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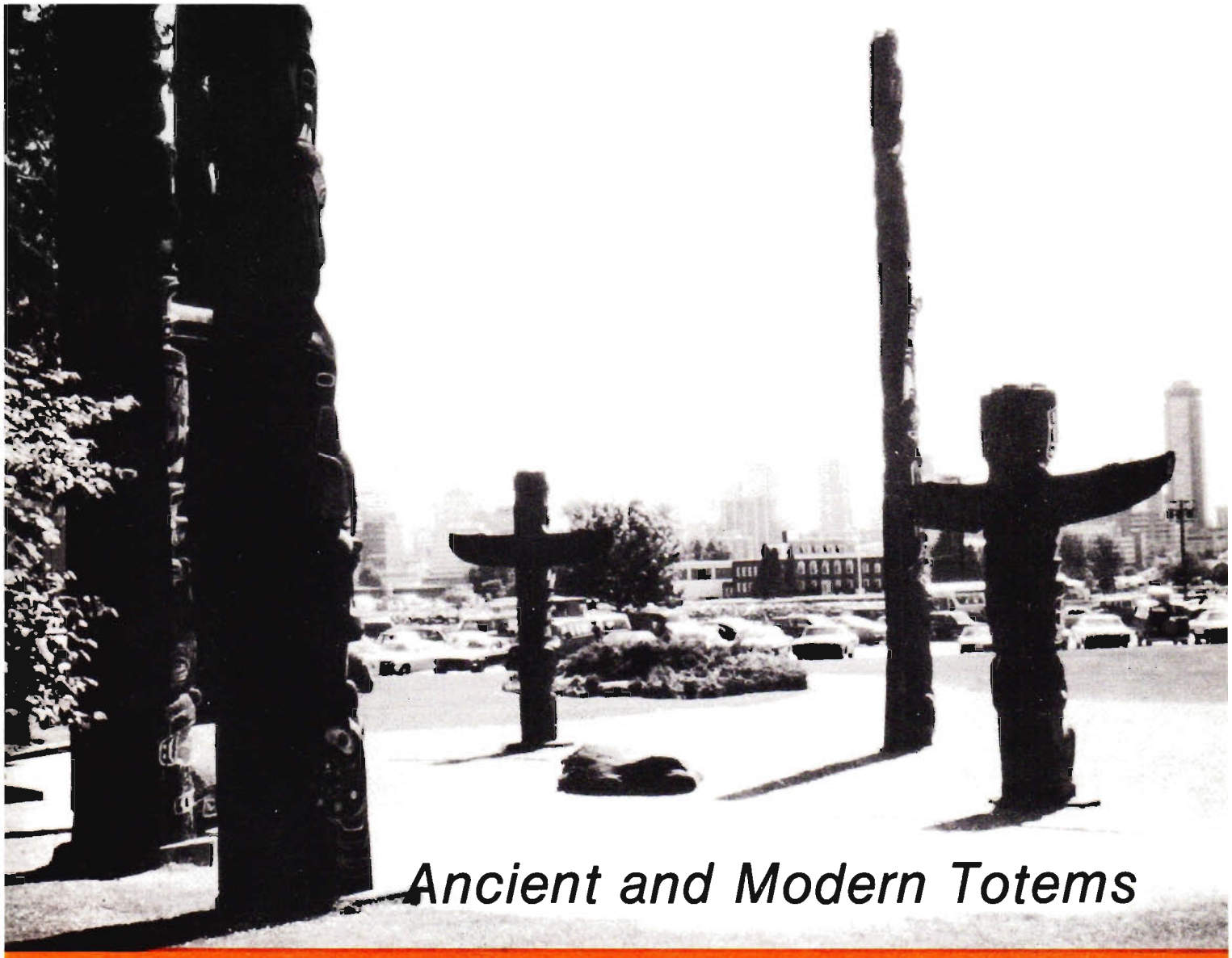

Ancient and Modern Totems

Stanley Park, Vancouver, B.C.

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

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The Biology Business

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In 1979 the controversy surrounding recombinant DNA research was on the wane. 1980 saw a resurgence of the debate that still continues today. The earlier discussion centered on the desirability and safety of interfering with the genetic material of any organism; the new debate is concerned with moral questions that arise as recombinant DNA techniques become part of a new commercial technology. Commercial firms are scaling up the volumes of cultures of recombinant bacteria to reach the production stage and are applying for patents to cover bacterial strains and splicing techniques. Other new biological techniques are also being applied commercially to produce substances of value to medicine and research. In March, 1981, *Time* Magazine ran a cover story on "The Boom in Genetic Engineering".

The Biological Basis[1]

The DNA molecule, by virtue of the sequence of its subunits, specifies the proteins that a cell manufactures. The proteins produced by a cell give each cell type its unique character. Thus, when a segment of DNA can be introduced into another cell and can be induced to govern protein synthesis as it did for the original owner, the new host cell takes on some characteristics of the donor cell by producing proteins that are characteristics for that donor. The significance of this may have been masked by the scientific jargon that has just been used. But imagine bacteria producing human insulin, or a mouse producing enzymes found only in the rat intestine!

In recombinant DNA work, the host that is most often used is *Escherichia coli (E. coli),* a bacterium. The DNA that the investigator attempts to incorporate can come from many sources: other bacteria, plants, animals, even human beings. Enzymes which are highly specific in their action have been discovered, isolated, and put to use. One of these enzymes, restriction endonuclease, can be used to split DNA molecules into carefully controlled segments. *E. coli* possesses, in addition to its large, circular chromosome, small circular pieces of DNA called plasmids. Restriction endonuclease can be employed to open these plasmids. The segment of DNA to be introduced into *E. coli* is allowed to join with the plasmids at the point of the break. Another

enzyme, DNA ligase can then be used to repair the breaks. These plasmids, with their newly introduced DNA segments, are re-incorporated into *E. coli* bacteria. And, if everything has been done correctly, these bacteria will now synthesize proteins specified by the newly incorporated DNA.

The synthesis of several biologically active substances has now been achieved with the new technology. The most significant of these are human insulin, human growth hormone, and foot and mouth disease antibodies. Other protein molecules, such as blood-clotting factors, hormones, and antibiotics will eventually be produced in the same way. Other possible products of "designer gene" technology are bacteria that can fix nitrogen in the roots of non-leguminous plants, bacteria that can digest cellulose in the human intestine, and bacteria that can be used to clean up oil spills.

However, the possibility of dangers has also been suggested. *E. coli* is a normal inhabitant of the human digestive tract. A strain of *E. coli,* produced with recombinant DNA methodology by design or accident, which would produce dangerous toxins—not uncommon in other bacteria—or which had acquired dangerous new pathogenic habits, could conceivably do much harm to the human population. Furthermore, pathogenic bacteria might acquire a resistance to antibiotics which would make them more difficult to control. Such possible hazards have raised questions about this research in the minds of many people.

The Early Controversy

In 1973 several investigators had begun to have doubts about the safety of recombinant DNA research. These doubts surfaced at a conference and were subsequently described in a letter in the Sept. 21, 1973 issue of *Science.* Subsequently, *Science* (July 24, 1974) published a letter by eleven distinguished scientists, asking for a moratorium on recombinant DNA research until guidelines could be established to guarantee the safety of such research.[2]

The two letters in *Science* focused attention on the recombinant DNA debate. Newspaper articles, some informative, some with hair-raising scenarios for catastrophes, kept the issue in the public eye. The Asilomar Conference, held in February, 1975, in California, was convened specifically to formulate recommendations for procedures to guard the safety of recombinant DNA research. The National Institute of Health (NIH) immediately took these recommendations under study and arrived at guidelines. From the time of the second letter in July, 1974, until the NIH guidelines were announced on June 23, 1976,[3] no recombinant DNA research was carried out in the United States. Surprisingly, the dictum for science, "What can be done will be done," did not hold true during this period.

The NIH guidelines described two kinds of containment procedures to ensure safety of the research. The requirements for the first of these, physical containment, were described for four different risk levels. The second type of containment, biological containment, described for three different risk levels, depended on special strains of *E. coli* that cannot live outside the Laboratory. The guidelines banned certain experiments altogether, such as those with extremely pathogenic organisms and "shotgun experiments" in which the entire DNA complement of an organism is broken into fragments and systematically incorporated into *E. coli.* All federally supported work at universities and national laboratories in the U.S. was governed by the NIH guidelines. Industrial research by pharmaceutical and other companies was less tightly regulated because it is financed by private funds. Senator Edward M. Kennedy held hearings with the aim of formulating federal legislation governing recombinant DNA research, but because the furor over the topic waned, the legislation was not enacted.[4]

The public controversy extended to state and local governments. Several states enacted legislation governing DNA research. At the local level, the most publicized brouhaha occurred in Cambridge, Massachusetts, the location of both Harvard University and the Massachusetts Institute of Technology. The Cambridge Experimentation Review Board was appointed by City Council on August 6, 1976, to consider whether high risk level DNA research should be allowed to be conducted within the city. The review board, which consisted entirely of "lay" citizens, submitted a unanimous recommendation on February 7, 1977, to allow the research in question, with certain additional stipulations over and above the NIH guidelines.[5] Many scientists at the two institutions were not accustomed to being held accountable to the public for their research in this manner.

Many of the molecular biologists who originally thought recombinant DNA research should be restricted, soon began to feel that the 1976 NIH guidelines were too strict. They thought that their research programs were unduly restricted, and they objected to the fact that DNA research was being carried out very fruitfully in countries with less restrictions. Furthermore, they were of the opinion that fears of the dangers of the DNA work were unfounded. NIH relaxed most of its guidelines in January of 1980 to facilitate recombinant DNA research in the United States.

Industrial firms had some concerns of their own. They felt that the 10 liter volume limit prescribed by the guidelines prevented scale-up research required to develop industrial processes. They were also afraid that disclosure of research procedures would endanger the need to keep commercially valuable information private. NIH has also relaxed the guidelines that affect industrial research in answer to some of these concerns.

In these controversies the scientific community in the United States has shown restraint and responsibility. The ban on recombinant DNA research was largely self-imposed. R. Goodell has described how lobbying and uncritical press coverage has contributed to the lifting of constraints on investigation of recombinant DNA.[6]

New Developments

Putting Recombinant Bacteria To Work

As bacterial strains with new, technologically transferred synthetic abilities become available, much work by universities and corporations now centers on problems connected with scaling up the production to commercially suitable quantities. Several medically useful products are close to commercial production. Among them are interferon (for the treatment of cancer), growth hormone, somatostatin (a hormone from the brain that controls secretion of growth hormone), beta-endorphin (one of the body's painkillers), and, of course, insulin.[7] It is important to note that the insulin so produced is human insulin that produces fewer undesirable side-effects than the pig insulin that is now used to treat diabetics. Several clinical trials are now underway to test the safety and efficacy of these drugs. Other companies are investing large portions of their research and development budgets on projects designed to develop bacteria that may be useful in petrochemical technology, or to develop bacteria that produce ethanol, human and veterinary vaccines, or enzymes for diagnostic and clinical work. It is not surprising that the speed with which NIH can certify the drugs that are produced in this way is important to many companies.

A New Source of Enzymes

Enzyme technology, while less dramatic than genetic engineering, also receives a considerable share of funds from companies interested in the biotechnology market. Separation of cell and the product can be made very easy by immobilizing these cells or their enzymes in a solid matrix or a small pore gel. As nutrients ("substrate") are passed by the cells, they are converted to the desired product by cell enzymes.[8] Japan is leading in research and application of this technology. It seems to be a natural extension of that country's fermentation and antibiotics industries.

Interferon

One gene that has received enormous interest and publicity is the one that contains the information for the synthesis of interferon, a substance that is produced by the body to fight viral infections.[9] Interferon is presently the subject of much medical research because it is thought to be an effective weapon against cancer. Initially, this substance had been painstakingly removed from white blood cells. Now it is available from other sources: from human cell cultures, in which fibroblast or lymphoblastoid cells are grown, not unlike bacteria. Recombinant bacteria, carrying the gene for interferon, have also been used to produce the substance. Several corporations and countries are interested in the production of interferon; a commercial plant for fibroblast interferon is being built in Israel by the Yeda Company of Japan and the Ares Company of Switzerland. The laboratory of Dr. Charles Weissman in Zurich, in research paid for by Biogen, a drug company, has produced a strain of recombinant bacteria that produces interferon. It is probable that this will lead to commercial production by Biogen before long. Interferon produced by recombinant technology may eventually be cheaper than that produced by cell culture techniques. The high cost of interferon presently available has made wide use impossible.

In these controversies the scientific community in the United States has shown restraint and responsibility.

The story of interferon research in the United States reads like a spy novel. In the race for the production of a commercially suitable strain, the old habit of researchers of exchanging bacterial strains and other biological materials may have led to the acquisition of the interferon gene by the Genentech corporation. Nicholas Wade[10] gives one version of the story of how Genentech is thought to have obtained the interferon gene from UCLA researchers. Although Biogen seemed to have the lead in producing recombinant interferon, Genentech, in collaboration with Hoffman-LaRoche, announced in June, 1980, that they were able to produce two kinds of recombinant interferon, and that enough interferon would soon be available for clinical trials. Other pharmaceutical companies in the U.S. are thought to be in hot pursuit. It is ironic that despite all this

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effort, the therapeutic effect of interferon on cancer remains unknown.

Monoclonal Antibodies

Another exciting development over the last two years is the production of pure antibodies by new tissue-culture techniques. Antibodies are substances produced by the body to neutralize harmful substances or organisms. While many cell types of the body can be grown in laboratory cultures, not unlike bacteria, the culture of antibody-secreting cells had not been achieved successfully. However, British scientists were able to produce antibodies in tissue culture by fusing an antibody-secreting cell with a tumor cell. Cultures of this kind have been found capable of producing very pure antibodies. Such substances can be injected to fight a disease in the recipient. In the United States, several small companies, which will produce such "monoclonal antibodies", have been formed, and some commercial products that have been produced in this way are now on the market.[11]

It is difficult to keep up-to-date on the commercial ventures that aim to capture a share of the biotechnology market. In recombinant DNA technology, four pharmaceutical firms, Cetus, Genentech, Genex, and Biogen, have captured most of the news, but many other small companies have made huge paper profits, and have made instant millionaires of many scientists who are connected with them.[12] Other companies, perhaps less spectacular, are pursuing other biotechnology projects in enzyme or monoclonal antibody production.

As the concerns of the biological community about safety recede into the background, developments related to the new biotechnology are giving rise to new controversies. Some of these are related to the task of universities and their faculties, to the desirability of patenting new strains of bacteria and their products, and to the role of national governments in fostering new biotechnology industries within their countries.

Biotechnology And The University

> I am very concerned about the growing influence of industry on academic science. . .The direction of research influenced by industry may not be the direction that is in the public interest. Corporate requirements for scientific research may be at odds with pressing societal needs. There are many examples one could cite, especially in environmental research, nutrition and biomedical science. (S. Krimsky in an interview, *Nature,* January 10, 1980, p. 130-131)

Many have suggested that the biotechnology business can compromise the academic integrity of universities. Universities and their faculty members are rushing to become involved in biotechnology projects. Such involvement can take several forms: by faculty members serving as consultants to biotechnology firms, by faculty members in universities forming their own commercial enterprises, and through the funding of private or department research by corporations. While some faculty members are happy to cash in on their new-found and unexpected commercial worth, others have serious questions about the commercialization of the university. The magnitude of the gene boom should not be underestimated: a Harvard faculty member estimated that one half of his colleagues are involved in companies in one form or another. This has led to tensions within some universities, and to envy by scientists in more traditional disciplines.[13]

Commercial enterprise by a university is not a new phenomenon. The University of Toronto operated Connaught Laboratories at arm's length for many years, for example. Patents on the products of scientific research that benefit academic institutions have been common also. Departments such as engineering and medicine would not be able to attract faculty members if consulting activity or private practice would not be allowed. Nevertheless, the questions being posed in the current debate seem to have a new urgency.

In the Supreme Court decision there seems to be a particular insensitivity to the uniqueness of living creatures.

