion rate were increased very slightly, by only one part in 10^{14}, the universe would expand too rapidly to permit density fluctuations in the early universe to condense into bound systems like galaxies.[8]

It is not difficult to see, in this remarkable ordering of the universe, the hand of a Designer, guiding within precisely narrow limits the direction, magnitude and timing of each event of the universe, from that staggering explosion billions of years ago to the very present. Indeed, as we come closer to the present, to the period of life's origin, we encounter again a remarkable confluence of essential conditions.

The mysteries of the cosmos are not restricted to that first cataclysmic moment. Similar feelings of awe and perplexity are expressed by biologists who have studied mechanisms for the origin of life.

Owen Gingerich, in his Dwight lecture of 1982, has commented superbly on the marvelous way in which the data of science seems to form a rather beautiful panoramic tapestry of grand design. Among the many "vestiges of the designer's hand" to be seen, he chooses the remarkable relationship between the atmosphere of our Earth and the appearance of life.

> From what astronomers have deduced about solar evolution, we believe that the sun was perhaps 25% less luminous several billion years ago. Today, if the solar luminosity dropped by 25%, the oceans would freeze solid to the bottom, and it would take a substantial increase beyond the sun's present luminosity to thaw them out again. Life could not have originated on such a frozen globe, so it seems that the earth's surface never suffered such frigid conditions. As it turns out, there is a very good reason for this. The original atmosphere would surely have consisted of hydrogen, by far the most abundant element in the universe, but this light element would have rapidly escaped, and a secondary atmosphere of carbon dioxide and water vapor would have formed from the outgassing of volcanoes. This secondary atmosphere would have produced a strong greenhouse effect, an effect that might be more readily explained with a locked car parked in the sun on a hot summer day than with a greenhouse. When you open the car, it's like an oven inside. The glass lets in the photons of visible light from the sun. Hot as the interior of the car may seem, it's quite cool compared to the sun's surface, so the reradiation from inside the car is in the infrared. The glass is quite opaque for those longer wavelengths, and because the radiation can't get out, the car heats up inside. Similarly, the carbon dioxide and water vapor partially blocked the reradiation from the early earth, raising its surface temperature above the mean freezing point of water.
>
> As the sun's luminosity rose over the ages, so did the surface

temperature of the earth, and had the atmosphere stayed constant, our planet would now have a runaway greenhouse effect, something like that found on the planet Venus; the earth's oceans would have boiled away, leaving a hot, lifeless globe.

How did our atmosphere change over to oxygen just in the nick of time? Apparently the earliest widely successful life forms on earth were the so-called blue-greens, a single-celled prokaryote, which survive to this day as stromatolites. Evidence for them appears in the Precambrian fossil record of a billion years ago. In the absence of predators, these algae-like organisms covered the oceans, extracting hydrogen from the water and releasing oxygen to the air. Nothing much seems to have happened for over a billion years, which is an interesting counterargument to those who claim intelligent life is the inevitable result whenever life forms. However, about 600 million years ago the oxygen content of the atmosphere rose rapidly, and then a series of events, quite possibly interrelated, took place: 1) eukaryotic cells, that is, cells with their genetic information contained within a nucleus, originated which allowed the invention of sex and the more efficient sharing of genetic material, and hence a more rapid adaptation of life forms to new environments; 2) more complicated organisms breathing oxygen, with its much higher energy yield, developed; and 3) the excess carbon dioxide was converted into limestone in the structure of these creatures, thus making the atmosphere more transparent in the infrared and thereby preventing the oceans from boiling away in a runaway greenhouse effect as the sun brightened. The perfect timing of this complex configuration of circumstances is enough to amaze and bewilder many of my friends who look at all this in purely mechanistic terms—the survival of life on earth seems such a close shave as to border on the miraculous.[9]

Life as we see it on the surface of earth seems not only very tenuous, but also very rare. As we venture out onto the "cosmic sea," we are impressed with how much of it is apparently empty space, devoid of matter and also devoid of life as we know it. Sagan describes our predicament rather gloomily when he writes:

> The Earth is a place. It is by no means the only place. It is not even a typical place. No planet or star or galaxy can be typical, because the Cosmos is mostly empty. The only typical place is within the vast, cold universal vacuum, the everlasting night of intergalactic space, a place so strange and desolate that, by comparison, planets and stars and galaxies seem achingly rare and lovely. If we were randomly inserted into the Cosmos, the chance that we would find ourselves on or near a planet would be less than one in a billion trillion (10^{33}, a one followed by 33 zeroes). In everyday life such odds are called compelling. Worlds are precious.[10]

A View from Space

And even where there are relatively near neighbours, as in our own solar system, such neighbours seem alien and forbidding to us in our search for any life resembling earthly life. Picture yourself on a space craft, Voyager 2, launched from Cape Canaveral in July of 1979. Actually, despite the fact that the satellite is the size of an average living room, it is so full of equipment for power generation and space measurements that you and I can't really squeeze aboard. But let's imagine!

On the thirteenth day of our voyage, we accomplish a "space first" photographing our Earth and Moon together. At day 150 we fire rocket engines briefly for a slight correction of our spiral course. At day 215 we cross the orbit of Mars, our nearest planetary neighbor on this voyage to the outer planets. Mars had shown early promise as another place for life to develop, but the various satellites which have visited it have turned up no evidence for life forms of any recognizable kind. Despite astronomer Percival Lowell's lifelong expectations, based primarily on the so called "Martian canals," and H.G. Wells "War of the Worlds," there are no living creatures on the cold, sandy and boulder-strewn planet we call Mars. And it might be added, looking back over our shoulders, far behind us and much nearer the sun, the planet Venus is also a totally unlikely place for any kind of life we see on Earth.

Day 295 we begin a perilous six-month journey through a large band of asteroids, massive, tumbling boulders sailing by us ominously. Another three months beyond the asteroid belt, we begin to see the massive planet Jupiter clearly, more clearly than with any telescope on earth. It is truly immense, a swirling mass of dense gases and floating clouds, without solid surface or the familiar boundaries between land and sky. Our instruments tell us that the swirling mass is almost totally hydrogen, and that, in the interior, because of the enormous atmospheric pressures, the gas takes on a form unknown to us, liquid metallic hydrogen. And now we can also see clearly the outermost moon of Jupiter, Callisto, displaying an enormous crater from which radiate concentric rings like frozen ripples in a gigantic pond. Next we come to Ganymede, Jupiter's largest moon, with its deeply grooved and mottled icy surface, and then Europa, strangely smooth except for some striations which may be fissures in its thick icy crust. At this point we look for Almathea, an oddly shaped moon and find it part of a ring system which surrounds Jupiter, confirming the observation first made by our sister-ship, Voyager 1, some months previously.

On Day 647 we are directly adjacent Jupiter itself, and the famous Red Spot comes into view. It is like a giant geyser, an enormous column of complex gases forced up from the interior of the planet, a million year old Jovian storm. Next our attention is turned to another moon, called Io, brilliant with patches of red, orange, yellow and black and pocket-marked with the craters of many extinct volcanos. But wait, what is this?! Yes, a volcano actually in the process of eruption, its bright plume outlined against the darker surface and a vast dust cloud, a hundred miles high, surrounding it. Here is another first—the first active volcano ever seen outside of our own Earth! And then on Day 662, feeling the boost from Jupiter's gravity, we reset course and are on our way to Saturn, some 780 days of travel away.

Thus far no planet or moon we have seen holds promise for sustaining life as we know it. Temperatures are too low, and the various atmospheres are devoid of oxygen. Thinking of all we have seen, we are filled with awe at the magnitude of the great planet systems moving with clockwork precision around our sun, and staggered when we contemplate our solar system's place as a tiny pinpoint of matter in the vast universe. In this sense too, the immensity and beauty of what we have seen suggests a new application of the words of Hebrews 12: "...we are compassed about with so great a cloud of witnesses."[11]

On Day 874, we have a brief scare as our guidance system malfunctions—we have lost our fix on the star Canopus! But ground control analyzes the trouble as a brief error of our optical sensors, mistaking Alpha and Beta Centauri for Canopus. Guidance is restored and we breathe more easily! At Day 1350 we begin to see Saturn with its gigantic ring system looming up before us. Before the visit of our sister-ship, Voyager 1, the intricacy of the ring system was only hinted at. Not only do we see the six major rings, but now it seems there is no real break in the continuity between them. Indeed, our photopolarimeter tells us that there are upwards of 100,000 rings in the total system, far more than can be explained in terms of perturbations caused by the twenty or so of Saturn's satellites. As we come in close, at day 1429, we fire retro rockets to slow down to 45,000 miles per hour, the speed of rotation of the outermost ring. We can now see some of the fine structure of the rings, and note that there is a dynamic variation in the density, looking through the rings at the stars of Delta Scorpio. The density variation appears as some form of wave motion, and in the F ring, the innermost ring, the variations take on the appearance of a twisting or braiding of strands or ringlets. Finally, as we veer off from the whirling particles of dust and rock, snowballs and ice clumps, we see the spokes of the B ring, dark striations against the bright ring background. These curious lines extend about half way through the ring in a radial fashion with respect to the planet.

It is not difficult to see, in this remarkable ordering of the universe, the hand of a Designer, guiding within precisely narrow limits the direction, magnitude and timing of each event of the universe, from that staggering explosion billions of years ago to the very present.

Now, we turn our attention to Saturn itself. It is reminiscent of Jupiter; though smaller, it is a vast assemblage of hydrogen and helium, with turbulent winds extending 1,000 miles into its surface. Among its many satellites we see the very prominent Titan, second largest satellite in our Solar System. It is also the most interesting moon from our terrestrial perspective, since the chemistry of Titan may be similar to the primitive earth, a kind of early chapter in our own cosmic history. It looks mysterious, shrowded in clouds, with dark rings around its north pole. Its atmosphere, half the density of ours, is made up mostly of nitrogen and a smaller amount of methane. Its surface temperature is −289°F. There are traces of ethane, acetylene, ethylene and hydrogen cyanide, presumably photochemical products of the sun's action on methane. Perhaps we are looking at another place of the advent of familiar life, but the low temperature resulting from the great distance from the sun makes that very unlikely.

We have come to the end of our journey. At this point we must imagine disembarking from Voyager 2, just as it resets its course for a 1986 encounter with the planet Uranus. We have not gone this way before, so we can only guess at the wonders in the outer reaches of our solar system. But we have gone far enough to know that life as we know it is nowhere else to be found in our solar system. Indeed, worlds are precious!

As for the rest of the cosmos, we can only wonder how many other worlds there are. Sagan has given estimates as high as 100 million, but narrows this drastically when considering technologically sophisticated cultures.

Hearn, in his "Scientist's Psalm," takes a more joyous and optimistic view:

Earth we live on, merely one
Planet of a minor sun:
Join this entire galaxy
Showing forth His majesty!

Beyond our own galactic rim,
Billions more are praising Him.
Ten to some gigantic power
Times the height of Babel's tower.

Past the range of telescope:
God of Faith and Love and Hope.
Praise Him every tongue and race!
Even those in outer space!

Selah[12]

Gingerich takes an opposite but still reverent viewpoint, noting the "narrow window" for the advent of life on our planet and suggesting the possibility that we are alone in the cosmos, a unique production of the Designer.

Observer Participation in The Cosmos

Other scientists, taking a more anthropomorphic viewpoint, have explored the possibility that something intrinsic in the presence of intelligent life—in "observer-participation"—actually serves as a moving force in the cosmos. In a 1973 conference at Cracow, Brandon Carter[13] extrapolated from the anthropic principle to suggest that not only do the conditions prerequisite to human existence sharply constrain the range of possible observable universes, but the fundamental properties of force, space and time are actually constrained to incorporate the evolution of intelligent observers. John Wheeler of the University of Texas, in the 1979 Einstein Centennial at Princeton, spoke of this universe-observer interaction in analogy to the way the delayed-choice experiment is carried out in quantum mechanics.[14] According to Henry Simmons,[15] delayed-choice experiments in quantum physics involve an arbitrary decision on the part of the observer, while the experiment is still in progress, to observe the properties of electrons, photons or other quantum entities in either a wave-like or a particle-like manner. Wheeler describes the universe, based on this analogy, as follows:

> Beginning with the Big Bang, the universe expands and cools. After eons of dynamic development, it gives rise to observership. Acts of observer-participance—via the mechanism of the delayed-choice experiment—in turn give tangible reality to the universe not only now but back to the beginning. To speak of the universe as a self-excited circuit is to imply once more a participatory universe.

Other possible universes, if they lacked participatory observers, would in Wheeler's view be "stillborn." Carr and Rees, in a 1979 review article in *Nature*,[16] elaborate on Wheeler's work as follows:

> Wheeler envisages an infinite ensemble of universes, all with different coupling constants and so on. Most are 'stillborn,' in the sense that the prevailing physical laws do not allow anything interesting to happen in them; only those which start off with the right constants can ever become "aware of themselves."

Also present at the 1979 Einstein Centennial was physicist Freeman Dyson of the Institute of Advanced Studies at Princeton. His summary of the ideas of the anthropic principle is most lucid and searching:

> The idea of observer-participance is for Wheeler central to the understanding of nature. Observer-participance means that the universe must have built into it from the beginning the potentiality for containing observers. Without observers, there is no existence. The activity of observers in the remote future is foreshadowed in the remote past and guides the development of the universe throughout its history. The laws of physics evolve from initial chaos into the rigid structure of quantum mechanics because observers require a rigid structure for their operations. All this sounds to a contemporary physicist vague and mystical. But we should have learned by now that ideas that appear at first sight to be vague and mystical sometimes turn out to be true.
>
> Wheeler is building on the work of Bob Dicke and Brandon Carter, who were the first to point out that the laws of physics and cosmology are constrained by the requirement that the universe should provide a home for theoretical physicists. Brandon Carter has shown that the existence of a long-lived star such as the sun, giving steady warmth to allow the slow evolution of life and intelligence, is only possible if the numerical constants of physics have values lying in a restricted range. Carter calls the requirement that the universe be capable of breeding physicists the "anthropic principle." Dicke and Carter have used the anthropic principle to set quantitative limits to the structure of the universe. Wheeler carries their idea much further, conjecturing that the laws of nature are not only quantitatively constrained but qualitatively molded by the existence of observers.
>
> Wheeler united two streams of thought that had before been separate. On the one hand, in the domain of astronomy and cosmology, the anthropic principle of Dicke and Carter constrains the structure of the universe. On the other hand, in the domain of atomic physics, the laws of quantum mechanics take explicitly into account the fact that atomic systems cannot be described independently of the experimental apparatus by which they are observed in atomic physics; the reaction of the process of observation upon the object observed is an essential part of the description of the object.[17]

One wonders, at this juncture of the "material" universe and the observer function of intelligent beings, just where all our exploration will lead. Are we product or cause—or is all this explained by a vastly higher intelligence that has designed it all?! I choose to think the latter, but hasten to add that He has much more for us to know. We can joyously join with Pascal when he says:

> By space the universe encompasses and swallows me up like a dot; by thought I encompass the universe.[18]

Complexity in the Infinitesimal

As our knowledge of the cosmos has grown, we have been increasingly confronted with staggering levels of order and immensity, a surprising correspondence between scientific and theological views, and of exquisite preparation for the advent of intelligent life which can only be attributable to a Designer. In a sense, we have entered into the thought of the Designer, perhaps as a part of our legacy as His creation, as a part of our *imago Dei*. The beautiful song by Georgiana West states it this way. "I am God's melody of life; He sings His song through me. I am God's rhythm and harmony. He sings His songs through me."

One is impressed with the enormous complexity and intricate interaction of the cells which make up the nervous system.

The process of human evolution especially at the level of the contemplation of who we are and how we come to be here, has been called by philosophers the most profound question. There are those, like Jacques Monod, who see no special significance in the evolution of man, for, he says, we came as did the rest of the biosphere, "solely by chance."[19] But Arthur Peacocke impugns this as "false modesty, verging on intellectual perversity," suggesting, along with Polanyi, Eccles, and others that the understanding of our own evolution is the most important problem confronting evolutionary theory.[20]

This process of understanding our evolution has recently become a concern of biological scientists interested in the thought process itself, at the level of the intricate details of the function of the human brain. Here again one is impressed with the enormous complexity and intricate interaction of the cells which make up the nervous system. Anatomist Gareth Jones[21] tells us that the cerebral cortex contains $10^{10} - 10^{14}$ nerve cells, at least 10 times the human population on earth. Most nerve cells contact upwards of 5,000 other nerve cells through what are called synaptic junctions, with the information being transferred undergoing modification at each junction. The "connectedness" of brain cells is one of the most astounding phenomena yet encountered at the microscopic level. Indeed, the number of connections within one human brain rivals the number of stars in the universe!

As an example of this awesome "universe within," Gunther Stent describes for us the workings of the visual cortex in its interaction with the human eye as follows:

> . . .information about the world reaches the brain, not as raw data but as highly processed structures that are generated by a set of stepwise, preconscious informational transformations of the sensory input. . ." which "proceed according to a program" that preexists in the brain." "Transformation [of the light rays entering the eye] begins in the retina in the back of the eye. There a two-dimensional array of about a hundred million primary light receptor cells—the rods and the cones—converts the radiant energy of the image projected via the lens on the retina into a pattern of electrical signals, much as a television camera does. Since the electrical responses of each light receptor cell depends on the intensity of light that happens to fall on it, the overall activity pattern of the light receptor cell array represents the light intensity existing at a hundred million different points in the visual space. The retina not only contains the input part of the visual sense, however, but also performs the first stage of the abstraction process. This first stage is carried out by another two-dimensional array of nerve cells, namely the million or so ganglion cells. The ganglion cells receive the electrical signals generated by the hundred million light receptor cells and subject them to information processing. The result of this processing is that the activity pattern of the ganglion cells constitutes a more abstract representation of the visual space than the activity pattern of the light receptor cells. Instead of reporting the light intensity existing at a single point in the visual space, each ganglion cell signals the light-dark contrast which exists between the center and the edge of a circular receptive field in the visual space, with each receptive field consisting of about a hundred contiguous points monitored by individual light receptor cells. In this way, the point-by-point, fine-grained light intensity information is boiled down to a somewhat coarser field-by-field light contrast representation. As can be readily appreciated, such light contrast information is essential for the recognition of shapes and forms in space, or visual perception.
>
> For the next stage of processing the visual information leaves the retina via the nerve fibers of the ganglion cells. These fibers connect the eye with the brain, and after passing a way station in the forebrain the output signals of the ganglion cells reach the cerebral cortex at the lower back of the head. Here the signals converge on a set of cortical nerve cells. Study of the cortical nerve cells receiving the partially abstracted visual input has shown that each of them responds only to light rays reaching the eye from a limited set of contiguous points in the visual space. But the structure of the receptive fields of these cortical nerve cells is more complicated and their size is larger than that of the receptive fields of the retinal ganglion cells. Instead of representing the light-dark contrast existing between the center and the edge of circular receptive fields, the cortical nerve cells signal the contrast which exists along straight line edges whose length amounts to many diameters of the circular ganglion cell receptive fields. A given cortical cell becomes active if a straight line edge of a particular orientation—horizontal, vertical, or oblique—formed by the border of contiguous areas of high and low light intensity is present in its receptive field. For instance, a vertical bar of light on a dark background in some part of the visual field may produce a vigorous response in a particular cortical nerve cell, and that response will cease if the bar is tilted away from the vertical or moved outside the receptive field. Thus the process of abstraction of the visual input begun in the retina is carried to higher levels in the cerebral cortex. At the first cortical abstraction stage the data supplied by the retinal ganglion cells concerning the light-dark contrast within small circular receptive fields are transformed into the more abstract data structure of contrast present along sets of circular fields arranged in straight lines.[22]

The exquisite "connectedness" which this relatively simple sensory process displays draws us back again to the question of design, of purpose and plan; of "pre-existing programs," as Stent calls it.

Indeed, it would seem that, at every level in the cosmos, whether the astronomical ordering of light to stars to supernova, or the microscopic cellular abstraction and transformation in the brain or the delicate balance of the subatomic strong force holding atomic nuclei together, the hand of the great Designer is far easier to see than to ignore. Perhaps it is supposed to be this way, at least for "those who see," and "take off their shoes."

NOTES

[1]Romans 1:20. *Holy Bible*, New International Version.
[2]Elizabeth Barrett Browning, *Complete Poetical Works of Elizabeth B. Browning, Book VII*, Houghton Mifflin, Boston, 1900.
[3]Carl Sagan, *Cosmos*, Random House, New York, 1980, p. 5.
[4]Owen Gingerich, Dwight Lecture, University Pennsylvania, April 6, 1982.
[5]Sagan, p. 4.
[6]George Gale, "The Anthropic Principle," *Scientific American*, Vol. 245, p. 2, 1981.
[7]Henry Simmons, "Redefining the Universe," *Mosaic*, March/April, 1982, p. 18.
[8]Ibid.
[9]Gingerich.
[10]Sagan, p. 5.
[11]Hebrews 12:1, *Holy Bible*, King James Version.
[12]Walter Hearn, "Scientist's Psalm," *HIS Magazine*, InterVarsity Christian Fellowship, 1963.
[13]Brandon Carter, paper delivered at Cracow Conference, 1973, referred to in Simmons, *Mosaic*, March/April, 1982, p. 16.
[14]John Wheeler, paper delivered at Einstein Centennial, Princeton, 1979, referred to in Simmons, *Mosaic*, March/April, 1982, p. 19.
[15]Simmons, p. 19.
[16]B.J. Carr and M.J. Rees, *Nature*, April 12, 1979.
[17]Freeman Dyson, paper delivered at Einstein Centennial, Princeton, 1979, referred to in Simmons, *Mosaic*, March/April, 1982, p. 20.
[18]B. Pascal, *Pensees*, No. 265.
[19]Jacques Monod, *Chance and Necessity*, Vintage Books, New York, 1972, p. 59.
[20]Arthur Peacocke, "Chance, Potentiality and God" in *Beyond Chance and Necessity*, C.J. Lewis, ed., Humanities Press, New Jersey, 1974, p. 20.
[21]D. Gareth Jones, "Our Fragile Brains" InterVarsity Press, Downers Grove, IL 1980.
[22]Gunther Stent, "The Promise of Structuralist Ethics," *The Hastings Center Report*, Vol. 6, pp. 37-38, 1976.

The Anthropic Principle: A Religious Response

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A short review is given of many cosmological data that have been labeled "anthropic", in that they can be interpreted as a consequence of human observers being indispensable parts of the macrophysical world. Two interpretations of anthropic data are discussed in detail: The standard one called The Anthropic Principle *and an equivalent Biblical, theistic interpretation called* The Theistic Principle *(based on an evaluation of all human experience).* The Theistic Principle *provides a perspective on the rich complexity of Biblical and physical revelation and their interactions. This perspective reveals a comprehensive coherence; an internal consistency, i.e. inner simplicity; and a fruitfulness that can even lead to successful predictions. Both forms of revelation in our Universe, Biblical experience and natural experience, can illuminate each other by providing insights which lead to greater understanding. Together they point beyond themselves to the transcendent, Creator-Redeemer God who continually holds this Universe in being thereby making it a "fit habitat" for all human observers who uniquely are made in His image.*

Ever since Nicolaus Copernicus began to circulate drafts of his theory of a heliocentric solar system in the early 1500's, modern science has been influenced partly by the Copernican conviction that the earth and its inhabitants are not singled out as special beings in the Universe. Copernicus had forcefully shown that the earth was a typical rather than a unique piece of the Universe and this *Copernican Principle* was found useful in guiding future astronomical explorations. But today in the words of Paul Davies "something strange, it seems, is happening to the Universe. In the words of British astronomer Fred Hoyle, it is as though somebody had been 'monkeying around' with the laws of nature. And not only Hoyle but an increasing number of other scientists are baffled by a string of apparent 'accidents' and 'coincidences' so long that they cannot be dismissed."[1] Indeed it has been discovered "that many of the familiar structures of the physical world—atoms, stars, galaxies, and life itself—are remarkably sensitive to the precise form in which the fundamental laws of physics manifest themselves. So sensitive are they that the slightest shift in nature's parameters would bring about a catastrophic change in the organization of the cosmos. It seems as though somebody has fine-tuned nature's numbers to make the Universe"[2] uniquely suited as a habitat for intelligent human observers.

As a result of this growing body of evidence a number of prominent astronomers, cosmologists, and physicists are challenging the Copernican perspective of the Universe. They have reintroduced into cosmology an *anthropic* perspective that views certain features of the Universe, i.e. its size, as very dependent upon the awareness of man. In other words the fact that the real universe harbors intelligent observers places constraints on the diversity of physical laws and parameters that have governed the Universe's development. These scientists postulate a Copernican universe whose nature is constrained by observers. The conjecture that certain features

of the Universe are determined by the existence of observers has become known as "*the Anthropic Principle*".

Anthropic Evidence

Let us briefly examine some of the evidence for the many "coincidences" that modern cosmological research has uncovered. A portion of this evidence is summarized nicely as follows in the fine review article of Henry T. Simmons:

1. The coupling strength of the gravitational force . . . is so delicately poised that a slight change would alter radically the nature of the cosmos. To some scholars this shift would rule out the possibility of intelligent observers. If the gravitational force were slightly greater, all the stars would be blue giants. Such stars manufacture the elements heavier than iron essential to all life on earth and scatter them into supernova explosions. But the lifetime of blue giants is only a few tens of millions of years, probably too short for planetary life to evolve and far too short for the evolution of intelligent observers. . . .

   But if the gravitational force were slightly smaller, all stars would be hydrogen-burning dwarfs, like the sun. Their lifetime would be many tens of billions of years. This allows ample time for any evolution that might occur. But such a universe would be devoid of the essential-to-life elements heavier than iron.

   Thus the value of the gravitational coupling seems precisely poised to permit the evolution of a particular universe. This universe must contain short-lived metal-scattering blue giant stars; long-lived, evenly burning, slowly turning stars such as the sun; and observers.

2. There is a similar delicate balance between the strong force that binds the nuclei of atoms together against the enormous repulsion of their like-charged protons. If the strong force were slightly weaker, multi-proton nuclei could not hold together and only hydrogen could exist in the Universe; if slightly stronger, nuclei of almost unlimited size might exist. Similar small changes in the value of the electromagnetic coupling constant or in the ratio of the mass of the electron to that of the proton would block any conceivable kind of chemistry.

   The weak force also plays a critical role. "If the weak-interaction coupling constant were slightly smaller or larger . . . helium production would be either 100 per cent or zero," observe Bernard Carr and Martin Rees of Cambridge University. In one case there would be no water, in the other an entirely variant stellar evolution.

3. Additionally, the expansion rate observed in the Universe today is very close to the critical value necessary to achieve an open, flat, or infinitely expanding universe. . . . Princeton physicist Robert Dicke notes that this flatness is crucial for its evolution. "If the rate of expansion in the early Universe were only one part in 10^{14} smaller," he observes, "the Universe would have recollapsed before it would have formed stars and galaxies. And if this expansion rate were increased very slightly by only one part in 10^{14}, the Universe would expand too rapidly to permit density fluctuations in the early Universe to condense into bound systems like galaxies. And "since it would seem that the existence of galaxies is a necessary condition for the development of intelligent life, the answer to the question 'Why is the Universe isotropic?' is 'because we are here.'"[3]

These "seeming coincidences" and others provide the chief evidence for what has become known as *the Anthropic Principle*, which states that the laws and parameters that describe the physical universe may be "explained" by the existence of intelligent observers in that universe. Note that the important point of the evidence is not that there are many coincidences *but that all these "seeming coincidences"* are just what is required for life, i.e. intelligent observers to exist. The present validity of *the Anthropic Principle* as an explanatory principle depends strongly on the number of striking coincidences. Its future status is thereby tied to the "number of further anthropic relations which are discovered or, better still, predicted and then discovered." The scientists who object most strongly to using it as an explanatory principle of cosmology quite rightly point out that to date the anthropic approach is essentially retrodictive and *post hoc*. However it has made one striking prediction and this has given skeptics reason to reconsider their objection, for its existence meets one important test of a scientific theory, i.e. *predictive power*. It can be argued that the anthropic approach can be formulated in such a way as to favorably pass the other two criteria for judging the validity of any scientific theory, namely *comprehensiveness* and *simplicity*.[4]

As a result of this growing body of evidence a number of prominent astronomers, cosmologists, and physicists are challenging the Copernican perspective of the Universe.

Henry T. Simmons nicely summarizes the details of *the Anthropic Principle's* one predictive triumph in the following extended quote:

> The triumph occurred in the early 1950s, before scientists fully understood how the elements of the periodic table are manufactured by nucleosynthetic processes in stars. The original Big Bang theory, advanced by George Gamow, Ralph Alpher, and Robert Herman in 1948, postulated that all the chemical elements were manufactured in the original fireball. But there was a major obstacle: There are no stable nuclei with atomic masses of five or eight; the ladder is missing rungs.
>
> It was easy to see that protons—atomic mass: one could capture neutrons—also one—and form deuterons-atomic mass: two—and that collisions of deuterons would produce nuclei of atomic mass four, like those of helium. But the gaps at atomic masses five and eight would have prevented further buildup of elements in the fireball. For the buildup to occur, nuclei of those missing mass numbers had to have been produced, either by the addition of a single neutron to the helium nucleus to form lithium 5, or by the fusion of a pair of helium nuclei into beryllium 8.

It was British cosmologist Fred Hoyle who found a way around this roadblock in 1953. While lithium 5 and beryllium 8 are unstable, they can be produced as brief resonances. Although their lifetimes would be too short in the low-density fireball to enable them to fuse into larger, stable structures before they decay, the conditions obtaining in the dense cores of very hot, helium-rich stars are far different. In the case of the mass-8 barrier, Hoyle showed that collisions between helium nuclei are frequent, and the carbon 12 nucleus "wants" so desperately to come into being that a third helium nucleus has a good chance of fusing with beryllium 8 before the unstable beryllium can fracture into a pair of heliums. The result of that threefold union is a 12-baryon nucleus (12-atomic-mass nucleus, parenthesis mine) of carbon. And once carbon is formed, the process of helium fusion can go on to build elements all the way up to iron.

Nowhere in Hoyle's paper did he ever conjure the anthropic condition. Nonetheless, his predictive insight is regarded as an anthropic keystone, the bridge to carbon that had to exist if Dicke's observer-physicists were to be.

"Beryllium 8 was the really big stumbling block," recalls Dicke. "You could visualize universes in which the barrier (was not) crossed, for example, by adjusting the values of the strong and electromagnetic coupling constants. From the anthropic point of view, you would still have a universe, but we would not be here. But since we are here, it was obvious that nature had to cross the barrier in some way."[5]

Interpretations of "Anthropic" Evidence

After this brief review of the evidence for *the Anthropic Principle* let us consider an argument of the noted astrophysicist, Edward R. Harrison, concerning the most common formulation of this principle and also an alternative but equally valid interpretation of this evidence. Harrison envisions that not just one but an ensemble of physical universes exist and that each is self-contained and unaffected by the rest (the ensemble of physical universes is a conceptual framework borrowed from the Wheeler-Everitt "many-worlds" interpretation of the quantum-mechanical formation which is one possible, but not necessarily superior formulation of quantum theory, as its critics have pointed out).[6] In this real ensemble of universes, only our Universe and perhaps others closely similar contain living creatures, i.e., intelligent observers. "Life exists in one universe at least—and we occupy that Universe. Our existence determines the design of our Universe. This is *the Anthropic Principle* that has been expressed in different ways by Robert Dicke, Brandon Carter and John Wheeler. . . .

"The second interpretation is that a Creator has designed our finely tuned Universe specifically for the containment of life. This is *the Theistic Principle* as elaborated in mythology and theology. All other previously imagined universes may now be discarded. They serve merely as convenient fictions enabling us to realize that our Universe is finely tuned for habitation by life."[7]

Thus we have two contrasting perspectives on *the Anthropic Principle's* chief thrust that much scientific evidence indicates that the Universe that we live in is peculiarly suited to the production of life. The same scientific evidence indicates the probability of this Universe randomly organizing itself to produce life is nearly zero. As has been pointed out by John Leslie,[8] if there exist many other, not yet detected lifeless universes, the existence of one life-producing Universe among the many lifeless members of the ensemble would not be so surprising.

On the other hand the other perspective, that there is a God who fashioned this Universe to uniquely fit intelligent observers, also has merit as a worthwhile explanation, particularly if it is considered in conjunction with the total religious experience of the Judeo-Christian tradition, (i.e. the many historical events of the Old and New Testaments which Biblical theology sees as evidence of a personal God acting in the concrete events of history to redeem a people meant to be "servants of peace to all the Nations"). In any event it is worth noting that Leslie argues that the God hypothesis as contrasted to the many-universes interpretation is superior on the grounds of explanatory simplicity. It should also be noted that Leslie's theistic interpretation of *the Anthropic Principle* in no way requires that God be personal in nature. Arguments for the existence of a personal-infinite God are properly framed only in the context of the *totality* of *human experience;* scientific and religious experiences being complementary components of that totality. Note that the possibility that a purposeful God may reveal Himself in concrete historical events and through inspired prophets (who interpret such events) should not be ruled out of consideration because of scientistic (or positivistic) biases.