What is the task of a university? I have difficulty accepting the usual statements about objectivity and academic freedom. Rather, I would stress the importance of a university's commitment to respond with research and teaching to human and societal needs. It seems to me that it is the university's ability (or willingness) to respond to such needs that is compromised by the commercial involvements. Where do the institution's commitments lie, to the development of new commercial bio-medical products or to the society that make its existence possible? When the economic dominates the academic, some research options that should be pursued, will be ignored. "Just as war-related academic research compromised a generation of scientists, we must anticipate a similar demise in academic integrity when corporate funds have an undue influence over academic research," states S. Krimsky in the interview cited above.

Faculties of applied sciences such as medicine and agriculture are in a particularly touchy position. Faculty members in agriculture, for example, often are hired with research on problems in the industry of agriculture, or developmental research at an experimental station, as part of their job description. J. L. Fox has described how the ability to respond to the needs of agriculture can be endangered when a member of an agricultural faculty becomes involved in entrepreneurial activities.[14]

Scientific communication, an important component of the academic enterprise, is endangered by the new entrepreneurial spirit in several ways. Disclosure of methods and results by way of conferences or research publications,

the usual means of sharing scientific information, is hardly advisable when these methods and results are part of a production process in a commercial enterprise.[15] Furthermore, not giving in to the lure of the game may be even less fruitful. The discoverer of monoclonal antibodies, C. Milstein from Great Britain, did not apply for a patent on his new production process, preferring to give away cell cultures and procedures, only to find that the Wistar Institute in the U.S., and two it its employees had applied for, and had been granted, a patent for the new technique.[16]

Graduate students and "post-docs" have charged that faculty advisors tend to neglect their duties when commerce enters the lab. Faculty advisors have less time to discuss research projects, or research conferences are designed to glean information for the advisor's company. Others experienced that advisors were more interested in recruiting a young PhD graduate for their private firm than helping him or her obtain an academic position.[17]

Dr. Derek C. Bok, president of Harvard University, announced in November, 1980, that the university had decided not to become a partner in a firm that would exploit findings of the laboratory of one of its faculty members, Professor Mark Ptashne. Harvard's decision was reached after a great deal of discussion and internal controversy. Dr. Bok suggested in a subsequent article that the decision not to participate in the new company leaves many questions unanswered, questions to which the Harvard community will have to address itself.[18] At other universities commercial involvement has been initiated without much protest.

Patents

On June 16, 1980, the United States Supreme Court ruled that a bacterial strain can be patented if it is "human-made."[19] While genes tranferred by recombinant techniques hardly make a bacterium "human-made", the decision did give the go-ahead for the genetic engineering industry. The application for patent was made by General Electric for a bacterium genetically engineered by Ananda Chakrabarty to digest oil slicks. The patenting debate and the court's decision bring an interesting question to the fore. Is it right to patent living things? Our answer says something about what we perceive living things to be.

One group of countries that will not be participating in the establishment of biotechnology industries are those of the Third World.

There is precedent for granting patents on life forms. In many western countries, including the United States, seeds and nursery stock can be patented. Patenting of seeds has been possible for many years, but is becoming embroiled in a controversy of its own because it is felt that such patenting is eroding the genetic base of the world's food supply, and is making some needed seeds unavailable to Third World farmers.[20] Seeds and plants are covered by patent legislation passed by U.S. Congress in 1930 and 1970. Fungi and bacteria were specifically excluded by the 1970 law. The Supreme Court decision now grants bacteria the same status as plant varieties.

Jeremy Rifkin has discussed the implications of the Court decision.[21] He is firmly opposed to the patenting of new bacterial strains because recombination effected in the laboratory transgresses natural boundaries, is dangerous, and only benefits large corporations. He calls upon church leaders and other concerned Christians to work towards stopping recombinant DNA work. Since the time of the article, research and development of biotechnology products has gone ahead with very little public reaction. Goodell, in a perceptive article, has explored why it is that the press now supports DNA work so enthusiastically and optimistically.[22]

The Christian community should continue to raise meaningful questions about the new biotechnology. Is the safety issue less of a concern now, two years later? Will the new technology help those people who need it most, namely the sick and the hungry? Is there concern for developing medical products for third world diseases?

In the Supreme Court decision there seems to be a particular insensitivity to the uniqueness of living creatures.

> The bottom line of the Supreme Court's descision is that it does not matter whether something is living or not: Its patentability depends on whether it is a product of nature or man-made. . .The Supreme Court's thinking therefore follows the reasoning of a lower court, . . .which concluded after its review of the case: "In short, we think the fact that micro-organisms, as distinguished from chemical compounds, are alive, is a distinction without legal significance."[23]

One need not be opposed to the new DNA technology to object to this view of nature. It is important that Christians resist such exploiting language, and the view of nature that it conveys.

Nationalistic Tendencies

Biotechnology requires much technical know-how, and huge investments. National governments, particularly in Europe, have not been content to leave the fostering of the new biotechnology industry to the private sector, but have encouraged this industry through grants and other inducements. After all, no country wishes to be left behind in science. Biotechnology can help improve medical care within a country and can give rise to clean, desirable industry. Furthermore, it can help tap renewable resources, potentially yielding such products as methanol fuel, biogas, and single cell proteins.

Not only is there pressure on a government to invest in the development of biotechnology within its borders, there is also pressure to relax whatever research guidelines there may be. There is a considerable loss of employment and

prestige when a large corporation decides to move its laboratories to another country, where more favourable financial and regulatory conditions apply. There is also a tendency for research scientists to move out of a country if the research they wish to pursue is not possible there.[24]

One group of countries that will not be participating in the establishment of biotechnology industries are those of the Third World. This is ironic because these countries desperately need the help that biotechnology can provide in fighting parasitic and other diseases, and in fighting hunger by providing such products as single-cell proteins for diet supplements. It is a necessary part of development aid that developed countries see to it that the countries of the third world share in the benefits of the new technology.

Conclusion

Recombinant DNA and other biotechnology developments are here to stay, in spite of any questions that we may have. It is important that this technology be a responsible technology. Responsible application will mean, among other things, that it meet human needs, here and in Third World countries. We should also continue to press universities so that they will answer their primary calling, that is, to carry on research and teaching that answers the needs of society.

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[21]J. Rifkin, "Playing God", *Sojourners,* August (1980), 9-10.

[22]R. Goodell, pp. 41-45.

[23]N. Wade, 27 June (1980).

[24]The Jan. 10 (1980) issue of *Nature* (pp. 122-131) "reviews the state of the art of biotechnology around the world". See also several articles in *Nature,* Jan. 24, (1980), 319-325.

This reductionism has led to what David Hull calls "the arrogance of the physicists." They say, yes, you biologists deal with complex things, but the ultimate explanation will be supplied by the level at which we study. . . .I strongly disagree. They might find out all about particle physics, but it won't shed a single bit of light on, for instance, how the nervous system works or how ontogeny works. Complex systems have to be studied at high levels of complexity. ...Physical scientists must understand that biologists are not disclaiming physical phenomena. We are not setting up vitalism. We are not trying to produce a metaphysics. We simply claim that in complex, historically formed systems things occur that do not occur in inanimate systems. That is all that is being claimed.

Ernst Mayer, quoted by Roger Lewin in "Biology Is Not Postage Stamp Collecting," *Science,* May (1982), pp. 718-720

Behavioral Views of Punishment: A Critique

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Behavioral psychologists, notably Skinner, claim that punishment is ineffective and produces a number of adverse effects. The nature and types of punishment are discussed. Evidence on the effects of reinforcement and punishment is reviewed, alternatives to punishment are presented, and biblical teachings regarding punishment are reviewed. It is shown that punishment is effective and that the effects of reinforcement and punishment are similar in nature but opposite in direction. While biblical teachings clearly advocate punishment and thus imply that it is effective, there is clear convergence of biblical and behavioral emphases in encouraging use of alternative approaches.

The question of what role, if any, punishment should play is one of the most controversial areas in behavioral psychology. It is also an issue that raises significant concerns for those who hold a Christian perspective and who believe that the Bible advocates the use of punishment. In the discussion that follows, we examine how behaviorists use the word punishment, consider supporting data and arguments for and against the use of punishment from a behavioral perspective, discuss alternatives to punishment in dealing with problem behaviors, and explore how these compare and contrast with a biblical perspective on punishment.

Definition and Forms of Punishment

Behavioral psychologists use the word punishment in a somewhat unique way. Where our normal social definitions of punishment tend to focus on *what is done* to the person, a behavioral definition of punishment focuses on *how the person responds* to the stimulus event in question; that is behavioral definitions of punishment focus on the *function* of the stimulus in affecting the behavior of the person who receives it. Two basic classes of stimulus events are functional in affecting behavior: removal of a stimulus, and presentation of a stimulus. *Punishment is functionally defined by a decrease in the frequency of a target response when a stimulus is either removed or presented following that response.*[1]

Our definition of punishment suggests that there are two broad classes of conditions that may be termed punishment; what these two classes have in common is their effect in reducing the frequency of the behavior that they follow. Each of these is described in turn, along with Time Out, another procedure that has similar behavioral effects.

One other aspect of the relationship between reinforcement and punishment is important. A stimulus that will strengthen a response when it is presented following it, will also weaken a response if removed following that response. Thus the same stimulus events can function either to weaken or strengthen responses.

Punishment by Presenting a Stimulus

A punishing stimulus is defined as a stimulus that results in the reduction in the frequency of a response if it is presented following that response. A wide variety of events may function as punishing stimuli: spanking, being yelled at, scolding, the word NO, being slapped, electric shock and so on. The same stimulus event may function in dif-

Portions of this material were presented at the Annual Meeting of the American Scientific Affiliation at Taylor University, Upland, Indiana in August, 1980; adapted from Behavioral Psychology: A Biblical Perspective, *published by CAPS/Harper and Row (1981).*

ferent ways for different people or organisms. Thus we must be careful, when we describe a particular stimulus event as a punishment, that we are clear that this event functions as a punishing stimulus.

If we can show that presenting a certain event after a response, say a verbal reprimand after eating with fingers, results in a decrease in the frequency of that behavior, then we may describe the process as punishment. Punishment by a stimulus is probably the most commonly used form of punishment in our society.

Punishment by Removing a Stimulus: Response Cost

The removal of a stimulus following a response may also result in a decrease in frequency of the response. When a response is decreased in frequency by the removal of a stimulus we term this punishment *response cost.* Traffic tickets and fines for legal offenses are the most common examples of Response Cost procedures used in our society. Of course, removal of a particular stimulus may decrease response frequency in one person, have no other effect on another, and increase response frequency in a third person.

Time Out

Punishment by presenting a stimulus and Response Cost involve stimuli following a response. Another procedure that has similar effects involves the alteration of events that *precede* responding. Time Out involves either of two forms of changes in events preceding responding that result in a decrease in the frequency of a response. The first form of Time Out involves removing the child, for example, from the environment in which a variety of responses may be reinforced. Isolating a child in his/her room following tantrums, with the result that tantrums decrease in frequency, is an example of a Time Out procedure.

The second form of Time Out involves the contingent removal of a discriminative stimulus in the presence of which a variety of responses are reinforced. A frown on Mom's face (or the absence of a smile) may be an example of this type of Time Out if Mom's frown signals that one or more responses in her presence such as requests for cookies, asking her to play a game, or approaches for hugs will not currently be followed by reinforcement. If the frown results in a decrease in the frequency of responses when it is present, it might be an example of Time Out in this second sense. Prison involves some of the elements of Time Out in this second sense.

The common feature of the two forms of Time Out described here is that both involve a temporary termination of the opportunity to obtain reinforcement for certain responses. Time out does not fall within our definition of punishment given above. However, because of the similarity in behavioral effects it will be useful to deal with the Time Out procedure as essentially similar to punishment as we have defined it.[2]

The Punishment Controversy

Does Punishment Work?

Skinner believes that the use of punishment is widespread in our society because of the immediate effects that it produces, but he claims that "In the long run, punishment, unlike reinforcement, works to the disadvantage of both the punished organism and the punishing agency."[3] Skinner cites evidence from studies that both he and Estes conducted, which he interprets as support for the conclusion that punishment is not effective.[4]

In contrast with Skinner, Staats is a behavioral psychologist who believes that punishment has a legitimate and necessary role. "Actually, in our present state of social advancement, it is impossible to raise a socially controlled child without the use of some form of aversive stimulation. It is thus important to. . .minimize its adverse effects and maximize its productive effects."[5] Staats suggests several guidelines that he believes are important in meeting this objective.

> When punishment is employed, it is suggested that it be as infrequent as possible, as slight as is necessary to be definitely aversive, applied immediately but of short duration, and be paired with words so the words will later on be capable of substituting for the direct punishment.[6]

These words, which will come to produce negative emotional responses much like the unconditioned aversive stimuli, will later be enough to prevent the occurrence of undesirable responses. Staats advocates the use of what we have called Time Out. He also reminds us of the importance of using statements about the consequences of behavior to help the child come under control of language as well as primary punishment.

Probably the most serious objection to punishment raised by Skinner and his colleagues is the claim that punishment doesn't work. In an extensive review of research on the effects of punishment, Azrin and Holz criticize Skinner's interpretation of the data regarding the effectiveness of punishment.

Azrin and Holz conclude that in the Skinner and Estes procedures the introduction of punishment along with extinction could have served as a discriminative stimulus which indicated that reinforcement would no longer occur; termination of the punishment reinstated the original conditions and extinction proceeded in the normal fashion. The accuracy of this interpretation is supported by the results of an ingenious experiment in which Azrin and Holz used a pseudo-conditioning procedure of changing the key light from white to green (a neutral stimulus) for pigeons who had been reinforced only in the presence of a white key. They found effects similar to those previously obtained with shock, suggesting that the discriminative rather than punishing effects of shock and bar slaps had produced the effects found by Skinner and Estes. Azrin and Holz conclude that shock and bar slaps served notice that food was no longer forthcoming, rather than having a punishing effect. Consequently, the data from the Skinner and Estes studies do not bear on the question of the effectiveness of punishment.[7]

Azrin and Holz not only question the interpretation of the results of the Skinner and Estes studies, but go on to present ample data to support their conclusion that punishment is a highly effective method for reducing the frequency of responses. With mild punishment there is a characteristic recovery of the base rate of the behavior when punishment is discontinued. However, they note that with severe punishment it has been shown that the results are almost irreversible. "One of the most dramatic characteristics of punishment is the virtual irreversibility or permanence or the response reduction once the behavior has become completely suppressed."[8]

Other Effects of Punishment

A number of additional objections to punishment have been raised by behaviorists. First, punishment results in a tendency to avoid the punishing agent. When this happens with key social agents such as parents and teachers, the child loses the opportunity for important learning experiences. At the extreme, the person may become a social isolate. While this is an important concern, Staats points out that the tendency for punishment to produce avoidance may be counteracted by any reinforcement provided by the same person.[9] The effects of reinforcement and punishment on social attraction are opposite in direction. If reinforcement is the principle mode of interaction, then occasional punishment will not have a serious impact on social avoidance.

A second adverse effect attributed to use of punishment is that the punishing agent is modeling aggressive behavior, and that the person receiving the punishment is likely to adopt these behaviors.[10] To some extent this is true; however, the relationship between modeling and imitation is complex. A number of factors are known to interact with the experience of observing a model in determining whether imitation will occur, including sex and social status of the model, context, consequences to the model and consequences to the observer. Thus under appropriate conditions, the adverse effects on imitation of punishing behavior are not likely to be serious. Further, when socially appropriate punishment methods are employed, it is probably desirable that the recipient imitate the observed behavior.

Probably the most serious objection to punishment is the claim that punishment doesn't work.

A third adverse effect of punishment identified by critics is the fact that it produces a number of emotional effects. These emotional responses are essentially respondent behaviors; that is, they occur whenever certain stimulus events are present whether or not they follow another response in contingent manner. Thus they occur whenever punishment occurs, but are not limited to such occasions.[11]

The unpleasant emotional effects of punishment come to be associated not only with the punishing stimulus but with all stimulus events that occur at the time of the punishing event. The emotional effects are thus associated with the punishing agent, the situation in which punishment occurs and so on. These unpleasant emotional effects play a major role in the development of avoidance responses. Behavioral psychologists generally view this tendency for negative emotional effects to generalize to all aspects of the punishment context as undesirable. Certainly the tendency to develop avoidance responses to key social agents such as parents and teachers is undesirable. But as Staats accurately notes, in some ways this generalization of unpleasant emotional effects may be beneficial; learning to avoid situations or people that increase the likelihood of undesirable responses is a desirable outcome.

Fourth, in addition to affecting the response actually followed by punishment, punishment tends to affect other behaviors as well. A child who is busily doing his assignment while talking out loud to himself may cease talking out loud if this response is punished. The presentation of punishment, however, may affect his work on the assignment. The adverse effects of punishment on other ongoing responses may be limited in three ways. (1) As we have noticed before, the consequences of a response are most effective if they follow immediately after the response. (2) Punishment is more effective if it occurs consistently after a response. (3) Ongoing reinforcement for a response will interact with any accidental effects of punishment occurring

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after the response. For all of these reasons, punishment tends to act in a selective fashion to primarily influence the response that it consistently follows in a contingent fashion.

There is one way in which the tendency for punishment to affect other responses is clearly positive. Usually, other responses similar to the punished response are also undesirable. The tendency for punishment to reduce the frequency of similar responses is thus an advantage. We need to be cautious, then, about the effect of punishment on responses other than the target response, but this need not be a major concern.

Finally, several other criticisms have been raised with regard to the effects of punishment: delay of punishment leads to weakened effects in reducing the frequency of the response; failure to consider the function or effect of a particular stimulus for a particular person may result in accidentally reinforcing undesirable behavior; punishment may serve as a form of aggression in which the punishing agent acts out their anger. Each of these is a legitimate concern, but they are more relevant to considerations of how to punish effectively. The fact that sloppy punishment contingencies do not work well is no more serious a problem than the fact that careless reinforcement contingencies also are not very effective.

Effects of Reinforcement and Punishment: Parallels and Contrasts

In this section we examine in more detail the effects of reinforcement and punishment; Table 1 summarizes these. The first line indicates that reinforcement increases response rate, while punishment decreases response rate. These relationships should be familiar.

As we noted earlier, one of Skinner's criticisms of punishment is that it has temporary effects. The second line of Table 1 indicates that both punishment and reinforcement have *temporary* effects. In general, reinforcement is used when we wish to strengthen the frequency of a response that occurs at a low base rate. Following the introduction of reinforcement, the base rate of the response increases. If the reinforcement is then discontinued, the response decreases in frequency. Introducing reinforcement again quickly reinstates the higher base rate found when the response is reinforced. These results are summarized in the top half of Figure 1. In the lower half of Figure 1 the effects of punishment are portrayed in a similar fashion. Punishment is used when we wish to decrease the rate of a response; the baseline for the response to be punished is

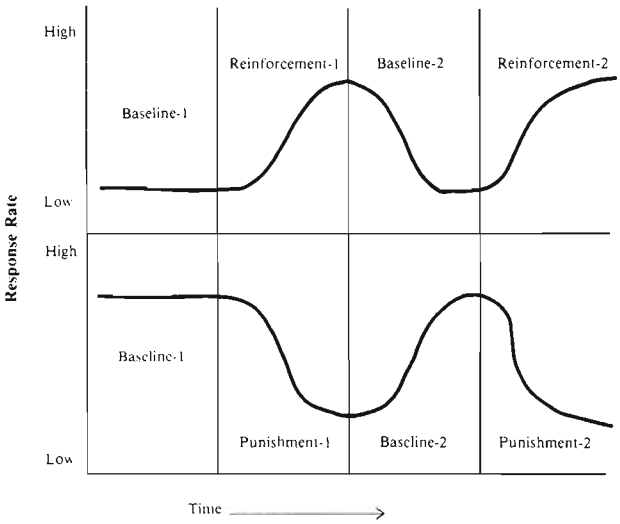

Figure 1. Effects of Reinforcement and Punishment

Table 1

Effects of Reinforcement and Punishment

Behavioral Characteristic	*Reinforcement Effects*	*Punishment Effects*
Target response	Increase	Decrease
Permanence	Temporary	Temporary
Emotional Effects	Positive	Negative
Social Effects	Interpersonal attraction (love, affection)	Interpersonal avoidance (hate, dislike)
Modeling Effects	Imitation of reinforcing interactions	Imitation of punishing interactions
Generalization	Similar responses strengthened; Co-occurring responses strengthened	Similar responses weakened; Co-occurring responses weakened
"Unauthorized" behavioral Effects	Theft, extortion, "conning" (eg. steal M&Ms, fake task etc.)	Avoidance behaviors (eg. play hooky, run away from home) and aggression

usually fairly high. When punishment is introduced, the frequency of the response decreases. Stopping the punishment results in a recovery of the base rate of the response. Reinstating punishment quickly recovers the lowered base rate found in the original punishment period.[12]

Notice that the effects of punishment are a mirror image of the effects of reinforcement. *In general, both reinforcement and punishment have temporary effects.* One further qualification is required: under limiting conditions both reinforcement and punishment may have virtually permanent effects.[13]

A second criticism of punishment raised by Skinner is that it produces adverse emotional effects. Generally overlooked in the behavioral literature is the fact that reinforcement also affects emotional behavior.[14] Just as punishment produces displeasure, anger, disliking and hate, reinforcement produces emotional responses such as attraction, liking and affection.[15] These relationships are summarized on line three of Table 1.

Some of the emotional effects of punishment that we have just discussed are essentially social effects as well. In addition to affecting emotional responses to other persons, however, punishment may also affect a wide range of other social behaviors. The child who is often punished by parents and teachers may soon learn to avoid contact with them. Technically we would term these responses avoidance and escape responses; they are negatively reinforced by preventing or terminating the presence of these social agents. Unfortunately, the child thus misses important learning experiences in socialization and education; in this way, both social relationships and learning experiences may be affected by the use of punishment.[16] By contrast, reinforcement has the opposite effect of producing social attraction and thus fostering important learning interactions.

Another important principle is that the consequences which follow a given response tend to affect other responses that occur at about the same time, as well as to effect other responses that are similar in form. This principle applies with punishment as well as with reinforcement: the effects of punishment influence not only the specific response that it follows, but also other responses ongoing at the same time and responses that are similar in form.

The reduction of the probability of other responses that are also undesirable by generalization effects of punishment can actually be a beneficial effect. If the punished response is desirable, however, or if other responses that are desirable are weakened along with the punished response, problems may be presented. Consequently, the generalization of the effects of punishment may be either good or bad. Further, the degree and probability of generalization effects will be influenced in important ways by other ongoing events such as the strength of behaviors that occur at about the same time as the punished response, the ongoing reinforcement support for those behaviors, the past experiences of the person with reinforcement and punishment, and so on.[17]

Although the directions of the effects are opposite, the kinds of effects produced by reinforcement and punishment are essentially the same.

Thus, while punishment clearly does affect responses other than those specifically followed by the punishing stimulus, this phenomenon is not limited to punishment. Reinforcement also has generalization effects. Careful management of contingencies can enhance or limit generalization effects for both punishment and reinforcement.[18]

A final problem that has been suggested for the use of punishment is that of "unauthorized" escape. An example of this is a rat in an experimental chamber in which an electric shock is presented by means of a metal floor grid at periodic intervals. The rat can avoid shock by pressing a bar before the shock begins, or escape by pressing the bar after the onset of shock. Rather than press the bar, some rats learn to lie down on their backs with feet, nose and tail in the air; in this manner they effectively escape the shock although the floor is electrified continuously.[19] The desired response of bar pressing does not occur, yet the animal is able to avoid the unpleasant experience of electric shock.

The same principle may be seen with human behavior. A child who is punished by his teacher for failure to turn in his homework may avoid punishment by doing his homework; he may also avoid punishment by playing hooky.

Another form of "unauthorized" escape is the use of counter-aggressive measures. When the neighborhood bully tells Johnny that he will beat him up if he comes to the playground again, Johnny can avoid the punishing event by staying away. He can also avoid it by beating up the bully, provided he is strong and able enough to do so. Or he may bring his older brother along for protection; in this instance, we might consider Johnny's response to be socially acceptable. If Johnny avoided punishment for not doing homework by assaulting his teacher, however, we would disapprove.

Conceptually, we may think of "unauthorized" escape responses as negatively reinforced behaviors that are socially undesirable. Almost totally neglected by the behavioral literature, but of equal social significance in my opinion, is the problem of "unauthorized" reinforcement. Behaviors that produce unauthorized reinforecement include theft, extortion, bribery, "conning" and the like. Stealing a candy bar rather than earning one is an example. These examples show that a person may obtain positive reinforcement or escape punishment in ways other than those that were intended by parents, teachers and experimenters. Although the directionality of the behaviors is different, in many ways similar problems are posed with unauthorized effects of both reinforcement and punishment.

Although the directions of the effects are opposite, the kinds of effects produced by reinforcement and punishment are essentially the same. Both affect the rate of a response; both have temporary effects except under limiting conditions; both produce emotional effects; social attraction is affected by both; generalization occurs with both; finally, unauthorized effects may occur with both.

Alternatives to Punishment

We have seen that punishment is effective, desirable and even necessary under some conditions. Our discussion would be incomplete, however, if we did not also examine alternatives to punishment and consider the circumstances in which these alternative strategies may be more desirable than punishment.

A major contribution of the behavioral approach has been the explicit description and study of the effectiveness of alternatives to the use of punishment in dealing with problem behaviors. A review of the behavioral literature suggests six strategies apart from punishment which may be used to eliminate undesirable behaviors: (1) changing the setting conditions;[20] (2) removal of the discriminative stimuli for the response;[21] (3) terminating reinforcement for the response;[22] (4) developing another response which prevents the problem behavior; (5) reinforcing any other behavior which occurs (DRO);[23] (6) elimination of the opportunity to respond. These procedures are presented in Table 2, along with examples of each technique. Space does not permit extended discussion of each technique here.

There are clearly limitations to each of the approaches offered as alternatives to punishment. Sometimes we are not able to control whether another person becomes tired, hungry, or sick yet we may wish them to be patient, tolerant and so on even when undergoing these unpleasant physical and emotional states. Not all stimulus events are readily controlled, thus it may not be possible to remove them. For some responses the reinforcement is intrinsic (running is reinforced by the physical sensations and by getting somewhere more quickly) and thus not amenable to extinction. It may prove difficult to devise a suitable incompatible response for some problem behaviors. And so on. Thus each specific problem response presents a challenge in identifying the most suitable technique for reducing the frequency of that response most effectively.

In practice, it is not uncommon to find two or more of these alternative techniques used together. For example, if Johnny has a tantrum problem, it might be dealt with by using a combination of approaches. First, we might arrange a specific punishment for any tantrums that occur. Second, eliminating any reinforcement for tantrums is an important additional procedure. Third, we might arrange to reinforce either a particular incompatible alternative, some other specific alternative response, or *any* activity other than tantrums. The ideal reinforcements would be the very things that Johnny has previously gotten by means of tantrums. Thus on a shopping trip a mother might do the following: (1) when a tantrum occurs she puts Johnny in the car until she finishes (a punishment), and gives him no candy or gum on that trip; or (2) in the absence of tantrums she allows Johnny to select a pack of gum or a candy bar as they leave the store and then permits him to eat it. This combination of procedures would likely be more effective than any single procedure alone.

Punishment should be viewed as one of a group of techniques for reducing the frequency of responses; punishment is effective, and in specific behavioral contexts it is the preferred method for reducing the frequency of specific problem behaviors.

The most obvious alternative to punishment when the

Table 2

Alternatives to Punishment

Procedure	*Examples*
1. Change setting conditions	get good night's sleep take an aspirin nothing to drink for 12 hours
2. Removal of a stimulus	turn out lights put dessert in cupboard
3. Terminate reinforcement: Extinction	Stop responding to requests without "please" no response to cries after being placed in bed
4. Develop specific response which prevents problem behavior	reinforce being in seat (vs reprimand for being up without permission)
5. Strengthen and alternative response	reinforce running (vs self-mutilation)
6. Eliminate opportunity to respond	lock gate to swimming pool take away ball

goal is to develop a response rather than to eliminate a response is the use of reinforcement procedures. Punishment is one of several effective procedures when the goal is to *decrease* the frequency of a specific response. When the goal is to *increase* the frequency of a response, or to develop a new response, punishment is not an effective procedure, and indeed the other procedures discussed here as alternatives to punishment are also not particularly effective. *Punishment is not an effective means for establishing a response,* though many parents in our culture attempt to use it in this way. In addition to using reinforcement to establish a response, reinforcement may also be used to strengthen a response that is already present but is so weak that it does not readily occur.

Punishment: A Biblical Perspective

In attempting to develop a biblical perspective on punishment, a number of biblical teachings should be considered. First, in the Mosaic Law there is the explicit provision for a set of procedures that correspond roughly to our current civil and criminal codes. Punishment was specified for a variety of offenses, and included a range of punishment procedures.[24] Second, in the Proverbs there are a number of references to the use of a rod for discipline of a punitive sort in the process of child-rearing.[25] Punishment is endorsed by the Scriptures, and there is a general principle that the nature and severity of the prescribed punishment is related to the nature of the offense. Further, it is suggested that more mild forms of punishment are a social norm: "reproofs for discipline are the way of life."[26]

It is interesting to note possible parallels between the use of a rod for discipline and some of the principles for punishment that we have discussed. It is definitely painful, can be applied briefly, lends itself to pairing punishment with words; the frequent references to reproof suggest that the use of words is an integral part of the discipline process advocated by the Bible. Another principle that the Bible reflects is the suggestion that punishment be used as infrequently as possible.[27] Finally, the suggestion that punishment be brief parallels the biblical principle that God's forgiveness is immediate and sure.[28]

Many examples of the use of punishment occur throughout the Bible. In some, God is the mediator of punishment, while others are carried out by social agents. When Adam and Eve ate of the fruit of the tree of knowledge of good and evil they were put out of the Garden of Eden; in addition, their relationship with God suffered an immediate disruption. Cain was punished for his failure to bring an acceptable sacrifice to God. Achan was stoned for taking forbidden plunder. David was punished for his adultery with Bathsheba. Ananias and Sapphira were slain for lying before God. Sodom and Gomorrha were destroyed. Israel and Judah were defeated in battle and carried away into captivity.[29] In each of these circumstances God had provided verbal warning beforehand that these behaviors were not acceptable. Indeed, the whole history of Israel and Judah is a cycle of disobedience, warning by the prophets, punishment in the form of oppression by their enemies and failure of crops, repentance, then renewal of the sinful patterns and practices.[30]

While it is clear that the use of punishment is endorsed and recorded in the Bible, there is much teaching that emphasizes the use of more positive methods of behavior influence. Parents are instructed to teach their children God's principles throughout the day as a part of normal daily activities: "When you sit at home, when you walk along the road, when you lie down and when you get up."[31] There are also many examples in the Bible that indicate the desirability of positive reinforcement; there are frequent references to the use of encouragement and to the focus on positive behavioral attributes.[32]

In summary, the Bible clearly advocates and records examples of the use of punishment. We can see a number of parallels between the biblical examples and the principles of punishment that we find in behavioral psychology. It is also clear, however, that punishment is not the sole method of behavioral influence advocated in the Bible. Thus, in broad terms, it appears that biblical teachings are compatible with the data regarding the use and effectiveness of punishment.

Punishment should be viewed as one of a group of techniques for reducing the frequency of a response.

Are the Effects of Punishment Bad?