Figures 1 and 2 are schematic representations of the two perspectives on possible "design" being present in physical

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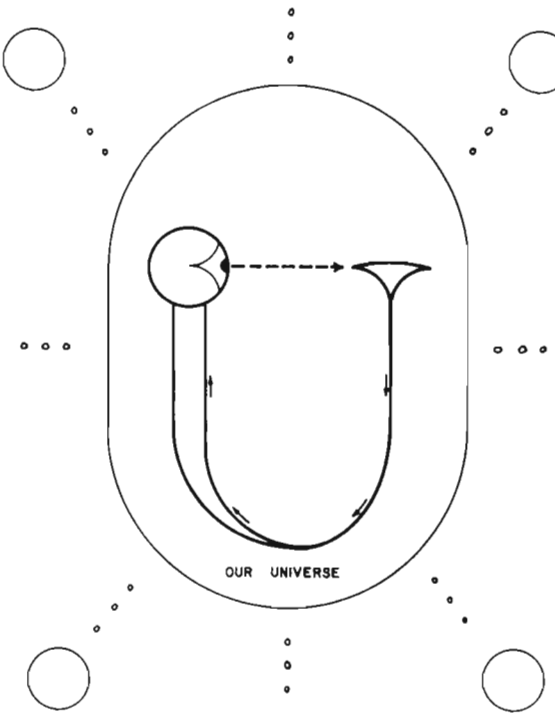

Figure 1. The Wheeler Interpretation of the Anthropic Principle.

An *ensemble* of physical universes exists each being self contained and unaffected by all the rest. We exist in only one of these universes which according to Wheeler is a "self-excited system brought into being by 'self-reference.' The Universe gives birth to communicating participators. Communicating participators give meaning to the Universe. . . ."[17] Thus the Universe is "viewed as a 'self-excited circuit.' The Universe, symbolized by the letter U, starts small at the big bang (upper right), grows in size, gives rise to life and observers and observing equipment. The observing equipment, in turn, through the elementary quantum processes that terminate on it, takes part in giving a tangible 'reality' to events that occurred long before there was any life anywhere."[18]

reality, the standard *Anthropic Principle* (Wheeler's version) and a *Biblical, Theistic Principle* (as formulated herein by a representative of the evangelical, Judeo-Christian community).

The complexity of figure 2 as compared to figure 1 is due to the fact that it attempts to do justice to the totality and richness of the whole of human experience including religious experience. From this standpoint I would argue it is more reasonable than the interpretation of figure 1 as it provides a *comprehensive* and *simple explanatory schema* of the open-endedness of our physical Universe, truly not a chaos but a cosmos, whose rich order in its totality has a deep personal character; as an example the Universe in its law-structures is utterly faithful and dependable. Lastly, concerning figure 2, let me as a Christian note that God's Revelation through His mighty acts in history and the great order found in created, physical reality are not independent of each other for truths found in one "Bible" can often illuminate the other. As an example, the God revealed in the Old and New Testaments is utterly faithful and reliable in His dealings with persons and the rest of His creation; He sets bounds and maintains covenants with all His creation. Therefore, is it not reasonable for humans made in the Creator-God's image to look for regularities inherent to physical phenomena that can be described in a rational way? Figure 2 portrays the interaction of Biblical Revelation (and the Biblical theology developed to understand and apply its enduring truth to changing cultures) and the "Bible of Nature"—all of physical reality including human observers (and the science developed to understand it); both "Bibles" point beyond themselves to the transcendent, Creator-God who holds both forms of revelation continually in being. Hence Biblical theology and science are not unrelated to one another, for as Thomas F. Torrance points out:

> . . . All this is again consistent with the recognition that, since the Word of God by whom all things were made and continue to be made became incarnate within the contingent, rational structures of space and time, within which theological science (I would prefer to say Biblical theology, parenthesis mine) and natural science alike pursue their inquiries, there must be a closer connection between the concepts employed by theological science and natural science than is often realized, even when we take into account the necessary change in meaning that theological concepts involve in accordance with the nature of their divine Object.[9]

Let me summarize this discussion of the *Biblical, Theistic Principle* by pointing out that its integration of Biblical Revelation and the revelation of physical reality can result in a better understanding of both aspects of the Universe. Indeed it provides a perspective from which we have discovered in the rich complexity of both forms of revelation and their interactions a comprehensive coherence; an internal consistency, i.e. inner simplicity; and a fruitfulness that can even lead to successful prediction.[10] The recent history of cosmology provides a striking example of how this fruitfulness manifests itself. Biblical Revelation clearly states that the Universe (as we now know it) both spatially and temporally had a beginning; it was *in the beginning* brought into being by God—its Creator and Redeemer. Indeed only as one responds openly to God's gracious, redemptive activity toward one's fallen human mind can one adequately come to grips with and better understand the deeper unity that is revealed as Biblical Revelation and the revelation of physical reality mutually illumine and modify one another. Even Christians trained in the sciences are still fallen sinners saved by God's grace alone; accordingly, let us never forget that all partial but true insights into the nature of God's Creation are a consequence of *both* God's Creative and Redeeming activities toward reality, and human knowledge of it. It is helpful in all discussions concerning the integration of Christian theology and science not to divide the knowledge of God as Creator from knowledge of Him as Redeemer. (For further comments concerning God as Creator-Redeemer see David L. Mueller, *Karl Barth*, Word Books, Texas, 1972, pp. 90–91.)

Biblically the specific physico-chemical mechanisms of the Universe's ultimate beginning are not "spelled-out" since the primary purpose of the Revelation is theological; the *Who* and *Why* aspects of God's activity are stressed, not the *How* aspects. Nevertheless such Biblical Revelation does illuminate

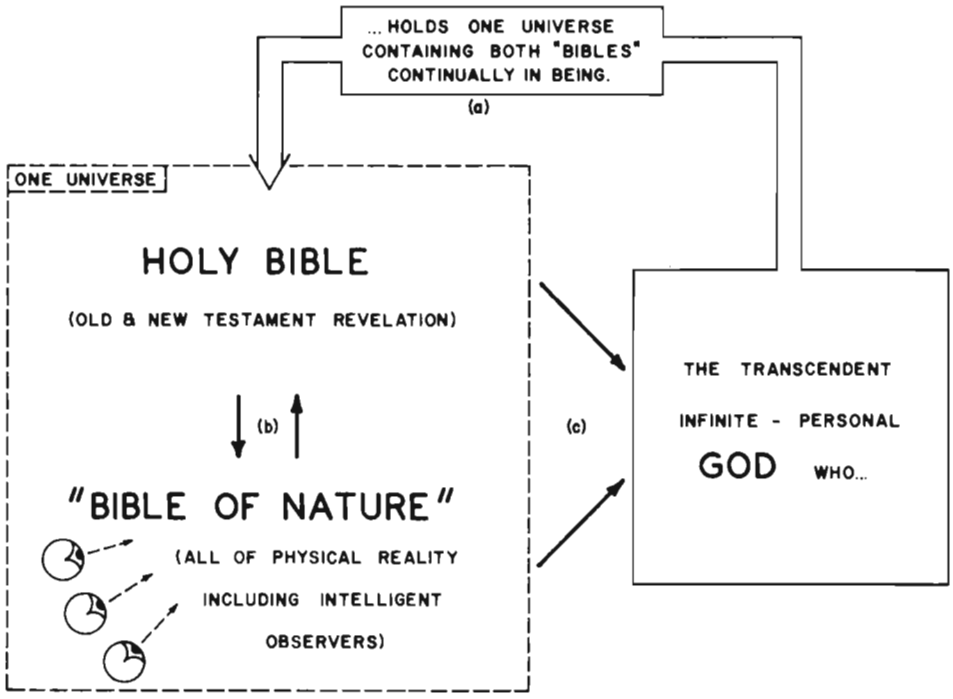

Figure 2. A Biblical, Theistic Interpretation of the Anthropic "Accidents" and "Coincidences."

One Universe exists continually held in being (a) by a transcendent, infinite-personal God who has revealed Himself to the intelligent inhabitants of that Universe, i.e. observers, by two kinds of revelation:

(1) The Holy Bible, a written, historical record of God's concrete actions in preparing a "chosen people" to become His instrument in bringing peace to all human observers. The Scriptures with the aid of God's counseling Spirit is thus a *conduit* of divine truth. Furthermore God has guided and continues to guide the Church (the community of believers) in preserving it through many human translations as a faithful and trustworthy guide to faith and conduct.

(2) The "Bible of Nature" as Francis Bacon described all of physical reality—the Universe we live in including ourselves as human observers of it. The Reformed theologians referred to the "light" (understanding) we receive from physical reality as *General Revelation* as contrasted to scriptural "light" as *Special Revelation*.

The great order and regularity present in both "Bibles" reveals itself in appropriate degrees to all human observers made in God's image who are sufficiently humble to be truly open in their explorations of the deep law-structures hidden beneath the exterior appearances of both forms of Revelation ("God does not wear His heart on his sleeve" and "God is very deep but never, never malicious"[9]). The insights observers "glean" from both "Bibles" shed light on each other (b) and both components of the one Universe point beyond themselves (c) to the transcendent, personal-infinite God who holds the one Universe containing both "Bibles" in continual being (a). Note that this Biblical, theistic perspective might be looked upon as a "closed loop" (in the Cybernetic sense) but only if it is clearly recognized that such a representation is a very imperfect analogy of the transcendent, Creator-Redeemer God's activity in continually maintaining the dynamic structure of the Universe. The "loop" is really never "closed" in that it contains the transcendent, openness of Yahweh, the living God.

our search for a scientific understanding of origins in that it makes certain types of scientific cosmologies highly unlikely, i.e. *steady-state* cosmologies. Indeed the weight of recent astrophysical evidence is strongly against such cosmologies[11] with their lack of a definite beginning and inconsistency with well-established physical laws, i.e. conservation of mass-energy. It is worth noting that only religious perspectives very foreign to Judeo-Christian Revelation can provide a meta-scientific framework congenial to such cosmologies.[12]

In summary both Biblical Revelation and natural science perceive the Universe's origin to be a contingent, singular (unique) event very different from the universal, timeless and necessary "truths" speculated about in some modern (and ancient) formulations of cosmology. Both revelations beautifully reinforce the notion that any proper understanding of cosmology has to do with what Stanley L. Jaki and Thomas F. Torrance call "the coherent singularity of the Cosmos" (Stanley L. Jaki, *Cosmos and Creator*, Scottish Academic Press, Edinburgh, 1980; Thomas F. Torrance, *Divine and Contingent Order*, Oxford University Press, New York, 1981).

It should be noted that neither the standard *Anthropic Principle* nor its *Theistic* version fits the deductive mode of reasoning that has long been characteristic of much scientific cosmology. A deductive cosmology begins by specifying the initial conditions of the universe and the laws of nature that apply to it; the cosmology then predicts the subsequent evolution of the universe. The *Anthropic Principle* or its *Theistic* counterpart has been invoked in cosmology precisely

because the deductive method cannot readily be applied there. "The initial conditions of the universe are not known, and the physical laws that operate early in its history are also uncertain; the laws may even depend upon the initial conditions. Indeed, perhaps the only constraint that can be imposed on a theory reconstructing the initial conditions of the universe and the corresponding laws of nature is the requirement that those conditions and laws give rise to an inhabited universe."[13] Rather than thinking of the *Anthropic* or *Theistic Principle* as a statement of scientific theory in the usual narrow sense, I would prefer to think of it as a meta-scientific statement that provides guidance, motivation, and meaning to our attempts to explore a physical reality where human observers are truly important not just because of physical attributes. For all human physical attributes are dwarfed by the immensity and complexity of the physical cosmos; the uniqueness of humanity lies rather in our ability to be truly aware of the cosmos in which we are engulfed. We use our human rationality to explore the complexity and richness of the law-structures that indeed describe all the physical cosmos which, in turn, points beyond itself toward a transcendent order which Heisenberg termed "the Central Order."[14] It is indeed interesting to note that both the major religions and modern science testify to the uniqueness of man (male and female) as a truly self-aware creature who is capable of discovering "hidden" order embedded in all the physical universe in which he or she is immersed; therefore is it so surprising to discover evidence in the physical universe that indicates it is indeed "designed" as a fit habitat for intelligent observers? Perhaps the best overall evaluation of the *Anthropic Principle* at this time has been given by Simmons under the title of *The Elevated Observer:*

> In their review in *Nature* of the coincidences supporting the anthropic principle, Carr and Rees marshalled an impressive array of coincidental relationships between the dimensionless numbers and the structure of the universe from the smallest to the largest scales. But sympathetic as they are to the anthropic explanation, they acknowledge its deficiencies: It is almost entirely *post hoc;* it is based on what many regard as an unduly anthropocentric concept of an observer, in that it demands elements heavier than hydrogen and helium, water, galaxies, and special types of stars and planets. 'It is conceivable that some form of intelligence could exist without all of these features—thermodynamic disequilibrium is perhaps the only prerequisite that we can demand with real conviction,' noted Carr and Rees. Further, the anthropic view does not explain the exact values of the various coupling constants and mass ratios, only their order of magnitudes.
>
> Moreover, the two scientists acknowledged that it may someday be possible to explain, with some as yet unformulated super-symmetry theory that includes gravity, all the things that still appear mysterious and coincidental in relation to their necessity for human existence. 'However,' they declared, 'even if all apparently anthropic coincidences could be explained this way, it would still be remarkable that the relationships dictated by physical theory happened also to be those propitious for life.'
>
> And there is another thing. Even if all the coincidences are finally snuffed out by some supergrand unification, what effect if any will the anthropic conjecture have on human perception of human relationships to the universe? Cosmologists John D. Barrow and Joseph Silk offer this thought: "Whatever the scientific status of the anthropic cosmological principle may be, its impact on the history of ideas may be significant. The principle overcomes the barrier between the observer and the observed. It makes the observer an indispensable part of the macro-physical world."[15]

The integration of Biblical Revelation and the revelation of physical reality can result in a better understanding of both aspects of the Universe.

If the "observer" is indeed "an indispensable part of the macrophysical world" and Biblical Revelation is also a valid part of that world, I would argue that the *Extended Theistic Principle* presented in this paper represents a comprehensive integration of the "anthropic evidence" and Biblical Revelation. But this latter principle will only be accepted as knowledge in communities that acknowledge the validity of all experience, including religious experience, and that, furthermore, perceive all reality to be open-ended in structure always pointing beyond to a transcendent order that provides its meaning. Such is the very nature of all knowledge, which as Michael Polanyi has ably shown is inescapably *personal* in character; knowledge cannot exist independent of communities of knowers.[16]

The author wishes to thank Enrico Cantore, Stanley L. Jaki, Thomas F. Torrance, Boris Kuharetz, and Robert L. Herrmann for a number of stimulating discussions on the topics of this paper. Any misunderstandings in this essay are, of course, my sole responsibility and not theirs.

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meaning see Enrico Cantore, *Scientific Man—The Humanistic Significance of Science*, ISH Publications, New York, 1977, pp. 289–329.
15. Simmons, *Op. Cit.*, p. 22.
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18. John Archibald Wheeler: "Bohr, Einstein, and the Strange Lesson of the Quantum;" in *Mind in Nature*; edited by Richard Q. Elvee, Harper and Row Publishers; New York, 1981, p. 18.
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Annotated Selected Bibliography on the Anthropic Principle

Part A

This material is intended for the general reader. The author and nature of each work is briefly described.

Carr, B.J., "On the Origin, Evolution and Purpose of the Physical Universe," *The Irish Astronomical Journal*, Vol. 15, #3, March, 1982, pp. 237–253.

A British Astrophysicist who was one of the first to recognize that much physical evidence linking the large and small scale structures of the universe could be related to the existence of intelligent observers. This article is a detailed overview of the "anthropic evidence" and possible interpretations. Accessible to the general reader.

Davies, Paul, "The Anthropic Principle," *Science Digest*, Vol. 91, #10, Oct., 1983, p. 27.

This article is a short, popular and very readable introduction to the Anthropic Principle by a well known British astrophysicist who has written many popularized accounts of modern physics (relativity, quantum theory and cosmology). He is not sympathetic to the Judeo-Christian concept of a personal-infinite God whose creative activity holds the Universe continually in being.

Gale, George, "The Anthropic Principle," *Scientific American*, Vol. 245, #6, Dec., 1981, pp. 154–171.

This article is a good popular introduction to the "anthropic evidence" and anthropic interpretation stressing possible philosophical implications in the context the current understanding of the nature of science. The author is an American philosopher of science.

Harrison, Edward R., *Cosmology—The Science of the Universe*, Cambridge Univ. Press, N.Y., 1981, pp 111–113 ("Anthropic & Theistic Principles").

The author, an American astrophysicist, has written this excellent textbook in cosmology that emphasizes understanding of physical concepts, mathematical analysis being kept to a minimum. It has a good, short discussion of the "anthropic evidence" and anthropic and theistic interpretations. This book is highly recommended. It is used at many good liberal arts colleges for science courses required by non-science majors.

Jaki, Stanley L., "From Scientific Cosmology to a Created Universe," *The Irish Astronomical Journal*, Vol. 15, #3, March, 1982, pp. 253–262.

The author, a distinguished Hungarian-born historian of science, provides an excellent, historical overview of science's evolving attempts to understand the universe as a whole, i.e., to formulate a truly scientific cosmology. He beautifully relates the development of such scientific understanding to former and present cultural and philosophical presuppositions. He strongly suggests that a good scientific cosmology will provide limited, never completely exhaustive explanations and will be in resonance with the Judeo-Christian doctrine of creation. The article stresses that good science and good theology *are not by themselves mysterious but* always point beyond themselves to the creator God, "the mysterious origin of all."

Simmons, Henry T., "Redefining the Cosmos," *Mosaic*, Vol. 13, #2, March/April, 1982, pp. 16–22.

Simmons, a former science writer for Newsweek, has written a very complete and scientifically reliable overview of the entire topic including a discussion of its modern historical development and possible philosophical implications. The article is detailed and exhaustive in scope, it is highly recommended.

Wheeler, John Archibald, "Bohr, Einstein, and the Strange Lesson of the Quantum," *Mind in Nature*, Edited by Rich Q. Elvee, Harper & Row, N.Y.; 1981; pp. 1–30.

The author is a distinguished American physicist who has made significant contributions to physics in many areas including relativity theory, quantum theory, nuclear theory, and astrophysics. This article and the next are non-technical introductions to his own striking, controversial formulation of the Anthropic Principle which emphasizes the role of the observer as an active participator in all observations of the Universe. This latter insight comes from his interpretation of current quantum theory which is not without its scientific and philosophical critics.

Wheeler, John Archibald, "Beyond the Black Hole," *Some Strangeness in the Proportion: A Centennial Symposium to Celebrate the Achievements of A. Einstein*. Ed. by Harry Woolf; Addison-Wesley Pub. Co., Inc., 1980, pp. 341–375.

Part B

This material is intended for the reader who has some professional competency in physics and philosophy. The material may be broken into three categories:

I. The articles by Carr, Carter, Dicke, Dicke, Patton, Rees, and Wheeler are written by prominent astrophysicists who are originators of the Anthropic Principle. They are key articles in which the principle was first formulated, and in which detailed documentation of its validity is provided. They are written for the professional physicist.

II. John Leslie, a Canadian philosopher of science, has provided in the three articles listed a detailed philosophical interpretation and criticism of the anthropic interpretations and a possible theistic interpretation. They are written for professional philosophers and provide the most significant philosophical critique of this concept to-date.

III. Paul Davies' book, *The Accidental Universe*, provides a good technical overview of the physics required to understand the Anthropic Principle. It is written at a level suitable for undergraduate physics majors. The title reveals Davies' philosophical bias.

Carter, Brandon, "Large Number Coincidences and The Anthropic Principle in Cosmology," *Confrontation of Cosmological Theories with Observational Data*, Ed. by M.S. Longair, D. Reidal Pub. Co., Boston, 1974, pp. 291–298.

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The Narrative Form of Genesis 1: Cosmogonic, Yes; Scientific, No

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A basic mistake through much of the history of interpreting Genesis 1 is the failure to identify the type of literature and linguistic usage it represents. This has often led, in turn, to various attempts at bringing Genesis into harmony with the latest scientific theory or the latest scientific theory into harmony with Genesis. Such efforts might be valuable, and indeed essential, if it could first be demonstrated (rather than assumed) that the Genesis materials belonged to the same class of literature and linguistic usage as modern scientific discourse.

A careful examination of the 6-day account of creation, however, reveals that there is a serious category-mistake involved in these kinds of comparisons. The type of narrative form with which Genesis 1 is presented is not natural history but a cosmogony. It is like other ancient cosmogonies in the sense that its basic structure is that of movement from chaos to cosmos. Its logic, therefore, is not geological or biological but cosmological. On the other hand it is radically unlike other ancient cosmogonies in that it is a monotheistic *cosmogony; indeed it is using the cosmogonic form to deny and dismiss all polytheistic cosmogonies and their attendant worship of the gods and goddesses of nature. In both form and content, then, Genesis 1 reveals that its basic purposes are religious and theological, not scientific or historical.*

Different ages and different cultures have conceptually organized the cosmos in different ways. Even the history of science has offered many ways of organizing the universe, from Ptolemaic to Newtonian to Einsteinian. How the universe is conceptually organized is immaterial to the concerns of Genesis. The central point being made is that, however this vast array of phenomena is organized into regions and forms—and Genesis 1 has its own method of organization for its own purposes—*all* regions and forms are the objects of divine creation and sovereignty. Nothing outside this one Creator God is to be seen as independent or divine.

In one of the New Guinea tribes the entire universe of known phenomena is subdivided into two groupings: those things related to the red cockatoo, and those related to the white cockatoo. Since there are both red and white cockatoos in the region, these contrasting plumages have become the focal points around which everything is conceptually organized. The religious message of Genesis relative to this "cockatoo-cosmos" would not be to challenge its scientific acceptability, but to affirm that all that is known as red cockatoo, and all that is known as white cockatoo, is created by the one true God.

Or, one may take a similar example from traditional China, where all phenomena have, from early antiquity, been divided up according to the principles of Yang and Yin. Yang

This is the second of two essays on interpreting the creation texts, the first of which appeared in the September 1984 issue of the Journal.

is light; yin is darkness. Yang is heaven; yin is earth. Yang is sun; yin is moon. Yang is rock; yin is water. Yang is male; yin is female. It would be inappropriate to enter into a discussion of the scientific merits of the Chinese system relative to the organization of Genesis 1; for what Genesis, with its own categories, is affirming is that the totality of what the Chinese would call Yang and Yin forces are created by God who transcends and governs them all.

There are certain uniquenesses in the 6-day approach to organizing the cosmic totality, spacially and temporally, but the point of these uniquenesses is not to provide better principles of organization, or a truer picture of the universe, in any scientific or historical sense. It is to provide a truer *theological* picture of the universe, and the respective places of nature, humanity and divinity within the *religious* order of things. In order to perform these theological and religious tasks, it was essential to use a form which would clearly affirm a monotheistic understanding of the whole of existence, and decisively eliminate any basis for a polytheistic understanding.

The Cosmogonic Form

The alternative to the "creation model" of Genesis was obviously not an "evolutionary model." Its competition, so to speak, in the ancient world was not a secular, scientific theory of any sort, but various religious myths of origin found among surrounding peoples: Egyptian, Canaanite, Hittite, Assyrian, Babylonian, to name the most prominent. The field of engagement, therefore, between Jewish monotheism and the polytheism of other peoples was in no way the field of science or natural history. It was the field of cosmology which, in its ancient form, has some resemblances to science, but is nevertheless quite different.

Given this as the field of engagement, Genesis 1 is cast in *cosmological* form—though, of course, without the polytheistic content, and in fact over against it. What form could be more relevant to the situation, and the issues of idolatry and syncretism, than this form? Inasmuch as the passage is dealing specifically with origins, it may be said to be *cosmogonic*. Thus, in order to interpret its meaning properly, and to understand why its materials are organized in this particular way, one has to learn to think *cosmogonically*, not scientifically or historically—just as in interpreting the parables of Jesus one has to learn to think parabolically. If one is especially attached to the word "literal," then Genesis 1 "literally" is *not* a scientific or historical statement, but is a cosmological and cosmogonic statement which is serving very basic theological purposes. To be faithful to it, and to faithfully interpret it, is to be faithful to what it literally is, not what people living in a later age assume or desire it to be.

Various patterns, themes and images used in Genesis 1 are familiar to the cosmogonic literatures of other ancient peoples. To point this out does not detract in the least from the integrity of Genesis. Rather, it helps considerably in understanding the peculiar character and concern of this kind of narrative literature. And it indicates more clearly where the bones of contention are to be located, and what the uniquenesses of the Genesis view of creation are.

The act of creation, for example, begins in Genesis 1:2 in a way that is very puzzling to modern interpreters, yet very natural to ancient cosmogonies: with a picture of primordial chaos. This chaos—consisting of darkness, watery deep and formless earth—is then formed, ordered, assigned its proper place and function, in short, *cosmocized*. Chaos is brought under control, and its positive features are made part of the cosmic totality.

If one is determined to interpret the account as a scientific statement, then one would need—to be consistent—to affirm several undesirable things. There is no scientific evidence whatsoever, whether from geology or astronomy, that the initial state of the universe was characterized by a great watery expanse, filling the universe. Nor is there any evidence that the existence of water precedes light (day 1) and sun, moon, and stars (day 4). Nor is there any evidence that the earth in a formless state precedes light (day 1), or sun, moon and stars (day 4). On the theological side, one would also be affirming—if this is to be taken completely literally—that water is co-eternal with God, since nowhere does the account specifically speak of God as creating water. Day 2 refers to water as being separated by the creation of the firmament, and Day 3 only speaks of water as being separated from the earth in order that the formless earth may appear as dry land.

The only viable alternative is to recognize that Genesis 1 is intentionally using a cosmogonic approach, and to reflect on

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the logic of the account in its own *cosmo*logical terms—not in *geo*logical or *bio*logical or *chrono*logical terms. The account is not pre-scientific or un-scientific but *non*-scientific—as one may speak of poetry (unpoetically) as non-prose. This does not mean that the materials are in any sense irrational or illogical or fantastic. They are perfectly rational, and have a logic all their own. But that logic is *cosmo*logical, and in the service of affirmations that are *theo*logical.

So the issue is not at all, How is Genesis to be harmonized with modern science, or modern science harmonized with Genesis? That kind of question is beside the point, if by the question one is proposing to try to synchronize the Genesis materials with materials from the various fields of natural science: biology, geology, paleontology, astronomy, etc. That would presuppose that they are *comparable*—that they belong to the same type of literature, level of inquiry, and kind of concern. But they do not. Trying to compare them is not even like comparing oranges and apples. It is more like trying to compare oranges and orangutans.

The questions then, are: Why is this cosmogonic form being used, and how does a cosmogonic interpretation make sense of the passage?

Like anything else in biblical literature, the cosmogonic form was used because it was natural, normal and intelligible in that time period. For some, it has been an offense to call attention to ancient Near Eastern parallels of the Genesis materials. This approach has appeared to undermine acceptance of the Bible as a unique vehicle of divine revelation. Yet the Bible, obviously, does not speak with a divine language—which, to say the least, would be unintelligible to all. The biblical authors necessarily used the language forms and literary phrases immediately present and available in Israel, which included materials available through the long history of interaction with surrounding peoples. They did not use a whole new vocabulary, or fresh set of metaphors and symbols, suddenly coined for the purpose or revealed on the spot. When one speaks of the Word of God, one must be careful not to suggest by this term that what is being delivered is some sacred language, complete with heavenly thesaurus and handbook of divine phrases, specially parachuted from above.

Jewish scripture abounds in literary allusion and poetic usage which bear some relation, direct or indirect, to images and themes found among the peoples with which Israel was in contact. An analogy may be drawn from contemporary English usage which contains innumerable traces of the languages and literatures, myths and legends, customs and beliefs, of a great many cultures and periods which have enriched its development. Thus one finds not only a considerable amount of terminology drawn from Greek, Latin, French, German, etc.—including the terms "term" and "terminology"—but references derived from the myths, legends, fables and fairy tales of many peoples: the Greek Fates, the Roman Fortune, the arrows of Cupid, Woden's day and Thor's day, and even Christmas and Easter.

The issue, then, is not where the language (Hebrew) and certain words and phrases came from, but the uses to which they are put, and the ways in which they are put differently. The cosmogonic form and imagery, in this case, is not chosen in order to espouse these other cosmogonies, or to copy them, or to ape them, or even to borrow from them, but precisely in order to deny them. Putting the issue in terms of "borrowing" or "influence" is to put matters in a misleading way. Various familiar motifs and phrasings to be found in surrounding polytheistic systems are being used, but in such a way as to give radical affirmation to faith in one God, a God who transcends and creates and governs all that which surrounding peoples worship as "god."

When one speaks of the Word of God, one must be careful not to suggest by this term that what is being delivered is some sacred language, complete with heavenly thesaurus and handbook of divine phrases, specially parachuted from above.

Such a God, furthermore, is not only transcendent but immanent in a way that the gods and goddesses could not be. These divinities were neither fully transcendent nor fully immanent, for all were finite, limited, and localized, being associated with one aspect and region of nature. The gods and goddesses of light and darkness, sky and water, earth and vegetation, sun, moon and stars, each had their own particular abode and sphere of power. One or another divinity, such as Marduk of Babylon or Re of Egypt, might rise to supremacy in the pantheon and be exalted above every other name. But they were still restricted and circumscribed in their presence, power and authority.

The biblical affirmation of One God is decisively different from all finite and parochial attributions of divinity. In the words of the Apostle Paul, this God is "above all and through all and in all" (Ephesians 4:6). The very fact that God is "above all" makes possible a God who is at the same time "through all and in all." Radical immanence presupposes radical transcendence. At the same time all things are *in God,* for apart from God they have no being; they do not exist. As Paul also says, citing a Greek poet: "He is not far from each one of us, for 'In him we live and move and have our being' " (Acts 17:28).

Genesis 1 is, thus, a cosmogony to end all (polytheistic) cosmogonies. It has entered, as it were, the playing field of these venerable systems, engaging them on their own turf, with the result that they are soundly defeated. And that victory has prevailed, first in Israel, then in Christianity, and also Islam, and thence through most of subsequent Western civilization, including the development of Western science. Despite the awesome splendor and power of the great

empires that successively dominated Israel and the Near East—Egypt, Assyria, Babylon, Persia, Greece and Rome—and despite the immediate influence of the divinities in whose names they conquered, these gods and goddesses have long since faded into oblivion, except for archeological, antiquarian or romantic interests. This victory belongs, in large part, to the sweeping and decisive manner with which the Genesis account applied prophetic monotheism to the cosmogonic question.

The Plan of Genesis 1

How, then, does an understanding of this cosmogonic form—as radically reinterpreted in Genesis—help in understanding the organization and movement of the passage?

The emphasis in a cosmogony is on the establishment of order (*cosmos*), and the maintenance of that order, and therefore upon the ultimate sources of power and authority. Given these concerns, there are three amorphous realities that are seen as especially threatening to order: the watery "deep," darkness, and the formless earth ("waste" and "void"). These potentially *chaotic* realities must be *cosmocized*. They are not, however, simply threatening or demonic, but rather ambiguous. They have a potential for good as well as evil, if controlled and placed in an orderly context. The particular organization and movement of Genesis 1 is readily intelligible when this cosmological problem, with which the account begins, is kept clearly in mind.

Water, for example, has no shape of its own. And, unchecked or uncontained, as in flood or storm or raging sea, water can destroy that which has form. Darkness, also, in itself has no form, and is dissolvent of form. Only with the addition of light can shapes and boundaries and delineations appear. Similarly, earth is basically formless—whether as sand, dust, dirt or clay. And it is doubly formless when engulfed by formless and form-destroying water and darkness.

These fundamental problems confronting the establishment and maintenance of an orderly cosmos, therefore, in the logic of the account, need to be confronted and accommodated first. The amorphousness and ambiguousness of water, darkness and formless earth must be dealt with in such a way as to restrain their negative potential and unleash their positive potential. Otherwise, it would be like building a house without giving careful consideration to potential threats in the region, such as the adjacent floodplain, or shifting sand.

The structure of the account, then, is that of beginning with a description of a three-fold *problem* (the chaotic potential of darkness, water and earth) which is given a solution in the first three days of creation. The *first* day takes care of the problem of darkness through the creation of light. The *second* day takes care of the problem of water through the creation of a firmament in the sky to separate the water into the waters above (rain, snow, hail) and the waters below (sea, rivers, subterranean streams). The *third* day takes care of the problem of the formless earth by freeing earth from water and darkness, and assigning it to a middle region between light and darkness, sky and underworld.