We have seen that punishment not only reduces the probability of response, but also has unpleasant emotional effects, affects other ongoing responses, contributes to social avoidance and may foster aggression. *Whether these effects are good or bad is a question of values.* One way to resolve the question of values is to adopt the view that pleasant effects are good, and that unpleasant effects are bad. They could then be studied scientifically by examining which events strengthen behaviors that they follow and which weaken behaviors they follow. A second approach is to measure the reaction of people regarding whether these outcomes are good or bad, and then adopt the majority opinion. A third approach is to appeal to some *a priori* set of values (e.g., those given in the Bible). *Central to all three of these approaches is that they make a value commitment that lies outside the scope of science.* Science can tell us whether people find certain outcomes pleasant or unpleasant, or whether they view them as good or bad. But it cannot tell us that the majority view is *right;* that is an extra-scientific issue. *Deciding that the use of punishment is good, bad, or neutral is an ethical-philosophical, moral and religious issue, not a scientific one.*

Scientifically we can say that punishment produces unpleasant emotional effects. But Skinner is making a value

statement when he says that punishment is, therefore, bad or undesirable. Moreover, this is a value about which there is considerable disagreement. Staats suggests that the unpleasant emotional effects of punishment contribute in a positive way to the development of a controlling vocabulary of words such as NO, STOP, and so one which actually reduces a child's exposure to unpleasant or punishing events. When the child reaches for the flame on a candle, a loud "NO" prevents a burned hand. A second way in which Staats views the emotional effects of punishment as desirable is through generalization of the effects of punishment to similar responses and similar stimulus conditions. A child who is punished for throwing a baseball through the neighbor's window will be less likely to throw footballs, basketballs, rocks, or other objects through that window in the future, and will also be less likely to throw objects through the windows of buildings down the street or across town. Staats views these effects as desirable, and I concur.

The emotional effects of punishment are particularly important when those emotional effects influence human social relationships. Most persons have both reinforcing and punishing relationships with others around them. Thus the emotional response to a given person, say Mother, reflects a combination of both positive emotional effects associated with reinforcing experiences and negative emotional effects due to punishing experiences. The overall quality of the relationship depends on the relative frequency and impact of reinforcing and punishing events in the relationship with Mother. Thus a mother who is mostly reinforcing, but occasionally punishes will be loved. A mother who often punishes and rarely reinforces will be disliked or hated.

These same principles apply to the avoidance and aggressive behaviors that are sometimes produced by the use of punishment. Avoidance and aggressive responses can be minimized if punishment occurs in a context that involves a high frequency of positive reinforcement, thus maintaining approach and attraction at high strength (these responses are incompatible with avoidance and aggression). Furthermore, if aggressive behavior is maintained at low strength through punishment, it will be very unlikely to occur.

One other aspect of punishment needs to be clarified. Punishment is not restricted to the action of social agents. Punishment is a natural feature of our world. If I stick my fingers into the fire I experience pain. There are several choices at my disposal regarding how to deal with this experience. First, I can keep my hands out of the fire in the future; second, I can use some method to anesthetize or destroy the pain sensors; third I can continue to stick my hands into the fire and endure the pain as I am best able; fourth, I can eliminate fires from the environment. For a variety of reasons, we usually choose to live with fire and learn to minimize our personal experiences of pain from it. Something about the social aspects of punishment seems to make it more difficult for us to deal with social punishment in such a matter of fact fashion.

A fundamental factor in the behavioral objections to punishment seems to be a frank dislike of punishment. Personally, I dislike it too. I dislike administering it (except when provoked), and especially I dislike receiving it. But this distaste does not negate either the effectiveness of punishment or the biblical instructions regarding its use. It is significant, in this regard, that the Bible recognizes our distaste for discipline, and also indicates that there are two kinds of mistakes with regard to discipline: first, the mistake of loving so little we fail to do it; second, the mistake of loving so little that we enjoy carrying out discipline.[34]

We defined punishment in terms of the effect of a stimulus event on behavior. With this in view, then, several conclusions are possible: (1) punishment works; (2) punishment may produce a number of effects in addition to reducing the frequency of the target response; (3) reinforcement has side effects similar in nature to those associated with punishment, but opposite in direction; (4) the potential adverse effects of punishment may be minimized by careful application of punishment; (5) biblical teachings clearly support the use of punishment; (6) the issue of whether punishment is good or bad is a value issue that must be decided on an extrascientific basis. We have suggested biblical teachings on punishment which indicate that punishment is a legitimate procedure. We need to remember, however, that both the methods and goals of punishment must be examined in light of biblical teaching to establish their legitimacy.[35]

The Bible clearly advocates and records examples of the use of punishment. .. It is also clear, however, that punishment is not the sole method of behavioral influence advocated in the Bible.

Summary

We have defined punishment in terms of the effect of a stimulus event in decreasing the frequency of a response. The principal types of punishment discussed include punishment by presenting a stimulus following a response and Response Cost or punishment by removing a stimulus following a response. In addition, we noted that Time Out has features that are conceptually different from punishment but produces similar behavioral effects.

The widespread behavioral perspective that punishment is ineffective and undesirable has been discussed in terms of the interpretation of the findings of key experiments by Skinner and Estes, and in terms of the effects of punishment on the recipient. Comparisons and contrasts were

drawn between the effects of reinforcement and punishment. In general reinforcement and punishment have similar kinds of effects which are opposite in direction. Both generally have temporary effects; both affect emotional responses; both affect social attraction; both have modeling effects; generalization occurs with both; unauthorized effects are possible with both.

Research clearly suggests that punishment is effective; however, there seems to be ample reason to consider alternative techniques and to minimize the frequency of punishment in view of the potential effects of punishment on social avoidance, its generally unpleasant emotional effects, the risk of modeling effects contributing to aggressive responses and the possibilities of unauthorized avoidance.

Several alternatives to punishment as techniques for eliminating undesired responses exist including: changing the setting conditions, removing the discriminative stimuli, terminating reinforcement for the response, developing a specific alternative response, strengthening any alternative response, and eliminating the opportunity to respond. One of the major contributions of the behavioral approach has been in the development and study of these alternative techniques.

Review of biblical teachings regarding punishment suggest that punishment is clearly sanctioned by the Bible, but also reveals that there is ample support for the use of alternative techniques in managing human behavior. Thus there seems to be a convergence between biblical teachings and the interpretation of the behavioral data on punishment presented here, which suggests that punishment is highly effective, but that its use should be limited to circumstances in which elimination of a specific response is the goal and in which alternatives are not suitable.

One possible factor that contributes to the widespread behavioral objections to punishment is a personal dislike for punishment among the investigators, and a tendency to interpret data in light of this pre-experimental commitment.

In conclusion, we have seen that punishment works and that it has many effects in addition to the immediate effect on the punished response, but that these effects are similar in nature and opposite in direction from those associated with reinforcement. We have also seen that there are a number of alternative approaches to dealing with problem behaviors, and that when practical these may be preferred to use of punishment. Finally, we noted that biblical teachings support the use of punishment, but are generally consistent with the precautions that emerge from the behavioral study of the effects of punishment. While we have concluded with a limited endorsement of punishment, in the context of this presentation we have not considered how to go about punishing in an effective manner. These issues remain to be addressed at another time.

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[6]*Ibid.*, p. 236.

[7]Azrin and Holz, *op. cit.*, p. 420 ff.

[8]*Ibid,* p. 410.

[9]Staats, *op. cit.*, p. 236 f.

[10]See A. Bandura, *Aggression: a Social Learning Analysis* (Englewood Cliffs, N.J.) 1973, and A. Bandura, *Principles of Behavior Modification* (New York: Holt Rinehart and Winston) 1969.

[11]For a discussion of the nature of emotional behavior from a behavioral perspective, see S.W. Bijou and D. M. Baer, *Child Development I: A Systematic and Empirical Theory* (New York: Appleton, Century Crofts, 1961). Bijou and Baer's thesis is that emotions are respondent behavior, and that all consequences of behavior, both reinforcing and punishing also elicit emotional responses.

[12]See G. S. Reynolds, *A Primer of Operant Conditioning,* revised edition (Glenview, Illinois: Scott, Foresman and Company, 1975) pp. 35-38.

[13]*Ibid*, pp. 123-128.

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[16]Staats, *op. cit.*, p. 233 f.

[17]See Staats, *op. cit.*, p. 239 ff.

[18]Azrin and Holz, *op. cit.*, pp. 416, 433-434.

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[25]See, eg., Proverbs 13:24; 22:15; 23:13-14; 29:15, 17.

[26]Proverbs 6:23; also see Matthew 5:21-24, Luke 17:3; Ephesians 6:1-2.

[27]See Ephesians 6:4 which admonishes fathers not to provoke their children. One of the surest ways to provoke is to be constantly punishing or nagging.

[28]See 2 Samuel 11:1-12:14, especially 12:13-14; I John 1:9.

[29]See Genesis 3:1-24; Genesis 4:1-16; Joshua 7:1-26; 2 Samuel 11:1-12:14; Acts 5:1-11; Genesis 18:1-19:29; 2 Kings 17:1-18ff and 2 Kings 25:1-21 respectively.

[30]This theme of disobedience, warning and punishing is woven throughout the Old and New Testaments. Some examples occur in: Deuteronomy 28:1-66; Joshua 7:1-8:3ff; Judges 3:7-14, 4:1-24, etc.; Jeremiah 7:1-26 ff, 29:10-19 ff; Matthew 12:38-45; Luke 10:1-16; Jude 3-11ff; Hebrews 11:1-12:29, cf. especially 12:25-29. For a discussion of the Old Testament writings on this theme see Larry Richards, *The Edge of Judgement* (Elgin, Illinois: David C. Cook Publishing Company, 1977).

[31]Deuteronomy 6:4-9, New International Version.

[32]For example, see: Philippians 1:3-6; Colossians 1:3-8; I Corinthians 1:4-7; I Thessalonians 1:2-3 Instruction to practice giving thanks and praise are given in: Ephesians 5:4; Philippians 4:8. The emphasis of Scripture in this area, however, is more on the prohibition of being critical and destructive: for example, see Ephesians 4:29-31; Philippians 4:2-3; Galations 5:13-15.

[33]For a discussion of some of these issues, see the section on Psychological Engineering in C. Ellison (Editor) *Modifying Man: Issues and Ethics* (Washington, D.C.: University Press of America, 1978).

[34]See Hebrews 12:7-11; Proverbs 12:1, 15:5.

[35]See R. Bufford, Ethics for the mass application of behavior control in C. W. Ellison, *Modifying Man: Implications and ethics* (Washington, D.C.: University Press of America, 1978).

Debunking Some of the Myths About Glossolalia

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Recently, a young man was observed muttering to himself as he examined various titles on the shelves of a bookstore. He would run his fingers over the title of the book in a gingerly manner then touch his forehead lightly with the volume. This would be followed by incomprehensible muttering. It soon became apparent that the youth was praying in a strange language. It was glossolalia—the pietistic utterances of those who feel they are expressing their faith in a manner similar to first century Christians at the day of Pentecost (cf Acts 2) and in the Corinthian Church (cf 1 Corinthians 12).

Events like this, plus many other different but similar experiences, have led many to presume that glossolalic persons were abnormal at worst or eccentric at best. Such questions as the following have been posed: "Are glossolalics psychologically different from others"? Do glossolalics tend toward greater preoccupation with emotional experience than others"? Is the experience of glossolalia one in which persons go into a trance and lose consciousness"? In what manner could glossolalia be considered a valid Christian experience?

In an effort to answer these questions a programatic study of these issues has been in process at the Graduate School of Psychology, Fuller Theological Seminary since 1971. For the past eight years graduate students under the direction of this author, a clinical psychologist and United Methodist minister, have completed a variety of experiments designed to determine the parameters of glossolalic phenomena. This essay is a report of this research.

What Is Glossolalia?

Although most persons are acquainted with glossolalia a brief summary of its meaning is in order. The literal definition of the term is "gift of tongues". In the Christian tradition it referred originally to phenomena which occurred on the day of Pentecost. The author of Acts reports that as the faithful were gathered together in prayer forty days after the death/resurrection of Jesus the Holy Spirit swept over them with mighty power and they each began to speak in one of the languages of the world. None of them had any background in these languages so the ability to speak in them was understood as due to the power of the Holy Spirit. The explanation given for this miracle was that it occurred so the good news of Jesus could be spoken to the nations.

As the church became established in the cities of the Roman empire, glossolalia came to be thought of as evidence that the Holy Spirit was present in one's life. In

the tongue speaking noted in the church at Corinth the utterances did not seem to be recognizable languages and the problem of interpreting the meaning of the words became an issue. Further, tongue speaking was suggested to be only one of the indications that a person was baptized with the Holy Spirit.

Since biblical times, glossolalia has continued to be a part of numerous Christians' experience although it long ago ceased to play a major role in Catholic, Orthodox or Protestant Christianity. Nevertheless, contemporary Christianity includes several smaller denominations for whom all gifts of the Spirit, and especially speaking in tongues, are of central concern. These well established Pentecostal churches have been joined in the last half of this century by a neo-Pentecostal revival within major religious groups. Thus, there is a vital and increasingly accepted facet of Christianity that expresses its faith in this manner even though no research has proven these utterances to be understandable in the syntax or semantics of any extant language.

There is a vital and increasingly accepted facet of Christianity that expresses its faith in glossolalia even though no research has proven these utterances to be understandable in the syntax or semantics of any extant language.

Who Becomes Glossolalic and Why?

Since by no means all Christians speak in tongues the quetion of who does and why becomes important.

A number of personal and situational variables have been, or should be, considered. Psychopathology was early suggested as the prime concomitant of glossolalia (Knox, 1950). While several authors[1] postulate such a relationship, Hine[2] concluded there was none.

Glossolalics have been found to be well adjusted to their social environments,[3] and able to control their thought processes outside the experience in a way dissimilar to schizophrenics who also spoke in tongues.[4] While evidence of interpersonal uncertainty was reported in other research utilizing psychological tests[5] still no signs of psychopathology were observed. In fact, Gerrard[6] indicated that an analysis of MMPI profiles suggested glossolalics were better adjusted than members of a conventional denomination. Only Kildahl and Qualben,[7] among contemporary investigators, reported evidence for lower ego strength and higher suggestibility.

Pattison[8] suggested there was an interesting relationship between social expectancy and psychopathology in glossolalia. He proposed that in religious groups where glossolalia was the norm, speaking in tongues would not be psychopathological but that in groups where it was not expected the reverse would be true.

He further reported that there were class differences in his research. Overt psychopathology seemed to be present more often among lower class glossolalics than among middle and upper classes. This accorded with the insight of Boisen,[9] among others, that glossolalia functioned as a status symbol among the isolated and dispossessed.

Hine[10] termed this the disorganization-deprivation theory. Where society was fluid and changing and where a group of people were not succeeding in moving up the socio-economic scale, there glossolalia would be expected to be a compensatory act designed to overcome isolation and lack of status. Boisen,[11] Johnson,[12] Lanternari,[13] and Pattison[14] all concluded that in marginal socio-economic groups certain religious expressions served as substitutes for

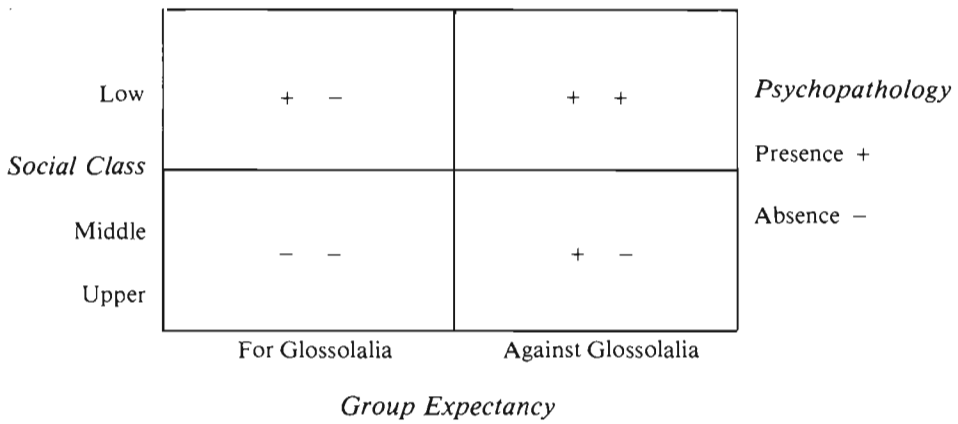

Figure 1. The presence of psychopathology in glossolalics of different social classes and group expectancies.

lack of achievement.

Another interesting tendency reported by Hine[15] was an inclination for second generation glossolalics to speak in tongues less frequently than their parents who tended to come from denominations where it was devalued. It has also been suggested that in middle class groups, glossolalia meets group goals rather than personal needs. It is more a matter of social conformity than of compensation for loss. Therefore the functional meaning of tongue speaking seems to be more critical among those for whom the experience is a more radical departure from social expectancy.

A three dimensional model including the presence of psychopathology, the group expectancy of glossolalia and social class was conceived as the basis for our investigations. Figure 1 illustrates this model.

Thus, where a person was glossolalic we hypothesized (s)he would be more likely to be psychopathological if (s)he was from the lower class in a group where glossolalia was not the norm. (S)he would be less likely to be psychopathological if (s)he were a member of the middle-upper class in a group where glossolalia was the norm.

In the first study, based on this model, the incidence and frequency of glossolalia were correlated with the personality variables among youth who were members of a religious group where glossolalia was the expected norm (i.e. middle to upper class Assembly of God youth attending a summer camp). Over ninety percent of the youths (ages 14-17) reported they spoke in tongues. Demographic data regarding family background, initial glossolalic experience, conversion, etc. were also assessed. These data were analyzed via analyses of variance in which high and low frequencies of glossolalia were the independent variables. No relationship was found between introversion or extroversion (using the Eysenck Personality Inventory) and the incidence or frequency of glossolalics to feel more internally or externally controlled (as measured by Rotter's I-E Scale[16]).

These results lent some support to our presumption that there would be no evidence of psychopathology among those in the middle to upper social classes where glossolalia was the norm. Of related interest was the finding of a significant tendency for high-frequency glossolalics to be more intrinsic in their orientation to religion than either non-glossolalics or low frequency glossolalics (as measured by Allport's EIRO Scale). This suggested to us that they were more likely to perceive religion as meeting individual personal fulfillment than status needs in their lives. Demographically, glossolalia was related to having been converted, frequency of church attendance and the religious activity of parents. It was not related to sex or an index of socio-economic class, i.e., salary of father. While it most often began in a group setting, it was more frequently used in private devotions.

A second study was undertaken to replicate the data on intrinsic orientation toward religion plus relate glossolalia to religious beliefs and an index of religious activity, i.e., social action. Sample weaknesses in the first study were also corrected.

Tongue speaking Christians appeared to be normal both prior to as well as after they became glossolalic. Most surprising was the finding that being a part of the group had as much impact as speaking in tongues.

This interest in whether glossolalia resulted in new behavior (such a participation in social action projects) was prompted by Gerlach, et. al.[17] who saw glossolalia as a sign that the personality was being radically reorganized and a person was willing to risk new behavior. Again, the investigation was conducted among persons of similar social background who had all been exposed to similar religious experiences where glossolalia was the expected norm. Forty Assembly of God youths who went on a social action trip to Mexico were compared to forty youths who did not go. High and low frequency glossolalics in each group were also compared. The data were subjected to analysis of variance. The earlier lack of relationships between socio-economic class and sex was confirmed as was the tendency for glossolalics to be more intrinsic in their orientation toward religion and for glossolalia among youths to be related to glossolia among parents. There was a significant tendency for youths who participated in the social action project to be more glossolalic, thus giving support to the hypothesis about the behavioral effect of the phenomena. Further, although there were no differences in beliefs about God's nearness and accessibility, there was a significant tendency for more frequent glossolalia to be related to a negative and sinful view of man. Those who participated in the social action project were more pessimistic in their view of man than those who did not participate.[18]

In a more direct test of our model, we compared upper and lower class glossolalics on physiological changes which occurred during the experiences.[19] Early in the 1900's investigators had proposed that glossolalia was a regressive psychological state involving automatisms, loss of conscious control, fugue states and dissociations resembling hypnotic trance. Later Pattison[20] proposed that there were different types of glossolalia with varying degrees of cortical control. Those with less control he called "serious" and those with more control he termed "playful." We hypothesized that those in the lower social class, from a religious tradition where it was not expected, who frequently spoke in tongues, would show physiological changes (i.e., be more hysterical and suggestible) while those in the middle upper social classes, from traditions where glossolalia was the norm, who spoke infrequently, would not show such changes. The former we labeled "Process" glossolalia

(cf Pattison's "serious") indicating it was a *personal* inner process probably reflecting psychological compensation for lack of status. The latter we labeled "Act" glossolalia (cf Pattison's "playful") indicating it was a social *act* designed to reflect group conformity.

Changes in brain wave activity and heart rate were assessed as glossolalics prayed in English and prayed in tongues. Contrary to expectation there were no significant differences between Act and Process glossolalics.

Initially this led us to conclude that our model was in error. This still may be so. However, we are more inclined to think that the lack of results was due to the problems we encountered in convincing people to come to pray in a psychophysiological laboratory and the errors we made in assigning persons to socio-economic levels. In regard to the first we may have utilized a very biased sample of persons. They seemed to be neo-Pentecostals for whom glossolalia appears to be predominantly under voluntary control. We need to assess the phenomenon among traditional Pentecostals for whom glossolalia reportedly is much more likely to be experienced as uninvited possession. Further, the instrument used in determining social class assessed occupation and education. In one case, this formula placed an unemployed graduate student in the lower social class—an obvious error of measurement. A more rigorous standard is needed. However, if the results of this study are accepted as conclusive, the inference that glossolalics are different psychologically at the time of the event must be reconsidered.

Perhaps our most conclusive study to date was concerned with personality changes that might result from the experience of becoming glossolalic.[21] As early as 1908 Lombard[22] had suggested that glossolalia was a "rejuvenating" experience, i.e., that it had some positive impact on persons. As noted earlier, although the presence of psychopathology in the glossolalic experience had been postulated little evidence had been found for this dynamic save in the research of Kildahl and Qualben[23] and Wood.[24] We reasoned that the "normality" observed in such studies as Gerrard and Gerrard[25] and Vivier[26] could perhaps have been accounted for by the impact of speaking in tongues on personality integration. In other words, they might have been abnormal before the event but have become mentally healthy afterwards.

Heretofore there had been no published studies on personality changes resulting from glossolalia that included assessment prior to the experience. This study attempted to study the effects of this phenomenon by measuring persons in "Life in the Spirit" seminars on personality and attitudinal variables pre, post, and three months after the seminar. These seminars (in Roman Catholic and Episcopal churches in New Mexico and California) were twelve week long study groups designed to introduce persons to the gifts of the Holy Spirit. Persons who become glossolalic were compared to those who were already glossolalic and those who did not become glossolalic. No one of the groups was psychopathological at pre-testing time. Although persons who did not become glossolalic were highest in depression, hostility, and anxiety at the beginning of the seminar, all groups were similar at the time of follow-up. All persons changed in the direction of personality integration. However, those who became glossolalic did not change more than those who did not. The results were interpreted primarily as a function of attending the seminar rather than of the glossolalic experience.

We even compared the participants in the seminars to the standardized norms for the several personality tests we used and found them to be not significantly different on any measure from the average prior to the experience. Thus, we concluded that tongue speaking Christians appeared to be normal both prior to as well as after they became glossolalic. Most surprising to us was the finding that being a part of the group had as much impact as speaking in tongues.

Finally, our most recent study extended the investigation of physiological changes during speaking in tongues by comparing "body auras" in glossolalic and non glossolalic Presbyterians.[27] Matched pairs (on sex, marital status and years in the church) were measured via the Kirlian (negative photography) method in resting, prayer-in-English, and prayer-in-tongues conditions. Thorough analysis of variance procedures among conditions and between group comparisons were made. No significant differences in such measures as size and color of aura was observed. The hypothesis that change in auras should be different in

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various kinds of persons and among emotional conditions, was not confirmed. No evidence for significant physiological change during the phenomenon was observed. Trance state was not evident.

Our Conclusions

Our research in ongoing. We are still asking some of the basic questions concerning individual differences among persons who speak in tongues and concerning the nature of the phenomenon itself. We are well aware of the significant variety in traditions, setting, and types of glossolalia and intend to replicate our study of socio-economic class and group expectancy.

However, our conclusions to date are as follows:

1. Speaking in tongues appears to be a concomitant of pietistic revivals throughout Christian history.
2. Contemporary glossolalic expression can be observed in both traditional and in neo-Pentecostalism and varies greatly in terms of group expectancy, setting and frequency.
3. Where tongue speaking is expected, the vast majority of youth are glossolalic by age seventeen. More frequent glossolalics do not differ psychologically from less frequent glossolalics but do appear to participate in more projects of social action.
4. Frequent glossolalia evidenced by persons in the lower social class from a background where it was not the norm does not appear to differ in kind from that practiced infrequently by upper to middle class persons in traditions where it is expected.
5. There is no indication that glossolalics go into trance during the experience.
6. Persons who speak in tongues do not appear to be mentally unhealthy either before or after the experience.

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Demon Possession and Mental Illness

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From prehistoric times until the Middle Ages the most popular explanation of the cause of emotional disorders was demonic influence or possession, but today the various theoretical frameworks invoked to explain the phenomena of mental illness including the biological, psychoanalytic, behavioral and sociological models are all undergirded by the philosophy of secular humanism which excludes the supernatural. However, the Bible clearly teaches the existence of Satan and fallen angels and describes several examples of demon possession together with the casting out of evil spirits by the Lord Jesus and His disciples. The symptoms of demon psssession and its management including the use of exorcism are discussed, and illustrations are given both from my own psychiatric practice and from the experience of others.

From earliest antiquity until the present day, people have been fascinated and intrigued by the problem of mental illness and have sought an explanation for the causes of emotional disorders. From prehistoric times, during the period of the civilizations of ancient Mesopotamia and Egypt, Greece and Rome and on through the Middle Ages, the demoniacal model of mental illness was the favorite. It was believed that a mentally disturbed person was in such a condition because he had been possessed by evil spirits, punished by the gods or rendered mad by the spell of a witch doctor.[1] For example, remains of trepanned skulls have been found in Peru dating from prehistoric times, trepanning apparently having been performed in cases of epilepsy or other conditions accompanied by violent behavior, with a view to liberating the afflicted patient from evil spirits in his head.[2]

It appears that in the First Chinese Dynasty the practice of medicine was entrusted to priest-doctors and witch-doctors (2600 B.C.). The fourth book of the Vedas deals exclusively with sorcery magic and demonology, with diseases and their cure. The Ebers papyrus written in Egypt in about 1570 B.C. attributed mental disease to demon possession.[3] At the beginning of the Christian era, it was popularly believed that insanity was due to supernatural agencies personified by particular deities. However Hippocrates, the Father of Medicine (c470-400 B.C.) was of the opinion that madness was due to a disturbance of the brain, and Galen (AD 129-199) held the view that mental illness resulted from an imbalance of humors and advocated physical methods of treatment such as baths, vapors, emetics, catharsis and diets.[4]

For the most part, the demoniacal model of mental illness persisted throughout the Middle Ages and even as late as the 18th Century abnormal individuals were likely to be diagnosed as witches.[5] During the reign of James I of England, two old women known in the chronicles as Demdike and Chattox were arrested on charges of practicing the black art of witchcraft and exercising demonic power resulting in suffering and death. They made ludicrous confessions of guilt and told stories of having received orders from Satan himself at Malkin Tower on the bleak heights of Pendle Hill in Lancashire. These old crones, who were probably psychotic, together with other individuals including Dame Alice Nutter, a woman of noble birth and or considerable wealth, were later implicated and were condemned to be burnt at the stake at Lancaster Castle for the crime of witchcraft.[6]

The Renaissance was a significant milestone in the development of psychiatry for two important reasons: The emergence of a humane attitude towards the mentally ill, and the development of scepticism and doubt regarding the supernatural causation of mental illness. Typical of this attitude towards the aetiology of insanity were the views of Paracelsus (1493-1541 AD) who wrote, "The experienced doctor should not study how to exorcise the devil but rather how to cure the insane. The insane and the sick are our brothers; let us give them treatment to cure them, for nobody knows whom among our friends or relatives this misfortune may strike . . ."[7]

Paper presented at the annual ASA meeting at Taylor University, Upland, Indiana in August 1980.

Alternative Explanations

Today we have various theoretical frameworks within which to explain the phenomena of mental illness, including the biological, psychoanalytic, behavioral and sociological models. These are not necessarily mutually exclusive but all are undergirded by the philosophy of secular humanism that has no room for the supernatural and cannot tolerate belief in God, Satan, angels or demons.

Humanistic mental health professionals have sought to explain demonic possession and other occult phenomena such as witchcraft by various psychological explanations including psychoanalytic theory. Sigmund Freud sought to provide a psychoanalytic foundation for the understanding of the occult, observing that "states of possession correspond to our neuroses . . . the demons are bad or reprehensible wishes, derivatives of instinctual impulses that have been repudiated and repressed."[8] A.M. Ludwig in an article "Witchcraft Today" published in *Diseases of The Nervous System* in 1965 stated that belief in witchcraft and demons was a defence mechanism that permitted the projection of unacceptable feelings and wishes onto a scapegoat.[9]

Spiegel and Fink in an article in *The American Journal of Psychiatry* (1979), dealing with the subject of hypnosis and hysterical psychosis, presented the case of a 15 year-old boy who believed that he was possessed by "demons of Satan." They suggested that this youth's belief that he was demon possessed was an hysterical defence against his incestuous attraction to an older sister and his resentment against his family's religiosity.[10]

Resurgence of Interest

Yet despite the almost complete domination of modern psychiatry and psychology and indeed the whole field of the natural and social sciences by the philosophy of secular humanism, there has been a resurgence of interest amongst the general public in the occult including the worship of Satan since the mid 1960's. The film "Rosemary's Baby" was a box office hit of the year, grossing forty million dollars.

This era marked the founding of Anton Szandor LaVey's First Church of Satan in San Francisco, the altar of which is a live and naked woman symbolizing the pleasures of the flesh. In three years California alone reported more than 100 murders that were somehow related to occult involvement, the most notorious being the Manson murders, Sirhan Sirhan and the Zodiak killers. In June 1970, a devil worshipping pack of young people killed a gas station attendant and a school teacher who was the mother of five children. The following month another pair of Satan cultists murdered a Montana social worker near Yellowstone National Park. They shot him, hacked his body into six pieces and then ate his heart.

Allegedly, LaVey takes the credit for the death of actress Jayne Mansfield who had been a member of his "church." He had put a ritual curse on Jayne's boyfriend, Attorney Sam Brody, who apparently had hated LaVey's group. Within a year Sam Brody and Jayne Mansfield were killed in an automobile accident, Jayne being decapitated. Information from reliable police informants has described in detail the sacrificing of cats, dogs and various other animals during weird witch type rites. One informant described an incident wherein the blood of a sacrificed dog was mixed with an LSD 25 preparation and drunk by the participants.

In three years California alone reported more than 100 murders that were somehow related to occult involvement, the more notorious being the Manson murders, Sirhan Sirhan, and the Zodiak killers.

I believe that we have a Christian alternative to secular humanism in all fields of knowledge and in every scientific discipline including the behavioral sciences and modern psychiatry. The advances of knowledge in many fields of human learning including the most recent discoveries in astronomy and astrophysics concerning the origin of the universe, the concept of the expanding universe, Einstein's theory of relativity and the succession of discoveries in biblical archaeology have made it easier for us to believe in the Bible as the inerrant Word of God (in the autographs) and to use it as the foundation for a Christian model for the behavioral sciences, building into the superstructure all that is scientifically accurate and compatible with Scripture in the biological, psychoanalytic, behavioral and sociological models.

Avoiding Extremes

It is imperative that we heed diligently what the Bible has to say about Satan, demonism and the whole field of the occult, with its clear teaching that Satan and myriads of demons and fallen angels are active in the world today. On the other hand we must avoid falling into the trap of attributing all sorts of abnormal emotional conditions and even ordinary human sins to demon influence or demon possession.

A well known English Christian magazine, which should have known better attributed the auditory hallucinations typical of schizophrenia to the voices of evil spirits indwelling the afflicted individual. A teenage boy suffering from paranoid schizophrenia, who for a while was a patient of mine, was subjected to exorcism by a church group in New Hampshire on the mistaken assumption that his abnormal emotional state was due to demonic possession.