This then readies the cosmos for populating these various realms in the next three days, like a house which has been readied for its inhabitants. In fact, the third day also takes care of providing food for its forthcoming residents through the creation of vegetation. We thus observe a symmetrical division of the account into three movements (Problem, Preparation, Population), each with three elements. The account could be read as if written in three parallel columns as shown in Table 1.

The *problem* of the three "chaotic" forces is resolved in the first three days by circumscribing their negative potential and making use of their positive potential. As a result a harmonious context is established in *preparation* for the *population* of these three regions. Darkness is contained and counterbalanced by light; water is separated and confined to its proper spheres by the firmament; and the earth is demarcated from the waters, allowing dry land and vegetation to appear.

Thus, with everything readied and in order, the inhabitants of these three cosmicized regions are created and invited to

Table 1

Outline of Genesis 1

Problem (vs. 2)	*Preparation* (days 1-3)	*Population* (days 4-6)
Darkness	1a Creation of light (Day) b Separation from Darkness (Night)	4a Creation of Sun b Creation of Moon, Stars
Watery Abyss	2a Creation of Firmament b Separation of Waters above from Waters below	5a Creation of Birds b Creation of Fish
Formless Earth	3a Separation of Earth from Sea b Creation of Vegetation	6a Creation of Land Animals b Creation of Humans

take their proper places. The light and darkness of day one are populated by the sun, moon and stars of day four. The sky and waters of day two are populated by the birds and fish of day five. The earth and vegetation of day three make possible a population by the land animals and human beings of day six.

In this way of reading the account, the dilemmas that arise for a literalist (i.e., scientific and historical) interpretation disappear. The three problems, which are envisioned as difficulties for cosmicizing, are dealt with first, followed by a sketch of the way in which these cosmocized regions are then inhabited. This is the logic of the account. It is not chronological, scientific or historical. It is cosmological.

Literalism presumes that the numbering of days is to be understood in an arithmetical sense, whether as actual days or as epochs. . . . But the use of numbers in ancient religious texts was often numerological rather than numerical.

The procedure is not unlike that of a landscape painter, who first sketches in with broad strokes the background of the painting: its regions of light and darkness, of sky and water, and of earth and vegetation. Then within this context are painted birds and fish, land animals and human figures. It would be quite inappropriate for anyone to try to defend the artistic merit and meaning of the painting by attempting to show that the order in which the painting was developed was scientifically and historically "correct." That order is irrelevant to the significance of the painting as a whole and the attribution of its authorship. It is a painting of the totality. And the critical concern is to sketch in all the major regions and types of creatures, so as to leave no quarter that has not been emptied of its resident divinity, and no elements that have not been placed under the lordship of the Creator.

The Numerology of Genesis 1

In this way of organizing the material, Genesis has used a numerological structure built around the number three—a hallowed number, as is apparent in the sacred formula, "Holy, holy, holy." Three is the first number to symbolize completeness and wholeness, for which neither number one nor two is suitable. Three also symbolizes mediation and synthesis, as the third term in a triad "unites" the other two. These symbolic uses of three are evident in the way in which phenomena are organized in terms of two sets of opposite forms which are *separated* from one another (days 1 and 2, 4 and 5), then completed and mediated by days 3 and 6. Light and darkness of day 1, and sky above and waters below of day 2, are completed and mediated by the earth and vegetation of day 3. The triadic movement is then repeated as the first three days are populated by the second three: the sun, moon (and stars) of the day and night skies (day 4), and the birds of the air and fish of the sea (day 5), are completed and mediated by the land animals and humans of day 6.

The ultimate mediation is then given to human beings who, while belonging to the earth and with the animals (and therefore in the "image" of the earth and the "likeness" of animals), are also created in the "image and likeness" of God. Humanity is thus placed midway between God and Nature—which has now *become* nature by being emptied of any intrinsic divinity. Hence the traditional theological phrasing of "Nature, Man and God." As the Psalmist in a parallel passage put it with enthusiastic exclamation:

> Thou has made him little less than God
> and dost crown him with glory and honor.
> Thou hast given him dominion over the works of thy hands;
> thou has put all things under his feet,
> all sheep and oxen,
> and also the birds of the air, and the fish of the sea,
> whatever passes along the paths of the sea.
>
> Psalm 8:5–8

This triadic structure of three sets of three points up another problem with a literal reading of the account. Literalism presumes that the numbering of days is to be understood in an arithmetical sense, whether as actual days or as epochs. This is certainly the way in which numbers are used in science, history and mathematics—and in practically all areas of modern life. But the use of numbers in ancient religious texts was often numerological rather than numerical. That is, their symbolic value was the basis and purpose for their use, not their secular value as counters. While the conversion of numerology to arithmetic was essential for the rise of modern science, historiography and mathematics, the result is that numerological symbols are reduced to signs. Numbers had to be neutralized and secularized, and completely stripped of any symbolic suggestion, in order to be utilized as digits. The principal surviving exception to this is the negative symbolism attached to the number 13, which still holds a strange power over Fridays, and over the listing of floors in hotels and high rises.

In the literal treatment of the six days of creation, a modern, arithmetical reading is substituted for the original symbolic one. This results, unwittingly, in a secular rather than religious interpretation. Not only are the symbolic associations and meanings of the text lost in the process, but the text is needlessly placed in conflict with scientific and historical readings of origins.

In order to understand the use of the imagery of days, and the numbering scheme employed, one has to think, not only cosmologically, but numerologically. One of the religious considerations involved in numbering is to make certain that any schema works out numerologically: that is, that it uses, and adds up to, the right numbers symbolically. This is distinctively different from a secular use of numbers in which the overriding concern is that numbers add up to the correct total numerically.

In this case, one of the obvious interests of the Genesis account is to correlate the grand theme of the divine work in creation with the six days of work and seventh day of rest in the Jewish week. If the Hebrews had had a five-day or a seven-day work week, the account would have read differently in a corresponding manner. Seven was a basic unit of time among West Semitic peoples, and goes back to the division of the lunar month into 4 periods of 7 days each. By the time Genesis was written, the 7-day week and the sabbath observance had been long established. Since what is being affirmed in the text is the *creative work* of God, it was quite natural to use the imagery of 6 days of work, with a 7th day of rest. It would surely have seemed inappropriate and jarring to have depicted the divine creative effort in a schema of, say, 5 days or 11 days.

Those who would attempt to impose a literal reading of numbers upon Genesis, as if the sequence of days was of the same order as counting sheep or merchandise or money, are offering a modern, secular interpretation of a sacred text—in the name of religion.

It was important for *religious* reasons, not secular ones, to use a schema of seven days, and to have the work of creation completed by the end of the sixth day. "And God ceased on the seventh day from all work which he had done" (Genesis 2:2). The word "ceased" is *shabat*, a cognate of the term *shabbat*, sabbath. The "creation model" being used here is thus in no sense a scientific model, but a liturgical-calendrical model based on the sacred division of the week and the observance of sabbath. This is the religious form within which the subject of work is to be treated, even the subject of divine work.

The seven-day structure is also being used for another, not unrelated, reason. The number 7 has the numerological meaning of wholeness, plenitude, completeness. This symbolism is derived, in part, from the combination of the three major zones of the cosmos as seen *vertically* (heaven, earth, underworld) and the four quarters and directions of the cosmos as seen *horizontally*. Both the numbers 3 and 4 in themselves often function as symbols of totality, for these and other reasons. Geometrically speaking, 3 is the triangular symbol of totality, and 4 is the rectangular symbol (in its perfect form as the square). But what would be more "total" would be to combine the vertical and horizontal planes. Thus the number 7 (adding 3 and 4) and the number 12 (multiplying them) are recurrent biblical symbols of fullness and perfection: 7 golden candlesticks, 7 spirits, 7 words of praise, 7 churches, the 7th year, the 49th year, the 70 elders, forgiveness 70 times 7, etc. Even Leviathan, that dread dragon of the abyss, was represented in Canaanite myth as having 7 heads—the "complete" monster.

Such positive meanings are now being applied by Genesis to a celebration of the whole of creation, and of the parenthesis of sabbath rest. The liturgically repeated phrase "And God saw that it was good," which appears after each day of creation, and the final capping phrase "And behold it was very good," are paralleled and underlined by being placed in a structure that is climaxed by a 7th day. The 7th day itself symbolizes its completeness and "very-goodness."

The account also makes use of the corresponding symbol of wholeness and totality: 12. Two sets of phenomena are assigned to each of the 6 days of creation, thus totalling 12. In this manner the numerological symbolism of completion and fulfillment is associated with the *work* of creation, as well as the *rest* from it on the 7th day. The totality of nature is created by God, is good, and is to be celebrated both daily and in special acts of worship and praise on the sabbath day. The words "six" and "seven" are themselves words of praise: six expressing praise for creation and work; seven for sabbath and rest.

Uses of the number 12, like 7, abound throughout the Bible. Not only is there a miscellany of references to 12 pillars, 12 springs, 12 precious stones, 12 gates, 12 fruits, 12 pearls, etc., but it was important also to identify 12 tribes of Israel, as well as 12 tribes of Ishmael, and later the 12 districts of Solomon, as well as Jesus' 12 disciples.

Though in the modern world numbers have become almost completely secularized, in antiquity they could function as significant vehicles of meaning and power. It was important to associate the right numbers with one's life and activity, and to avoid the wrong numbers. To do so was to surround and fill one's existence with the positive meanings and powers which numbers such as 3, 4, 7 and 12 conveyed. In this way one gave religious significance to life, and placed one's existence in harmony with the divine order of the cosmos. By aligning and synchronizing the microcosm of one's individual and family life, and the mesocosm of one's society and state, with the macrocosm itself, life was tuned to the larger rhythms of this sacred order.

For twentieth century, western societies the overriding consideration in the use of numbers is their *secular* value in addition, subtraction, division and multiplication. We must therefore have numbers that are completely devoid of all symbolic associations. Numbers such as 7 and 12 do not make our calculators or computers function any better, nor does the number 13 make them any less efficient. Our numbers are uniform, value-neutral "meaningless" and "powerless." What is critical to modern consciousness is to have the right numbers in the sense of having the right figures and right count. This sense, of course, was also present in the ancient world: in commerce, in construction, in military affairs, in taxation. But there was also a higher, symbolic use of numbers. In a religious context, it was more important to have the right numbers in a sacred rather than profane sense. While we give the highest value, and nearly exclusive value, to

numbers as carriers of arithmetic "facts," in religious texts and rituals the highest value was often given to numbers as carriers of ultimate truth and reality.

Those, therefore, who would attempt to impose a literal reading of numbers upon Genesis, as if the sequence of days was of the same order as counting sheep or merchandise or money, are offering a modern, secular interpretation of a sacred text—in the name of religion. And, as if this were not distortion enough, they proceed to place this secular reading of origins in competition with other secular readings and secular literatures: scientific, historical, mathematical, technological. Extended footnotes are appended to the biblical texts on such extraneous subjects as the Second Law of Thermodynamics, radiometric dating, paleontology, sedimentation, hydrology, etc. These are hardly the issues with which Genesis is concerning itself, or is exercised over.

Phenomenal Language

Since Genesis is teaching creation over against procreation, and monotheism over against polytheism, it cannot be said to be teaching science, or any one form of science over against any other. Insofar as Genesis deals with relationships within nature, it does so in a phenomenal manner: as things *appear* to ordinary observation. Genesis is not in the business of teaching a "young earth" theory of sudden creation in 6 literal 24-hour days. Nor is it teaching some form of "progressive creation" with a mix of fiat creation and epochs of gradual development. Nor is it teaching "theistic evolution" or "pantheistic evolution" or "panentheistic evolution." It does not teach *any* of these views of science and natural history because it is not using language in that way, for that purpose, or out of that concern.

If scientists wish to take such positions on their own, it is certainly within their province and right as scientists to do so, and to debate such positions within scientific forums. But it should not be done for *religious* reasons, or motivated by a supposed greater fidelity to the Bible. Nor should anyone presume that such efforts in any way confirm or deny biblical teaching. It is a linguistic confusion to try to argue that any of these scientific positions, or any other scientific positions, past, present or forthcoming, represent the biblical position, and can therefore be questioned by science, verified by science, or falsified by science.

A prime example of this confusion is the energy expended by certain biologists in construing the frequent reference to reproducing "each according to its kind" as a statement concerning biological species and speciation. The phrasing is repeated 10 times in Genesis 1 with reference to vegetation, birds, sea creatures and land animals. If one may take this to be a biological statement, then it would be appropriate to introduce extended discussion of fixity of species, genetic mutations, natural selection, missing links, stratigraphic evidence, and the like. If not, then the discussion, however interesting and important, is beside the point. And it is not. The repeated stress upon "kinds" is not a biological or genetic statement. It is a *cosmological* statement. While that may appear to modern interpreters very much like a biological statement, it is actually a different "species" of statement that cannot be "cross-bred" with scientific statements. The type of species-confusion involved here is not that of biological species but linguistic species!

Since cosmologies are concerned with the establishment and maintenance of order in the cosmos, central to the achievement of order is the act of separating things from one another. Without acts of separation, one would have *chaos*. Thus ancient cosmologies commonly begin with a depiction of a chaotic state, where there are no clear lines of demarcation, and then proceed to indicate ways in which the present world-order (*cosmos*) with its lines of demarcation has been organized. In other cultures this was achieved by divine births, wars, etc. Here cosmos is accomplished by separating things out from one another, and by creating other things (e.g., light or firmament) that aid in the separation. Everything is thus assigned its proper region, allowing it to have its own identity, place and function in the overall scheme. The imagery used in Genesis 1, in fact, is drawn largely from the *political* sphere. It is that of a divine sovereign, issuing commands, organizing territories, and governing the cosmic kingdom.

In Genesis 1 the inanimate features of the first four days are achieved by being "separated" or "gathered together." On the first day "God *separated* the light from the darkness." On the second day "God made the firmament and *separated* the waters which were under the firmament from the waters which were above the firmament." On the third day God said, "Let the waters under the heavens be *gathered together* into one place, and let the dry land appear." And on the fourth day God said, "Let there be lights in the firmament of the heavens to *separate* the day from the night."

The same theme is then pursued on the third, fifth and sixth days in dealing with plant and animal life. "Each according to its kind" is a continuation on the animate level of the acts of separation on the inanimate level. The process is then climaxed by the creation of human beings who are granted their unique place in the cosmos by being separated from the rest of the animals by virtue of being in the image and likeness of God, yet at the same time separated from God as creatures of divine creation.

Beyond this general cosmological concern to attribute all types of beings, and all types of order, to the creation and control of God, there is no specific interest in or reference to what we might recognize as a biological statement on species, genera, phyla, etc., or a geological statement on the history of water and earth, or an astronomical statement on the relationship between sun, moon, stars and earth. The language used is phenomenal and popular, not scientific and technical. As John Calvin wisely noted, early in the growing controversies over religion and science: "Nothing is here treated of but the visible form of the world. He who would learn astronomy and the other recondite arts, let him go elsewhere."[1]

This observation on biblical usage is very important for the doctrine of revelation. The biblical message offers itself as a *universal* message. It is addressed to all human beings, whatever their knowledge or lack of it. It is therefore couched in a form that employs the universal appearances of things

which anyone anywhere can identify with. As Calvin also states: "Moses does not speak with philosophical (i.e., scientific) acuteness on occult mysteries, but states those things which are everywhere observed, even by the uncultivated, and which are in common use."[2] Thus when Genesis 1 discusses the "separating" or "gathering" of inanimate forces, these are not astronomical or geological terms, but cosmological ones, which draw upon everyday observations of nature. Similarly, the word "kind" (*min*) is not functioning as a genetic term, but describes the animate order as it is perceived in ordinary experience. Biblical statements in all these areas are the equivalent of phenomenal statements still commonly in use, despite centuries of astronomy, such as "sunrise" and "sunset."

It is a linguistic confusion to try to argue that any of these scientific positions, or any other scientific positions, past, present or forthcoming, represent the biblical position, and can therefore be questioned by science, verified by science, or falsified by science.

Calvin pointed out, for example, that the biblical statement—if construed as a scientific statement—that the sun and moon are the two great lights of the heavens, cannot be reconciled with astronomy, since "the star of Saturn, which, on account of its great distance, appears the least of all, is greater than the moon."[3] And, as we now know, there are many suns greater than our sun. But, Calvin insisted, "Moses wrote in a popular style things which, without instruction, all ordinary persons, endued with common sense, are able to understand."[4] Similarly, in his commentary on the reference to the two "great lights" in Psalm 136, Calvin affirmed that "the Holy Spirit had no intention to teach astronomy; and in proposing instruction meant to be common to the simplest and most uneducated persons, he made use by Moses and the other prophets of popular language that none might shelter himself under the pretext of obscurity."[5]

As Francis Bacon perceptively argued in 1605, addressing the apparent flat earth teaching of the Bible, there are two books of God: "the book of God's Word" and "the book of God's Works." These books, however, must not be confused in their nature, language and purpose. We must not, Bacon warned, "unwisely mingle or confound these learnings together."[6] Religion and science are not necessarily running a collision course along the same track, except when someone mistakenly switches them onto the same track. Religious language and scientific language intersect at many points, to be sure, as they touch upon many of the same issues and realities. But they do not move along the same plane of inquiry and discourse. They intersect at something more like right angles.

Science, as it were, moves along a *horizontal* plane, with its steadfast attention to immediate causes and naturalistic explanations for phenomena. Religion moves along a *vertical* plane that intersects this horizontal plane from beginning to end—and not just in certain "gaps" which are defended so as to make room for God at intermittent points along the line. Science, with its eyes focussed on the dimensions of the horizontal plane, tends to have a naturalistic bias, and to see all experience and knowing, and all affirmation, as reducible to this plane. Religion, however, adds another dimension, a supernatural dimension, which it insists intersects this horizontal plane at every moment, and in fact is the ultimate source of its being, meaning and direction. It is a dimension which, along its vertical axis, is both transcendent and immanent. It is simultaneously present with the natural, and without it the natural does not exist. But it is not reducible to the natural, nor is language about it reducible to natural forms.

If one wishes to argue for deeper meanings and mysteries in scripture, they are certainly there. But they are not scientific in character. They are theological and spiritual. They are not meanings and mysteries hidden from the ancients, but now revealed to 20th century scientists, which lie along the horizontal plane. They are rather inexhaustible depths of meaning and mystery which lie along the vertical plane. "O the depth of the riches and wisdom and knowledge of God! How unsearchable are his judgments and how inscrutable his ways. . . . For from him and through him and to him are all things" (Romans 11:33, 36).

NOTES

1. John Calvin, *Commentaries on the Book of Genesis*, ed. John King (Grand Rapids: Eerdmans, 1981), pp. 184–5.
2. *Ibid.*, p. 84.
3. *Ibid.*, p. 85.
4. *Ibid.*, p. 86.
5. John Calvin, *Commentary on Psalms*, vol. V (Grand Rapids: Eerdmans, 1981), pp. 184–5.
6. For an excellent discussion of Bacon and Calvin, see Roland Mushat Frye, "The Two Books of God," *Theology Today* (October, 1982), pp. 260–266.

The Future of Supernaturalism in Religion: The Middle Eastern Case

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The 19th century positivist, Auguste Comte, predicted that scientific study of society will eventually replace religious and metaphysical efforts, especially those studies which assume supernaturalism in religion and metaphysics. Naturalism in the form of scientism seemingly dominates most serious sociocultural research and theory today—even affecting traditional evangelical Christian scholarship with some poorly disguised acceptance of naturalistic humanism in both postulate and model for research.

Our focal question is: Will religion, a universal in human societies and cultures, persist with supernaturalism as a basic assumption? Furthermore, will this assumption persevere in evolving sociocultural systems as modern scholars seek resolutions to problems confronting mankind today in national and international situations? Middle Eastern data are used to support this essay's conclusion that religion, viewed as belief and behavior blended into supernaturalism will persist as an imperative factor, either positively or negatively, for understanding sociocultural phenomena, especially in attacking various problems therein.

Giancarlo Zizola in his article, "China's Great Restoration: 'Clinging To Heaven' Despite State Atheism," in *Panorama* (cited in *World Press Review*, April, 1984, p. 61) concludes that "God is alive in China." He notes that the conventional image is of a China devoid of religion with a supernatural presupposition. Of course as all Sinologists hold, religion defined in terms of the supernatural has never found a favorable sociocultural milieu in China, as for example, in India or the Middle East.

A Chinese government, which is committed to official atheism, has decided to finance the restoration of religious monuments which had been destroyed, or were marked for removal, including Taoist pillars, Confucian temples, pagodas, churches, and mosques. Whatever may be the political or other motivations behind this dramatic reversal in policy, the present regime's new policy is to be explained and implemented in the "Institute for Research in the Study of Great Religions," established in 1983 in Peking.

The serious ethnologist, along with other scholars, will need more substantial evidence from qualified field work before concluding that the Chinese people have retained or are returning to supernatural assumptions. Nevertheless, one may well anticipate support here for the thesis of this essay.

Auguste Comte on Religion

Western thought, with its pronounced drift into secularism and humanism, cannot be identified with any single scholar, or even with some philosophical school at some temporal stage in history. Western culture can be seen as an ideational stream with its headwaters rising in Middle Eastern antiquity and early Mediterranean societies. As this metaphorical

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stream flowed through medieval Europe, the Renaissance and the Reformation became significant tributaries to become a swelling current under the influence of the emerging skeptics and agnostics in the 18th and 19th centuries. Then, as this stream of thought crested in Euro-American culture, it overflowed into many non-Western ideational streams of thought to affect markedly those of radically different assumptions.

Auguste Comte, a leading French social philosopher, made lasting contributions to the stream in the 19th century. This founder of modern sociology actually expressed little more than what many of his contemporaries had already proposed. He, however, provided a structured and comprehensive organization for the growing ideational shift from a mystical world view to a radically contrasting approach to foster the understanding of societies by science in what became known as positivism.

Comte's positivistic philosophy, by its suggestions for understanding society through science, established five propositional categories: (1) the rigorous adoption of the positive or scientific method; (2) the law of three stages of intellectual development; (3) the classification of the sciences; (4) the conception of the special and incomplete philosophy of each of the sciences anterior to sociology; and (5) the synthesis of the positivist social philosophies. One is immediately reminded of E.O. Wilson's 20th century effort to do just that in his controversial writings (1975, 1978) with his commitment to ethological postulates and conclusions.

As he failed to give due recognition to the many scholars who obviously conditioned his thinking, Comte for the most part did little more than dogmatize the ideas of Turgot, Burdin, and Saint Simon (Comte, 1975; also see Harris, 1968). His ideas and interpretations of evolution in human thought illustrate this, for he posited human knowledge progressing from a theological stage through a metaphysical state on to a climax that is wholly scientific. This French savant's classification of the sciences hinged on a hypothesis that empirical efforts must inevitably develop in the direction of decreasing generality and increasing complexity.

In essence, this scheme makes science the final court of appeal for establishing knowledge, although the theological and metaphysical approaches could also contribute (along with intuitive insights, perhaps) if they were modified to conform to the positivistic dictum. It is quite evident that in such a proposal the future of religion implicit in a theological approach, especially if based upon supernatural assumptions, would become vitiated and very likely disappear as a significant means to acquire "truth" or reality.

In his scheme for social reorganization, Comte dedicated himself to social planning to produce an utopian society; this has been emulated somewhat more recently by E. O. Wilson in his "sociobiology" (1975), and by B. F. Skinner in his notions of "Walden Two" (1962) and "beyond freedom and dignity" (1971). But Comte thought he found that theological concepts survive most tenaciously in sociology. As a matter of fact, his rationalistic admirers became astonished when Comte's conception of the ideal positivistic society was revealed as a religious utopia. Unexpectedly, he believed that, in his view of religion, the organization of the Catholic Church, *when divorced from its supernaturalism,* might well provide an ideally structured and symbolic model for the new positivist society. It became a cardinal tenet of Comte's proposal that any desirable and permanent social improvement must be preceded by an appropriate moral transformation.

One critical question in such thought is: Whence the source of recommended morality? For the Catholic God, the Supernatural Being, Comte substituted devotion to what he termed the "Great Being," by which he meant humanity, past, present, and the future. Morality then is to stem from such "religion." This new "faith" was "the religion of humanity," but subsequent explanations revealed the faith to be essentially a system of social ethics. With considerable arrogance, Comte envisioned himself as the supreme social architect of the new social system to be built on a worship of the Great Being. One is reminded again of Wilson, Skinner, and others of more recent views.

Futurology and Supernaturalism

Many books now coming from the presses outline scenarios that bear on the future of supernaturalism in religion. We may read, for example, Toffler's *Future Shock* in which, with journalistic flair, he concludes: "Science first gave man a sense of mastery over his environment, and hence over the future. By making the future seem malleable, instead of immutable, it shattered the opiate religions that preached passivity and mysticism. . . . In consequence, we witness a garish revival of mysticism" (1970:449–450).

On a more scholarly level, Toffler has edited *The Futurists* (1972). Among the "Philosophers and Planners" we find Ossip Flechtheim as a pioneer in his attempt to introduce "futurology" as a new science (1972:264–276). This mild-mannered German professor advocates that such a new science become a required course of study in all curricula of all institutions for higher education. His firm conviction is that scholarly prophecies are of crucial value even though the prediction might accomplish little more than unveil the inevitable.

According to Flechtheim's "Futurology—The New Science of Probability" (the essay's title) mankind has been traditionally concerned with destiny in terms of family, tribe, city, or nation as long as people have been preoccupied with a supernatural future. Most, perhaps all, primeval and nonliterate peoples have been fully absorbed with death and an after-life. Although this German futurist does not make mention of the Old Testament, it seems certain that he would cite the miserable Job's probe: "If a man die, shall he live again?" (Job 14:14 RSV). Flechtheim notes that the ancient Egyptians sought to resolve this problem by remarkable means of body preservation. Again, he would certainly agree that the hope among the early Christians for an imminent millenium with resurrected bodies must be included, and rejected, in the world view that is to be committed to science, including futurology.

As Flechtheim looks at history, secularization of Western

thought has challenged such theological and mystical assumptions—the Biblical view that human history is but a brief chapter in an eternal book of God's creation. The secularist tends to replace such thought by a this-world theory of progress. Such conclusions, advocated often in liberal and philosophical writings, including some by theologians, have been categorized as "technolatry" and "scientism" with the emphasis on the here and now. The psychologist Keniston aptly labels this stance as "the cult of the present" (1960: 209). Whatever Utopia may be sought (as Skinner's Walden Two) it is not attained through death and supernatural salvation, but rather through mankind's striving for improvement in time and space by scientific effort and accomplishment.

Within Flechtheim's Futurology are: (1) Mankind's prospective and psychological evolution together with the entire range of sociocultural activities. By ignoring the supernatural, *Homo sapiens* is to seek reality as defined by science with, as its ultimate purpose, the promotion of ecological harmony with the physical universe in general and the earth in particular. (2) Futuristic quests must objectively pursue questions for improving the destiny of our civilization. Relevant questions must include: (a) Can we anticipate the uninterrupted growth of Western civilization along lines firmly drawn throughout its history? (b) Will our civilization be characterized by a new functional organization which is to be attained by eliminating separate economic, political, and social powers, and by the emergence of an inclusive world culture based on secularism? And (c) will the so-called "civilizational process" (i.e., the scientific, technological, and developments which previously have proved to be cumulative and progressive) irreversibly persist until it will have transferred, for the first time in human history, the planet into a unified and technological world civilization devoid of the supernatural?

Even while he ponders these futurological questions, Flechtheim betrays forebodings which reminds one of the Russian-American sociologist, Pitirim Sorokin, in his ominous pronouncements directed at Western "Sensate" culture (1941). Flechtheim's essential scenario is the very thing that Sorokin asserts is threatened by collapse and disappearance unless some dramatic alteration occurs within the Sensate process. The very nature of this essay is a confession of scanning the horizons ahead; no supernatural viewpoint can ignore what lies ahead!

Listen to Flechtheim's own dire option facing mankind:

> . . . will the so-called social and cultural lag, which has become so painfully evident since Hiroshima, stop or even reverse this civilizational process? Is our Western civilization irrevocably doomed to decline as the economic crises and social upheavals, of bloody revolutions and deadly wars, leading up to a complete relapse into another Dark Age of primitivism and ruralism, localism and bestialism? In other words, will war and want, hunger and servitude prove passing clouds on a bright horizon or will they reveal themselves as the long shadows of death? (1972:273).

During this essay's original preparation, the news media were reacting to Alexandr Solzhenitsyn's recent apocalyptic scenario at an award ceremony in London. Although I have not seen his complete text, several responses pointed to this scholar's censure on the declining spirituality (surely we must admit that he sees "spiritual" as supernatural from his writings) in American values. One news analyst, George F. Will, had reacted earlier to Solzhenitsyn's eloquent Harvard commencement address in 1978 with these words: "We have placed too much hope in political and social reforms, only to find that we were deprived of our most precious possession: our spiritual life" (Beaver County (PA) *Times*, June 20, 1978).

Religion is belief in the supernatural with attending emotions and activities both in ritual and lifestyle.

Solzhenitsyn's charge is appropriate in reference to what we have sought to note in Flechtheim's ideas, for the Russian sage also stated at Harvard these accusations:

> How did the West decline from its triumphant march to its present sickness? The mistake must be at the root, at the very basis of human thinking in the past centuries. [An erroneous world view] became the basis for government and social science, and could be defined as rationalistic humanism of humanistic autonomy: the proclaimed and enforced autonomy of man from any higher force above him. It based modern Western civilization on the dangerous need to worship man and his material needs.
>
> However, in early democracies, as in American democracy at the time of its birth, all individual human rights were granted because man is God's creature. That is, freedom was given to the individual conditionally, in the assumption of his constant religious supernatural responsibility. Subsequently, however, all such limitations were discarded everywhere in the West: a total liberation occurred from the moral heritage of Christian centuries with their great reserves of mercy and sacrifice. The West ended up by truly enforcing human rights, sometimes even excessively, but man's sense of responsibility to God and society grew dimmer and dimmer (*Time*, June 19, 1978:33).

Such views tend to be overwhelmingly rejected by most American scientists and philosophers, especially my colleagues in the social sciences. Thus, Sidney Hook, an influential philosopher with interest in scientific models, responds with these words: "Solzhenitsyn speaks in the tradition of Dostoyevsky, who taught that if man did not worship God, he would worship the devil or himself in the form of Caesar. Organized religions in the past have supported despotism, and some churchmen in our own time still do" (*Time*, June 26, 1978:22). To me it is tragic indeed that Western scholars more and more conclude that mysticism and supernatural interpretations are synonymous with institutionalized religion; as I see it, they are not. Such assumptions distort Solzhenitsyn's plea to admit and accept what ethnological research finds to be a human imperative, namely, the belief in the supernatural realm and its reality in sociocultural systems however bizarre and fantastic the concepts may be in

terms of beings or power. Flechtheim's "Futurology" is but another heuristic proposal to join others which rest upon dubious postulates.

And what is the contemporary view which is the logical consequence of what Comte formalized for science and which Flechtheim sees ahead? Perhaps we may suggest that Comte's "religion of humanity" finds an eloquent definition by Sellars:

> Naturalistic humanism . . . is largely a contemporary development, at once religious, scientific and philosophical, which postulates the necessity of an overt, conscious and decisive break with the framework and emphases of theism or supernaturalism, orthodox or esoteric. . . . It sees all phases of the past as part of man's immemorial march toward mastery of himself and his environment, a march begun in ignorance, but in these days, illumined by ever-increasing knowledge and—what is still more encouraging—the means and methods for extending and deepening that knowledge.
>
> . . . It seeks to develop, for man, a positive perspective within the framework of a mature type of naturalism, capable of doing justice to the actualities of human life. It is thus, in essence, an attempt at a reorientation of religion, holding, as it does, that the heart of religion is man's need to possess a working complex of attitudes, sentiments and ideas about the meaning of life, the human situation, the kind of universe man is in, and the ideals he should embrace. Humanism holds that religion is not a static thing but something which evolves and reflects the stage of human culture (1958:417).

The Apostle Paul would find this orientation incomprehensible to him as he penned the opening words to the Romans. Paul would suggest that this is precisely what he had in mind when he wrote: "For although they knew God, they neither glorified him as God nor gave thanks to him, but their thinking became futile and their foolish hearts were darkened. Although they claimed to be wise, they became fools and exchanged the glory of the immortal God for images made to look like mortal man and birds and animals and reptiles" (Romans 1:21-23 NIV).

Beyond the Apostle Paul's rebuke just cited, we cannot elaborate on certain fundamental weaknesses in this religious notion of Sellars with its roots in Comte's 19th century vision. Such an effort is worthy of an extended essay in itself. As a fitting response, let us turn to an apt summarization by James Sire. This evangelical Christian scholar has outlined the process wherein supernaturalism in theistic views has declined to a frightening void and a meaningless state for mankind. Or, as Sire addresses it, mankind has abandoned supernaturalism in the quest for meaning in human existence with the end result of aggravated frustration and futility. Its logical end is complete abandonment to nihilism. But let us allow Sire to put it in his lucid phrases:

> To summarize: the first reason why naturalism, inseparable from humanism as noted in Sellars' view, turns into nihilism is that naturalism does not supply a basis on which man can act significantly. Rather, it denies the possibility of an innate self-conscious character. Man is a machine—determined and capricious. He is not a person with self-consciousness and self-determination (1976:83).