A young woman with a long history of psychiatric symptoms suggestive of manic depressive illness and with a history of frequent binges of overeating came to see me for the first time in May, 1980. She was troubled that she might

have been possessed by a demon of gluttony. I explained to here that if she knew the Lord Jesus as her Savior, it would be impossible for her to be be demon possessed, because at conversion one receives the Holy Spirit into one's life and therefore evil spirits cannot inhabit a person indwelt by the Holy Spirit. Very soon after this she entered into the assurance of salvation through the Lord Jesus Christ. Her episodes of over-indulgence in food had nothing at all to do with demons, but were associated with her emotional conflicts and her depression. Mental illness may sometimes look like demonism, i.e. obscene and blasphemous thoughts or fear of having children. In acute schizophrenia, hallucinatory voices urging suicide or making blasphemous suggestions may simulate demonism. However, demons cannot be exorcised by Phenothiazines, antidepressant drugs or ECT.[12]

Examples of Demon Possession

Having sounded the warning of the dangers of seeing demonic influence behind all kinds of abnormal behavior and emotional disturbances, let me state emphatically that I believe that demonic influence upon human beings and demon possession do actually occur. My evidence for this assertion consists of the biblical accounts of cases of demon possession, the scriptural teachings relating to occult practices, and the many accounts of instances of demonic bondage recorded by missionaries, pastors and Christian psychiatrists.

The only clear case of possession by an evil spirit mentioned in the Old Testament is that of King Saul who had disobeyed the Lord after vanquishing the Amalekites in battle by sparing their King Agag and the best of the sheep and oxen. Because he had been disobedient and had rejected the word of the Lord, God had rejected him from being king over Israel.[13] Later the sacred record tells us that the Spirit of the Lord departed from Saul and an evil spirit from the Lord troubled him.[14] This demonic bondage was accompanied by depressive symptoms culminating in suicide on the battlefield of Gilboa.[15] The clinical picture is suggestive of manic depressive illness, but this appears to have been triggered off by the influence of the malevolent spirit upon him. In some instances involvement in the occult or demonic influence upon an individual may be an aetiological factor in the production of recognized types of emotional illness.

In the New Testament we are told that the Lord Jesus cast out evil spirits from many who were possessed with demons (St. Matthew 8:16) and in addition the gospel narratives relate specific instances in which the Savior cast out evil spirits including the cases of the demon possessed man of Gadara,[16] the daughter of the Syro-Phoenician woman,[17] the demon possessed lad who suffered from epileptic seizures[18] and the man with an unclean spirit in the synagogue of Capernaum.[19]

In Acts 16 we read the story of the girl possessed by a spirit of divination and the subsequent exorcism by the Apostle Paul. In the Gospel story it is recorded that the Lord Jesus gave his twelve disciples power against unclean demonic spirits to cast them out (St. Matthew 10:1).

In modern times accounts of many instances of demon possession have emanated from the mission fields of the world. Dr. John L. Nevius made a serious attempt to survey the phenomenon of demon possession in China as early as 1879 although the results of his research in this field were not published until 1894. The resulting book on demon possession is still considered to be a reliable and balanced presentation of the subject even today. He sent out a detailed questionnaire to Protestant missionaries all over China requesting information regarding the identification of cases with their locations and dates and a minute description of the symptoms of the individuals thus afflicted.[20] In his own experience in missionary work in China from 1859 to 1893 he recorded many remarkable instances of demon possession, his encounters in the missionary field being very reminiscent of the gospel accounts.[21]

In *Demon Possession*, a symposium edited by Dr. John Warwick Montgomery, W. Stanley Mooneyham gives ten examples of or comments on demonism from three different continents. Let me describe two of these examples.

A paper given by Reverend Detmas Scheunemann at the 1974 International Congress on World Evangelism at Lausanne, Switzerland described a very wealthy family in Java which had attained to a position of great riches through making a covenant with Satan on a certain mountain peak in that island on the condition that one member of the family would die each year. This has been taking place.

Walter Colin Johnson graduated from Guy's Hospital Medical School, University of London, England, MBBS, in May 1944. He has been in the private practice of psychiatry in Hanover, Massachusetts since 1962 and is on the staff of two private psychiatric hospitals in the Boston area. He is particularly interested in biological psychiatry and in the relationship between psychiatry and the Christian faith. In addition to articles published in the Journal ASA, *he is the author of an article, "A Neglected Modality in Psychiatric Treatment—The Monoamine Oxidase Inhibitors," published in* Diseases of the Nervous System, *September 1975.*

In his book *Storm over Borneo*, about the 1967 Dyak uprising, Robert Peterson of the Overseas Missionary Fellowship describes the tremendous influence of demon spirits upon these tribespeople. He recounted awesome evidences of demonic power at Andjungan where Dyak tribesmen used their fists and feet to break display cases with glass flying all over the place. Some of these men actually danced on the broken glass with bare feet, but nobody was injured. One missionary observed Dyaks stepping into pans of acid used to coagulate rubber. Undiluted, such acid could be expected to burn the flesh to the bone but these men were unscathed. Others struck locked and bolted doors with their bare hands breaking them down as easily as if they had been rammed by a truck.[22]

Also in Dr. John Warwick Montgomery's symposium on *Demon Possession*, several cases of demonic bondage are described by Dr. William P. Wilson, Dr. R. Kenneth McAll and Dr. John White. A 26 year-old single woman, a patient of Dr. John White, Professor of Psychiatry at the University of Manitoba, was referred to him following a suicide attempt. She was agitated, hyperactive and depressed, but her condition improved following the administration of psychotropic medication. However she was a practicing homosexual, organizing secretary of a gay league in Winnipeg, and living with a woman who had alcohol and other personality problems. She professed to be a Christian, but her attempts to sing hymns or pray were attended by verbal expressions of blasphemy that took her by surprise. These incidents dated back to the time when she had lived in a haunted house where according to the patient a "friendly ghost" had been heard walking across the room causing creaking of boards and the appearance of depressions in the rug. Later she had been tormented by rattlings, shakings, knockings and tappings that had increasingly disturbed her sleep. Dr. White attempted exorcism and at the end of the appointment he felt subjectively that the main struggle was over although the demon or demons had not left the patient. A few days later at a religious meeting a young girl commanded "Demon, whose name is Legion, I command you to come out of her in the name of Jesus." Allegedly, the patient screamed and fell on the floor in a convulsion and when she regained consciousness she found herself saying, "He could not possibly love me," while the other people in the group kept assuring her of the love of Jesus. She abandoned her homosexual lifestyle and in the two years following that time her life has been an experience of uninterrupted spiritual and emotional growth.[23]

Personal Case Histories

Even in my own psychiatric practice, I believe that I have seen the effects of demonic influence upon individual patients. D. had a long history of depressive symptoms sometimes accompanied by hallucinationary voices. She was diagnosed from a psychiatric perspective as suffering from schizophrenia, schizo-affective type, and her symptoms were at least partially alleviated by the administration of a phenothiazine and a tricyclic antidepressant agent. On at least three occasions she had asked Satan to come into her life. In an interview with me on June 20, 1979 she admitted to me that she had asked Satan to come into her life again. At about 3-4 a.m. she had been getting out of bed and running around the house fearful lest somebody were chasing her. She told me that she hated to have sexual relations with her husband because she would hear Satan's name being repeated in her head when they were having intercourse. On several occasions she heard hallucinatory voices commanding her to burn her hand and apparently she obeyed several times. She also heard voices saying "take your life." When the pastor would begin to preach at church something inside her would make her want to scream and voices in her head urged her to stand up and declare that there was no God. Sometimes she wanted to laugh and at other times wanted to scream and throw the Bible at him. Sometimes she would become upset when mention was made of the precious blood of the Lord Jesus Christ and once when I prayed with her she admitted to me that she wanted to laugh. On one occasion she wrote me a letter describing her hopelessness and the domination of Satan in her life. She referred to herself in the third person. At times she had heard tapping on the windows but when she looked out there was no sign of anybody. She had felt sometimes as though there were spirits in the house.

Having sounded the warning of the dangers of seeing demonic influence behind all kinds of abnormal behavior and emotional disturbances, let me state emphatically that I believe that demonic influence upon human beings and demon possession do actually occur.

In August 1979 she again asked Satan to take over her body while having sexual relations with her husband. She has been involved with horoscopes from time to time recently and has made drawings of witches, people hanging by ropes and people with blood coming out of their mouths. Allegedly she was molested by her father at age 6 and by her stepfather at age 10. When she was 5-6 years of age her mother apparently would take her into bar rooms, become intoxicated and tell fortunes. In 1975 her mother allegedly put a spell upon her. She has felt much anger and hatred towards her parents. Around 1973 she became involved with a fortune teller who helped her to make a satanic rug with a picture of Satan woven upon the fabric. Her daughters age 20 and 18 have been involved with spiritist seances and her 18 year-old daughter has been involved in drugs and alcohol. It appears that recently this daughter has also asked Satan to come into her life. Her 13 year-old daughter has been reading horoscopes and has talked of suicide. When the patient has seen me for psychiatric consultations, I have prayed with her asking the Lord Jesus to deliver her from the power of Satan and she has also had counselling with her pastor. Owing to her

geographical location and the difficulties of transportion I have lost touch with her lately, but I understand that she has more recently professed saving faith in the Lord Jesus Christ and that there has been a weakening of Satan's hold upon her life.

D.L. is a 28 year-old married woman who first came to see me late in 1979 with severe depression and paranoid delusions to the effect that she was becoming the antiChrist and turning into a man. As a teenager and young woman she had been rebellious, promiscuous and involved in alcohol and drugs. On one occasion when she was a student at a certain college in New Hampshire, she attended a spiritist seance with some fellow students who wanted to bring up the spirit of an aged and deceased woman who had been house mother at the school. During the seance, the power of Satan fell upon one of her fellow students who began to speak in the voice of an aged woman (presumably an impersonating demon spoke through her). D.L. also attended two other seances. About 2 to 3 years ago she received the Lord Jesus Christ as her Savior and was genuinely converted. However, for a while she was quite fearful when she attended church and even now is afraid when the pastor preaches on the Book of Revelation. She has readily admitted that a causative factor in the production of her mental illness had been her previous sinful life style. In my opinion, her previous involvement with the occult may well have been a triggering factor in the development of her psychotic breakdown. She was diagnosed as suffering from schizophrenia schizoaffective type and treated with Thorazine for the alleviation of her psychotic symptoms and Amitripyline for the relief of her depression. She has also been given biblically based counselling. There has been an improvement in her emotional condition and a gradual strengthening of her Christian life.

In March 1980, a 13 year-old girl was brought to see me in an acutely psychotic state with severe depression and paranoid delusions. Her paternal grandfather had been a witch doctor in South America and her father allegedly had the power of telekinesis. Her 16 year-old brother had been diagnosed as having demon possession and was exorcized by his youth pastor. He is presently attending church and youth group regularly and shows every evidence of being a born again Christian.

Even in my own psychiatric practice, I believe that I have seen the effects of demonic influence upon individual patients.

The first and third cases of mine illustrate the fact that the sins of the fathers are visited upon the children unto the third and fourth generations. Such sins in the fathers may lead to occult bondage and emotional disorders in the children and grandchildren.[24] My first and second cases amply demonstrate that involvement with occult practices may lead to demonic bondage and to mental illness. Scripture indicates that such involvement can also lead to physical disease. Fortune telling, astrology, involvement in witchcraft and spiritistic seances are expressly forbidden in the Bible; the same prohibitions would also apply to ouija boards, card laying, the use of Tarot cards, etc.[25] Certain types of types of music, drug addiction, mental illness, repeated and deliberate rejection of Christ and continued, wilful yielding to sin may render a person more vulnerable to occult bondage. I understand that certain composers of rock music have felt that when composing such music they have been inspired by an outside force.

Conclusion

The chief characteristic of demon possession is the automatic projection of a new personality in the victim, the inhabiting demon using the body of the possessed individual as a vehicle for his own thought, words and acts. The new personality may speak in a different voice and the victim may be referred to in the third person instead of the first. The demon-possessed individual may give evidence of superhuman knowledge, may exhibit episodes of violent behavior and may demonstrate increased physical strength. Moral depravity associated with sexual excesses and obscenity may sometimes be a mark of occult bondage. A demon-possessed individual is likely to exhibit a marked aversion to any mention of the deity and the precious blood of the Lord Jesus Christ.[26]

The symptoms of demonic bondage may be different from the features of recognized psychiatric illness, but it must be remembered that both conditions may co-exist in the same person. It would appear from Scripture that a Christian cannot become demon possessed because he is indwelt by the Holy Spirit; indeed his body is described as the temple of the Holy Ghost.[27] It is inconceivable to me that foul demonic spirits can live in a person who is indwelt by the Holy Spirit of God. Nevertheless, a believer who has persistently and wilfully given way to sin or dabbled in the occult may fall under demon influence, the symptoms of which may be similar to those of demon possession though often less in degree. I cannot say that I have had any real experience of exorcism, though I have prayed for the deliverance from the power of Satan with the patients whom I felt might be under occult bondage. It is dangerous to approach the exorcism of a demon possessed individual lightly and without adequate spiritual preparation. Jesus warned in relation to the exorcism of the epileptic demon-possessed boy that this kind goes not out except by prayer and fasting (Matthew 17:21). A bitter and fierce spiritual warfare is involved, a battle against principalities and powers of evil (Ephesians 6:12) that can be won only in the power of the resurrected Christ. The sad story in Acts of the sons of Sceva who attempted to exorcise an evil spirit from a man and who were attacked and wounded by the demon-possessed individual should be a serious warning to any person who would attempt exorcism without adequate spiritual preparation.[28]

When a person under demonic bondage has been exorcised and has received the Lord Jesus Christ as his own per-

son Saviour, it is essential that he renounce all the works of darkness and get rid of all occult books, ouija boards, horoscopes and all the paraphernalia of occultism. He should maintain a regular and devoted prayer life and should be diligent in the study of God's Word.

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[13]I Samuel 15.

[14]I Samuel 16:14.

[15]I Samuel 31:4.

[16]Matthew 8:28-34, Mark 5:1-20, Luke 8:26-39.

[17]Matthew 15:12-28, Mark 7:24-30.

[18]Matthew 17:14-21, Mark 9:14-29. Luke 9:37-43.

[19]Mark 2:23-28, Luke 4:33-37.

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[24]Exodus 20:5.

[25]Exodus 22:18, Leviticus 12:26, 31, Leviticus 20:6-7, Deuteronomy 18:9-14, Isaiah 2:6, Isaiah 8:19, Jeremiah 27:9-10, 1 Timothy 4:1-4, Revelation 21:8, Revelation 22:15.

[26]Unger, M.F. *Demons in the World Today.* Wheaton, Illinois, Tyndale House Publishers, 1971, pp. 102-108.

[27]I Corinthians 6:19.

[28]Acts 12:13-17.

Every engineer knows that the profession is relatively powerless. Engineers do not make laws; they do not have the money; they do not set the fashions; they have no voice in the media. It is one of the most irritating ironies of our time that intellectuals constantly complain about being in the grip of a technocratic elite that does not exist. ...If intelligent, energetic women reject engineering because of an all-consuming desire to sit on the thrones of power, then woe to us all in the age of feminism. ...The ultimate feminist dream will never be realized as long as women would rather supervise the world than help build it.

Samuel C. Florman

Blaming Technology: The Irrational Search for Scapegoats, St. Martin's Press, New York (1981); pp. 128-130.

A Clarification of "The Christian Mind"

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Harry Blamires' book, *The Christian Mind,* opens with the rather dramatic judgment that "there is no longer a Christian mind."[1] But as one reads on, one notes that Blamires seems to minimize the impact of his statement by the use of such expressions as ". . . deficiency of Christian thought,"[2] ". . . the lack of any used field of discourse for people thinking Christianly,"[3] ". . . almost total disappearance of the Christian mind,"[4] and ". . . limited operation of Christian thought."[5] One concludes that Blamires did not mean what he said in the beginning. It would be difficult to develop a sustained argument to support his judgment. For to say that there are Christians and at the same time that there is no Christian mind is slightly odd. The expression "Christian mind" is equivalent to "mind of the Christian," in the same way that "scientific mind" may be translated, without change or loss of meaning, to "mind of the scientist." If there are scientists, there must be a scientific mind; if there are Christians, there must also be a Christian mind. But when may we say that a Christian is exhibiting a Christian mind? What constitutes a Christian mind?