Towards an Ethnological Definition of Religion

In previous studies we have sought to define religion as we believe such can provide the most helpful assumption for cross-cultural research in ethnological efforts which encompass all of human societies temporally and spatially (Jennings, 1971, 1976, 1977, 1983). Rather than reiterating those comments, but retaining the fundamental premise, we now seek to document how others subscribe to the supernaturalistic assumption. Hence, the ethnologist, John Middleton, reflects like views in his "The Religious System" (1970). Significantly, Middleton's analysis is found in a theoretical work which advocates various models for ethnological research; therefore his proposals for advancing understanding of religion in cross-cultural efforts become quite pertinent to our present thinking.

Middleton's assumptions include: (1) If one is to study "such an all-pervasive part" of cultures and human experiences, one must have some reasonable conceptualization encapsulated in an operational rubric. (2) Anthropological scholars agree that religion is a social fact, hence it requires analysis in sociological terms. Of course as part of human behavior it can be examined by using other assumptions, but the social feature is primary for ethnological study. And (3) the ethnological analysis postulates a system which rests upon an underlying pattern or structure.

Middleton's second assumption occurs in a monumental study by Gottwald entitled *The Tribes of Yahweh: A Sociol-*

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ogy of Religion of Liberated Israel, 1250–1050 B.C.E. (1979). The undergirding postulate held by Gottwald is essentially that expressed in the Old Testament's opening words: "In the beginning God . . . (Hebrew: *elohim*, a plural form of supernatural beings but when the definite article is used or inferred the reference is to the single supernatural Being).

Yet while Gottwald is engaged basically in a sociological critique of cultural materialism stemming from Marxism, he finds it imperative to pursue the origins and destiny of religion. As he views Marx's conclusions about religion, he notes that the religion this atheist observed was mostly contemporary European, in both Jewish and Christian forms. In his opinion, Marx's confidence that religion would disappear under new forms of social relations in the future was a concrete function of the religious sublimations that Marx knew best. If, as Marx thought, religion is chiefly or exclusively a form of class justification and of class struggle (whether employed by the dominators or by the dominated), it follows logically that with the disappearance of class struggle, religion will also disappear.

Gottwald states that if, however, it turns out that religion is a more pervasive form of consciousness that cannot be restricted to any of the known religions, or to all of them taken together, and is further separable from belief in gods as personal beings or as invisible forces, it may be that its origins are anterior to social stratification in a form of ideation which tries to grasp the synthetic human experience of the interpenetrating mode of total lifestyle within groups and elaborated cultural products as a coherent but changing, even fragile, whole. Of course Gottwald's "religious consciousness" cannot be separated from dogmatic beliefs in supernatural beings (1979:637) even though his analysis is geared primarily to sociological theory and data rather than theological views. In his words: "What I am pointing out is that the Marxian view of religion cannot be settled by merely reaffirming or denying its truth, but only by extended scientific research and by future unfolding of human life in changing social relations" (1979:637).

Middleton notes that some ethnological efforts have sought to support evolutionary schemes in religion, but he calls for rigorous field work by ethnologists rather than the earlier armchair speculations. Unfortunately, recent field work has tended to slight religion in favor of politics, kinship, economics, and other cultural phenomena because (1) in rapidly changing cultures, religious behavior is much more difficult to reduce to empirical data, and (2) the failure to agree as to what constitutes a "religious sphere" in social life.

While paying respect to useful summarizations already attempting to define the "religious," including such noted ethnologists as Horton (1960), Goody (1961), Geertz (1965), and Spiro (1966), Middleton observes that the religious usually has been delineated with "common-sense" terms: myths and cosmologies, rituals, belief in gods, spirits, ancestral deities, belief in magic, oracles, witches, and various ceremonial activities. He correctly reminds us that ethnologists most frequently detect many beliefs in overt behaviors such as rituals but in many cases the religious phenomena must be explicated by informants with such inherent faults as the informants' lack of understanding, the absence of adequate terminology (with the possible confusion between the "emic" and the "etic" concepts as suggested by Pike, the linguist, 1950), or possible misrepresentation to protect sacred secrets in dogma and behavior.

Nevertheless at the heart of all ethnological research which deals with this universal but variegated, complicated, and sometimes esoteric human behavior, Middleton arrives at what he claims to be "the central attribute of the religious"; it is the concept of a "spiritual being" or power which is thought

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to stand outside human life and society. While beliefs in such a power appear to be universal, the concept necessitates explicit definition; it may be envisioned in highly divergent forms, and it may be thought to behave in multiple (including bizarre or capricious) ways within diverse cultural environments.

Consequent to these vague and diverse forms, ethnologists have considered these mystical beliefs and expressions to represent various kinds of social forces and experience. This supernatural being-power constellation of varying opinions gives rise to differing analytic ideas by various scholars: To Tylor (1873) it is understood as "belief in Spiritual Beings," while Durkheim (1954) proposed the "sacred" as the symbol for the power of society and human interdependence, but Otto (1917) suggested that it must be seen as an attribute of holiness. These and similar proposals have proven unsatisfactory, says Middleton, when there is a consideration of any particular religion. He holds that ultimately in trying to establish a religious nucleus or core, we must return "to the notion of a spiritual, divine power at the center" (1970:501).

Assuming that we can accept Middleton's "center" of the religious sphere, the supernatural, we are faced then by a controversial morass as to what constitutes the reasonable limits of behavioral phenomena to be included in the religious. It is almost impossible for people in a nonliterate culture to discern sharply the religious from the non-religious in terms of social reality. Many times this same confusion exists among literate cultures as well. The reason is that even with an institutionalized priesthood and theological treatises, the great body of "common" or "lay" members of the religion do not engage in esoteric abstractions to establish formal limits that govern behavioral decisions in social reality. And in those cases where limits are delineated there is seldom

complete agreement among those who give serious thought to religious peripheries in human behavior. (The reader undoubtedly recognizes that this cause gives rise to many of the divisions within Christianity in "civilized, literate, and educated" Western peoples.)

Middleton's further analysis into religious studies by ethnologists extends beyond what is directly pertinent to this essay. Rather we believe that some reiteration may show our accord with his fundamental conclusion about the meaning of religion, or the "religious" as useful in scientific study of any people. At the core of cultural thinking, feeling and acting (i.e., the beliefs, the emotions, and the overt activity in rituals as well as total lifestyle) lies the supernatural or spiritual—the mystical or "extra-human" in some ethnologists terminology—concepts which are basic to appreciate the religious for both cross-cultural theory and research. Here then is my conclusion: *Religion is belief in the supernatural with attending emotions and activities both in ritual and lifestyle.*

To contend that belief occurs before behavior (rituals) or vice versa is to engage in a futile chicken and egg argument. However the behavior and belief system may not be given theological exactitude or structure by the adherents, nor may there be a clear demarcation between what is sacred and what is profane, but "confession of the faith" is nonetheless maintained by those marked by degrees of hypocrisy; a hiatus between confession of faith and demonstration in conduct is universal among mankind in whatever culture. There is always a difference between the ideal and the real.

The Middle East as a General Example of Persisting Supernaturalism

General consensus among scholars, including ethnologists, today, both in the Middle East and elsewhere, often suggests that religion as just defined is opposed by powerful forces. Some maintain that the threat to supernaturalism in the Middle East has reached critical proportions which causes alarm among militant Muslims who have reacted with what has been termed "resurgence" or "revival."

As an ethnologist seeking empirical data for scientific interpretation, I must remember that (1) the present crisis in religion may not be more serious than in the past (e.g., the crisis confronting Christianity and Judaism in the Middle East at the inception and explosion of Islam), but merely that the exigency now assumes a different form as we, in field study, observe it among Muslim people (or other religious groups for that matter) in the Middle East; and (2) a crisis such as the Reformation in Europe was essentially a problem *within* supernaturalistic views of religion, whereas the contemporary difficulty may be described as an attack on supernaturalism in general and upon Middle Eastern Islam in particular by anti-religious forces.

My research for over three decades in Egypt, Ethiopia, Iran, Jordan, Lebanon, Palestine, and Syria has revealed varying degrees of adherence to religious supernaturalism, but at practically all levels there is the dominance of the mystical among most of the "mosaic" (Coon, 1966) of peoples, Muslims or otherwise. In spite of the headlines and cover stories about the Middle East, the cynosure on a supernatural Allah (God) in the lives of Muslims is rarely appreciated even by those who ought to know better. My reiteration is that the message of the Prophet Muhammad continues to be proclaimed and heard by diverse Islamic

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segments in the mosaic. To an ethnologist even greater significance than the dogmatic tenets of the faith (not usually articulated by the majority) is the manner in which the Qur'an and the Hadith are incorporated, with many contradictions, into daily life.

At some risk of stating the wellknown, Western impact upon Middle East culture includes degrees of naturalistic humanism which surely must infer some attack upon Islamic supernaturalism. What is sometimes labeled "scientism" as a world view by some opponents in the West seeks the minds and hearts of "developing" peoples who are of course to be found in the Middle East. Scientism in Islamic lands, as elsewhere, is committed to the dogma that science is the ultimate means by which Muslims and minorities there are to solve sociocultural problems in a progression toward utopian life. Since this scientism is introduced as a form of Western humanism, the intrusive thrust is accompanied by an individualism in its excessive form of self-reliance unwittingly disseminated by the Western innovators.

This individualistic concentration on personal morality and piety neglects traditional features in Islam and other Middle Eastern faiths; consequently the attack on the religion(s) is more than a challenge to the theistic postulate which is almost universal: it is a thrust at the social structure through which Islam finds its traditional expression and strength (Turner, 1974). In the Middle East, as elsewhere for most of human history, religion as herein defined has been directly relevant to societal life as a whole—ethnologists concur in this. As a matter of fact, it was the societal phenomena among Australian aborigines that led Durkheim (1954) to conclude that society is apotheosized because the group supplied individual needs; that is, the society possessed "supernatural" power for the individual.

Furthermore, in the Middle East, the Arabic term *din* designates the total life of a community or what Tönnies would call, *Gemeinschaft* (family-like "community" in contrast to a state-like "society," which he termed *Gesellschaft*, 1957). Hence, *din* is even more than a Weltanschauung with

related cult practices. In Islam it encompasses civil and criminal law, personal ethics, matters of etiquette and hygiene, and the entire gamut of social customs (e.g., hospitality). The contrast between the Islamic view of religion and that characteristic in the West is obscured when Western Christians propose that religion *should be applied* to economic, social and political affairs. In Middle Eastern Islam, religion is *within* and inherently inseparable from social and cultural institutions.

Such an interpretation of religion, especially when part of a dominant supernaturalism with a preordained fatalism (not random fate), is more in agreement with what has been traditionally religious throughout human experience. This view compels the ethnologist to pose questions: Is there something that only supernaturalistic religion can do? Or that it can best do? Is the future function of religion likely to be in greater accord with Western ideas or those of Islam? Answers that appreciate such questions become highly relevant because the distinction between the contrasting views enables the ethnologist to anticipate acculturative ends in the contemporary and future Middle Eastern scene.

Thus far the acculturative forces are dominated by a secularizing process readily apparent to the field worker, especially in urban settings but also in most villages except those most remote from the cities. We must exercise caution here, though, to recognize a distinction between "secularization" and "secularism." The former is a process which allows science and technology to replace some need sources, while the latter is a philosophical stance.

To clarify this distinction, we may note that in cultural change, or acculturation, secularization occurs when activities formerly controlled explicitly by religious institutions are increasingly directed by a non-religious body. Such a case is obvious in Western social welfare. The care of the indigent or orphans is now, for better or for worse, largely under governmental supervision rather than by churches (admitting that the latter continue to provide significant aid in many instances). The same is true in the decline of ecclesiastical supervision when education gives way to state control. This secularizing process is quite evident from my field observations in the Middle East but at present it lags far behind the West.

Yet while secularization may be noted in the Middle East, we believe that it is devoid of scientism which explicitly rejects the supernaturalism so traditional in the people's religious dogma and ritual. Western secularism has appeared in the Middle East among some of the elite who have received education in Western schools of higher learning; such incipient agnosticism is retained in certain urban enclaves where traditional religious supernaturalism has less rigid control over the people's lives. But even here, the secularism tends to be a veneer over hidden Islamic supernaturalism.

In other words, secularism with a base of scientism has not developed any elaborate literary expression. Some scholars do cite such philosophical expression in the laicism advocated by Ataturk in Turkey following the first World War, but my research finds confirmation from others that this laicism has proven to be a rather fragile facade largely held by some of the educated elite in positions of power. The great majority of Turkish people never relinquished supernaturalism.

Acculturative Forces and Reactions in the Middle East

Education offers an excellent demonstration of the culture change impact stemming from Western innovations in the Middle East. A brief history of this contact form illustrates this. Political leaders in the Ottoman's decline of the 18th century sought to emulate the aggressive and victorious European intruders by sending their young people, mostly men, to the West, especially England, France and Germany, for military training seemingly unaware that it could effect far more change than anticipated. They believed that they could develop a Western type of military organization with officers learning only those sciences and language terms directly bearing on military expertise; they did not foresee such education altering the student's intellectual orientation in other ways.

The ruling elite justified this erroneous conclusion by concluding that the Western exposure was essential for achieving military prowess; the cadets would remain unaffected by the theological and philosophical views in Western thought. After all, Islam had very early in its history immunized itself against Christian ideas when it conquered much of the old Byzantine world as well as North Africa and most of Spain—all areas with peoples committed to Christianity, at least in theory.

This traditional immunization found support in those early victorious encounters by the doctrine of *tahrif*—"corruption of the scriptures" by both peoples of "the Book," Jews and Christians (Watt, 1969:612). Though far less sophisticated in theological expression than that of the Christians, this doctrine enabled them to reject the Christian thrusts on the ground that the Christian Bible had been tampered with and could not be accepted. Early in Islam's history, a few Muslim scholars seem to have given some serious investigation to biblical study but this limited interest disappeared and left no legacy in Islam. Consequent suspicion of all Christian thought persisted to become important dogma in Islam. This negative stance was not confined to religion per se, but, as we have come to observe during our field work, is part of the inclusive holism in Islam, including social and political spheres.

With the return of the Western educated youth to the Middle East, there arose two systems of education: the traditional system controlled by the establishment and the military system, which was not considered education at all by the *'ulama'* or learned scholars who interpreted the *shari'a* or divine law. But this emerging second education, tolerated by the *'ulama'* because of its primary military focus, was actually an acculturative step toward much more unanticipated alterations. Western Christian missions followed with their programs and personnel as well; not the least of these innovations was the establishment of "modern" educational systems in strategic Middle Eastern cities such as Beirut, Cairo and Istanbul.

These acculturative forces were welcomed because the previous educational contacts had revealed certain features, such as military superiority, increasingly sought by Middle Eastern leaders. Not surprisingly, then, the Christian educational institution provided much religious instruction in Christianity at the expense of Islamic beliefs—indeed, that

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was the original goal of many programs. But this Western educational thrust did not confine itself to religious evangelization because some Christian institutions drifted toward liberal theological thought as they increasingly disseminated much of what is now known as naturalistic humanism and the West's secularism.

Thus education (as one of significant acculturative forces in the Middle East) became a means par excellence to foster secularization in the Muslim world. Secularization became most advanced in the major metropolitan centers such as Beirut, Cairo, Istanbul, Tehran, and others. Cities, of course, have always been strategic centers for acculturation in most countries throughout history (e.g., Jerusalem and Rome in Christianity, Mecca and Medina in Islam). Reviewing acculturational patterns, the ethnologist, Foster, notes this when writing: "Most social and economic change begins among the upper classes [who are almost urbanites] and then spreads downward to the traditionally inarticulate lower classes and outward to the countryside. The cultural innovation of urban areas have prestige attached to them" (1962:29).

This writer's field efforts in villages both in Iran and Lebanon found such diffusion from Tehran and Beirut respectively even though there was far less acculturative secularization in such villages (Jennings, 1957–58, 1960, 1972). For instance, in our conclusion to the study of an Iranian village, Mamazan, located 25 miles southeast of Tehran, we offered this summary:

> First, there is the alteration in the economic system with the more or less autonomous subsistence type giving way to a cash economy that links the village inextricably to the national system. Secondly, there is a decline in village autonomy under large landowners or administrators to increasing integration within larger political structures. Third, there is a change from a value system focused upon family and community solidarity to one emphasizing adventurism and individualism. And finally, *there is a drift from a pronounced religious orientation to a secularization with the sacred and profane assuming sharper distinctions in economic and political areas of life* (1957–58:325, emphasis added).

Notwithstanding the secularization to be found in Mamazan and other villages under this writer's study, and admitting that the profane has become more advanced in the cities, we must emphasize that very few scholars in the Middle East have committed themselves without reservation to secularism in their retention of supernaturalistic Islamic dogma. We can assert this as valid despite the appearance of Marxist Communism that scholars such as Laqueur have held to be Islam's undoing. This recognized student of Middle Eastern affairs goes so far as to say three decades ago that "Islam has gradually ceased to be a serious competition of Communism in the struggle for the soul of the present and potential *elites* in the countries of the Middle East" (1956:6). Evidently the Ayatollah has neglected to read such genres of writing! And the assassination of Anwar al-Sadat in Egypt was not by Marxists but by the Muslim Brotherhood (*Ikhwan al-Muslimun*), as has been clearly outlined by Aly and Wenner (1982).

While Communism has grown with increased numbers of Communist sympathizers in the Middle East, a comparison with other world regions reveals important differences. In Burma and China, there has appeared synthesis or syncretism between Marxist ideas and those of Buddhism and Confucianism respectively. This has not happened in the Middle East—indeed, it is unthinkable. Marxist atheism has been rejected overwhelmingly. Even where a Communist political program has been somewhat accepted—and this is not always the case—those promoting it have usually been, or claimed to be, good Muslims (e.g., Nasser in Egypt, Assad, though an Alawite, in Syria, and even Saddam Hussein as the Ba'ath Party leader in Iraq).

Because "socialism" is frequently linked with secularism among many scholars, Christian and otherwise, a word of explanation is in order. In some cases, socialism is viewed as a diluted form of Communism. But in the Middle East there are growing evidences of positive—and militant—reactions to the presence of Marxist Communism as Watt has noted (1969:629–631) and as is clearly obvious in Khomeini's leadership among Shi'ite Muslims. My field research suggests that the more thoughtful Muslim politicians realize that it is futile to denounce the Communists as atheists; rather these leaders realize that they must devise positive programs to correct the economic and social ills that have been the avowed target of the Communists.

There are even some Middle Eastern leaders (during my three decades of observation there) though relatively few, who allow themselves to be known as "Muslim socialists," but on the whole there has been far less talk of Islamic socialism, than, for example, of African socialism. Even the late Nasser's attempt to weave together socialism, which he labeled "Arab socialism," with his fervent nationalism in Egypt met with very limited success as demonstrated by the drastic reversal in Sadat's policies. Arab nationalism or Arabism (*'uruba'*) has always been closely linked with Islamic supernaturalism, and thus it is not surprising to find a marked proximity between mysticism or the sacred and Arab socialism (von Grunebaum, 1962; Haim, 1962).

We may note briefly that most Middle Eastern students give attention to the tragic drama associated with the abandonment of Turkey's laicism program under Ataturk and the futile efforts of the Pahlevi Dynasty to modernize Iran. In both cases the supernaturalism of Islamic leaders and followers prevailed. We may also note in passing the case of the late Anwar al-Sadat in Egypt. As we observed Sadat's leadership, it became clear that he gained much more esteem among Western people than among his own Egyptians, especially as time moved along. Significantly, his role reflected a syncretism of Middle Eastern and Western ideas in that he enjoyed English apparel and his presidential perquisites (including nine official residences which he shared with but one wife), and he remained faithful to Islamic tenets of mysticism. It could be noted that his forehead bore the mark that is common to devout Muslims who touch the ground while praying.

Even in his unprecedented visit to Israel in November, 1977, to carry his diplomacy into an arena where Islam could not be allowed to overshadow political aspirations for peace, Sadat referred to his visit as a "Sacred Mission." Further on that epochal visit, he did not neglect a devout Muslim's imperative, namely, to pray at the revered *al-Masdjid al-Aksa* (al-Aksa Mosque) adjacent to the "Dome of the Rock" in the "Temple Square," which ranks in sacredness to Muslims only below that of Mecca and Medina. Obviously it seems precarious to cite a single autobiography as supporting datum for our argument of supernatural persistence, especially when that datum source, Sadat, was opposed and slain by fanatical supernaturalists of his own country. Yet accepting this seeming weakness, we think it defensible to use Sadat's own life history as valid evidence of Middle Eastern supernaturalism in Islam. He wrote what amounts to a manifesto for the spiritual dimension with these words:

> God says: "We offered Responsibility to the Earth, the Heavens and the Mountains but they declined to bear it and felt unequal to it: Man bears it (the Koran)." God has assigned to man a role which distinguishes him from all other creatures. In the Bible we are told that God created man in His own image and in the Koran that He breathed His Spirit into man. Without a vocation, man's existence would be meaningless. We have been created to bear the responsibility God has entrusted us with. Though different, each man should fulfill his specific vocation and shoulder his individual responsibility. To do this he should first recognize and be loyal to his real entity within, regardless of any external factors; for it is this alone which will enable him to belong and owe allegiance to that Entity which is greater, vaster, and more permanent than his individual self (1978:82).

If leaders of major influence like Sadat subscribe to supernaturalism in their world view, we may state that the great mass of lower class people in the Middle East are much more committed to that stance. After years of research in the Middle East I confess that it is difficult to determine how wide and how deep is the acceptance of secularism as a creed or philosophical stance. Among those of my informants who have had Euro-American education, a number do argue on behalf of a secularistic *Weltanschauung*. My overall observations, however, convince me that the same people retain varying degrees of clear mystical attachment. As I see it now, for the rest of the present century few are apt to adopt mere secularism as distinct from some form of Marxism.

On the whole my ethnological efforts show that the wave of secularism as an assumption opposed to supernaturalism is receding. We are joined in this conclusion by serious scholars in the Middle East as they realize the gravity in such crises as that in Lebanon and the Iran-Iraq conflict, to cite but two of the many. As the horrendous atrocities assume repeated and frightening proportions with no lasting peace yet in sight, there is a growing feeling for a need of religious experience which will enable them to cope with the impingement of ominous scenarios affecting their lives as well as the welfare and future of their society and culture.

We believe that the Islamic resurgence in reemphasizing supernaturalism is evidence for the indefinite continuity of that spiritual dimension in religion, in the Middle East as elsewhere.

Bill (1984), a leading student of the Iranian people and their religion of Shi'ism (1984) makes some noteworthy comments that will surely give Middle Eastern secularists pause for thought. He writes:

> The reassertion of Islam that is evident worldwide coincides with the deep disillusionment of Third World peoples with Western models and packages that have failed to provide them with satisfactory answers to the particular social and political ailments. . . . After decades of experimenting with alien ideologies such as socialism, Marxism, Ba'athism, Nasserism, liberalism, and western capitalism, they have chosen to move back to Islam—an all-encompassing ideology and way of life that is an integral part of their history and culture. Although it is true that Islam has always been very much alive in the region, this great religion is now being actively reexamined, reemphasized, and renewed as an overarching sociopolitical system of principles to be applied to all aspects of life. This assertion and reemphasis upon Islam is evident in every Gulf community. . . .
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> The most important aspect of the surge of Islam in the Gulf is that it is not something promulgated and propagated from above but rather is a massive movement bubbling up from below. It is Popular Islam (*Al-Islam Al-Sha'bi*) as opposed to Establishment Islam (*Al-Islam Al-Rasmi*). In the Gulf, there are at least five major identifiable movements that represent Popular Islam: (1) the *Al-Salafi* (traditional/ancestral) movement; (2) *Al-Islah* (reform) fundamentalism; (3) the new *Al-Ikhwan* (Muslim Brotherhood) movement; (4) popular Sufism; and (5) Shi'a populism (1984: 4–5).

Conclusion

Ethnological studies have been marked with findings which Linton identified as "Nativistic Movements" (1943),

what Wallace called "Revitalistic Movements" (1956), and what Barber had earlier described as "Acculturation and Messianic Movements" (1941). In these and similar theoretical efforts, there is general consensus that victims undergoing acculturation (mostly from the West) that threatens their culture with its values, including world view and religion, react by anticipating deliverance and restoration through supernatural power and means. Thus there occurred the "Ghost Dance" among the American Plains Indians (Mooney, 1965), the "Cargo Cults" in Melanesia (Worsley, 1968), the viable "Peyote Way" among North American Indians (Slotkin, 1955–56), and similar reactive developments which find peoples shocked from acculturation appealing to supernatural aid for relief and compensation.

Admittedly, it may be straining the acculturative concept when it is used for large sociocultural areas such as the Middle East; it must be used with caution and for general conclusions. Be that as it may, we believe that the recurring supernatural frame of reference in response to culture change is present in the Middle East as this has been evident among smaller, "tribal" societies. In other words, we believe that the Islamic resurgence in reemphasizing supernaturalism is evidence for the indefinite continuity of that spiritual dimension in religion, in the Middle East as elsewhere.

It seems reasonable, therefore, that the Middle Eastern data is relevant for all of mankind in that human beings cannot or will not be satisfied—"culturally content"—when confronted by imponderables of existence or ultimate meaning by excluding what the ethnologist, Bharati, refers to as the "extra-human" (1976). Whether we choose to speak of that realm as "extra-human," the "spiritual," the "mystical," or the "supernatural," we find that all serious ethnological studies of religion from all known societies live in reference, directly or indirectly, to that realm. We may indeed cite one reason in particular: It is that human beings everywhere recognize human limitations in the face of adverse circumstances over which they have little or no control. The late Robert Lowie, eminent ethnologist who specialized with American Indians and was professor at the University of California (Berkeley), was not one who admitted to any religious identification in his numerous publications dealing with religion. Yet he concluded one essay with these words that suggest the supernaturalistic imperative for mankind:

> What the average man wants above everything else is security. But does science supply this? The answer is "No." That complete worldview that science explicitly renounces is precisely what the layman craves. In this perilous universe he is forever beset with dangers beyond his control. He wants at all odds to survive, and here science leaves him in the lurch—not everywhere and always but often enough to make him keenly sensible of its imperfections. If he is dying of an incurable disease, it cheers him little to be told that medical science has made great strides in the past decades and that a remedy will almost certainly be found a hundred years hence, and probably sooner. . . . Science has achieved remarkable results, both practical and theoretical, but it has not made man a superman; so long as the enormous chasm yawns between man's rational control of nature and his biologico-psychological drives, there will still be room for belief in a Providence that grants not mere comfort, but security—not mere probability, but certainty. (1963)

The late Loren Eiseley, a leading ethnologist but hardly a theist in religious commitment, wrote late in life about "science and the sense of the holy" (1978) in which essay he made reference to *Das Heilige, The Idea of the Holy,* authored by the German theologian, Rudolf Otto. That book appeared in 1917, a time of bitterness and disillusionment in the Western world, especially in Germany where the seething condition later erupted in the horror of the Nazi holocaust. The book continues to command attention because it cuts across denominational lines or cleavages with its concern for a "mysterium tremendum," that very awe before mankind which Freud had sighed over and dismissed as irrational, only an illusion derived from childhood fantasies. But, as Eiseley notes, Freud left human adults considerably shrunken and misjudged—misjudged because some of the world's greatest scientists and artists have been deeply affected by the great "mystery," less so the child at one's knee, who frequently must be enculturated to what in India has been called "the opening of the heavenly eye" (Otto, 1917).

To those of us who rest our case upon the Bible (not upon scientific models of biblical interpretation which makes science the ultimate court of appeal rather than the commanding postulate that God can and has revealed His truth to be accepted by faith) for ultimate answers, we recall the Apostle Paul's confession to a younger associate:

> . . . I am writing these instructions . . . that . . . you may know how one ought to behave in the household of God, which is the church of the living God, the pillar and bulwark of the truth. Great indeed, we confess, is the mystery of our religion: He [God] was manifested in the flesh, vindicated in the Spirit, seen by angels, preached among the nations, believed on in the world, taken up in glory (I Timothy 3:14–16 RSV).

We who pursue an ethnology which specializes in religious theory are quite aware that we may find our offices as "ivory towers" in which we may be snug and secure when speculating about mankind's problems in respect to changing sociocultural phenomena. Often we do not face undue stress from consequences stemming from our opinions about how remedial action should be taken in respect to mankind anywhere. It is usually quite safe to recommend to Middle Eastern peoples, or those in any other cultural sphere, that they must accept science and/or religion as we see one or the other as the means for their adequate entry into Western civilization.

There are those of us who may denigrate, or at least be scornful of, those who seek to employ ethnological findings of supernaturalism while defending our scientific aloofness with the questionable conclusion that "science is to be the quest for truth, wherever that may lead with little or no concern for valid application" and to ignore overwhelming problems among peoples outside the West. Such an indulgence is a luxury of the West that can no longer be tolerated. It must be replaced by recognition of the supernatural in religious experience, which in turn can give greater responsibility toward coping with the sociocultural malignancies which threaten mankind today.

To me, there cannot be a substitute or viable alternative for applied ethnology for cross-cultural communication and understanding that denies the enduring premise of the super-

natural in religion. That there is desperate need to respect this assumption is forcefully supported by the Swiss theistic psychiatrist, Tournier, who holds this firmly in his therapy, and states:

> Further, I have a threefold vocation: medical, psychological and spiritual. It is bad enough to fall into a technical routine as a doctor or as a psychologist; it is much worse to turn soul-healing into a matter of routine. I confess that it is this spiritual vocation which interests me most, for the very reason that all my experience has taught me the limits of medicine and of psychology, and *because the supreme and universal need of man is to find God* (1957:37, emphasis added).

Why this from a scientist in medical practice seeking to correct mental pathological stress so common even in Western culture? His therapeutic procedures stem from long experience with people steeped in naturalistic humanism or scientism or secularism that in one form or another has deprived them of a supernatural context with the spiritual void that proves intolerable for human beings. As this same therapist puts it:

> There is the positivist who thinks himself free from all metaphysical preoccupations, and yet confesses that he is beset by religious longings that have never come to the surface of his consciousness (1957:59).

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Christian Teacher—Secular College: A Paradox

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The active presence of a Christian teacher in a secular college is not only non-contradictory; but this presence is absolutely necessary, if the true mission of the school is to be realized and if its true aim is to be attained.

The gift of the Christian message to the school is as necessary for its proper end to be realized, as is the gift of grace necessary for each individual to reach his or her proper end. Individuals who resist grace lose their way and institutions that reject this same grace in the form of the Christian message lose their way as well.

The thrust of this paper will be to propose that a Christian teacher in a pluralistic, secularistic school is not only non-contradictory but this presence is absolutely necessary, if the true mission of the school is to be realized and if its true aim is to be attained.

Two works serve as the basis of this presentation: *The Idea of a University* by John Henry Cardinal Newman (1852), and *Lay Teachers—Witnesses to Faith*, a document on the Catholic lay teacher from the Sacred Congregation for Catholic Education (1982).

In 1852, John Henry Cardinal Newman, Rector-elect of the new Catholic University in Dublin, began a series of lectures to the church hierarchy of Ireland in an attempt to persuade them to support the founding of the university. These lectures grew into *The Idea of a University*. Newman argued that of necessity, theology must be a formal and integral part of the university. He attempted to justify this relationship to his audience by not "bringing into the argument the authority of the Church, or any other authority at all; but I shall consider the question simply on the grounds of human reason and wisdom."[1]

Although most of us do not teach in departments of theology, I believe that there is a close parallel between Newman's arguments for the inclusion of a "Theological Chair" within the university and the inclusion of the "Christian Message" in secular subjects. Such parallel does not imply a substitution of the Christian message for the content of a secular subject. What is intended is to allow the light of the Christian message to illuminate this content wherever possible. This illumination is only justified if it allows the truth of the secular subject to be seen more clearly or comprehended more completely by the student. Any attempt to equate this message with the content of the secular course, or to replace one with the other would be a foolish and abusive use of teaching authority.

There are two important questions raised by the proposal to include the Christian message in secular subjects. How, in an admittedly pluralistic society such as ours, could it be possible for one to teach secular courses in a secular university within the framework of one specific religious belief system? This is without doubt a question of significance and one which must be answered. I believe, however, that the second question is more basic. Is there any one specific religious belief system which can be used as a framework within which all human endeavor and knowledge take on a more full, clear, and profound meaning? The answer to the latter question is yes, and this religious belief system is the Christian message which is not only the fulfillment of Old Testament promises, but the

ultimate source of any and all truth to be found in all other religious belief systems. The former question can only be addressed as it must be, after the latter is answered in the affirmative.

Whether or not the college or university is founded upon Christian presuppositions is not really important. Whether or not the Christian message is necessary for that institution to be what it should be, and to do what it should do is very important.