To answer the question, this paper[6] clarifies the use of the term "mind" and attempts to establish its strict use. A distinction between the expressions "scientific mind" and "Christian mind" is made. Proposing that the mind of Christ constitutes the Christian mind, the article proceeds to expound on John 4:7-38. Finally based on observations regarding the mind of Christ, some suggestions are made as to how Christians ought to relate their Christian faith to their academic activities: how and on what should Christians think in order that it may be said that their thinking is Christian and not merely that they are thinking Christians?

This paper de-emphasizes the idea that mind/thinking is completely and totally an inward operation, that it cannot be seen and hence is mental as opposed to physical. There is a hiddenness of mind, a bit of mystery about it, hence our curiousity or anxiety over one who claims to be a mind-reader. Admittedly, there is a sense in which one's mind is exclusive and private to a person. When we urge someone to "Say what's on your mind" or "Speak up" we are also saying "Do not keep your thoughts to yourself." Even when such thoughts are expressed in language and bodily gestures, still there are times when we do not know whether or not what the other person is saying of an object is true, especially if we do not know the object. One can lie and deceive one's listeners even as they follow the trend of the person's thinking.

Importance of Language

To admit that there are difficulties in knowing another person's mind does not mean, however, that *therefore* one's mind is completely cut off from any external observation and absolutely impossible of public notice. This paper contends that one external manifestation of mind which is more or less reliable is one's use of verbal language. In one's use and manipulation of language is disclosed the person's way of thinking, the care given to one's ways of relating one item with another, the caution employed when making conclusions. We hear the commendation "She/He always talks sense," meaning that in the person's talk we find the person sensible. In contrast, "She/He is full of talk" is to say "She/He is a bag of wind." Still, there are others whose language is characterized by: (1) ambiguities and vagueness, with no attempts at clarity; (2) gross extension of meanings of words to suit their private purpose, and (3) logical fallacies and innuendoes. This language is often labelled *clever double talk* and we are warned to take the speaker and the speaker's language with a grain of salt. Clearly, what we are thinking about, where our mind is, how we think, are accessible to public observation. To say that someone is independent-minded is to judge that a pervasive quality is *discernible* in one's total behavior. "For as a man thinks, so is he" (Proverbs 23:7). As we speak, people see us as we are. In the discourses of Christ, much is discerned of His thoughts and His manner of thinking. The disclosure of Eternal Truth, of Himself, in His language

How and on what should Christians think in order that it may be said that their thinking is Christian and not merely that they are thinking Christians?

was always central and the focus of His mind. Similarly, if there is a Christian mind, then, it must also be evident in the way one thinks about everything as made manifest in one's talking.

Examples of "Mind"

Consider, now, a few examples of the uses of the term "mind": (1) "And his brothers were jealous of him, but his father kept the saying in his mind" (Genesis 37:11). (2) "I will call to mind the deeds of the Lord; yea, I will remember thy wonders of old" (Psalms 77:11). Both uses of "mind" are equivalent to the expression "don't forget" or "remember." The expression "I'll keep you in mind" which also means "I'll think of you" are similar to the above examples. (3) "What's on your mind?" asks the question "What are you thinking about?" On the other hand, (4) "Jones' mind is made up" suggests that her thinking about something is now concluded. She has made a decision about it. Sentence (3) exemplifies a process while (4) could be its conclusion. Then we hear the advice (5) "Mind your own business." This could mean either that a person should concentrate on what he is doing, or that he should attend to his own affairs and not meddle with someone else's. There is the suggestion of restricting a person's focus to what he is doing. One also hears of someone being (6) "a broadminded person." This does not always suggest that broadmindedness is characteristic of the person when viewing a specific problem. It is also used to describe one's total outlook and general dispositions toward life. Of course, it may be that one is broadminded on some things, but not in others. The concept "mind" is an ambiguous term. It has more than one meaning, and it allows degrees of intensity; thus, one can ask: "How well does the person think?"

These examples show that "mind" is commonly associated with cognitive terms and activities, e.g., remembering, reasoning, calculating, figuring out, deciding; concluding, attending, concentrating, perceiving (in the sense of outlook), etc. When one is said to be "minding," he could be doing any one of the above activities. The above activities are also activities of thinking. To ask, "What are you thinking about?" could elicit the reply "I am figuring this one out." To say "the mind of Christ" is to say either "the thoughts of Christ" or "His manner of thinking." It is common to interchange "mind" with "thinking" and we do so in this paper. "Mind" or "thinking" covers a wide range of activities, some of which are more central, others peripheral, to it. The interest here is to establish the strict sense of "mind."

The Peripheral Sense of "Mind"/"Thinking"

To think is always to think about something. Thus, when one says "I am thinking," the quick retort is "about what?" The reply, "about nothing" is acceptable, and at the same time there is something not quite right about it. For to say "I am thinking about nothing" means that I am not thinking at all, if it is assumed that thinking always takes an object. Moreover, to say that I am not thinking is slightly odd, for certainly we are thinking all the time.

In what sense is "I am thinking about nothing" acceptable? Consider the question: "Are you thinking about it again?" This suggests that one's thinking about it stopped and then started again. This does not mean that the person stopped thinking, only that the object of thought changed. Of course, it may be the case that one is thinking about it again. One could also say, "No, I am simply wondering, thinking out loud, talking, exchanging ideas about it." Someone may say, "I am *just* thinking about it," suggesting a difference between "thinking" and "just thinking." Or the reply could be that I am simply imagining, musing, even day-dreaming about it. These expressions suggest a presence of thinking *to some degree,* e.g., when they are said to relate things together, figure out why, ask questions, perhaps, more in wonderment and awe than in seeking answers, etc. But these processes, although associated with thinking, suggest aimlessness, absence of rules and focus, no end-in-view. Strictly speaking, there are no rules to be observed in the process of exchanging ideas, thinking out loud, etc., except, perhaps social ones. (I am aware that sociolinguists tell us otherwise.) There are no correct rules for imagining, day-dreaming, etc. The talking/musing/wondering, etc., can go on for a long time. When it is concluded, no one is shown to be right or wrong about the problem talked about. For, indeed, some of the activities above can be engaged in for a long time with no intention of solving a problem. They are *just talking.*

"Thinking" in "I am thinking about nothing" is used when one is engaging in any one of the above activities that are peripheral to the concept "mind" or "thinking." It is acceptable. To say "I am thinking all the time," even when I am not thinking about something in particular, is, likewise, to engage in one or some of the above activities at one time or another. What then is the strict sense of "mind" or "thinking?"

The Strict Sense of "Thinking"

The strict sense of "thinking" is intentional and focused; it is consciously directed to a specific problem, identified as such, and to its conclusion. A person who is thinking in this sense is conscious of the object of thought and of one's manner of thinking. The person controls the direction that thinking takes. The steps leading to the conclusion of a problem are controlled to make sure that they are clearly, if not logically, related to one another; when the conclusion is reached, it is either necessarily derived from the previous premises or inductively derived from the determinative

facts of the case. When thinking about a problem is concluded, the problem may be solved. Thinking in this sense observes rules presupposed in thinking and rules necessarily derived from the nature of the object of one's thinking, e.g., mathematical thinking, literary thinking, artistic thinking, etc. To say that someone is scientifically-minded means that the person tends to think according to the canons of science, not that the person is a scientist. To say that one is a scientist, however, implies that one occupies oneself with matters of science and is scientific in one's thinking about them. When a scientist is carried away with science, then the scientist tends to view everything from the point of view of science. Such reductionism is questionable when scientific thinking encompasses more than it should, even perhaps usurping or replacing Christian thinking.

Likewise, a Christian is one whose thoughts are disciplined by the thoughts and manner of thinking of Christ. Neither the scientist nor the Christian, when they think in the strict sense, are free to think in any way they wish and still insist that what they are doing is in accord with scientific or Christian thinking. Thinking in the strict sense presupposes certain rules of thinking, and is subject to correction, verification, or validation. When thinking is concluded, one knows whether or not the problem is solved and if the solution is correct. It is, of course, also possible for one to think in the strict sense and still be judged as not thinking at all. This means that one's thinking is not thorough and sound, but not that one is thinking in the peripheral sense of thinking. One does not think freely independent of all rules, if one wants to think well. It is "thinking" *in the strict sense* that is used in the rest of this paper.

If there are Christians who think in the strict sense and may be described as thinking Christians, does this mean that their thinking is Christian? Not necessarily. Rules of logic and evidence are indifferent to the interests of Christianity. They are formal rules applicable to any problem on hand. If the manner of thinking about a given problem is drawn from different branches of human knowledge, then the problem is given a human solution. If it is solved adequately by human knowledge independent of the thinking of Christ, then, clearly such a solution does not derive from Christian thinking/thought. For thinking to be Christian it must necessarily take into account the manner of thinking and the thoughts of Christ, in the same manner that for thinking to be scientific, it must necessarily take into account matters and manners of science.

Relationship of Faith and Life

Before proceeding to expound on the mind of Christ, it is useful to show by conceptual analysis why Christian academics, businessmen, professionals, etc. are obligated to raise the question of the relationship of their beliefs and their activities in the world, and to attempt to answer it as best they can.

To speak of a person being a scientist (a cook, a medical person, an artistic mind, or whatever) is to speak of someone's specialization. We are, therefore, talking of a language that is specialized, technical, addressing itself only to problems particular to a field of study. Of necessity, the language is limited, thus the language of science, the language of music, the language of poetry, etc. In contrast, the meaning of "being a Christian" is not to specialize in Christ in the sense that we become professional Christians in a limited aspect of life's problems to which our Christian language applies. Rather, to be a Christian is to embrace a distinctive total way of life derived necessarily from the truths of Christ. If as a Christian a person embraces a way of life, and if one's chosen profession/specialization is an aspect of one's total life, then the specialization/profession as an internal part of the whole must necessarily partake of the qualities of Christian mind. The expression "Christian mind" is broader than "scientific mind." To limit scientific thinking to matters judged scientific is correct. But to limit Christian thinking only to matters judged to be Christian problems is questionable. Christian thinking embraces all of life.

Noting that Christian thinking differs from academic or scientific thinking in its presuppositions, logic, and commitment, how may Christian academicians relate their Christian faith and science? Being a Christian and a scientist at the same time implies that there must be something more to the Christian scientists' science, either in their ways of doing it or their thoughts about it, than to the non-

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believer's science *in some central ways.* What this difference is and whether or not the difference is significant enough to cause one to develop another view of science, e.g., Christian science, is a *nagging* question. What is clear is that one's Christian thinking is of necessity brought to bear on whatever problem the Christian is attending to. If it does not make any difference in what we are doing, then it suggests one of the following: (1) that the meaning of Christian scientist has not been correctly discerned; (2) that the expression is a mere label with no meaning substantial enough to reform/transform one's conception of science; (3) that Christianity applies only to limited spheres of life, labelled private morality and spirituality; (4) that the relationship between being a Christian and being a scientist is arbitrary: the two are not related at all; or (5) that being a Christian refers to one's person whereas being a scientist refers to one's specialization. Since the two are distinct from each other, i.e., they demand different requirements, it is possible to separate one's professional/academic activities from one's Christian life. It is clear that there are difficulties and problems raised about our understanding of the relationship between our academic studies and our Christian faith.

Christ's Thinking/Mind

Now, we turn to the question "What constitutes a Christian mind?" by referring to Christ's mind exhibited in His discourse in John 4:7-38.

Christ asks for a drink of water to quench His physical thirst. In reply, the woman questions His right to ask for a drink from her by invoking cultural practices, namely, that the Jews have nothing to do with the Samaritans and with women. Jesus replies, "I know what I needed: water. I asked you for it but you do not give it to me. You have come here to fetch water. It is not, in truth, what you need. But you do not know your need, neither do you know me. So, you cannot ask me for that which you do not know you need. But had you known me, who I am, and had you known your need, you would have asked and I would have given you what you need, *living water.*" Ignorance prevented her from asking *living water* from Christ. Jesus starts to change His level of talk, from one of mere physical necessity to *living water.*

The woman corrects Christ by saying, "You have no can and the well is deep; the facts do not meet the conditions required to secure water" (v.11). So far, the woman is correct on two counts: cultural practice, in the first instance when she behaved properly toward Christ, and factual observation, in the second. Noting the difference between "water" and "living water," she asks, "Where do you get this living water? Obviously not from this well, and who are you?" (vs.11-12). In verses 13-14, Christ does not answer the question about His identity directly. Neither does He answer the question in verse 9. However, He refers to His being the source of living water, indirectly suggesting that the question is from Whom, not where, do we get this living water. Christ continues with His own thoughts of "water," and "living water." He compares, "Water from this well will not quench one's thirst forever; but the water I give, will. Moreover, the water becomes *in* the person who receives it a spring of water welling up eternal life" (v.14).

A Christian is one whose thoughts are disciplined by the thoughts and manner of thinking of Christ.

The reply in verse 15 is eager and positive. It is not clear whether or not she understood what Christ said. But whether or not she understood, her positive response evokes the command, "Go, call your husband and come here" (v.16). The answer seems odd for when she says, "Give me this water," Christ replies, "Call your husband." In another sense it is not odd for Christ is saying, "Before you can have the living water, you must do certain things first, put matters right. First, call your husband." Her answer is clever, straightforward, and legally correct, "I have no husband." Christ commends her for telling the truth, "You are right . . ." (v.17) and proceeds to give a true description of her situation that she does not deny. At this point, the woman and Christ are conversing on the same level and with each other, where previously they did not. She changed the topics from living water and herself to the identity of Christ. She asks, "Since you could tell me who I am, you must be a prophet" (her question in v.12 is beginning to be answered; it is obvious she missed Christ's reference to Himself as the source of living water in v.14) "so, you can answer the question: where ought we to worship?" (v.20). Christ replies: "Where ought we to worship is not the important question but rather what constitutes true worship and who the true worshippers of God are" (vs. 22-24). Without accepting or rejecting Christ's answer, she acknowledges that when the Messiah comes, He will show us all things, including the answer to true worship. At this point, with arresting simplicity and obvious gentleness, with no fanfare, no exaggerated claims about Himself, Jesus discloses Himself to her so simply, "I who speak to you am He" (v.26).

Now, indeed, the hour is come for the Messiah to show her all things. At the return of the disciples, we are led back to the earthly and physical world of humankind—her concern was water to drink; the disciples' concern was for food to eat. When the disciples express their concern for His physical needs, Christ, without saying that food is good or bad, necessary or not, moves ahead with the reply in verse 34, presenting the vision of the universal need of humankind to come to a saving knowledge of Him, humankind's need for "living water" that they may thirst no more. Beginning with physical thirst, the dialogue concludes with spiritual matters, reminding one of the Parable of the Sower and His discourses on the Kingdom of God.

Of Cosmic Significance

What observations may be made regarding the mind of Christ as exhibited in His discourse? First, Christ's thinking is of cosmic significance, encompassing both heaven and earth, the eternal and temporal. He notes earthly matters of fact such as physical thirst, suggesting that He does not deny physical needs, and marital status. He is not oblivious of the world around Him. However, he transmutes the physical need into a spiritual need by a series of images: from water to living water, to spring of water, to eternal life. Having established spiritual need to be the basic need, Christ moves on to talk of morality, then matters of true worship, implying that the object of worship determines whether or not worship is true worship, and, finally eternal values. How these statements are connected with one another is not shown. What, indeed, is the connection between water and eternal life? But He states them as though they were self-evident truths. And the point comes across clearly that we are not at one discrete point physical, at another spiritual, and at still another point intellectual or emotional—but that all blend into the total person. Moreover, Christ connects the basic spiritual need with sin/evil, which was a reality in the woman's life, even as it is in our lives. Before the woman's thirst, both physical and spiritual, could be quenched, her sin had to be dealt with first, the absence of Christ in her life. And once the basic spiritual need is fulfilled, its consequences spill over into one's total life.[7]

What are some specific points that can be drawn from the above? Christ used factual matters to make His points on living water and eternal life. He did not show contempt for wordly matters of fact nor did He deny the need for food and drink. He showed only that life is more than these things. In so doing, He showed us that we are not cut off from our times, nor are we independent of past human intellectual and moral achievements. However, in dealing with the problem of the woman at the well, He also showed that we cannot be dependent solely and absolutely on human knowledge. For while they are necessary to our earthly conduct, they are not always sufficient for our understanding of human problems simply because they do not always take account of the root of such problems, namely, the nature of humankind.