The gift of the Christian message to the university is as necessary for its proper end, as is the gift of grace necessary for each individual to reach his or her proper end. Individuals who reject grace lose their way, and institutions that reject this same grace in the form of the Christian message lose their way as well.

In teaching, there are three concepts which must be taken into consideration: The subject matter being taught, (truth), the recipient or object of the teaching, (the student), and the relationship between faith and reason. Regardless of the type of teaching institution, Christian or secular, the instructional tone of that institution will be significantly influenced by the accepted meaning of these concepts.

I personally believe that the lack of possession of the concept of the real nature of the student is the one major failing of our educational system. We try to teach our students to be fully human without knowing or accepting their real nature. This ignorance of true human nature is secondary and flows naturally from the essential ignorance of not recognizing or accepting the reality of God—Father, Son and Holy Spirit. As Christians we believe with certitude that we are a composite; a body via human generation and a soul created by God. We are the result of a cooperative act of love. Our parent's conjugal love was left cooperatively open to the creative love of God. We were literally loved into existence by the creative will of God. Our nature is, although not that way from the beginning, sinful, fallen, imperfect and naturally prone to evil. Fortunately God loves us so much that He not only wants us with Him, He became incarnate to personally atone for our sins and to tell and show us how to live to be happy here and now and for all eternity. We come from God as our true origin. We live by the grace of God, our true sustainer. We return to God, our true end. This is real human nature.

Unless all parties to the educational process recognize, accept and act upon the real nature of the student, the process is doomed to failure. If we do not remind our students of their true nature, they will be told without hesitation and with an enthusiasm often greater than our own that they are grand accidents, very intelligent, but only animal in nature, here only for their own ease, comfort and enjoyment. And why not? After life there is only the oblivion of extinction.

In addition to having a Christian concept of the nature of our students, we also have the Christian concepts of the nature and relationship of truth and faith. As Christians we believe that truth exists on two planes: natural truths which may be arrived at by the use of reason alone, and supernatural truths which human reason would never arrive at unless aided by Divine Revelation. Truths to be taught then do exist at two levels, the level of reason and the level of faith.

Reason refers to one process by which we are able to arrive at truth. Truth, as used in this paper, is to be taken in the general sense of conformity of mind and reality. It is not within the scope of this paper to distinguish kinds of truths, e.g., logical truth, scientific truth, metaphysical, ontological truth, moral truth, or revealed truth, etc.

Faith and reason are distinct entities but as both are always found to a degree in one individual they are not completely separated from each other. There is a definite relationship between faith and reason. The common ground of both faith and reason being truth.

No one can seriously argue against the fact that teachers are professionals. What we may need to be reminded of from time to time is that teaching is more than a profession. It is a vocation.

Many, in and outside of academic circles, would have us and our students believe that Divine Faith and human reason are incompatible. Faith and reason are presented as contradictions. We know that this is a distortion. We recognize a compatibility between acts of faith and acts of reason. We do not fall into the trap of saying that Faith and reason are contradictory; human reason alone is not able to completely understand the mysteries of Faith which we accept as true based upon the authority and truthfulness of God, the Revealer. To admit to a contradiction here, would force us to admit to contradiction between our reason and physical "mysteries" presented to us by authoritative and truthful specialists in any field of human knowledge in which we lack complete mastery.

It is natural to find in everyone a response between faith in some human authority and the use of our natural human intelligence. It is just as natural to expect to find in those who leave themselves open to it, a "relationship between human response to God's revelation and the use of human native intelligence."[2] Among other things, human reason "can both show that the mysteries of the faith are in harmony with naturally known truths and can defend their validity against the charge of being contrary to reason."[3]

In order to "teach students" it is necessary to know and act upon these basic concepts—the true natures of the student, truth, faith and reason, and the real relationship between faith and reason. Newman considers faith in the traditional sense, of being an intellectual act (rather than as a strict feeling or emotion). Faith has truth as its object; as its

result faith produces knowledge of things to be believed (credenda), and of things to be done (agenda). Faith, therefore, in this sense is communicable.

Problems—Old and New

A question which Newman asks early in his lectures is "whether it is consistent with the idea of university teaching to exclude Theology from a place among the sciences which it embraces."[4] It would seem that in many contemporary institutions of higher learning this question has been answered with a thundering affirmative. Not only has Theology (faith in the Triune God, seeking understanding through formal and systematic study), been excluded, but even the most vague reference to the Deity as a reality that has something to say about our life-styles has been anathematized.

The exclusion of theology from the university was to Newman, an "intellectual absurdity."[5] He presents his reason for saying so in the form of a syllogism:

> A university, I should lay down, by its very name professes to teach universal knowledge: Theology is surely a branch of knowledge: how then is it possible for it to profess all branches of knowledge, and yet to exclude from the subjects of its teaching one which, to say the least, is as important and as large as any of them? I do not see that either premise of this argument is open to exception.[6]

If the university is to operate on a consistent plane of logic, God cannot be ignored. If God is ignored by the university, then other realities may, by the same lack of logic, be ignored. Newman asks:

> Are we to limit our idea or university knowledge by the evidence of our senses? Then we exclude ethics; by intuition? We exclude history; by testimony? We exclude metaphysics; by abstract reasoning? We exclude physics. Is not the being of a God reported to us by testimony, handed down by history, inferred by an inductive process, brought home to us by metaphyscial necessity, urged upon us by the suggestions of our conscience? It is a truth in the natural order, as well as in the supernatural.[7]

In retrospect, Newman's examples may limp, but his conclusion—that if sacred knowledge is compromised, the end result will be to "break up into fragments the whole circle of secular knowledge, if you begin the mutilation of the divine"[8]—is valid. When I first read these words on the fragmentation of this circle of human knowledge, I could not help thinking of the almost infinite number of courses offered to our students. Departmental disciplines have been so extended, so protracted that the basic truths of these disciplines have been stretched and shredded into a proliferation of courses that cannot be explained merely on the basis of any type of knowledge explosion or technological demand.

Newman talks about human obstacles to knowing Faith as truth. There are those who would deny the propositions of the Faith altogether. There are those who recognize their existence, but deny the right to teach matters of Faith in any but formal theological studies. There are still others who recognize it, but recast it in their own image. How close to home strike the quotations used by Newman to describe the remarks of the antagonists of his time. "We do not pretend to lecture on Theology, and you have no claim to pronounce upon Science."[9] "Why cannot you go your way and let us go ours."[10]

Newman cautions about the consequence of failing to teach religious truth.

> . . . if there be religious truth at all, we cannot shut our eyes to it without prejudice to truth of every kind, physical, metaphysical, historical, and moral; for it bears upon all truth.[11]

Newman makes an analogy between two systems of education. One system of study is one in which the idea of the agency of man in the natural world is neither recognized nor allowed and only physical and mechanical causes are considered. Man's mind and its powers are omitted in a most cavalier fashion. If man is mentioned at all, it is only by way of explanation of his omission. The other system, one with which we are only too familiar, is one in which the agency of God in human events is treated in the same way.

Certainly the former scheme would present a radically one-sided view of reality, a view so radical that if we proposed such a system of education, we would be considered mad. We would be rightfully told that the knowledge which we were transmitting was unreal. In using this analogy Newman brings out the unreality of both schemes. If the omission of man is an absurdity,

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> worse incomparably, for the idea of God, if there be a God, is infinitely higher than the idea of man, if there be a man. If to blot out man's agency is to deface the book of knowledge, on the supposition of that agency existing, what must it be supposing it exists, to blot out the agency of God?[12]

In Newman's mind the suppression of teaching the Faith will result in the compromise of all truth.

Another result of not teaching the truths of the Faith is that an intellectual vacuum is set up temporarily. Other things not proper rush into this void and take the place of what rightfully should be there. If Faith is removed, non-Faith will enter. As Newman puts it: "We cannot do without a view, and we put up with an illusion, when we cannot get a truth."[13]

In regard to the intellectual vacuum which results from not teaching the truths of the faith he observes:

> that if you drop any science out of the circle of knowledge, you cannot keep its place vacant for it; that science is forgotten; the other sciences close up, or, in other words, they exceed their proper bounds, and intrude where they have no right . . . they would be sure to teach wrongly, where they had no mission to teach at all.[14]

The truth of this statement is borne out by practical experience in my own field. Biology speaks often and well when she "sticks to her last." However, when the biologist, as a biologist, speaks to matters that are of faith rather than science, science suffers, is made to appear foolish, and the student is not presented with truth but with biased conjecture and outright lies. It is very difficult, especially for an intellect in the process of development, to recognize that an authority in biology may be just that and no more. Speaking as a biologist, there is an overstepping of the bounds of his or her authority when teaching about matters of faith exclusively under the umbra of this natural science. This dishonest approach to teaching not only presents a distortion of faith, it is extremely poor science.

Such biased digression from truth is illustrated by the chapter on evolution in *A View of Life* by Salvador Luria, Stephen Gould, and Sam Singer, which was published in 1981. Sadly, the misrepresentations stated in this text are the rule rather than the exception in textbooks of general biology.

The student is told: "Evolution is a fact."[15] There is no qualification of the sense in which the term evolution is used. The impression is that evolution in the Darwinian sense has been proven scientifically. In fact it has not.

Continuing, the student reads: "Humans have evolved from ape-like primates. That too is fact."[16] In both of these statements the authors seem to have taken an inordinate amount of liberty with their use of the word fact. Words do, and must have meaning, and the word fact means something known to have happened, a truth known by actual experience or observation.

Professor Luria and his co-authors cap their point of view with the following declaration:

> Then biology demonstrated that we are not created in the image of an all-powerful God, but had evolved from monkeys by the same process that regulates the history of all organisms.[17]

How could biology demonstrate anything about a nature (God's) to which the humanistic-rationalist denies existence? How could biology, a science, demonstrate anything about an object which is non-quantifiable? Biology would certainly appear foolish in any attempt to measure the immeasurable. Biology could never prove or disprove that man is made in God's image. We can at this point echo a loud "Amen" to Newman's observation that "They would be sure to teach wrongly, where they had no mission to teach at all."[19]

If the university is to operate on a consistent plane of logic, God cannot be ignored.

Not only is this declaration of Luria, *et al* a typical corruption of a supernatural truth, which in itself is bad, but even worse is its potential effect upon the student; it offers him an illusion when he seeks the truth. How many accept and live, based upon frequency of repetition, the illusion that we are biological accidents; that we are made strictly for animal pleasure; that sex is only for fun; that marriage is solely for convenience; that taking of innocent human life by abortion and euthanasia is permissible and desirable; that escape from the unpleasantness of reality through the use of drugs and alcohol is a legitimate recourse; that we live only for the here and now and, should life become a burden, suicide is an option; and that there is no life principle higher than self-indulgence and self-gratification?

Is it any wonder that our students from non-Christian homes experience great difficulty in initially encountering the truths of the faith? Is it any wonder that students with only a nominally Christian background lose their faith? Can we expect anything less than a weakening of faith among students from homes where Christianity is practised?

The exclusion or corruption of religious truth from university teaching is not only a compromise of truth itself, it is also a compromise of the spiritual and physical good of our students. This is particularly true in a student-teacher relationship where the teacher is often perceived by the student as an authority in all things. Newman describes this situation: ". . . and as every man has not the capacity of separating truth from falsehood, they (false teachers) persuade the world of what is false by urging upon it what is true."[19] This is not to imply that "experts" are never wrong within their fields of specialization. Nor is it to be implied that one can never speak correctly outside of their own area of professional expertise. However, it must be recognized that not infrequently some "experts" do use their position in the academic and scientific

community to impress upon the public their personal opinion, prejudice, and illusion as truth.

Mission is Integral Human Formation

The imparting of truth (instruction), is an important part of the educational process, but by no means is it the sole reason for the existence of the school. These truths, secular and sacred, do contribute to the mission of the school, but taken by themselves are not the mission. Mission has to do with "a sending; a going forth from one person to others in order to effect some beneficial change in their (the others) favor."[20]

Newman tells us that:

> education is a higher word (than instruction), it implies an action upon our mental nature, and the formation of a character; it is something individual and permanent. . . ."[21]

Education deals with integral human formation. Each type of education is conditioned by a philosophy, by a specific idea of who man is and what it really means to be a human person.

Very few seek knowledge for its own sake. It seems to be the mission of education to provide knowledge for use. The mission of education is to form knowledgeable people into wise men and women. The development of the proper use of knowledge imparted by instruction, which may also be described as the development of Christian character, is then the mission of the school.

An expansion and elaboration upon Newman's idea of "acting upon our mental nature and the formation of a character" might be the following. Here I quote from *Lay Teachers—Witnesses to Faith.*

> In order to fulfill its mission, the school must be concerned with constant and careful attention to cultivating in students the intellectual, creative, and esthetic faculties of the human person; to develop in them the ability to make correct use of their judgment, will, and affectivity; to promote in them a sense of values; to encourage just attitudes and prudent behavior; to introduce them to the cultural patrimony handed down from previous generations; to prepare them for professional life, and to encourage the friendly interchange among students of diverse cultures and backgrounds which will lead to mutual understanding."[22]

It also involves preparing students "to open themselves, more and more to reality, and to form in themselves a clear idea of the meaning of life."[23]

For the Christian teacher, the idea of reality and the meaning of life is clear and unequivocal. We come from God, created in His image. We are fallen and have been redeemed. We are to live according to the words and example of Jesus Christ. This life is, with the graces won for us by the life, suffering, death and resurrection of Christ, difficult but always within our grasp. Christ will come again to judge the living and the dead. This is openness to reality. There can be no more clear and real idea of the meaning of life. Christian wisdom is promoted and sustained by an openness and docility to the reality of Christ in our daily lives.

To see the mission of the school as anything less than the development of Christian wisdom or, if you perfer, Christian character would seem to blur and confuse very different and very basic concepts. This blurring and confusion of basics will result in the development of a shallow philosophy of life. Newman talks about the dangers of separating knowledge from the development of Christian character and he reviews some of the concepts whose meanings have consequently become obscured.

We can at this point echo a loud "Amen" to Newman's observation that "They would be sure to teach wrongly, where they had no mission to teach at all."

> Knowledge is one thing, virtue is another, good sense is not conscience, refinement is not humility, nor is largeness and justness of view, faith. Philosophy, however enlightened, however profound, gives no command over passions, no influential motives, no vivifying principles. Liberal Education makes not the Christian. . . ."[24]

Whenever there is talk of proper and just use of knowledge (wisdom), or that particular character of the human person which we designate as Christian, we become involved with human acts directed to specific ends. We become involved with conscience. The word conscience as being used here is taken in the Thomistic sense of being an intellectual act, the making of a judgment on the morality of an action. We know that there is no automatic response of right action merely because we are in the possession of certain knowledge. The accumulation of knowledge without the education of the part of the intellect which makes moral decisions (conscience) within the framework of the truths of the Faith cannot produce wise, Christian men and women.

The education of conscience requires a harmonious balance that can only come with the fullness of truth. If we do not educate conscience by the rules of Divine Faith, it will be educated by the rules of human faith. Simple, controverted human knowledge will be the sole basis of our intellectual, moral decision making. If Divine Faith is ignored (or more properly, if God is ignored), then there can be no concept of a transgression against the Divine. There can be no sense of sin, as traditionally expressed in Christianity.

> Conscience tends to become what is called a moral sense; the command of duty is a sort of moral taste; sin is not an offense against God, but against human nature.[25]

The objective distinction between right and wrong, between good to be done, and evil to be avoided is replaced by a subjective feeling of what we think is fitting and proper and the nice thing to do. We lose our hold on moral objectivity as

well as upon objective reality in general. Newman describes those who have developed this type of secular wisdom.

> The notion of an All-perfect, Ever-present God, in whose sight we are less than atoms, and who, while He deigns to visit us, can punish as well as bless, was abhorrent to them; they made their own minds sanctuary, their own ideas their oracle, and conscience in morals was parallel to genius in art, and wisdom in philosophy.[26]

This shallow philosophy of life must result from a Godless education. The results are predictable and all too obvious to us. Newman faced with the same situation speaks to this doctrine.

At no time in the history of our nation have so many been exposed to so much education with so little apparent effect.

> Such a doctrine (Religion of Philosophy), is essentially superficial, and such will be its effects. . . . It is detection, not the sin which is the crime; private life is sacred, and inquiring into it is intolerable, and decency is a virtue. . . . Poets may say anything, however wicked, with impunity; works of genius may be read without danger or shame, whatever their principles; fashion, celebrity, the beautiful, the heroic will suffice to force any evil upon the community. The splendours of a court, and the charms of a good society, wit, imagination, taste and high breeding, the prestige of rank, and the resources of wealth are a screen, an instrument and an apology for vice and irreligion.[27]

What greater appeal can be made for the common sense of including truths of Divine Faith in teaching? What more obvious, common sense results than those cited by Newman could be expected when the truths of Divine Faith are excluded?

The proponents of this "religion of philosophy," although they will not readily admit it, are extremely reluctant to allow the slightest intrusion of any religion other than their own into the school. Their attitude says, in effect, that the university is their church and that church extends from classroom, to speaker's bureau; from governance procedures to the selection of textbooks; from student activities to campus based cultural events. This false religion seems to be tolerant and pluralistic except when it comes to the person and message of Jesus Christ.

Exclusion or corruption of Divine Faith tends to lead to intellectualism, the belief that our reason is the principle of reality.

> Knowledge, viewed as knowledge, exerts a subtle influence throwing us back on ourselves, and making us our own center and our minds the measure of all things. This, then, is the tendency of that Liberal Education, of which the university is the school, viz., to view revealed religion from an aspect of its own—to fuse and recast it—to tune it, as it were, to a different key, and to reset its harmonies—to circumscribe it by a circle which unwarrantly amputates here and unduly develops there; and all under the notion, conscious or unconscious, that the human intellect, self-educated and self-supported is more true and perfect in its ideas and judgments than that of Prophets and Apostles, to whom the sights and sounds of Heaven were immediately conveyed. A sense of propriety, order, consistency, and completeness gives birth to a rebellious stirring against miracle and mystery, against the severe and the terrible.[28]

Reviewing the Problem

Perhaps, for the sake of perspective, a brief review of the consequences of excluding or corrupting the truths of Divine Faith and failure to recognize the true nature of students in university teaching is in order. These consequences are as follows:

There will be confusion about the real nature of human beings.
There will be an antagonism developed between faith and reason.
There will be a basic inconsistency with the idea of a university—the very name implies teaching of all truth (human and divine).
There will be fragmentation and distortion of human truths.
There will be disciplines which teach out of their areas of authority—lies are taught rather than truth.
There will be a disposition on the part of the student to accept illusion rather than truth.
There will be a weakening or loss of the Faith in those who possess it.
There will be a severe impediment in the path of those who, consciously or unconsciously, are searching for the Faith.
There will be the prevention of the integral formation of the human person (Christian character will not be formed).
There will be an impossibility of properly educating and forming a right and certain conscience on the part of the student.
There will be the establishment of a false and intolerant religion of philosophy.
There will be the development of intellectualism.

Solutions—Old and New

What can we do?

Let us not, as Christian teachers, become discouraged with our vocation—to bring the message and example of Christ to our students in the classroom. Let us not despair that we will be unable to fulfill this calling in a secular university setting. If we look at the calling of Old Testament servants of God, from Moses to Abraham, to Gideon, to Isaiah, to Jeremiah and to the New Testament servant of God, the Blessed Virgin Mary, we find the same Divine promise. In each of these callings the Lord promises to be with those whom He has called. Our vocation is blessed with the same Divine promise. We are never alone. God is always with us.

Newman looked in a very positive way upon the secular university environment of his time. He saw it, with God's help, as an opportunity.

> It is one great advantage of an age in which unbelief speaks out, that faith can speak out too; that, if falsehood assails Truth, Truth can assail falsehood.[29]

This is most definitely a moment in history when truth is under assault.

The tendency toward gloom which may from time to time settle upon us is understandable. At no time in the history of our nation have so many been exposed to so much education with so little apparent effect. Not only does the system generally fail on the intellectual level, it fails on the level of character formation. Murder, deviant sex, suicide, moral atrocities at the individual and international level abound. It is certainly a cause for dejection for those of us involved in the process; but at the same time it is a cause of hope for us. We know the basic reason for the failure—the exclusion of God from the process. The system is trying to educate man fully without recognizing that his or her full potential is only to be realized supernaturally. The United States has, in the last half of the twentieth century, written its own sad educational history. Newman sums up this situation very succinctly. "When, then, in a comprehensive scheme of education, Religion alone is excluded, that exclusion pleads in its own behalf."[30] Could there be any more obvious and eloquent plea than the intellectual and moral chaos in which our nation currently finds herself? Almost every human remedy has been tried. As Christian teachers, we must look to the rule of prayer and action. We must pray and work toward the end of bringing the Divine Physician to our ailing educational system. We must do this with gentleness, persistence, and courage. We must do it immediately.

We have all practised and developed, within our speciality areas, our own art of teaching, our own unique pedagogy. In order to bring Christ to our students, our pedagogy must give "special emphasis to direct and personal contact with the students."[31] We must use Christ's example as a teacher, and this was His human vocation. He was a rabbi, a master practising the art of teaching in the manner of His time. Part of this art was to live in very direct and personal contact with His students. There was never any doubt who the authority was. There was always the prudent combination of familiarity and distance. Jesus' closeness to His students was such that His life was a confirmation of His message. We should always make this a part of our pedagogy: to establish a Christ-like relationship with our students. This type of relationship will "allow for an openness and a dialogue which will facilitate an understanding of the witness to faith that is revealed through the behavior of the teacher."[32]

We must also remember that we not only are sharing Christ's pedagogy, we also share or continue His mission of helping the students to grow in holiness. We must be profoundly convinced that we share in the educational and thereby sanctifying mission of Jesus. This sanctifying mission of education, as we all know, is never easy. Once again we must look to Christ as an example. He, throughout His life, met with hostility and rebuke—culminating in the ultimate rebuke of crucifixion. Christian teachers cannot expect less. Difficulties in our mission should "be viewed and confronted with a healthy optimism and with the forceful courage which Christian hope and a sharing in the mystery of the Cross demand of all believers."[33] The fortitude to do this can only come as a result of a personal identification with Christ.

We must remember that what we bring to our students, we have received as a grace, a free gift from God freely given. No strings attached. We must offer this gift of faith intact. Not only intact in the sense of wholeness of content, but also in the sense of the spirit in which it was given to us. Jesus did not force the faith upon us. The gift was offered. It had appeal, both to faith and to reason. We freely opened ourselves to it and accepted it. We must present the faith to our students in the same way. "Though offered insistently and urgently, it cannot be imposed."[34]

In order to "teach students" it is necessary to know and act upon these basic concepts—the true natures of the student, truth, faith and reason, and the real relationship between faith and reason.

When Christ offered this gift it was with an authority, a warmth, a love, and a freedom which were an integral part of the personality and life of the Divine Teacher. Just as Christ's life expressed and made real the gift of faith, so must the lives of Christian teachers. We must be "the incarnation of the Christian message in the lives of men and women."[35] We must offer, by example, a life-style not demonstrated by the world. We must put to rest any notion that regards "Christian behavior as an impossible ideal."[36]

No one can seriously argue against the fact that teachers are professionals. What we may need to be reminded of from time to time is that teaching is more than a profession. It is a vocation. Our mission is made more difficult, if not impossible, if we reduce our role to a strict definition of professionalism. Our mission is only possible if our "professionalism is marked by and raised to a supernatural Christian vocation."[37] We must recognize the momentousness, fruitfulness, and the obligations of this profession, if we are to function as Christian teachers.

The fact that we are professionals makes it imperative that we keep abreast of developments within our areas of specialization. The fact that we have a supernatural vocation makes it imperative that we are not only knowledgeable about the truths of the Faith, but that we make these truths the bed-rock of our personal and professional lives.

We must constantly keep ourselves attune and open to the sources of God's grace without which nothing of significance is possible. Or on a more positive note—with God's grace anything of significance is possible. We must constantly be aware of our primary obligation as creatures to our Creator. This primary obligation is to pray. We must pray without ceasing. Prayer is a primary source of grace as are reading and living Sacred Scripture, liturgical celebrations and making use of all sensible signs instituted by Christ to give grace. Without Divine Grace no one can hope to make the truths of the Christian Faith the bedrock of their professional lives. Without Divine Grace, growth in spirituality and holiness is impossible.

The Christian teacher must "put on" a Christ-like sensitivity to the spiritual needs of the student. We must be sensitive to these needs whenever and wherever they are expressed. We must respond to these spiritual needs gracefully and in a Christ-like manner.

Signs of Contradiction

Finally, I submit that if the mission of the university is integral human formation, and if the aim of all university teaching is truth, there is only one framework within which this mission and aim can be fully realized. This framework is the message of salvation found only in the words, example, life, death, and resurrection of Jesus Christ. One obvious way that this message can come to the university is to be "preached" by the words, example and life of the Christ-like Christian teacher. There is no purely sociological or psychological, no purely economic, political or educational system that can satisfy this mission and aim. No purely human effort will suffice. The Christian message presented by the Christian teacher in a pluralistic, secularistic university would seem to be the only non-utopian hope for the realization of this mission and this aim.

That Christian teachers in secular schools are not outright contradictions surprises everyone except Christians. To us it comes as no surprise because ours is a religion of apparent contradictions. Ours is a religion of paradox: that God should become incarnate; that the Son of God should become the son of a carpenter; that everything comes from nothing; that the last are often first; that inheritance comes through meekness; that richness comes through poverty; that comfort comes through mourning and weeping; that satisfaction comes through hunger and thrist and purity of heart; the Kingdom through persecution; and dominance through gentleness.

Who other than a Christian would live such foolishness? Who but a Christian teacher would have the confident expectation, the hope, of using the profane, the secular and the temporal as the tools to build the sacred, the holy and the eternal? Who other than the Christian teacher could possibly do it?

NOTES

1. John Henry Cardinal Newman, *The Idea of a University*. New York, N.Y.; Holt, Rinehart and Winston, 1964, p. 6.
2. John Hardon, *Modern Catholic Dictionary*. Garden City, N.Y.; Doubleday and Co., Inc., 1980, p. 205.
3. Ibid., p. 205.
4. Newman, op. cit., p. 14.
5. Ibid., p. 14.
6. Ibid., p. 14–15.
7. Ibid., p. 19.
8. Ibid., p. 20.
9. Ibid., p. 33.
10. Ibid., p. 39.
11. Ibid., p. 39.
12. Ibid., p. 45.
13. Ibid., p. 47.
14. Ibid., p. 55.
15. Salvador E. Luria, Stephen Gould, and Sam Singer, *A View of Life*. Menlo Park, Ca.: Benjamin/Cummings Pub. Co., 1981, p. 575.
16. Ibid., p. 575.
17. Ibid., p. 568.
18. Newman, op. cit., p. 55.
19. Ibid., p. 59.
20. Hardon, op. cit., p. 354.
21. Newman, op. cit., p. 86.
22. Lay Teachers—Witnesses to Faith. *The Pope Speaks*. vol. 28. 1883, p. 49.
23. Ibid., p. 50.
24. Newman, op. cit., p. 91.
25. Ibid., p. 145.
26. Ibid., p. 147.
27. Ibid., p. 153. How often have we heard this plea when the private life in question involves homosexuality, prostitution, pornography, pederasty, and abortion?
28. Ibid., p. 165.
29. Ibid., p. 287.
30. Ibid., p. 287.
31. Lay Teachers, op. cit., p. 52.
32. Ibid., p. 52.
33. Ibid., p. 54.
34. Ibid., p. 55.
35. Ibid., p. 56.
36. Ibid., p. 57.
37. Ibid., p. 59.

William Harvey is one of the outstanding figures in the history of medicine, known especially for his 1628 essay on the circulation of the blood. In his CIVILIZATION AND DISEASE, *Henry Sigerist had this comment:*

> *"Harvey was a great man not only because he made a great discovery but also because he knew his own limitations. He solved one problem once and for all, and he had the courage to leave other problems unsolved. He explained only what he could demonstrate experimentally and was not afraid to admit that he had no answer for other questions. This makes him a true scientist."*

Humility and honesty should be dominant qualities for both the true scientist and the true Christian. How many of our controversies are rooted in a stubborn arrogance that leads us to ignore or distort the truth, often unwittingly?

Communications

Objectivity in Christian Perspective

Objectivity—a Christian Ideal

The Christian case for objectivity as an ideal in science is (and always has been) so obvious as hardly to need stating. If God is the Author of the Book of Nature, our obligation is to read it and to do justice to it as He has in fact written it, whether we like it or not. If we publish results of our investigations we must strive to 'tell it like it is,' knowing that the Author is at our elbow, a silent judge of the accuracy with which we claim to describe the world He has created. In this sense our goal is objective, value-free knowledge. If our limitations, both intellectual and moral, predictably limit our achievement of this ideal, this is something not to be gloried in but to be acknowledged in a spirit of repentance. Any idea that it could justify a dismissal of the ideal of value-free knowledge as a "myth" would be as irrational—and as irreligious—as to dismiss the ideal of *righteousness* as a "myth" on the grounds that we can never perfectly attain that. This is why I have elsewhere (1) described the currently fashionable *dismissal* of objectivity (as distinct from recognition of its limits) as symptomatic of "practical atheism." Christians who give way to the fashion are, I suggest, radically inconsistent. They forget that, whatever their difficulties in gaining objective knowledge, they are supposed to be in the loving service of the One to whom Truth is sacred, and carelessness or deliberate bias in stating it is an affront.

A Special Case

Thus far I have been speaking of science as traditionally understood—the enterprise of mapping God's world as it is, whether we like it or not. For this purpose, as quantum physics illustrates in a particularly dramatic way, we must do our best to minimize the extent to which our exploratory activity 'reacts back' on the territory we are exploring. Without such methodological detachment our maps are at best rendered fuzzy and uncertain; and at worst we are in danger of 'cooking' our results, determining their form by our own actions, and perhaps according to our own desires. Psychologists in particular have difficulty in preventing their experimental procedures from acting as 'beds of Procrustes' that distort or pre-determine the situation they want to describe.

There is one area of investigation, however, in which complete detachment is not merely difficult but impossible in principle. This is the area of *the investigator's own cognitive processes,* and other processes causally dependent on them. Learning about cognitive processes is itself a cognitive process. It is not hard to see that learning about ones *own* current cognitive processes, whether as an individual or a society, is bound in the end to be a circular or "reflexive" business, in which the correctness or otherwise of a detailed description must depend in part on whether or not you know or believe it, and how you value it.

The consequences of this special feature of human investigation, for which the latest buzz-word is "reflexivity," are far-reaching. As I put it in a paper written some 30 years ago entitled "Man as Observer-Predictor" (2): "The trouble with man as a scientific subject is that he is himself, of course, an observer: that the system being observed is itself an observer. The scientist studying man, then, is dealing with a sensitive system, in the sense of a system which amplifies the effects of his observations. However little you disturb a man by observing him, if the man knows that he is being observed this may have a large-scale effect, so that the man magnifies the effect of your disturbance on him. In engineering jargon, there is 'feedback' in the situation. . . . [H]ence any predictions that you would like to make as a scientist are likely to be invalidated as a result of this interaction.

"There is a second difficulty in achieving withdrawal—the scientific prerequisite for prediction—in the study of human systems, namely that if your prediction becomes known it can invalidate itself. . . . It may [even] be that the more accurate your prediction, the more devastating will be its effect on the basis of prediction if you allow it to affect the system. So in such situations, if your aim in making a prediction is to act upon the system on the basis of the prediction, there is a very severe limit on the reliability of your action." More explicitly (from a paper (3) written 20 years ago): "Any complete description of a cognitive information-system must include, or depend on, the information possessed by the units of the system. Any change in the information possessed by a unit must, in general, require a change in the complete description. It follows that in general, *no complete description exists which would be equally valid whether or not the units were informed of it.* In other words, no complete machine-model (nor any other complete predictive model) of a society is possible, which would be equally valid before *and* after any member of that society learned of it. In this area, then, there is a fundamental incompatibility between two of the normal aims of science—to observe facts, and to spread knowledge of those facts as widely as possible."

Information or Manipulation?

As a recent article (4) by Mary Stewart van Leeuwen shows, the peculiar consequences of this reflexivity are now becoming more widely recognized in the human sciences. Such a recognition means, among other things, that much of what passes as scientific 'investigation' of human social

situations does not and cannot yield even approximately objective knowledge, in the sense of 'take-it-or-leave-it' specifications which are logically independent of our value-judgments on them. In particular, as Popper (5) points out in *The Poverty of Historicism,* this exposes the fallacy in the idea that human history is inevitably predictable by extrapolation from its past, so that all a wise man need do is to discern its direction and mount the appropriate band wagon. No matter how scientific the basis of an alleged prediction of the course of history, it will still be possible for an individual or society confronted with it to make nonsense of it, by taking the opposite attitude to the one assumed when the calculation was made.

In extreme cases what such an 'investigation' does is not to *inform* but to *manipulate* the individual or the society upon which the investigator operates. In the paper cited above (3), I considered the possibility that with a sufficiently complex predictive model, a prediction (say of an election result) could be trimmed in such a way that when published it ensured its own fulfilment. In that case "nobody who believed it feels himself to have been deceived. But suppose it had not been published? Then (*ex hypothesi*) the result would have been different—perhaps even reversed. Thus publication here was not primarily informative, but manipulative. And although a large computer may not always be essential to this end, the more powerful the predictive apparatus used, the more subtle and wide-ranging will be the manipulation of social attitude possible under the guise of scientific prediction. . . . [O]ur society's insatiable thirst for information about itself and its future has now laid it wide open to the most subtle bondage of all, in which major decisions can in principle be taken for it (wittingly or otherwise) by those whom it asks to predict them; and in an age that takes verification as its chief criterion of truth the manipulators could have the strongest possible defence: 'We were right, weren't we'? "(6).

The inference I drew was that "On many questions of social attitude now open to scientific study, it is fallacious to suppose that there must exist neutral scientific knowledge to be publicly acquired. The declared aim of science is to propound conclusions which are true regardless of the attitude people take to them. It is now abundantly clear that many questions being asked of applied social science even today *have no such answers.* To recognise the ineradicably instrumental character of public scientific enquiry here is to lay emphasis on a new dimension of the responsibility of the scientist, at present barely acknowledged. It is not simply that we are able to alter people's opinions predictably, which all propagandists can [do]. What seems objectionable is our unrecognised and unavoidable power to do so when we are asked (and believed) to supply only "objective" information." (6).

Two Responses to Reflexivity

To this widely recognized dilemma we can react in various ways. One, which strikes me as the obviously honest way, is explicitly to disclaim for the pronouncements of investigators in human reflexive situations the 'take-it-or-leave it' status of 'scientific' descriptions. This does *not* mean (as Dr. van Leeuwen mistakenly implies) denying the name of 'science' to all investigations of social and human affairs—far from it. But it does mean having the humility and honesty to renounce the kudos attached to the label 'scientific' when promulgating 'findings' in situations that deprive these 'findings' of objectivity.

An alternative course, which seems to appeal to some practitioners, is to insist on retaining the label 'scientific' in reflexive situations without any qualifications, and to blur vital distinctions by talking as if *all* science suffered from the same kind of difficulties in attaining objectivity. The results of such confusion are lamentably illustrated towards the end of Dr. van Leeuwen's article (4). She begins well by outlining clearly the damage done to the image of man by Watson's materialist behaviourism, and provides a useful sketch of the diverse ways in which social scientists are trying to break away from that (particularly inept) straitjacket. When she turns to the views of some fellow-Christians, however, Dr. van Leeuwen lays scholarly care aside, presenting an account (unsupported by any direct quotations) that does serious injustice to both the content and the spirit of their arguments. To date, she says, it is relatively rare for Christians to resolve what she terms the 'mechanistic/personalistic dilemma' "other than through a species of 'perspectivalism' . . . according to which the social sciences, including psychology, are left to regard and study human activity only in its determined, mechanistic aspects, while the pursuit of reflexivity-conditioned human activity, while admitted to be important, is relegated to the humanities. This position . . . seems to be based on the conclusion that if one has to choose between a model of persons as unscripturally passive and one which sees them as unscripturally *autonomous,* it is safer to choose the former. In Dooyeweerd's language, such thinkers seem to prefer the risk of flirting with the 'science ideal' (the notion that the whole universe is impersonal and mechanistic) than with the 'freedom ideal' (the notion that at least some people can transcend their own determinism and 'play God'). . . . In point of fact, what we must all strive for is a unified (*not* compartmentalised or 'perspectivalised') view of persons which does *equal* justice to both their creaturely and their creative aspects, and to both their *Imago Dei and* their fallenness."

Dr. van Leeuwen represents the present writer, among others, as seeing symptoms of practical atheism in "any [*sic*] questioning of the ideal of objective value-free knowledge," and she then defends such questioning without qualification as "the inevitable result of a recovered respect for human reflexivity." "[W]hen well-trained, much-respected scientists begin . . . to show a greater humility and historical relativity concerning their own efforts and a greater respect for the demonstrated reflexivity, autonomy and rights of their human subjects," she goes on, "we are being not more, but less objective when we ignore their conclusions in pursuit of an inflated but outdated view of the purity of scientists and the passivity of the human beings they study."

A Realistic Balance

The reader may judge, in the light of the extracts above (2, 3, 6), how accurate is the impression so rhetorically

created. It would be hard to guess that even the very article (1) attacked by Dr. van Leeuwen contained an explicit discussion of reflexivity and the limits it sets to objectivity. A quotation from another old paper (7), entitled "Scientific beliefs about oneself," may serve to sum up my true position: "Does this [logical relativity, one of the consequences of reflexivity] mean, then, that true objectivity is unattainable in a complete science of man? Not at all. It means only that if we want to be objective we must amplify our descriptions by saying who would be correct to believe the statements concerned. The *correctness of what people believe* about themselves and others could in principle be objectively established, at least in retrospect. All we must abandon is the presupposition, which admittedly goes deep into our thinking, that if one individual is correct to believe that X will happen at time t, all others would be correct to believe the same, and incorrect not to.

"We could, of course, take this point in another way. The goal of objective science is to establish facts which if true for one are true for all. Relativity theory has taught us that where facts are about *relations* (with observers) rather than *objects*, we cannot expect all observers' descriptions to agree, though we may hope to find some more fundamental representation from which individually correct beliefs about relations can be derived. Viewed in this light, we can take what I have been saying as a proof that in an important sense people cannot be *objects* of scientific scrutiny. An object in this sense is something of which there is one and only one objective specification that could logically claim the assent of all. By contrast, what we have seen is that the concept of a person is fundamentally relational; there is no single complete and objective specification of any one person that could claim the unconditional assent of all persons, including that person himself."

No, the branding of Christian objectivists such as the present writer as "lacking respect for the reflexivity, autonomy and rights of their human subjects," and as "holding an inflated but outdated view of the purity of scientists and the passivity of the human beings they study" (4) simply does not square with the facts. The mechanistic reductionism that undervalues human freedom is something I have spent a lifetime contending against (2, 3, 6–8), and it gains no support whatever from the objectivity for which I am also arguing. Only a sad confusion of issues can excuse the innuendo that they go together. As indicated above, a proper "respect for reflexivity" has consequences that some anti-objectivists may find unpalatable; but it affords no honest refuge from the Christian's plain duty to respect and strive for objectivity, wherever possible, as a God-given ideal.

[1]MacKay, D.M. 1980, Value-free knowledge: Myth or norm? *Faith and Thought*, 107, 202–209.
[2]——— 1955, Man as Observer-Predictor, in: *Man and his Relationships* (H. Westmann, ed.) Routledge, London. pp. 15–28, esp. 20–21.
[3]——— 1963, Machines and Societies, in: *Man and his Future* (G. Wolstenholme, ed.), Churchill, pp. 153–167, esp. 165.
[4]van Leeuwen, M.S. 1983, Reflexivity in North American Psychology: Historical reflections on one aspect of a changing paradigm, *Journal of the American Scientific Affiliation*, 35 no. 3 pp. 162–167, esp. 166.
[5]Popper, K.R. 1957, *The Poverty of Historicism*, Routledge, London.
[6]MacKay, D.M. 1963 *op. cit.* pp. 164–6.
[7]——— 1971, Scientific Beliefs about Oneself, in: *The Proper Study* (G.N.A. Vesey, ed.), Royal Institute of Philosophy Lectures, Vol. 4, Macmillan, London, pp. 48–63, esp. 54–55.
[8]——— 1954, On comparing the Brain with Machines, *The American Scientist*, 42, 261–268; 1957, Brain and Will, *The Listener* (BBC), May 9th and 16th. Reprinted in: *Body and Mind* (G.N.A. Vesey, ed.) Allen and Unwin (1964), pp. 392–402; 1957, Information Theory and Human Information Systems, *Impact of Science on Society*, 8, 86–101; 1960, On the Logical Indeterminacy of a Free Choice, *Mind*, 69, 31–40; 1960, Man as a Mechanism, *Faith and Thought*, 91, 145–157; also in *Christianity in a Mechanistic Universe*, I.V.F. (1965); 1965, Information and Prediction in Human Sciences, in: *Information and Prediction in Science* (S. Dockx and P. Bernays, eds.) Academic Press, NY, pp. 255–269; 1965, A Mind's Eye View of the Brain, in: *Cybernetics of the Nervous System* (Norbert Wiener and J.P. Schade, eds.), Progress in Brain Research, 17, Elsevier, pp. 321–332; 1969, *Information, Mechanism and Meaning*, M.I.T. Press, Boston; 1974, *The Clockwork Image: A Christian Perspective on Science*, Inter-Varsity Press; 1979, *Human Science and Human Dignity*, Hodder and Stoughton, London, and Intervarsity Press. Downers Grove, Ill. 1980, *Brains, Machines and Persons*, Collins, London, and Eerdmans, Grand Rapids.

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Single Theory Myopia

In the behavioral sciences, and to a lesser extent in the physical sciences, there is a tendency to attempt to explain behavior or events by a single theory. Proposing a single theory to account for a complex phenomenon is often called the *Sovereign theory approach*, the *Simple theory approach* or the *Unity theory approach* (Robertson, 1977). Discipline specialization has also encouraged this view. As Wolfgang and Ferracuti (1967:1) note:

> Owing to increasing specialization in the study of human behavior, there has been a lack of integrated scientific theory. All knowledge tends to be unitary, and disciplinary activities are only artifacts required because of man's limited grasp of the universe of ideas.

With field experience in a behavioral science area, one soon finds that all human behavior, such as depression, rarely can be explained or understood by a single theory. Yet, in the history of science, the rule was to do just that. In the area of juvenile delinquency, for example, some researchers have tried to explain almost all delinquency by "labeling theory," others by "differential association theory," still others by "control theory," and still others by Merton's "anomic theory" (Empey, 1982).

The tendency to attribute phenomena to a single cause or one theory is also evident in everyday social relations. We still have a tendency to see one person as "at fault" after a divorce, in spite of the fact that sociological research reveals

that this is rarely the case and the laws in most states reflect this. The study of violent behavior has found that many violent crimes are often an interplay between a potential victim and offender. This discovery has resulted in the science of victimology, the study of how the victims' behavior contributes to a dyadic relationship which results in a violent crime. In domestic violence, the victim almost always contributes to some degree to the situation which causes the other person to perpetuate what may become a crime. Especially in domestic violence, it is often a matter of chance who ends up the victim and who the offender.

Many researchers write as if their particular theory totally explains some behavior, such as delinquency and, in essence, argue apologetically in defense of their faith in their pet theory. Few writers, for example, openly acknowledge that, although one theory may explain some types of delinquency for some social classes or groups, no theory explains *all* types of delinquency. Most researchers, of course, recognize that it is likely that many factors are responsible for complex behavior such as juvenile delinquency, but this is not often stressed. The fact that most theories are partly correct, even if only as a minor cause of delinquency, is often only indirectly mentioned.

Baron and Byrne (1981:9) stress that it is now clear that human social behavior is "far too complex in origin to permit the luxury of simple, unitary explanations." As Shepard (1981:32) concludes:

> Events in the physical or social world are generally too complex to be explained by any single [theory]. . . . For this reason scientists are guided by the principle of *multiple causation* which states that an event occurs as a result of several factors operating in combination. What, for example, causes crime? Cesare Lombroso . . . believed that the predisposition to crime was inherited and that criminals could be identified by certain primitive physical traits (large jaws, receding foreheads). Modern criminologists reject Lombroso's (or anyone's) one-factor explanation of crime. They now cite numerous factors that contribute to crime, including extreme permissiveness and freedom; subcultures of violence turned against society; rapid social change and economic development; excessive materialism; hopeless poverty in slums; and overly lax, overly strict, or erratic childrearing practices.

Despite the fact that most of the simple sovereign theories have fallen from favor, their historical importance cannot be overlooked. Most of the classical theories were far too sweeping in scope, actually to such a degree that they were soon found to be very inaccurate. Their legacy is that they rested on an important assumption which has held today: social behavior, like other natural events, is both lawful and predictable.

The History of Some Major Sovereign Theories

Allport, (1968) in a review of the history of social psychology, observed that at one time most researchers tended to subscribe to one of five, simple, sovereign explanations. These were hedonism, egoism, sympathy, imitation, and suggestion.

One of the more famous of these five is hedonism theory, especially as discussed by John Stuart Mill and Herbert Spencer. Hedonism theory, similar to hedonistic philosophy, is the belief that all behavior is ultimately based on the natural, normal, universal human desire to maximize pleasure and minimize pain (boredom being interpreted as pain). A modern version of this position is *exchange theory,* which interprets all behavior as a series of exchanges based on the person's assumed advantages or "gain" from making the exchanges. The drive to experience pleasure and avoid pain was a popular way of interpreting human actions because virtually every behavior could be "explained" by the theory quite well. Some behaviors, though, require strained explanations to understand them, such as one gives to others (altruism) only because of an expected payoff, and some normally unrewarding behaviors such as pain were, in cases of inversion, rewarding. A hedonistic world view is the deliberate focus on maximizing personal gain from these exchanges, or the value that pursuit of pleasure is lifes highest purpose (Banowsky, 1969:9).

Another outdated sovereign theory, the *power hypothesis,* was advocated by Friedrich Nietzsche: all behavior, especially social behavior, stems from the universal desire of human beings to obtain power and thereby increase their power or status, a view usually called *egoism.* These are only a few of the many theories that researchers argued for years as to the validity of one compared to the others.

In the physical sciences the concept of a single theory has been historically prevalent, causing researchers to ignore other influential factors (Sarton, 1959, Singer, 1959). Geneticists for years have attributed almost all phenotypic variation to random shuffling of genes that occurred in the process of meiosis, and from mutations in the formation of the zygote (Nordenskiold, 1935). McClintock from her research on "Jumping Genes" has introduced another factor which, until recently, was largely ignored, possibly for the reason that valid, acceptable, explanations existed for her data which were interpreted in the single theory myopic orientation as fully adequate.

Many other examples from the physical sciences could be given, such as God, sin, or germs as *the* cause of disease, a battle which is still not over (Hume, 1947). Even the hereditary vs. environment issue is still with us. While researchers typically acknowledge both as influential, there is a tendency for sociologists to almost totally ignore heredity and likewise sociobiologists to almost totally ignore environment (Montagu, 1980). The creation-evolution controversy is also often dichotomized in the same way (Thurman, 1978). Some creationists assume that every variation extant in nature must have been specifically created, and many evolutionists work under the assumption that the natural world is totally the result of pre-existing natural law, time and chance, rejecting the possibility of intelligent intervention or direction.

The Movement from Sovereign Theories to the Eclectic or Integration Approach

In many fields, early researchers began with many sovereign theories and, as the field developed, they were dropped

or modified. Psychology may have advanced beyond sociology in that most psychologists stress that there are a multiplicity of factors which influence the events they study. In the development of schizophrenia, for example, they typically recognize that biological predispositions are influential but that environment and individual factors are also very important.

As there is no single theory to describe the behavior of individuals, likewise no single theory exists that describes the behavior of groups. As Rose (1982:9) stresses:

> . . . it will probably always appear that there are turning points at which processes may move in one direction or another. For the sociologist . . . this means that we shall probably never be able to speak with confidence of [for example] *the* riot process, *the* disaster process, or *the* process by which a successful protest is accomplished. Rather, we hope to observe such a variety of episodes that we can say with *some* confidence that a certain step, if taken, is likely to increase the probability of a next step in one of the several process patterns that we have observed.

For this reason, in the study of social movements, Zurcher (1981:479) stresses that, in order to understand social movements, "an exclusively psychological or an exclusively sociological approach . . . is not sufficient. Either of these exclusive orientations tend to lead to simple and sovereign explanations for the behavior of human beings in social movements."

Decision theory has found that for any given behavior there almost always exists many different influences and causative factors (Brown, 1973). These influences vary according to the actor and the individual situation. For some individuals, Factor I may be most important, but others are always influential. For other persons, Factors I, II and III may be somewhat equally important, and for yet others Factor III may be the most important but, again, others are always influential.

Application of Decision Theory

An illustration will help make the above clear. The purchase of an automobile, a common behavior in American society, involves selecting from a wide variety of choices and options. One could purchase an expensive large car, a four-door sedan, a convertible, a station wagon, or some combination of the above. In addition, one could purchase a Plymouth station wagon with or without air conditioning, with or without a radio, etc.

Applying the decision theory to this situation, we would conclude that the explanation of why a person purchases a car is *not* made on the basis of one theory (e.g. an automobile purchase is for the purpose of obtaining a means to transport the owner from one place to another or is the result of the purchaser being socialized into a certain lifestyle). Purchasing an automobile would *always* involve several motivations—although some may be far more important than others. It is possible to find the most common motivations, which may in time change in statistical frequency. In a certain period of American history the most common reason, but not the only reason, for certain persons for purchasing a car may be to achieve status. In other periods, such as after a gasoline shortage, other factors may become more important such as concerns about gas mileage or economy. Elements which may be important include:

1. *Specific automobile environment,* i.e., if a person was raised around Chrysler products and his or her first few cars were Mopars, the person may feel "brand loyalty" to this line, and therefore continue to purchase them. Of course, within this broad motivation, one could purchase a Plymouth Horizon or a Chrysler Le Baron—considerably different automobiles. Thus, again, this factor will account for only part of the behavior which we could entitle "automobile brand or type purchasing motivation."
2. *Experience* with a certain brand name of car. If a person owned a Ford and experienced problems with either the car, the dealer, or both, in the future he or she may be influenced to purchase another type of car.
3. *Chance factors,* i.e., one may simply happen to live near a Chevrolet dealer, have a friend who sells Plymouths, or notice a car for sale which, for some reason (like past experiences) "catches one's eye."
4. *Rational considerations* including price, engineering innovations such as front wheel drive, gas mileage, use of an electronic ignition system. Also, in this group are reputation for endurance, body appearance and other factors.

The above may seem obvious, but when the same principle is applied to sociology, psychology or the other behavioral sciences, ironically it meets with much resistance. For example, Merton's theory of anomie undoubtedly is an important factor in much lower and some middle class crime but does not, contrary to the claims of its supporters, explain *all* crime for *all* classes and *all* individuals. Cohen's theory of a "contra-culture" or the existence of subcultures in which crime is a response to frustration in achieving respectability and satisfaction of social and ego needs within the dominant society is likewise important, especially with certain individuals in the lower classes. Instead of endeavoring to determine which theory best explains juvenile delinquency, it would be much more functional to delineate those factors which explain crime and, specifically, *which* factors seem to be important with which elements. One theory may explain crime among the lower class, high I.Q. population and another why talented but frustrated individuals are prone to crime. Our goal then, would be to delineate all or most of the many factors which influence juvenile delinquency or crime in general, and endeavor to understand exactly what they successfully explain. Since decision theory specifies that we look for *many* factors, our concern becomes looking for *several* different explanations instead of *one.* In other words, "there is more than one way to skin a cat," and, as Leo Roster wrote, "If an explanation relies on a single cause, it is surely wrong," (Shepard, 1981:32).

Admittedly, efforts to examine behavior from several vantage points has not always been fully successful. But, as Wolfgang and Ferracuti (1967:xx) stress:

> Although the history of efforts to promote interdisciplinary cooperation in the behavioral sciences has not been blessed with outstanding success, we firmly believe the efforts should continue. Our own experience has led us to be more than ever convinced that when the notions of one discipline are subjected to the sharp edge of critical comment by another discipline, the

fuzzy layers of impression, inadequate methodology, incomplete theoretical models, and non-operational hypotheses are quickly cut from core ideas that might be better reconstructed with integrated tools.

Applications of the above theory will undoubtedly help us avoid many of the pointless discussions that are commonly found in the behavioral sciences which are reminiscent of some of the theological arguments of the middle ages. Indeed, there are many similarities between pro and con discussions of, for example, Merton's theory of anomie and pro and con discussions of the premillennial, post-millennial and amillennial theological positions in Christian eschatology. This is not to say that discussion and debate is not important, but the debate should help us understand specifically to what group of people and under what conditions a theory applies, and not only whether the theory is valid or invalid. Undoubtedly, almost *all* theories which purport to explain juvenile delinquency have *some*, even if only limited, validity.

Summary

An eclectic approach, using psychological, sociological and biological insight, will probably produce explanations closer to reality. It is for this reason that, instead of assuming that the Freudian view of human behavior is the "correct" view and explains all behavior, almost all psychotherapists use an eclectic approach (apply the technique or theory which seems to work best to help a specific patient). Likewise, sociologists, educators and others should be fully cognizant that the "one theory approach" is not reality, and the real world of human behavior requires an eclectic explanation.

As Rose (1982:11) stresses,

> Recognizing social 'reality' as an infinitely complex matter, to classify that reality into a finite number of types is to do violence to the radical individuality of each unit of sociological analysis: each person, each group, in our case, each episode. If we are looking, then, for *the* set of types that corresponds to the delineation that exists in reality, we shall look forever in vain.

A step in the direction of looking at reality from several theoretical perspectives in unison has been taken by sociologists to unify the three basic prespectives in sociology, the conflict, functionalist and interactionist approaches. As Shepard (1981:15–16) notes:

> Which theoretical perspective—functionalism or conflict theory—is best? Neither; there is no one best theory. Each of these perspectives sheds light on certain aspects of social life. The advantages of one theory are the disadvantages of the other. Functionalism explains much of the consensus, stability, and cooperation within a society. Conflict theory explains much of the constraint, conflict, and change. Since each theory has captured an essential side of society's nature, their combination or synthesis is a reasonable next step.
>
> Some attempts to combine functionalism and conflict theory have already been made (Dahrendorf, 1958; van de Berghe, 1963). One of the most promising is the attempt to specify the conditions under which conflict and cooperation occur. Gerhard Lenski (1966) contends that people cooperate—even share the fruits of their labors—when scarcity threatens their survival. But conflict, competition and constraint are likely to occur when there is more than enough for everyone. Thus as a society moves from a subsistence economy to an affluent one, conflict, competition, and constraint increase.

This is reflecting itself in more and more fields of study. Lasswell and Lasswell (1982:161) note that in mate selection theory, process theory has won out. Process theory says that there "can be no single-principle approach, but instead there are many factors that determine marital choice."

Such a multiple theory approach needs to be applied to all of the sciences, both physical and social, to fully understand the complexities of reality. Our goal should be, as Wolfgang and Ferracuti (1967:2–3) emphasize:

> . . . whether our knowledge of human behavior increases through the efforts of individuals in separate disciplines working alone or through the efforts of multi- or interdisciplinary teams, integration of past and present knowledge and theory should be considered a *sine qua non* of these efforts.
>
> We use the term 'integration' because we are suggesting that it means something different from interdisciplinary collaboration. Integration in this context means bringing together empirical data, relative to the same phenomenon, that have been collected by independent disciplines and interpreted within their limited parameters of orientation so that an analytical synthesis becomes minimally the combination of the parts and maximally a new perspective.

Theological Implications

Studying the creation obviously gives insight into the mind of the Creator. The concept of dual revelation, i.e. God reveals Himself through both the scriptures and His creation, also illustrates the concept of multiple causation.

Problems associated with the various interpretations of scripture have given rise to the science of hermeneutics. In that the same God wrote the Bible as created the laws of behavior, we would expect similarities as is true of any authorship. As it is clear that a multi-level of interpretation of the behavior world is necessary for complete understanding, thus the multi-level interpretation of the scriptures and Christianity as a whole is necessary for a full understanding of the faith.

For example, this principle has been expressed by theologians in the interpretative rule of Biblical exegesis that prophecy has a major and a minor fulfillment. Further, it is understood that Christ taught in parables so that the general concept could easily be conveyed and applied to a wide variety of situations. The literal usefulness of, or application of, the literal situation is often very limited. An example is Matthew 5:20, where Christ said that a person should take the log out of one's own eye before attempting to remove the splinter from an associate's eye. Entire volumes have been written on this scripture, focusing on such concepts as xenophobia, ethnocentrism, verstehen (Max Weber), the concept of Cooley's "looking glass self," etc. Theological disputes often occur when a very limited or single interpretation of a scripture or a set of related scriptural passages is

imposed. Our goal should be to sort out the many interpretations and endeavor to apply the concept of multi-interpretation to fully understand the passages' meaning and proper intent.

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Priestley, Nonconformist Minister

Joseph Priestley (1733–1804) was a remarkable person! He was a nonconformist not only in religion, but also in politics and in science.

Son of a Yorkshire weaver and dresser, he was brought up to be a Presbyterian minister. Although poor health interrupted his formal education, he excelled in languages and, on his own, studied Semitic ones. At home he had as a tutor a dissenting clergyman, who had been a student of Colin Maclaurin, the mathematician; he read S'Gravesande's "Elements of Natural Philosophy." At nineteen he entered a nonconformist academy to prepare for the ministry. Enthralled with David Hartley's "Observations on Man," he tended to adopt heterodox sides of almost every question. He had already begun to form some doubts as to the divine inspiration of the Holy Scriptures and supernatural influences (except miracles).

Priestley had inherited stuttering, which he never quite overcame; he adopted a conversational style of speaking in public. At the age of twenty-three he received his first call, to a chapel in Suffolk. Since his congregation dwindled he had to supplement his income by teaching classics and mathematics. His next ministry was at a more broad-minded chapel in Cheshire. Here he started a school and bought a small electric machine and air pump. This successful venture led to his appointment, at thirty-two, as tutor of languages and belles-lettres in the Warrington Academy (between Liverpool and Manchester). In the same year he was awarded an honorary LID. by the University of Edinburgh (Oxford and Cambridge were not open to dissenters) for his Chart of Biography.

Meanwhile, he had fitted up a small house as a laboratory, primarily for electrical experiments. Priestley was an enthusiastic and zealous amateur. For him natural philosophy was a great adventure; he had a predilection for science and mathematics. His persistent curiosity led him to explore many interesting byways, although he tended to explain away his discoveries as due to happenstance. On a trip to London (1765) he met John Canton and Benjamin Franklin, who recommended that he write a History of Electricity. One fourth of the published book (1767) consisted of his own investigations. He determined the electrical conductivity of various substances. Most important, however, he noted that the inside of a metal container charged electrically on the outside was not at all charged; he inferred an inverse square law of force—experimentally verified 1784–5 by Charles Coulomb. At thirty-three he had been made a fellow of the Royal Society.

At thirty-four he was called to a chapel in Leeds, where he remained six years. During this period he developed pneumatic chemistry by the simple device of collecting gases over mercury instead of the customary water. (His innovative techniques influenced the whole teaching of chemistry.) Priestley himself analyzed what he called various types of "airs," e.g., alkaline, nitrous, phlogisticated, dephlogisticated, et al. He received the Royal Society Copley Medal for his identification of the last in 1774 (wrongly named Oxygen (acid-forming) by Antoine Lavoisier, whom he had met in Paris). In modern terms he isolated nitrous oxide, nitric oxide, carbon monoxide, ammonia, sulphurous acid, gaseous hydrochloric acid, and silicon fluoride. He noted that plants inhaled oxygen and exhaled carbon dioxide in daylight; that sound is more feeble in hydrogen but louder in carbon dioxide than in air. He discovered "aerated" (carbonated) water. It is truly amazing how Priestley, without any general knowledge of chemistry and with only limited apparatus, became one of the outstanding chemists of his time—based solely on his ardor, industry, and ingenious manipulative skill. Strangely, this stubborn nonconformist persisted in believing in the discarded idea of phlogiston until his death.

During this time he also published thirty-four works,

mostly theological; in particular, "Institutes of Natural and Revealed Religion." He had concluded that the 39 Articles of the Church of England should be reduced to one, viz., the religion of Jesus Christ, that the "livings" of all clergy should be the same, that the clergy should have only clerical duties, and that every member of a community should have as a civil right, regardless of his church affiliation, the freedom to serve his country in any civil capacity for which he was otherwise qualified. In his own case, in 1771 an invitation to join Capt. James Cook on his second voyage was vetoed by church personnel. As he himself admitted in 1772, Presbyterians then were more likely Socinians than Christians, (cf. the 16th-century Sozzini's, who denied the divinity of Christ; we would probably use the more modern term Unitarian).

One essay (1768) dealt with "First Principles of Government and the Nature of Political, Civil, and Religious Liberty." He believed government should not interfere with the life, liberty, and property of members of the community. True freedom exists only if anyone can aspire to the highest office. In 1773 Priestley was invited by Lord Shelburne, a Whig statesman, to be nominally his librarian—actually an intellectual advisor. During this employment he published 23 works, including 4 on gases. His increasingly radical philosophy compelled him to resign voluntarily this position.

At forty-seven he retired to Fair Hill near Birmingham, the flowering of the new industrial society, where he could live comfortably on his Shelburne pension (he refused two government pensions in order not to jeopardize his independence). He was able to carry on his research with generous grants from some friends; at the same time he enjoyed the informal (full moon) meetings of the Lunar Society. He was happy for eleven years, particularly when invited to be the minister of the New Meeting in Birmingham (said to be the "most liberal" in England). Priestley was relieved from weekday chores by a colleague; he himself started a nonconformist Sunday school to rival the establishment one started there earlier; he became involved in the public library. In 1785 he wrote "The Importance and Extent of Free Inquiry" and "A History of Early Opinions Concerning Jesus Christ." Five years later he published all his "air" researches and a "History of the Corruptions of Christianity" (a historical approach to philosophical theology), which infuriated both Calvinists and Lutherans. Two years earlier he had given a sermon against the slave trade.

Priestley had always been sympathetic to the principles of the American and the French Revolutions. (He declined, however, membership in the National Convention of France.) Although he did not attend the local dinner honoring the second anniversary (14 July 1791) of Bastille Day, he did not escape the frenzied mob, incited by scurrilous handbills and forged letters, which sacked and burned the Meeting Houses, as well as the homes of prominent dissenters. Priestley escaped to London where he found himself not only attacked by the Church and King Party, but even shunned by most fellows of the Royal Society. The Courts were lethargic in meting out justice; they made meager recompense for his losses, which included invaluable manuscripts and notes.

In despair, at sixty-one, he and his family set out courageously for the New World. They settled in Northumberland, Pennsylvania. (In 1785 he had been made a member of the American Philosophical Society.) From 1791 to his death he published thirty works; he declined the chairmanship of the University of Pennsylvania Department of Chemistry. Nevertheless, when he lectured at the Universalist Chapel in Philadelphia he was regarded more as a curiosity than as a thinker. At seventy-one he died and is buried in a cemetery near the Susquehanna River; his house is now a historic monument with a laboratory museum adjoining. The National Institute of France published the obituary of this associate, but the Royal Society made no mention of his death. The American Chemical Society has as its most prestigious award the Priestley Medal.

Whatever Preistley touched—religion, politics, science—bears the indelible stamp of a man who was independent and bold, candid and courageous. Thomas Jefferson, with whom Priestley sympathized and corresponded, particularly with respect to public education, remarked, "I have read his 'Corruptions of Christianity' and 'Early Opinions of Jesus,' over and over again; and I rest on them . . . as the basis of my own faith. These writings have never been answered."

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*This is the eighth in a series on religious scientists.

"The scientist, even when he is a believer, is bound to try as far as possible to reduce miracles to regularities; the believer, even when he is a scientist, discovers miracle in the most familiar things."

Natural Law and Divine Miracle
R. Hooykaas (1959)

Book Reviews

EDUCATION FOR CONTINUITY AND CHANGE by Mary Elizabeth Moore, 1983, Abingdon, PB, 222 pp. no price given.

The author's primary concern in this book is the apparent emphasis of Christian education nowadays on Bible-centered studies (the past) or life-centered ones (the present)—with little regard for the future (unknown). Disturbed by the split of the present from the past and the future, she proposes as her thesis a maximizing of continuity and change by her so-called *traditioning model*, which allows the present to develop out of the unknown past towards the uncertain future. (How does a person interact with his/her future?) To do so, she reformulates educational practice: its ideals, goals, and objectives (all life is included in the educational process). No distinction is made between general education and religious education, although the subtitle "A New Model for Christian Religious Education" implies that Christian education may not be religious. Her use of the context of education to mean "the Christian faith community" is nebulous. Nor am I impressed by her example of a specific objective being a comparison of elections in Biblical times, the Middle Ages, the Reformation, and now. Her discussion of the disconnectedness of most curricula is good, but her claims that her own model, "the accumulating wisdom of the Christian community," will meet the needs of the participants, facilitate their interactions, promote knowledge with understanding and transformation does not belong in her conclusion; it is wishful thinking.

Unfortunately no evidence is presented to justify such claims. This essay is couched in typical educational jargon. Two thirds of it is introductory material leading up to the thesis. The author insists upon defining everything, even the obvious. For example, "*Action* is what we do." "The *infinite* is what goes beyond the limits." "The *aims* of education are what education points towards," et al. She likes to high-light assumptions, often unnecessary and at times trivial, for use in ad hominem arguments (her favorite word is "suggests").

It is probably natural that a faculty member of a School of Theology (Claremont) should discuss at length theological aspects of education (applied, empirical, feminist, hope, liberation, situation). It is not surprising that an Assistant Professor of Education should be unduly concerned about titles such as Minister of Education and Minister of Program. What is truly disturbing is to find Christ mentioned only twice—and then casually. The author seems to believe that everyone is more familiar with God, His daily actions, His Spirit—and even "God's future." I do not believe that "the Christian Church exists for the world."

I do not understand her lack of appreciation of the Bible—if only as literature. Somehow she has the notion that the telling of a Bible story must be dry as dust—like the unwrapping of a mummy—without relevance to the present or the future. Who would ever recommend replacing Abraham's settling in Canaan with a science-fiction tale about colonizing a planet? Or, who would wish to substitute for God's revelation either Orwell's pessimistic predictions of 1984 or Huxley's "Brave New World?" The author sets up straw teachers, whom she then criticizes. Apparently she has never met a good teacher, who communicates, or a good story teller. She turns, therefore, to substitutes such as role playing, simulation games, et al. Spiritual values however, are caught rather than taught. Her section on "Teaching: How Do We Do It?" will be of little help to teachers. I doubt if many could successfully follow her suggestion that they "seek to interpret their life experience by creating a meaningful *saga* that explains the events in their life. The author likens the problem of education to the perplexity of a person at a modern traffic intersection. A good illustration—too bad she tries to cross without regard for the Biblical traffic signals!

As a physicist, I cannot close without comments about the author's few mentionings of science. I was shocked to find Francis Bacon still regarded by anyone as the founder of experimentation. Does anyone really believe that "persons apply the scientific method in their life"? Who would define "the scientific method as the evolutionary process grown self-conscious"? What is meant by "the world implied by scientific method"? She speaks of "human science"; does this include human biology? It is strange to find science so completely disregarded in "our Father's world."

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DESTINED FOR GLORY: THE MEANING OF SUFFERING by Margaret Clarkson. Grand Rapids, Michigan: Eerdmans, 1983, 132 pages, $4.95, paperback.

The question "why do bad things happen to good people" has elicited a spate of words on the topic of suffering. *Between Faith and Tears, Where Is God When It Hurts,* and *A Loving God and a Suffering World* are three recent books on the subject.

Destined for Glory can now be added to the number. While this book adds few ideas to the discussion, it is unique because it deals with the problem of suffering from a Biblical perspective by an author who has experienced headaches, vomiting, juvenile arthritis, and a congenital back problem. Margaret Clarkson has suffered the psychological pain of tension, fear, insecurity, isolation, guilt, anxiety, alienation, and despair.

This book is unique in another way. Its 132 pages are divided into 43 chapters and this makes it suitable for use as a devotional book of short readings. Biblical, organized, and logical, *Destined for Glory* is persuasive and easy reading.

Margaret Clarkson came from a home broken by divorce. She became a Christian at age ten after reading *Pilgrims Progress*. After struggling with the pain of physical and psychological suffering, Clarkson finally found answers to her questions when she was well into her forties. She came to the conclusion that "the possibility of evil's entering the universe may be God's responsibility, but its actual presence in our midst is our own." Why is there so much suffering in the world? "Suffering is the inevitable result of the evil man brought into the world. We cannot blame it on God."

The reader of this book will learn a lot not only about suffering but also about related topics such as prayer, Satan, scripture, judgment, and sin. Recommended for everyone who seeks careful counsel about pain, this book will provide information and inspiration.

Reviewed by Richard Ruble, John Brown University, Siloam Springs, Arkansas 72761

THE TEACHING OF JESUS by Norman Anderson, IVP, Downers Grove, Illinois (1983). Paperback. 219 pp, $6.95.

This book attempts a concise, balanced discussion of the teaching of Jesus. Any such attempt is difficult, due to the enormous scope of the subject; it is dangerous too, because the author must guard continually against imposing his own thought patterns on the records of Jesus' teaching. Perhaps it is for these reasons that scholarly books devoted to the study of the teaching of Jesus are not more numerous; anyone who might be able to write such a book would consider himself inadequate for the task. Nonetheless there are few needs as urgent in the church today as the need to study and understand Jesus' teaching. Sir Norman Anderson's book is a welcome introduction to such study.

The author is an expert in Islamic law, not a theologian; but he shows a thorough acquaintance with the current theological debates. More important, however, is his deliberate choice to emphasize the gospel records primarily, and the theological details only where necessary. On any given page there may be one or two apposite quotations from scholars, but there are typically several quotations from the gospels themselves, along with references to other Scripture passages.

In keeping with this emphasis on the gospel records, Anderson makes an effort to build the structure of his own analysis around the structures Jesus used. Thus, in his discussion of the nature of the Kingdom, he adopts the set of 'parables of the Kingdom' used by Jesus as his own outline, and finds the mysterious parables admirably suited to describe the mysteries of the Kingdom of God. Or again, in considering the relationship between the ethical teaching of Jesus and the ethical standards of the Old Testament, he singles out Matthew 5:17–48 as the essential passage, and uses the organization of Jesus' thoughts in this teaching as a guide to organizing the discussion. In this he is faithful to his pledged attempt

> to allow his [Jesus'] teaching to speak for itself, rather than force it into any preconceived mould. (p. 7)

The overall structure of the book is likewise derived from Jesus' teaching. As the author puts it,

> the plan I have adopted is to take what is almost certainly the basic theme which he proclaimed—the Kingdom of God—as the core or essence of his teaching, the thread that runs through all its varied facets, and the pattern that gives coherence to the whole. (p. 7)

This unified approach is a major strength of the book. It provides an organizing principle around which a topical study naturally develops. Anderson divides this into three sections. In Part I, 'The Summons to the Kingdom', he begins by discussing the proclamation of the good news of the Kingdom, and considers the nature of this Kingdom as described in the parables of Jesus. Then he proceeds to compare the concepts of 'eternal life' and 'salvation' with the Kingdom:

> These two concepts seem indeed to have been regarded as almost synonymous with the Kingdom. An outstanding illustration of this is provided by the story of 'The Rich Young Man' recorded in Mark 10:17–26, with its parallels in Matthew 19:16–26 and Luke 18:18–29. In each case the question he asked was what he must do 'to inherit eternal life'; but this incident provoked a discussion between Jesus and his disciples about who can 'enter the kingdom of God', and the disciples asking him 'who then can be saved?'" (pp. 61, 62)

Part II, 'The Ethics of the Kingdom', considers the rule of God in the lives of those who have entered the Kingdom. This is divided into three chapters: the first surveys the relationship Jesus perceived between his teaching and the Old Testament law, and the others deal with personal ethics and social ethics as taught by Jesus. The chapter on personal ethics adopts a more personal tone, quoting such authors as Martyn Lloyd-Jones and A. W. Tozer. The chapter on social ethics benefits from the author's practical experience as a lawyer. His discussion is noteworthy for the balance it strikes, making every effort to apply the maxims of Jesus to ethical dilemmas while taking care not to wander beyond what Jesus actually said.

Finally, Part III, "The Consummation of the Kingdom', looks at the various stages by which the Kingdom is established. The first stage is Jesus himself; and there is much in his teaching to explain who he was, and what he had come to do. The claims of Jesus about his person, and about his death and resurrection, are inextricable from his other teaching, and indeed form an inseparable part of it. This section includes a discussion of the self-consciousness of Jesus, with an emphasis on his relationship with God the Father. The next stage is the coming of the Holy Spirit, and the mission of the church. Here the author rightly takes exception to the scholarly

opinion that Jesus never advocated evangelizing the Gentile world. The final consummation of the Kingdom is the Parousia, and the eschatological discourses of Jesus enter the outline quite naturally at this point.

There is very little in the book that is novel, and that is as it should be. Instead, the author presents a variety of perspectives from different authors, tying them together with his own comments, and typically advocating a particular view. Thus the book forms a survey of the teaching of Jesus which is thick in its style, but also in its content. Its systematic, synthetic character lends itself more to individual or group study than to quick reading; however those who read it quickly will appreciate the many Scripture quotations which are printed out in the body of the text. One feature of the book will daunt some readers: there is a substantial digression in the introductory chapter devoted to a comparison between the Christian Scriptures and the oral and written traditions of Islam. The digression is not without a purpose, as the author explains, and it will be doubly interesting to anyone familiar with Muslims. However, if it slows you down, skip ahead to the rest of the book. It is well-conceived and well-written, and will repay careful study.

Reviewed by Keith Clemenger, Berkeley, California.

THE HARD SAYINGS OF JESUS by F. F. Bruce Inter-Varsity 1983, PB, 266 pp., $6.95

The author, former Rylands professor of biblical criticism and exegesis of the University of Manchester (England), discusses 70 provocative, "hard sayings" of Jesus (cf. John 6:60 AV, RSV, NIV)—difficult for Christians then and now to understand or to practise. I found the following topics particularly thoughtful and interesting: #1 "Eating the Flesh and Drinking the Blood of the Son of Man," 8 "One Jot or One Tittle Shall in No Wise Pass," 12 "Divorce and Remarriage," 16 "Love Your Enemies," 19 "Lead Us Not into Temptation," 23 "Seeing and Not Perceiving," 29 "Hating One's Parents," 37 "Taking Up the Cross," 46 "Sell What You Have," 48 "The Camel and the Eye of a Needle," 53 "The Rate for a Job?" 57 "The Cursing of the Fig Tree," 63 "This Generation Will Not Pass Away," 66 "This Is My Body. . . This Is My Blood," 67 "Let Him Who Has No Sword Buy One," 70 "Why Hast Thou Forsaken Me?"

The author refers frequently to "The Teaching of Jesus" and "The Sayings of Jesus" by T. W. Manson. I must confess I am always bothered by interpreters who introduce their own opinions by the casual use of words such as appears, could, may, might, perhaps, possibly, presumably, probably, seems, sometimes, suggests, supposed, et al.

Reviewed by Raymond J. Seeger, NSF (Retired), 4507 Wetherill Rd., Bethesda, Maryland, 20816.

THE AUTHORITATIVE WORD—ESSAYS ON THE NATURE OF SCRIPTURE— Edited by Donald McKim, William B. Eerdmans Publishing Co. Grand Rapids; 1983 pp. 270, $10.95

The Authoritative Word is a collection of previously published essays by authors of many persuasions on both the nature of Scripture and its collection into the present canon we call our Bible. Non-conservatives such as Paul Achtemeier and Robert Grant appear alongside such familiar names as Bruce, Beegle, Bloesch, and Riddexbos. Yet each essay has been carefully chosen so that a theme—the living God of Israel and the Father of Jesus as one who worked in history and is revealed in His word by His spirit, and still works today—emerges.

The topic is a most important one to members of the ASA. In a sense these essays attempt to say where an open, spirit-lead, yet scientific attitude toward the Bible leads.

The first division of the book deals with the authority of Scripture in terms of how the Scriptures were written, their sources and how they became canonical.

The lead and crucial essay is by Paul J. Achtemeier who asserts that both the conservative and critical scholar come to Scripture with presuppositions. Achtemeier says that the conservative (for him this means belief in rigid inerrancy) seeks ways of understanding the text that preserves their inerrancy. For example, in harmonizing the gospel accounts of Peter's betrayal of Jesus the inerrantist comes up with six denials of Jesus. The critical scholar, on the other hand takes the text *more literally*, asking what the author was trying to achieve with that statement, rather than harmonizing them with other Scriptures.

The tools of a critical approach to the Scriptures are the same tools that all scholars use in studying manuscripts of that same time period. It asks questions about their sources and how the author used these sources in presenting his vision of reality to the reader. Achtemeier proceeds in the first article to argue that (page 5) "The critical assumptions are truer both to the nature and intention of Scripture" than the inerrantists approach. To make his point, he produces numerous passages in the Old Testament which far more naturally support his view than that of the inerrantist. How does God fit into this approach? "He says" (page 9) "the clash of divine mercy with conventional social values points not to a static Scripture of eternal immutable laws, but rather to a process whereby God's revelation of Himself and His will is taking command of Hebraic national life, the same process which we can observe in the prophets."

The second section of the book deals with the doctrine of the authority of the Scripture. Articles on the concept, the authority and the writteness of revelation are followed by the role of the Holy Spirit in understanding Scripture. Terms applied to Scripture are clarified and a historical survey of the concepts are found in the last two articles of this section.

For example, Bloesch asserts that we often come to Scripture with what we think of as an evangelical view, but which

in reality is a twentieth century view of scientific exactitude, foreign to both the authors of Scripture and to our spiritual predecessors, the reformers. Bloesch feels much more comfortable with a view of infallibility which means free from lying and fraud.

In the last essay of this section, Rogers argues against the "old Princeton tradition" of inerrancy, which is seen to have its roots in the scholasticism of Turretin and Aquinas coming from Aristotle, and for a view which sees error as willful deception, based upon an Augustinian tradition.

The third section deals with current views of Biblical history and has excellent essays by Smapt and a Roman Catholic, Avery Dulles.

The book concludes with an annotated bibliography so that if you are hungry for more, you'll know where to look.

As with any collection of essays, some will be liked and appreciated more than others. But it is very nice to have a selection of essays on a topic, to help one appreciate the diversity of thought.

This book is important for ASA members since it is an attempt to get its readers to see that critical scholarship need not be the enemy of the cross, but that it may provide techniques which can enhance and enrich our understanding of the Bible.

This reviewer believes that we have nothing to fear from honest critical scholarship applied to the Biblical text. And this book confirms that belief. *The Authoritative Word* is a must starting place for all who would be informed about the new ways evangelicals are viewing Scripture.

Reviewed by Fred Jappe, Dept. of Physical Science, Dept. of Religious Studies, San Diego Mesa College.

UNTIL JUSTICE AND PEACE EMBRACE by Nicholas Wolterstorff, Wm. B. Eerdmans, Grand Rapids, Michigan, 1983. 197 pp. $13.95.

Nicholas Wolterstorff, Professor of Philosophy at Calvin College, was honored by being invited to be the first lecturer in the new Kuyper Lecture Series initiated by the University of Amsterdam in 1981. The eight major chapters of this book correspond essentially to the eight lectures presented in this series. To them the author has added some additional material for integration and supplementation that is inserted after Chapters 3 and 6, as well as 20 pages of notes and references. Faced with injustice, inequity and human suffering in the world, Wolterstorff is concerned primarily with leading Western Christians to recognize the fact that things could indeed be different, and that it is they who are called to be involved in changing them.

Attitudes of Christians toward faith and life fall frequently into two frameworks. There is the most common attitude in which people do their best to live as Christians *and* as members of society, the two aspects of life being reasonably well separated. There is the less common attitude in which people do their best to live as Christians *in and through* their participation in society, i.e., seek to express by the totality of their life commitments and orientations what it means to acknowledge the Lordship of Jesus Christ over all things. It is to the latter attitude that Wolterstorff calls the reader in this book.

Wolterstorff provides a number of helpful definitions and discriminations that enable the reader to understand the nature of the issues involved. His treatment of the differences between *avertive* and *world-formative* religious attitudes, and their relationship to distinctions between secular and sacred, helps to sharpen the emphasis and consequences of certain theological choices. Contrasting the Calvinist and Lutheran concepts, Wolterstorff says,

> . . . the Calvinist saw his occupation as something *through which* to exercise his obedience. *Remaining in that role* is not the thing which is to be done out of obedient gratitude; rather, *the actions performed in that role* are what is to be done out of obedient gratitude. (p. 16)

It is not only people who are corrupt; it is also human societal structures that are corrupt. It is not only people who need cleansing and regeneration; it is also the structures of society that more often than not do not serve the common good.

In his outworking of this theme, Wolterstorff focusses on the following principle subject areas: the social structures that characterize the modern world and how these structures widen the gap between affluent and needy peoples; a comparison between the approaches of "liberation theology" and of "neo-Calvinism" toward these issues; a view of the rich and the poor in the world in which the role of the rich in *causing* poverty is given adequate recognition; inequities that find their root in excessive loyalty to nation, and in the pitting of nation against nation, leading to the conclusion that in the modern world the existence of ethnic states inevitably leads to injustice; the ugliness of modern cities and their underlying dynamics; and the role of "labor and liturgy" as one of the distinguishing characteristics of a Christian's life in this world.

These apparently quite diverse themes are integrated under the Christian vision of *shalom:* a biblical perspective in which peace is intertwined both with justice and with the enjoyment of right relationships with God, self, fellow humans and nature. It is this broader vision of *shalom* that leads Wolterstorff to incorporate discussions on aesthetic and worship-related questions as well as on political and economic questions. *In Christ* Wolterstorff is an optimist that there may yet be a total world-formative expression of Christian commitment and living, and this in spite of the apparently overwhelming evidence that the secularization of human society has long since been completed. There is a consuming need for such a world-formative faith:

> The West grasps freedom at the cost of inequality, thereby consigning the economically impoverished to all the constraints of poverty. The East grasps equality at the cost of freedom, thereby consigning the politically powerless to all the inequities

> of tyranny. . . . Our world today is a world of failed ideals. Not many Russians believe that in their land a new age of equality and participation is being ushered in. No longer do many Americans believe that in their land a new age of liberty and equality has arrived. (p. 39, 113)

There is a consuming need for such a Kingdom of Shalom:

> Yet in the modern world, loyalty to nation has bitten so deeply into the life of the church that most Christians in America feel themselves less united as members of one holy dedicated nation with those in Russia, in Vietnam, in Germany, or in El Salvador than they feel themselves divided from them as Americans in distinction from Russians, from Vietnamese, from Germans, from Salvadorans. (p. 119)

There is a consuming need for the worship that arises from Shalom:

> Nevertheless, it is not difficult to predict what will happen when proclamation, centered in the sermon, becomes the overwhelmingly dominant action of the liturgy: all that might distract our attention will be stripped away, up to the point where the congregation sits in silence, lined up in rows in a well-lit white box, listening. (p. 159)

This is a book that every Christian should read and consider, every church should evaluate and reflect upon. One need not agree with the author in every instance to appreciate the depth and the eloquence of the challenge here placed before us.

The only major addition that one might desire in such a global treatment is a more specific incorporation of the teachings of Jesus and their New Testament interpretation. In a footnote early in the book, Wolterstorff points out that "(Bonhoeffer) saw, as did the Calvinists, that the New Testament in isolation gives insufficient guidance for the new praxis." However undeniably true this statement is, it seems to me that the task of specifically relating the new praxis developed on the basis of the whole Bible with the specific worldview given to us by Jesus would be a valuable keystone to the perspective presented in this book.

Reviewed by Richard H. Bube, Department of Materials Science and Engineering, Stanford University, Stanford, California 94305.

WHO IS FOR PEACE? by Francis Schaeffer, Vladimir Bukovsky, and James Hitchcock, Thomas Nelson Publishers, Nashville, TN, 112 pages, paperback, $3.95

This book is composed of three essays: Francis Schaeffer, *The Secular Humanist World View versus the Christian World View and Biblical Perspectives on Military Preparedness;* Vladimir Bukovsky, *The Peace Movement and the Soviet Union;* and James Hitchcock, *The Catholic Bishops' Search for Peace.*

As indicated by his title, Schaeffer discusses two rather unrelated subjects. In the first part of his essay he summarizes the theme he has developed so well in his early publications, such as *How Shall We Then Live?* There has been a steady erosion of Christian values in Western society. He then emphasizes his more recent concern with legalized abortion

Books Received and Available For Review

(Please contact the Book Review Editor if you would like to review one of these books.)

Harry Blamires, *On Christian Truth*, Servant.

Colin Chapman, *The Case for Christianity*, Eerdmans.

Gordon Clark, *The Biblical Doctrine of Man*, Trinity.

Robert Clouse (ed.), *Wealth and Poverty: Four Christian Views of Economics*, IVP.

Adela Collins, *Crises and Catharsis: The Power of the Apocalypse*, Westminster.

Melinda Delahoyde, *Fighting for Life: Defending the Newborn's Right to Live*, Servant.

Charles Durham, *When You're Feeling Lonely*, IVP.

Richard Ecker, *Staying Well*, IVP.

Don England, *Faith and Evidence*, Gospel Light.

A. Fryling & R. Fryling, *A Handbook for Married Couples*, IVP.

Denise George, *The Christian as a Consumer*, Westminster.

B. Ghezzi & M. Kinzer, *Emotions as Resources: A Biblical and Pastoral Perspective*, Servant.

Bob Goudzwaard, *Idols of our Time*, IVP.

Karin Granberg-Michaelson, *In the Land of the Living: Health Care and the Church*, Zondervan.

Randall Hekman, *Justice for the Unborn*, Servant.

James Hitchcock, *What is Secular Humanism?*, Servant.

Paul Holmer, *Making Christian Sense*, Westminster.

Philip Hughes, *Christian Ethics in Secular Society*, Baker.

Grace Jantzen, *God's World, God's Body*, Westminster.

Peter Kreeft, *The Best Things in Life*, IVP.

George Lindbeck, *The Nature of Doctrine: Religion and Theology in a Postliberal Age*, Westminster.

Richard Longenecker, *New Testament Social Ethics for Today*, Eerdmans.

H. Newton Malony (ed.), *Wholeness and Holiness: Readings in the Psychology/Theology of Mental Health*, Baker.

Dorothy Nelkin, *The Creation Controversy*, Beacon.

Richard Neuhaus, *The Naked Public Square: Religion & Democracy in America*, Eerdmans.

John Polkinghorne, *The Way the World Is*, Eerdmans.

Charles Rassleur, *Christian Renewal: Living Beyond Burnout*, Westminster.

Ronald Reagan, *Abortion and the Conscience of the Nation*, Nelson.

Robert Roberts, *The Strengths of a Christian*, Westminster.

Milton Rudnick, *Christian Ethics for Today*, Baker.

Peter Schakel, *Reason and Imagination in C.S. Lewis*, Eerdmans.

Dorothee Soelle, *The Strength of the Weak: Toward a Christian Feminist Identity*, Westminster.

Tim Stafford, *The Friendship Gap*, IVP.

Lester Sumrall, *Jerusalem: Where Empires Die*, Nelson.

Thomas Tracy, *God, Action, and Embodiment*, Eerdmans.

Allen Verhey, *The Great Reversal: Ethics and the New Testament*, Eerdmans.

John White, *The Race: Discipleship for the Long Run*, IVP.

P. Williamson & K. Perotta (eds.), *Summons to Faith & Renewal*, Servant.

Edwin Yamauchi, *Pre-Christian Gnosticism* (2nd Ed.), Baker.

Keith Yandell, *Christianity and Philosophy*, Eerdmans.

Edward Yoxen, *The Gene Business: Who Should Control Biotechnology?*, Harper & Row.

as the ultimate in "loss of compassion" in our culture, a loss that will pave the way for infanticide and euthanasia. In the second part of his essay he moves to a consideration of our nation's relation to the Soviet Union. On the basis of a relativistic comparison—we're bad but they're worse—he justifies the development of nuclear weapons. The reader is left with the impression that, on the international scene, God will be there to defend the ungodly if our opponents are worse than we are. I don't think Habakkuk or the other prophets would agree.

Bukovsky, as a Russian dissident and emigré, gives a vivid, factual, and understandably emotional picture of the social and political conditions inside the Soviet Union. He also emphasizes the aggressiveness of Soviet foreign policy although he attributes it all to Marx and Lenin and ignores the aggressions of the Czars. As indicated by his title, his essay—nearly half of the book—is concerned mainly with developing the theme that the Peace Movement is largely Soviet-inspired and Soviet-controlled. He states this view most directly on pages 57 and 58:

> This is not to deny that there are plenty of well-intentioned, and genuinely concerned and frightened people in the movement's ranks. I am certain that the overwhelming majority of them are. Just as it did in the 1950s, the movement today probably consists of an odd mixture of Communists, fellow-travellers, muddle-headed intellectuals, hypocrites seeking popularity, professional political speculators, frightened bourgeois, and youths eager to rebel just for the sake of rebelling. There are also the inevitable Catholic priests with a "mission" and other religious people who believe that God has chosen them to make peace on earth right now. But there is also not the slightest doubt that this motley crowd is manipulated by a handful of scoundrels instructed directly from Moscow.

Hitchcock, a politically conservative Roman Catholic, defends "Just War Theory" and its continued applicability to the present world situation. He criticizes the Catholic Bishops' pastoral letter, *The Challenge of Peace: God's Promise and Our Response*. His essay is largely a review of the differences among the American Catholic Bishops, not only on basic principles but in the semantics of the several versions of the pastoral letter. To this reviewer, who is not yet a pacifist, the most interesting sentence in this essay is, "In the history of the church, *outside the earliest centuries*, its only significant example of a pacifist is Saint Francis of Assisi." [emphasis mine]

As a Christian biologist, seriously concerned about the nuclear weapons dilemma, I found this book to be disturbingly unbalanced and unhelpful. None of the authors seem at all concerned that nuclear weapons are many times more destructive than anything previously used. For example, on page 50 Bukovsky counters the statement, "Nuclear weapons are immoral!" with the question, "Are conventional weapons moral?" To my peace-church friends—whom Schaeffer dismisses as "misguided"—it is obvious that *all* weapons are immoral. To many of us who have a more moderate position, for whom war appears to have been a sometimes necessary evil, nuclear weapons bother us so much because, for the first time in human history, a complex of weapons systems give human beings the power to totally destroy civilization, if not all life. That is historical fact, and even if we think the Communists are the worst evil among nations, we need to take such destructive potential seriously.

Schaeffer accuses the peace-movement among Bible-believing Christians of "naiveté, romanticism, and wishful thinking." To write a book on "Who Is For Peace?" with such little regard for the unprecedented, mass-murder potential of current weapons systems is even more naive, romantic, and wishful. As Christians we need to ask ourselves if the God, who, according to Schaeffer (and rightly so), will judge us for our secular humanism and abortion on demand, is going to condone this ultimate in human brutality—whoever uses it and for whatever reason?

Reviewed by Wilbur L. Bullock, Professor of Zoology, University of New Hampshire, Durham, NH 03824

RITES OF LIFE: THE SCIENTIFIC EVIDENCE FOR LIFE BEFORE BIRTH by Landrum Shettles, M.D. and David Rorvik, Zondervan Publishing House, 1983. 162 pages, hardcover: $12.95.

Because abortion is such an emotional issue, it is difficult to have clear, rational discussions on the topic. *Rites of Life* is a book both sides should read and intelligently discuss.

The subtitle indicates the main thesis of the book, namely, that there is much evidence from a scientific (medical) perspective that the fetus (and even the embryo) is a human being worthy of respect and compassion. As such, pro-choice advocates will probably consider the book progaganda and therefore not read it.

But the credentials of the two authors should interest all people who are honestly seeking facts, not just opinions. Landrum Shettles, M.D., is an experienced obstetrician-gynecologist who has specialized in research in fertility and sterility, hemorrhagic disease of newborn infants, and sperm biology. He is well-known for his micrographs and photographs which appear in over 50 medical textbooks. His pioneering work in *in vitro* fertilization and other research in human conception convinced him of the meaningfulness of life before birth and consolidated his opposition to abortion.

Co-author David Rorvik is a science and medical reporter and author of numerous articles and books. He was an avid supporter of abortion until he studied the evidence of Dr. Shettles and others on the subject.

The major portion of the book is a detailed examination of life before birth, starting with conception. Dr. Shettles believes that there is a great lack of knowledge about life in the womb and the effects of abortion, both in individual women and society as a whole. He attempts in this book to make clear specific details about the medical procedures of abortion and show why these are inhuman acts that should appall us all. He tells of some doctors' reaction to and avoidance of viewing the dismembered fetus after a "D & E" abortion, yet they continue to perform and defend them.

Two recent developments in medicine that Dr. Shettles believes will change society's acceptance of abortion are (1) treating diseases and defects in the fetus before birth, including surgery and blood transfusion, and (2) the ability to sustain life in a baby born even 3 months prematurely with as small a birth weight as one pound.

The authors also explore the new speculations in the psychological life of the unborn baby. According to the latest studies in fetology, there is increasing evidence that the unborn fetus is capable of human emotion and feeling.

The second section of the book examines the debate over abortion, including what the court said in 1973, when does life begin, family planning, and abortion in the future—what will happen.

Dr. Shettles' position on abortion is based primarily on his knowledge of fetology. In this book he does not stress religious opinions. His presentation is clearly designed to show the reader the scientific, rational basis for opposing abortion. He gives many examples from medical research and current knowledge of life before birth.

This is a valuable book for Christians to read and share with those who approve of abortion but do not have much knowledge about the subject. It is an authoritative and understandable book for the lay person. I suggest that Christians, after reading this book, recommend that it be bought for their local school and public libraries. Since it is written by experts and is not a religious book, it should be well received by them.

Reviewed by Janet Neidhardt, educator and free-lance writer, Randolph, New Jersey, 07869.

SENTENCED TO LIFE, by Malcom Muggeridge and Alan Thornhill, Thomas Nelson, 1983, PB, 129 pp, $3.95.

This book is an excellent parable in three acts by the journalist Muggeridge, former editor of Punch and rector of the University of Edinburgh. As they say, "What we think about birth (abortion) and about death (euthanasia) determines what we think and do about life . . . This is the greatest ideological issue underlying all other issues." The play deals with so-called mercy killing. The Prologue presents a couple who are enthusiastic advocates of the right to die, with dignity; he is an Oxford lecturer on English poetry, she had been a concert pianist until a sudden attack of paralysis that has left her immobilized except for small movement of head and toes. The Prologue sets the stage for a TV interview on the Way of Life, viz., mercy killing. In the first Act the wife discloses her decision that she wishes to die. Her physician brushes her off; her husband is aghast at her request that he poison her. She berates him for not practising what he preaches. In Act II the TV program, having been successful, wishes to exploit an interview of daily behavior at home. She proposes an actual death scene. The Director is appalled, but seeks advice. The husband gives her some coffee, which she recognizes is poisoned, as she dies typing her responsibility with her toes. A camera shoots the scene. In the third Act the husband reviews his prison experience; he has been sentenced to live—guilty of murder. He is provoked by the desire of an agitator to use this case for euthanasia propaganda. He has realized that he should have helped his wife to live rather than to die. He realizes now God's love as exhibited by the Man on the middle cross. Recommended for adult discussion groups.

Reviewed by Raymond Seeger, NSF (Retired), 4507 Wetherill Road, Bethesda, Maryland 20816.

MERE MORALITY by Lewis B. Smedes. Grand Rapids: Eerdmans Publishing Company, 1983, 282 pages, $14.95.

Lewis B. Smedes, professor of ethics at Fuller Theological Seminary, has written a relevant, interesting, and intelligent book about the moral commandments of the decalogue. It is relevant because it speaks to issues people face every day, i.e., abortion, divorce, suicide, stealing, and honesty. It is interesting because it gives many pertinent illustrations, some from scripture and some from contemporary life. It is intelligent because it clearly presents each issue, discusses alternate views, applies scripture, and arrives at justified conclusions.

Smedes says "mere morality" is difficult to define but relates to the choices we make which put us in the wrong or the right with ourselves and God. Then he proceeds to sharpen its profile by telling what it is not: Christian devotion, heroics, for believers only, mysterious, sectarian, or redemptive. Smedes says that he is not presenting an "evangelical morality" but is seeking to convey the essence of what God expects from ordinary people.

Smedes writes from a background of Reformed, Calvinistic theology. His application of the ten commandments to this era should not dissuade dispensationalists from the great value to be found in this book. With the exception of the fourth commandment, all of the ten commandments are reiterated in the New Testament and incumbent upon Christian morality.

This would be an excellent book to use in a college course on ethics and is appropriate in a study group in a church. It lends itself well for that purpose because it is written in simple, straightforward language (that is easily understood) and opens up many areas for vigorous discussion. Smedes has included questions for discussion at the end of each chapter to stimulate involvement.

This is also an excellent choice for casual reading by the individual, a few pages at a time. The reader will find that Smedes' book will bring many issues of the day into better focus.

Reviewed by Richard Ruble, John Brown University, Siloam Springs, Arkansas 72761.

LIVING WITH DEATH, by Helmut Thielicke, Wm. B. Eerdmans Pub. Co., 1983. 208 pgs., $11.95

When Helmut Thielicke writes about living with death, what he says is flavored by his own brushes with death during World War II and subsequent illnesses. He says: "The book could hardly have been written without this background" (p. ix). He believes that the problem of death is most clearly seen in first-person terms. "The real truth about human dying . . . (is) that it is a personal event that belongs inexchangeably to me" (p. 11). Thus he distinguishes human death from a mere ending of biological processes, or from death in nature. He deals first with the problem of death. Is it the end? Is there nothing beyond death? When does a fetus become a person, so that its death is not just a biological fact? Is there meaning in life and death? After a survey and discussion of these issues, he goes on to examine several philosphical approaches to death. Plato, Nietzsche, Hegel, Marx, and Goethe are dealt with in some depth, and other writers are mentioned briefly.

Then Thielicke gives the biblical understanding of death. This he does, not in terms of theological categories drawn from Dogmatic Theology, but in terms of Old and New Testament teaching. Following the Reformers, he emphasizes that what distinguishes human life from biological life is a relationship with the Creator (as created in His image). Death is then seen not in ontological terms, as a ceasing of existence, but in relational terms, as a result of guilt and wrath. Therefore death is not just the ceasing of bodily functions, and our dealing with it cannot be delayed until the last hours of life. Death is present with us all our lives. Those who refuse to face up to death during their lives are compared to Adam and Eve, who did not accept their limitations, and therefore sinned in trying to be like God. Thielicke believes that by accepting our limitations and living by faith, the fear and sting of death can be removed.

Whereas the world suppresses or denies anxiety caused by contemplating death (as demonstrated in the discussions of the philosphers mentioned), Thielicke offers a way to conquer anxiety through the cross and resurrection of Christ. For those who believe in Jesus, the roots of anxiety and fear have been cut off. "I am a companion of Jesus. Where He is, I shall be. Is He not in life? Then I shall live, and death cannot separate me from the love of God." (p 166).

Thielicke deals with timely issues like abortion and euthanasia, as well as the age-old questions of life and death. He dedicates some space to defending an intermediate state of unconsciousness, while awaiting the resurrection. He gives advice on how to talk about death with both Christians and non-Christians, and how to preach about this subject which many want to avoid. The fact that he deals with his subject in terms both of specific scriptural passages and widely-adopted philosophies gives the reader help in seeing how to relate what the Bible teaches to what non-Christians believe. In this way he helps prepare Christians for evangelism and apologetics, as well as for ministering to fellow believers and for living with death themselves.

Reviewed by Joseph M. Martin, Professor of Missions, Edward Lane Bible Institute, Patrocinio, M. G., Brasil

GOD'S TRUTH: A Scientist Shows Why It Makes Sense to Believe the Bible by Alan Hayward, Thomas Nelson Publishers, Nashville, Tennessee (1983). 331 pp. Paperback. $6.95

This is a revised edition of a book originally published in England in 1973. The author, Dr. Alan Hayward, is research and development advisor with Redwood International Ltd., in England, up to 1977 principal scientific officer in a government research laboratory, and the author of *God Is.* In the opening chapter the author tells us that it is his purpose to "open up the Bible," and that he does this not "from the point of view of a scientist, but as a student of the Bible." He intends the book for "ordinary men and women" and promises to stick to "simple English." In this he is very successful and the book should be readily understandable to general readers.

The book is divided into three parts. In Part I, Hayward presents, in eleven chapters, some positive arguments for believing that the Bible is the Word of God. Part II counters objections raised against the Bible, and consists of fourteen chapters. Part III consists of a brief two chapters providing encouragement and guidelines for Bible study. The book concludes with Notes and References, and an Index.

Hayward's case for the Bible as God's Word rests upon discussions of fulfilled prophecy, the uniqueness of Jesus, the evidence of the Resurrection, the relevance of the Old Testament law for continuing concerns in health, conservation and family life, and evidences of internal harmony and consistency. Chapter 6 entitled, "Who Could Have Invented Jesus?" is particularly effective in supporting the argument that "the Jesus of whom we read in the Gospels was, at the time the Gospels were written, uninventable." In general, Part I presents a strong case for the unique power and character of the Bible. The reader may wonder at a few statements. The fulfillment of Daniel 2:44 is ascribed to the future rather than to the establishment of the kingdom with the coming of Jesus 2000 years ago. Since the Jews are said to have accepted many Old Testament passages as being Messianic in character, Hayward argues that "we are bound to take the Jews' word for it." Hayward advances two somewhat curious arguments in support of biblical harmony: "the failure of the firstborns," or the Old Testament record that "Not one acknowledged first-born is ever a success in God's sight" until God's own First-Born appears; "the story of sweat," in which it is pointed out that the three mentions of sweat in the Bible (Gen. 3:19, Luke 22:44, Ezek. 44:18) summarize the whole Christian Gospel. He also argues that Jesus "had an uncanny knowledge of the twentieth century" (see also Chapter 5).

The thrust of the argument in Part II often tends to become more problematical. Underlying any specific statements are two approaches that are underlined repeatedly. The first of these is "Don't let the experts pull the wool over your eyes," which, although a timely warning, tends easily to become a choice for obscurantism rather than for thorough understanding. On a somewhat populist note, Hayward tells the reader, "like a civil servant, you are well able to consider the evidence and decide for yourself." This might or might not be true, but it certainly would require a careful assessment of all of the evidence. Because it is by nature "scholarly," however, much

of the evidence with which a Christian apologist needs to deal is not given to us by Hayward. Instead one often feels the impact of a second approach: argument by ridicule. Those who object to the Bible as the Word of God tend to be countered as much by poking fun at them as by substantive comments. At the root of Hayward's approach is the position,

> Being a scientist might help you to spot the mistakes of other scientists when they condemn the Bible, but scientific knowledge cannot help us to decide whether the Bible is a message from God. Studying the Bible for ourselves is the only way we can do that. And we can study the Bible without knowing any science, or even any of the more useful subjects like Hebrew and Greek and ancient history. The only essential equipment is a thoughtful, inquiring mind. (p. 15)

Hayward's position becomes most clearly defined in Chapter 14, appropriately titled, "All—or Nothing." Here he argues that if Adam was not a literal historical man, then how can we be sure that Jesus was a literal historical man? There can be "only one right answer for the Christian." "The whole Bible stands or falls together." This leads Hayward to a simplistic dichotomy:

> It stands to reason that there are only two possibilities. Either the Bible's astonishing claim is true—or the book is the biggest confidence trick in history! . . Many leaders of religion refuse to accept that these are the only alternatives. They adopt a third point of view. They say that the Bible is sort-of-true and sort-of-false. Of course, they don't put it like that. They express their views in language that is almost impossible for the man in the street to understand. (p. 141, 142)

For Hayward this means that "If the Bible is what is claims to be, its sixty-six books must have been written by the men named as their authors." Or again, "If the Book of Isaiah did not even contain the words of Isaiah, you could hardly expect it to contain the words of God." What is the matter with people who would hold a contrary view? "Brilliant men are often lacking in plain common sense." In a section entitled "Why They Do It," Hayward attributes such foolish thoughts to a desire to conform, the fear of seeming ridiculous to their peers, too much respect for the "experts," and too professional a view of the Scriptures. Now all of these motives may or may not apply in particular cases, but are there no authentic reasons why devout Christian scholars would deviate from Hayward's rather fundamentalistic stance? Is there something unexpectedly revealing in Hayward's words,

> There are a few scholars who use the method of higher criticism in a sensible way and remain staunch Bible-believers. But for simplicity's sake I shall disregard their existence. (p. 154)

Although it is certainly true that the Bible's message of salvation by grace through faith is simple enough for the most naive minds to grasp for their eternal redemption, it is not true that the Bible's message comes to us without interpretation on our part. Yet this is what Hayward seems to argue in several places.

> A large part of the Bible is perfectly straightforward, needing no more interpretation than any other non-fiction book. . . . Interpreting it is no great problem, if only—and this is a big "if"—we manage to read it with a humble, seeking mind. Much of it interprets itself for us. (p. 195, 196)

One thing is certainly true: just as in science no fact interprets itself for us but must be given an interpretation by us, so no written material of any kind interprets itself for us. Interpretation of the Bible is the work of the Holy Spirit using all the means at His disposal, and working in and through the Body of Christ.

Hayward does deal successfully with many of the objections raised against the Bible, and these chapters in Part II provide a helpful summary for the Christian in dealing with others who raise such objections. In dealing with the traditional question, "Is the Bible Scientific?" in Chapter 21, he points out the well-founded distinction between "how" answers provided by science and "why" answers provided by the Bible, and indicates how each approach provides us with input not available from the other. He argues strongly for the acceptance of the scientific evidence for the age of the earth and against Flood Geology, and states that "Genesis was never intended to teach science." In spite of this, however, Hayward sees Genesis 1 as "a broad picture of the entire geological history of the earth—and a remarkably accurate one at that." In attempting to harmonize the scientific record with the days of Genesis I, Hayward is enthusiastic about accepting the theory that the days of Genesis 1 were actually the days on which God revealed the story of creation "to the angels or to one of His inspired historians."

With this orientation, it is not surprising that Hayward enters into some length to reject the theory of biological evolution. He so seriously prejudices the discussion at the very beginning by choosing to use the word "evolution" to mean "evolution by natural processes alone . . . to describe the belief that God played no active part in the development of life on earth," that any objective discussion for the Christian becomes impossible. He opposes the growing Christian awareness that what we call 'scientific chance' may indeed be our description of 'God's Providence.' What *must* be a most unfortunate misprint occurs in the midst of this discussion, reading, "It is not necessary to accept the facts of science." (p. 257) Hayward makes another serious mistake when he interprets "the principle of uniformitarianism" to mean "an assumption that God does not exist, or at least that He has left the world alone." At any rate, Hayward is certain that "by a special creative act God made the first man and woman."

In the chapter on "The Problem of Suffering," Hayward poses the dilemma in a most acute way, but does not seem to recognize its existence. Having told us that suffering came into the world because of Adam's sin, "so we too must suffer, and we too must die," he then tells us three pages later (having in the meanwhile interpreted "eternal death" to mean cessation of existence, not eternal punishment) that "the world would be worse off, not better off, if there were no suffering in it." Or again, "Strong characters can only be developed in a world where suffering is always present." The reader cannot help but wonder what would have been the consequences if Adam had not sinned!

I've been critical of many of Hayward's simplifications. I must for completeness also cite an aphorism that struck me as

being appealing: "Jellyfish always go along with the tide; it takes a fish with a backbone to swim against it."

There is much in this book that will prove helpful to the discriminating Christian reader. One must be aware, however, that Hayward is providing a one-sided perspective, and that his dogmatic assurance of having the one simple answer may not stand up under inspection in the real world. It is unfortunate that some of his treatment of the interaction of science with the Bible may be totally misleading for the layperson.

Reviewed by Richard H. Bube, Department of Materials Science and Engineering, Stanford University, Stanford, California 94305.

THE SOURCES OF MODERN ATHEISM by Marcel Neusch, Paulist Press, paperback, 264p, $9.95

Marcel Neusch states his purpose clearly in the Preface:

> My primary purpose is to conduct a search through what Henri Lefebvre calls 'the kingdom of the shades' and to flush out those 'giants in the shadow' who forged the dogma of modern atheism and gave current unbelief its shape.

By carefully forming his discussion of Atheism around seven historical exponents, Marcel Neusch provides a teaching vehicle for those of us not familiar with the development of atheistic thought over the past few centuries. The figures he deals with are: Ludwig Feuerbach, Karl Marx, Sigmund Freud, Friedrich Nietzsche, Jean-Paul Sartre, Roger Garaudy, and Ernst Bloch. Part character sketch, part historical context, part exposition, and part apologetic—Neusch weaves them all together into nine densely packed chapters plus a Conclusion, well referenced chapter notes and a Bibliography.

This work, originally written in French, is a seamless and flowing translation by Matthew J. O'Connell with no awkward phrasings or convoluted constructions. However, its content is demanding and requires study of the concepts presented and meditation on their implications. I read and digested this book in chapter segments over a period of months and sometimes reread past sections to clarify various points.

In his Conclusion, Neusch crystallizes the honest attitude of Faith toward Atheism:

> Faith seeks understanding; it presents itself for justification. It does not fear confrontation. In the dialogue with atheism faith is open to its objections, criticisms, and rejections. It does not present itself to the atheist as something unrelated to the requirements of reason. If its object is at bottom the God of love, then it must situate itself at the level of this object. God is not unreason, even if He is beyond measure.

Neusch leaves us with hope in conversing about God with our atheistic brothers and sisters but his major conclusion rests on our ability to demonstrate our love to the world through our actions.

Reviewed by Robert J. Brown, P. E., 2653 Regal Circle NW, Lawrenceville, Georgia 30245.

UNDERSTANDING THE CHRISTIAN FAITH by Charles D. Barrett; Prentice Hall, Inc.; 1980; 425pp. Hard Bound, no price stated.

Several years ago I received this excellent book from a publisher's representative. I am now using parts of it as one of my texts in my class in Science and Religion at Mesa College. It is a worthwhile book to read, study and share with others including nonChristians. The author is a warm, insightful existentially-influenced evangelical who accepts some higher critical views, particularly with regards to the Old Testament, but strongly affirms the heart of Christianity—the Incarnation, the Trinity, Salvation, and the Resurrection. The Incarnation (p, 71) is the "occasion of God's self-embodiment in a person named Jesus of Nazareth; (it) is to the Christian Covenant what the Exodus was to the Covenant of Israel:" The Trinity is explained as (p, 292–294) "an attempt to affirm that God is one, that God is alive, and that He is simultaneously both. The most audacious way the Bible says this is: "The Word was God and The Word became flesh and dwelt among us." Salvation and the Resurrection are both accepted; the latter in an excellent treatment of the difference between Hellenistic thinking and Biblical thinking where the author sees Paul as a Rabbinic Jew and not a Hellenistic one, the former in a treatment of "it is God who justifies."

Most members of the ASA will appreciate and profit by his view of science and religion as seen in the treatment of creation and redemption.

These two themes receive extensive treatment. Creation is the source of the world's order and goodness. It is not "scientific" in the modern sense. (p, 239) "The basic human meaning—the story makes clear—is that both the existence and order of the world are gifts to be received gratefully, to be appreciated continually, and to be used for the glory of their Giver and well-being of the Giver's creatures." It is suggested that evolution is an acceptable view, as old as St. Augustine. The Biblical-account statement, the "God is not identical with nature but is, rather, nature's transcendent Creator," implies that the investigation and control of nature will not involve the scientist in acts of sacrilege. Although it might appear, from the modern secular standpoints, to constitute a relatively minor concession to scientific freedom, such a "desacralization of nature" has actually been of historic importance. Its effect has been to open the way for science's many triumphs in the west even as that way has remained blocked in the east by nature-based religion."

Evil is looked at and its eventual defeat is seen as Salvation made complete. Redemption is the word that expresses (p. 300) "the saving deed by which God seeks to put his world in

order and to reestablish his rule." "It is based on God's power to conquer death. The God who is the source of life is greater than death. He who gives life to begin with and who renews it in every new moment by His continuous creation, is able to confer it again when and as He will. The Christian faith in resurrection is, in the last analysis, simply an expression and an extension by hope, of the Christian faith in God" (p. 394).

Excellent chapters exist on faith and community, which is how the church functions in the world (its organization and structure, faith and calling, etc.). The book opens with Part I, "A Faith Among Faith," a helpful approach in putting Christianity on the map using a historical, philosophical, comparative-religious approach.

Even though this is a textbook on Christian theology, the acknowledgment throughout is that Christianity is a project to be lived and not an object to be studied. Many valuable graphs and charts are in the book, as well as many stimulating questions. While it is not always easy reading, it is worth the effort. The author has an extensive bibliography, which unfortunately lacks ASA contributors.

Reviewed by Fred Jappe, Dept. of Physical Science, Dept of Religious Studies, San Diego Mesa College.

ANATOMY OF REALITY, MERGING OF INTUITION AND REASON by Jonas Salk. New York: Columbia University Press, 1983. $16.95, 124 pages.

Dr. Jonas Salk is the Founding Director and a Resident Fellow of the Salk Institute for Biological Studies in San Diego, California who gives his prophecy of the future of the world and its means of solution as, in his view, it evolves not only physically but in the minds of men, which he calls metabiology. This book is fifth in the Convergence series founded by Ruth Nanda Anshen, Ph.D., Fellow of the Royal Society of Arts of Great Britain. "Convergence is committed to the search for the deeper meanings of science, philosophy, law, morality, history, technology, in fact all the disciplines in the transdisciplinary frame of reference." "Mind and matter, mind and brain, have converged; space, time, and motion are reconciled; man, consciousness, and the universe are reunited since the atom in a star is the same as the atom in a man." These quotations from founder Anshen explain convergence.

Dr. Salk looks at the world with the concept of evolution as a central metaphor. "I began to imagine what might be done to ameliorate or to improve the human condition, just as I had tried to imagine what could be done to destroy the infectivity of a virus without removing its capacity to immunize" and he has "continued to play the same mind-game in relation to the human predicament." He is somewhat pessimistic about man's future evolution but sees more scientists now "whose interest and curiosity have been captured by the opportunities that exist for the further development of the human mind." Intuition and reason are perceived as now being used more in knowing "what is evolutionary right and wrong" so there should be selection of "those human minds that may contribute most effectively to an evolutionary path." These are the ones "most developed with respect to their awareness of themselves and with respect to their relationship with all else in the cosmos, near and far." Hence, "human creativity, like human procreativity, is necessary for the survival and evolution of the human species." "If the key to the future is through the talents of individuals, then it will be necessary to develop methods for their selection, and conditions for their cultivation." "A new way of thinking is now needed to deal with our present reality, which is sensed more sensitively through intuition than by our capacity to observe and to reason objectively." "Reason may be seen as that which man adds to explain his intuitive sense." "All belief systems, or bases of pedagogy, religion and cosmogony, arise within the human mind, in the interaction between minds, and also in the course of various kinds of experience."

Dr. Salk mentions many influences on our minds and concludes, "threats of the past may have been related more to physical existence. Now it appears that threats are related more to our minds and to the integrity of our minds, which are more readily and easily assaulted even than our bodies." Hence, "the remedy for the human predicament, for the malfunctions in the human condition, lies in the reconciliation of the intuitive and the reasoning powers of human beings." We need to reconcile religion and science, to map our future, "to correct those errors that inhibit evolution: the unbalanced growth of population; excessive preparation for war; excessive utilization of energy; excesses leading to crime, violence, and terrorism; and excesses which have led to economic imbalance."

Reviewed by Russell L. Mixter, Professor Emeritus of Zoology, Wheaton College, Wheaton, IL 60187.

THE BONE PEDDLERS: SELLING EVOLUTION by William R. Fix, Macmillan Publishing Co., New York (1984), 337 pp + xxxvii, $18.95 cloth.

In this very interesting effort in which he takes on both the scientific establishment and Fundamental Christianity ("Whatever one may think . . . it should at least be clear that the tired alternatives of Darwin and Genesis no longer serve: too much else has come into the picture."), Fix presents an impressive amount of research of the scientific and "pseudo-scientific" (my term, not his) literature. He was provoked into this study by the current evolution/creation controversy, especially as reported by the news media. A particularly bothersome statement was made by a spokesman for the AAAS, "the 100 million fossils identified and dated in the world's museums constitute 100 million facts that prove evolution beyond any doubt whatever." In Fix's own words, "I began my deeper researches into the question of evolution in a position I described as 'middle of the road.' I was generally inclined to believe there might be some truth in both creationism and evolution, and so do I now. But my position is not unaltered."

The flavor of the book can perhaps best be gained from several brief excerpts:

> I discovered the amazing fact that almost every ancestor of man ever proposed suffers from disqualifying liabilities that are not widely publicized. The presentation of fossil evidence for human evolution has long been and still is more of a market phenomenon than a disinterested scientific exercise. When the problem of man's origin is considered holistically, it is thoroughly possible to doubt the man-from-animal theory without being either misinformed or a rock-bottom fundamentalist.
>
> The truth . . . is that Piltdown was not an unfortunate lapse of scientific poise in the infancy of the discipline (paleoanthropology), but was symptomatic of its standard operating procedure.
>
> There is simply no easy, graceful, or satisfying way around it: the geological record did not support universal macroevolution in Darwin's time and it does not do so today.
>
> In most other fields of science and with most other scientific questions, a valid objection to a theory or interpretation . . . will be taken on its merits regardless of whether a better theory or interpretation is offered. Not so with evolution.

I believe Fix presents ample evidence and good reasoning for many of his statements as represented by the above, relating to evolution and particularly in paleoanthropology. Unfortunately his scholarship is much less complete when he describes creation. The only alternatives Fix considers are the young-earth position with six 24-hour days for creation and the spiritual-agency-directed evolution of Robert Broom. The first is dismissed in a relatively few pages with a quote from McKenzie well representing Fix's position: "The difficulties raised against inerrancy from the natural sciences show that the language of the Bible is unscientific and that its conceptions of physical realities are those of its times. We now see that 'scientific truth' and 'scientific error' are modern conceptions; neither appears in the Bible, which makes no 'scientific' assertion of any kind, true or false." (At this point it is very interesting to compare the work of John Wiester in his recent book, *The Genesis Connection*, Thomas Nelson Pub.) Broom's theory is enthusiastically endorsed as refreshing and open-minded.

In developing the role of spiritual agencies Fix moves, in his words, "into the realm of the spirit". He discusses, in some detail, the progress in parapsychology, evidence for the astral or second body, out-of-body experiences, etc., for example: "Many serious investigators have now moved to a view of nature that brings them full circle with the ancient proposition that everything from the most humble plants to stars have some kind of spirit or intelligence." Fix proposes two theories to account for all the various forms of life, *psychogenesis* and *apparition theory*. He concludes, "Whatever one may think of psychogenesis and the apparition theory, it should at least be clear that the tired alternatives of Darwin or Genesis no longer serve: too much else has come into the picture." If you are curious about the mystical theory of psychogenesis and the magical theory of apparition, you can read the book.

I found the first half of the book generally well done. I'm afraid the second half of the book will do much to detract from the author's credibility.

Reviewed by B. J. Piersma, Dept. of Chemistry, Houghton College, Houghton, New York.

GOD AND THE NEW PHYSICS by Paul Davies, Simon and Schuster, New York, 1983, 255 pp, $16.95.

Judging from the number of books and articles that are currently being cranked out relating "new physics" to everything from health care to theology, one would think that there really is something "new" in physics to report to the lay public. Indeed, book publishers, constantly sniffing out areas of growing interest, may have guessed correctly that there is a genuine hunger in our society for ideas that integrate, introduce holism, and relate previously disparate subjects.

Anyone with the slightest inclination in this direction would very likely be "hooked" by a title like *God and the New Physics*. I certainly was. But as I got into the book I began to suspect that God may have received top billing in the title for reasons other than content. (Marketing comes to mind.) A more accurate representation might be "The New Physics vs. God."

Though I may have had grounds for quarreling about a misleading title, the Preface makes it abundantly clear where the author wishes to take the reader:

> In giving lectures and talks on modern physics I have discerned a growing feeling that fundamental physics is pointing the way to a new appreciation of man and his place in the universe. Deep questions of existence—How did the universe begin and how will it end? What is matter? What is life? What is mind?—are not new. What is new is that we may at last be on the verge of answering them . . .
>
> For the first time, a unified description of all creation could be within our grasp. No scientific problem is more fundamental or more daunting than the puzzle of how the universe came into being. Could this have happened without any supernatural input?

Paul Davies is eminently equipped to conduct this inquiry, at least from the scientific standpoint. A prolific author in popularizing cutting-edge physics—*Other Worlds, The Edge of Infinity, The Runaway Universe,* plus a number of student texts and technical books—he is Professor of Theoretical Physics at University of Newcastle-upon-Tyne and has appointments at two other British universities.

Davies chooses to concentrate upon what he calls the Big Four questions of existence: Why are the laws of nature what they are? Why does the universe consist of the things it does? How did those things arise? How did the universe achieve its organization? In the light of the above quote from the Preface, it will come as no surprise that Davies' anwers, however tentative, are based on the new physics and not the deity.

An adequate description of how he does this is impossible in the space available. So how about an "inadequate" one?

The author examines all the conventional arguments for the existence of the conventional God and finds them all flawed because of their dependency upon conventional notions of space, time, and matter. The new physics, he contends, requires a radical revision in the way we think about the underpinnings of our everyday reality—not that the experience of reality is all that different, it's the way we *explain* how it got here. If we use God to fill in the gaps of knowledge, then that God will automatically self-destruct (at least in part) whenever a gap is filled by science. And Davies feels that the new physics covers all the gaps quite nicely all the way back to the Big Bang with even that cataclysmic event comprehended in terms of an inflatable fragment of spacetime broken off another universe.

But Davies is not your typical reductionist. He has no room for "nothing-buttery" (citing ASA member Donald MacKay) and is genuinely concerned with the non-material aspects of a material universe. In dealing with the phenomenon of life he prefers to "regard life, not as an isolated miracle in an otherwise clockwork universe, but as an integral part of the cosmic miracle." (p. 70) The concepts of mind, soul, and self receive sensitive and penetrating treatment as does the issue of free will vs. determinism. *Level distinction* and *holism* play prominent roles in his attempts to avoid the logic traps in these areas which can so easily trip up the unwary. He takes a look at the *anthropic principle*, according to which "the universe *must* be such as to admit conscious beings in it at some state." (p. 171) A persuasive example of purpose and design is the fortuitous numerical coincidences which abound in our universe about which Davies has written at length in his book, *The Accidental Universe*. He hints at how impressed he is about this phenomenon in the closing sentence of Chapter 13, "Black Holes and Cosmic Chaos," " . . . the seemingly miraculous concurrence of numerical values that nature has assigned to her fundamental constants must remain the most compelling evidence for an element of cosmic design." (p. 189)

So what is the bottom line? How much God is left after all this analysis and gap-filling? As far as the God of first cause—the prime mover—is concerned, Davies sees no compelling reason for keeping him around since quantum physics provides ample room for "causeless" phenomena, particularly with hidden variables being proven unnecessary by Bell's Theorem. Furthermore, he concludes "there is no positive scientific evidence for a designer and creator of cosmic order (in the negative entropy sense). Indeed, there is a strong expectation that current physical theories will provide a perfectly satisfactory explanation of these features." (p. 186) Even the God of miracles is regarded as superfluous; Davies would just as soon put his money on mind-power rather than God-power for their explanation.

In fact, *mind* seems to be getting Davies' vote as the most likely god-like concept that can survive the scrutiny of physics and logic. No advocate of Cartesian dualism, he would let mind correspond to *software* and space-time-matter to the *hardware* of the universe. He sees life and organisms (including humans) having a similar relationship. Systems described as self-organizing, self-referencing, or bootstrapping have an appeal to Davies, and he sees the anthropic principle as supporting the notion that the entire universe functions analogously to such systems.

To say that this book is a challenge to conservative Christianity and Biblical literalism is to be guilty of gross understatement. It could be more easily dismissed if its author were just another carping critic of Christianity (and how many of those have come and gone?) and if he were using, say, geology or biology as a platform for launching his attack. But Davies cannot be categorized as an atheist or as anti-religious, and his platform is the foundation of all the other sciences including theology. He can only be accused of heralding the approaching paradigm shift in physics which will, inexorably, take everything else in our society with it (see *The Turning Point* by F. Capra). It would be ironic indeed if the high viscosity of religious dogma caused the Church to come in last again.

Reviewed by Robert L. Shacklett, Emeritus Professor of Physics, California State University, Fresno. Current address: 5015 Winsford Ct., Newark, CA 94560.

Letters

Encouragement from a Friend

That March issue of the ASA *Journal* is outstanding. Keep your publication evangelically anchored but an open forum for the exploration of significant ideas and issues even those that are off-the-wall.

Vernon C. Grounds, President Emeritus
Denver Conservative Baptist Seminary
Denver, Colorado.

Final Comment: The Last Word about Kessel and His Biological Interpretation of the Virgin Birth

M. Horisberger's critique of E. Kessel's writing, "A proposed biological interpretation of the virgin birth" (*Journal ASA* 3, 129–136 (1983) mirrors an all too familiar, distinctively uncomfortable image of restrictive thinking and policy.

Horisberger's citing that Kessel did not quote from the Bible indicates that the letter writer failed to grasp Kessel's foundational presentation as one based on a purely biological premise. Kessel could have, I'm confident, quoted from the Bible—but, the Bible is not a specificity handbook for biology. Besides, I would ask, which version/translation is Kessel supposed to quote from if he was so inclined?

Where Horisberger's letter really stirs up an area for immediate attention is his second point of rebuttal to Kessel: "Christians should reject forms of thinking which are sins, i.e. when reason is above revelation. Etc." Three days before my June 1984 copy of the *Journal* arrived, I was moved to inturrupt my work and wrote the following:

> The workings of God are not so deep nor mysterious as others would have you believe.
>
> Because so many men lack either the intelligence or the spiritual sensitivity (or both) to comprehend God's 'rationale' in creation, they feel secure only upon the act of denying the existence of such enlightenment to all others.
>
> By making the declaration that "no one is able to comprehend fully God's wisdom and creativity" . . . these men are, in fact, saying to me: "Stop thinking! Because of the fact that I can't comprehend, you cannot possibly comprehend either."
>
> To me, this is closed-system creationism at its worse—the essence of spiritual suffocation.

This can stand as a partial answer to Horisberger.

Let it be made abundantly clear to all the "Horisbergers" of the world—there is no area of thinking that is forbidden to a Christian. Perhaps there are areas of thought forbidden to certain denominationalists, but a Christian is free to pursue God at all levels of understanding and inquiry.

In the Word given us by Jesus Christ—the new covenant, the new contract (and the New Testament is the greatest of 'contracts') the promise is made in Matthew 7:7—"Ask, and it shall be given to you; seek, and you shall find; knock, and it shall be opened to you." There is no mention of an exclusionary codicil here that reflects unfavorably upon intelligence, reasoning and dialectic. Contrary to what Horisberger states: "The Bible is not an object to be discussed," try explaining the Bible without getting into a discussion; an impossibility within an air of open dialectic.

I've used the word "dialectic" twice within the contents of the above paragraph, and have done so for a reason. The June 1984 issue of the *Journal* featured a writing by David Wolfe, "Theoretical Pluralism and the Dreams of Childhood: An Immodcrate Proposal for Christian Sociologies". On page 79, Wolfe states: "I understand that (K.) Marx's notion of surplus value is rejected by traditional economists because it has no predictive importance. Yet Marxian economists insist on using it because it uncovers moral facts about exploitation which traditional theories overlook." Wolfe goes on to say, "I don't know enough about Marxian economics to assess this account, but it is suggestive for a Christian sociology."

Wolfe may not know enough about Marxist methodology in economics, but he was quick to sense the importance and value of dialectic. All Marxist doctrine is based on dialectic; and because of its superior foundation and strength, Christianity can function within a dialectic atmosphere also. Is this not proven, when in Mark 12:30, Jesus tells us "And you shall love the Lord your God with all your heart, and with all your soul, and with all your *mind*, and with all your strength."? Of course it does. We, who have been blessed with free thought, know very well that our Father encourages dialog encompassing all phases of His creation. We are supposed to ask, we are supposed to look, and in so doing we peel back yet another wonderfully exciting layer of the revelation of God. Our Father put in a considerable amount of time and trouble to develop our intellect—not so as to have it atrophy from underutilization.

To brand Kessel's conclusions as, " . . . a new form of paganism . . . " is a critique too harsh. Horisberger is directed to read and understand all of Proverbs 2. I'm confident E. Kessel has read this passage and comprehends the guidelines. I feel also that Kessel would have gone further than Horisberger's quoting of Job 42:2–3, and quickly picked up on verse 4: (Job still speaks:) "Hear now, and I will speak; *I will ask Thee, and do Thou instruct me.*" (NASB)

For those who pursue an intimate understanding of our Father's creation, Job 42:4 is the method to enlightenment. If it isn't, then the opening words of Isaiah 1:18—"Come now, and let us reason together . . . " aren't worth the paper they're printed on.

I'm sorry M. Horisberger, but there are some of us Christians who are in an open, vibrantly-progessive, and exciting partnership of accomplishment with our Lord Jesus Christ. Daily, we look forward to such a relationship with powerful expectations and are not the least bit hesitant about coming to our Father with the questions and hopes of small children.

Donald N. McKay
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New York 13035.

An Open Letter to Inter-Varsity Press About *Brave New People*

Few recent events in the life of the Christian community in the United States have struck me as more ominous than the decision of Inter-Varsity Christian Fellowship to suspend sales of *Brave New People* by D. Gareth Jones. By buckling under to political pressure, Inter-Varsity has jeopardized its own integrity for all the Christian students and faculty who look to it for guidance and support in troubled times.

One cannot imagine a person more fully qualified to reflect and comment on the issues surrounding the interaction of biology, human life, and biblical Christian faith that Dr. D. Gareth Jones. A distinguished author, a leading academician, an acknowledged scientist, and a committed and sensitive evangelical Christian beyond the slightest doubt, he and his work have now been rejected because they represent a minority opinion.

For 22 years I have served as Faculty Sponsor for the Inter-Varsity group on the Stanford University campus, as well as a supporter for the work at large. I have looked to Inter-Varsity to maintain its record of freely making known divergent viewpoints in the evangelical community. I tremble when I reflect on the consequences of this abandonment of that responsibility. Have we lost freedom of expression and the sharing of controversial opinions? Has it become necessary for fellowship in Christ to be conformed to a particular political ideology? God forbid that this tragic mistake should be left uncorrected and the damage already done be left unhealed.

What grim and dark days lie before us if Christians are willing to publish and uphold for mature reflection only the homogeneous consensus of the politically active! It is truly a time for prayer and repentance.

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