Christian thinking necessarily holds the nature of human beings to be central and significant for understanding and solving a problem. For example, Bube notes an absence of a necessary and crucial point in Feinberg's understanding of the problem of over-population, namely, human nature.[8] Bube suggests that if such a point were included, Feinberg's solution would have been different or that the problem would have been constituted differently in the first place. Feinberg does not view the nature of human beings to be part of the problem while Bube does. Someone has suggested that ". . .the whole nuclear power issue is more of a quasi-religious than a mere technological conflict."[9] This is not, of course, to say that for every specific problem, e.g., breaking down of a car, the direct cause is attributable to human nature. It is to say that *ultimately* the basic problem of the world/society is the insistence of human beings on being independent of God. In so doing, they mismanage the affairs of the world. It is often noted that it is how human beings use inventions/discoveries that engender social, political, and moral problems. Nuclear power is not in itself good or bad but it becomes either one or the other depending upon how it is used, for what purpose, and by whom.[10]

In the discourse of Christ, there is the unmistakable fact of the centrality of the reality of Eternity and its values. This is not to say that earthly, sometimes petty, concerns are denied, but that Christians are not rooted in them absolutely. Like the woman at the well, our jars can be left behind; like the Lord Jesus, we may miss our physical water. When we are consumed by our creaturely activities, attending to problems of pollution, nuclear reactors, shortage of natural resources, etc., it is well to remember that according to the Word of God the earth will not go on forever. This is not to conclude that we should abrogate our responsibilities in fulfilling our calling, but that we should place our calling in its proper prespective: in the light of Eternity.

This is, surely, where most of our problems as Christian academics/professionals begin. For we are schooled in thinking in discrete terms, in observing logics of different kinds and preserving their identity, whereas Christ showed that there is a connectedness between matters of fact and spiritual life, between earthly conduct and heavenly vision. But how are these connected with one another? Christ used factual matters to point to matters of eternal life. This suggests that academicians/professionals should use relevant human knowledge to clarify and solve human problems and then, like Christ, use them to point to deeper and ultimate problems of life.

For example, a partial solution to the shortage of natural resources may be to change our life style. Argument on this point could easily be limited to matters of morality, invoking such principles as universalizability, justice, fairness, etc. and could be agreed on. But how is this to be connected with the biblical doctrine of human nature? There is no logical way of showing how shortage of natural resources is connected with it. The former is a matter of fact claim. It can be publicly tested. Acceptance of a morality can be shown to be based on adequate reasonable arguments. The biblical doctrine, however, as a metaphysical claim, is not testable, even in principle. The two claims, requiring different grounds for acceptance or rejection, are not related logically or empirically. The conclusion does not follow from the matter of fact claim.

How are we to conduct our earthly lives *in the light of* Eternal values? Does this mean that at the outset, "we will be realistic about what we must leave behind at the end of the day, remembering that only those priorities which are eternal can survive?"[11] Earthly values and Eternal values can certainly be distinguished from one other. But to conclude that they are in no way related is to contradict the

thinking of Christ. Christ clearly showed that Christian thinking overcomes discreteness and dichotomous thinking. He saw everything in its holicity. Therefore, Christ was at ease in thinking the way He did on everything, combining different types of statements, now empirical, then metaphoric, then moral and metaphysical. Many of us would be ill-at-ease in using the kind of thinking that Christ used in successfully solving a given problem. This is a case of thinking in the strict sense.

Always Edifying

Second, Christ's thinking is always edifying. As He corrects the false in us, He teaches the true in Himself. As He admonishes, He heals and expresses concern for us all to be more like Him. He judges always correctly and for the right reasons. He is not evasive, but always focused, directional, never wandering, aimless, mindless in His talk. In contrast, some of our talk is not only small but also empty. His perception is right to the heart of the matter. But in His directness, there is no rudeness, only love.

Problem of Reconciling Different Kinds of Discourse

If Christ's thinking is Christian thinking, how did Christ connect His different statements? In showing how He did it, we also see how He thought about the problem and solved it. These questions are crucial since the burden of this paper is to figure out how we solve problems in our field of study such that our thinking about them is Christian. That there must be a relationship has been shown by our analysis of the meaning of "being a Christian" and "being a scientist" and by the thinking of Christ himself. The nagging question is: what is this relationship?

Throughout the discourse of Christ, one notices the absence of evidence[12] outside of Himself to support His statements. When He says that He is the Messiah, He simply says so. No credentials or certificates are offered to back up His statements. When He says that the water He gives is living water, which He translates as eternal life, He simply says so. No elaborate arguments are given to convince the Samarian woman. Still, there is rationality, sensibility, and truth in His thinking that persuades the woman to accept Him as ". . .the man who told me all that I ever did. . . ." (v.29). Christ knew the truth about her and what Christ said of her was true.

Christ did not need evidences to support His statements about Himself and other matters. He Himself is the evidence for the truths He uttered. From the fact that Christ said so, then it must be so. Truth and Christ are of necessity one. It is Christ who is the connecting link between the different kinds of statements. Since He is truth, then what He says is true. Although His utterances differed in logic and commitment, all of them shared the element of Truth by virtue of the fact that He uttered them. His Person constituted their relatedness. Not only is the truth of each utterance derived from Christ but also Christ relates/connects them with each other. The question of the relationship between our human knowledge and Christian faith is resolved by the person who holds them, even as Christ showed that it is *in* His person that relatedness obtains. The living water, eternal life, that Christ talked about does not come from the outside world, ready-made, independent of the person who accepts water. Rather, He says ". . .the water that I shall give him *will become in him* a spring of water. . ." (v.14). (Italics mine.) It is *in the person* that the conversion/transformation of what is accepted from outside takes place. By extension, it is *in the person* of the Christian that the transformation of what he accepts to be true takes place. The proposition "what is true" is not necessarily converted to "what is good" in one's person.

We are schooled in thinking in discrete terms, in observing logics of different kinds and preserving their identity, whereas Christ showed that there is a connectedness between matters of fact and spiritual life, between earthly conduct and heavenly vision.

Scientific knowledge claims are not transformed into religious knowledge claims or moral claims. They remain as propositions of science. Similarly, different kinds of knowledge claims remain true to their logic and commitment. Rather, the transformation takes place in the person, so it is the person *who* is transformed, not the different bodies of knowledge, now that he has accepted certain matters of human knowledge and matters of Christian faith.

Like Christ, Christian academicians embody the truths of what is known of the field of study and of the Christian faith. What one knows of a field of knowledge and what one believes in are now built into one's way of looking at things and talking about them. It is *in the person* of the Christian academician where the reconciliation of the different kinds of claims takes place and results in the person's trnsformed way of seeing and talking about things in an *integrative, holistic way*. Whereas the world tended to appear in discrete relationships, in disjoints, even in non-relationships, now one perceives an underlying unity among them in the person of God who upholds and sustains all kinds of relationships. A sense of wholeness pervades one's total life. But how such a holistic way of viewing things develops or arises cannot be completely and adequately shown and explained to everyone's satisfaction. Thomas confronted with the wounds of Christ that he could see and touch, responded properly, not with an empirical statement, but by accepting and *believing in* the revealed truth of Christ: "My Lord and my God." John, on entering the tomb, saw it empty and he *believed in* what he did not see: the revealed truth that Jesus Christ is God's Son, indeed. Based on what both of them *saw in the observable realm,* they *believed in* the claims of Christ with the eye of faith. Beginning with empirical facts, they arrived at and believed in the truth of

Christ's claims. How? Surely, not by logic nor inductive reasoning. Where there are no logical relationships between human knowledge/science, etc. and our Christian faith, where there are gaps in our thinking about them, relationships should not be forced or arbitrarily decided.[13] The conclusion both Thomas and John arrived at is *God's voluntary personal disclosure*[14] to them of His truths, a disclosure most of us know and believe in. Such disclosure of unity, of Ultimate unity, despite logical gaps, cannot be grasped by our discursive, digital knowledge. Hence, Christ used metaphors to enable His hearers to glimpse, even dimly, a vision of the wholeness of Truth constituted in His person.

The Basis for Relatedness

This discussion suggests that our tendency to argue the relatedness of human knowledge and Christian faith on the basis of a body of knowledge, or a system of logic, is wrong-headed. Clearly, there is no one logic that can accommodate different kinds of statements such that there can be no logical gaps between and among them. If this is insisted upon, one of two consequences could follow: we show that our Christian faith is at par with science on all its points, or we transform scientific claims to fit a preconceived theological framework. Both consequences lead to embarrassments and cast doubt on our intellectual integrity and honesty.

How can Christian academics be trusted with their religious claims if they cannot be trusted with the way they manage their scientific endeavours and the way they handle scientific claims? The woman first referred to the fact that Christ knew all that she ever did. Noting that all He said of her was true, she asked: "Could this be the Christ?" One kind of truth led her to ask of another truth. Like Christ, Christian academicians are the evidences of the truth of their statements. Whatever claims they are talking about, they know them; hence, any of their utterances on anything could be *taken* as true. When they say something, what they say is true. They can be trusted. Truth for the Christian, as shown by Christ, is closely related to the person who utters it, not simply that truth is a quality of statements but that in a significant way Christian academicians are bearers of truths and of the Truth. As bearers of truth, they are internally, not externally, related to it. Hence, their lives have been affected by it. In the Christian academicians' thinking is truth. It may be said that this is an onerous task. Even so, Truth constituted Christ's thinking.

To the extent that a Christian scientist, businessman, professional etc. approximates Christ's thinking on all things, to that extent is the thinking of a Christian scientist, businessman etc. Christian.

Our tendency to seek for a body of knowledge that may be used to show a relatedness between human knowledge and Christian faith suggests that we are thinking of a body of knowledge independent of the person who holds it. It is upon this knowledge that we depend for the relatedness of our Christian faith and academic tasks. This, clearly is not so, as shown by the discussion and example of Christ. The question as suggested by Christ is not *what,* or *where,* but *who* is the source of *living water*? It is the person who relates the two activities in one's life. This relatedness does not achieve perfect integration on this side of heaven. Because of the reality of sin, which is a falling short of the total good, we do not fully comprehend the full implications of our Christian beliefs. We do not know all there is to know, and that which we now know of the different aspects of life, we do not also fully understand, hence, our admission to know specific truths, fragments of truth.

Summary

Christ's mind constitutes the Christian mind. It is necessarily cosmic, embracing at once the temporal and the eternal. It constitutes eternal contemporaneity. Christian thinking takes necessary account of the human sinful condition, thinking about it is always edifying, and its concern is love for the human being. The person, not a body of knowledge independent of the Christian, relates together the different kinds of statements true of the world, of human society, of individuals, and of one's faith. This results in the person's integrative manner of viewing different kinds of claims and, indeed, of life itself, which, in turn, results in a person's integrated personality. When we talk of a Christian mind, we are not talking of mind as though it were an entity, complete in itself, encased in one's head or brain. To speak of a Christian's mind is to speak of a Christian person whose personality is characterized as integrated. Thus the point emphasized in this paper is that the different subject matter claims and Christian faith which a person now holds find unity in the person and is evident in one's thinking. The person possesses these matters in an inalienable way, i.e., they are necessarily part of one's life, or putting it more strongly, they constitute his being. Similarly, it is God, ultimately, who unifies all truths. Christian presupposition encourages us to continue the task that He has appointed for us to do in order that the whole Truth, which now is a vision, may be apprehended and known.

To conclude, this paper refers back to the discussion on mind in its peripheral and strict senses. Unlike Christ, we are not always thinking in the strict sense. Even when we attempt to do so, our thinking is not always without errors. But this is not to conclude necessarily that the thinking of Christians is not Christian or that "there is no longer a Christian mind." This paper shows that if there are Christians, there must be thinking that is Christian. Perhaps, our problem is that our Christian thinking is not exercised on or applied to all things always and in exactly the way that Christ did, in the strict sense. But taking into account the

fact that the concept "mind" is ambiguous and vague, allowing for degrees of minding, and that thinking need not be always thinking in the strict sense, it can be said that as long as the Christian fulfills, *even minimally,* the conditions posited to constitute Christian mind, then to that extent the Christian is exhibiting a Christian mind. To the extent that a Christian scientist, businessman, professional, etc. approximates Christ's thinking on all things, to that extent is the thinking of a Christian scientist, businessman, etc. Christian. There are some Christians whose thinking on all things are clearly Christian; they approximate very closely the mind of Christ. Unfortunately, there are also Christians whose thinking may not be clear cases of Christian thinking. There is no denying the fact that they are Christians, but their thinking on some things, say, schooling, science, pollution, economics, literature, etc. while humanistic, may not necessarily reflect the mind of Christ. This does not mean that one's thinking is not necessarily Christian; only that one's thinking *on all things* is not Christian. Perhaps a Christian has thought much about one's academic field of study, but somehow, one's thinking of the meaning of "being a Christian" is not fully comprehended. Granting, as well, that there are Christians who do think about all things as Christians, still their manner of thinking about them may not be necessarily correct. Even if it is correct according to the logical rules of thinking, still it could sound artificial, forced, a put-on, smacking of a self-righteous pose, and not effortless, seasoned with grace and truth as in the manner of Christ. Some Christians think more than others on more things; still others think about a few things and do it correctly and well. And some others do think only about things which they say are "things of the spirit." The vagueness of "mind" allows for acceptance of all cases above. To be strict and demand that the label "Christian mind" is allowed of a person if and only if the person's thinking is *exactly identical* to that of Christ's thinking is surely too restrictive and demanding. Very few could be accommodated and most of us would be disqualified.

The reason, then, that Blamires' judgement cannot be sustained is because a Christian tends to draw from some thoughts of Christ on some things and from His manner of thinking, from time to time. To say "I am a Christian" and to deny all of the thoughts of Christ is simply a contradiction. As already suggested, our problem is to develop our Christian thinking in such a way that it approximates very closely the mind of Christ, expressing itself in one's total life on all things. In the end, we fall back on the promise of Christ: if we subject every thought to His thoughts, we will know what to think about all things and know how to think about them in the way that He did. Then, our Christian-mindedness will be evident in our talk.

REFERENCES

[1]Harry Blamires, *The Christian Mind.* Ann Arbor, Michigan: Servant Books, 1978, p. 3. The first edition of Blamires' book was published in 1963 by S.P.C.K., London.

[2]*Ibid.*, p. 13.

[3]*Ibid.*, p. 17.

[4]*Ibid.*, p. 21.

[5]*Ibid.*, p. 26.

[6]A shorter version of this paper was read at the Thirty-Fifth Annual Meeting of the American Scientific Affiliation in Taylor University, Indiana, 10 August 1980.

[7]The meaning of "being a Christian" established earlier makes the same point.

[8]Richard H. Bube, "How Simple if Only not Complicated". *Journal ASA,* 32, 2 (June 1980), 68.

[9]Richard L. Meehan (197), "Nuclear Safety: Is Scientific Literacy the Answer?" *Science* 204: 571 quoted in David L. Willis, "Nukes or No Nukes". *Journal ASA,* 32, 2 (June 1980), 107.

[10]Even this point can be disputed. Elsewhere, I have argued that the hardware, e.g., computers, electronics, etc. of our industrial-technological society is not normless or neutral. To consider it as such is not only wrong-headed but dangerous. See: "The Medium Is the Message", *Insights,* 4, 3 (December 1967), 6-7. Publication of The John Dewey Society.

[11]Donald M. Mackay, *Human Science and Human Dignity.* London: Hodder and Stoughton, 1979. p. 11.

[12]One could be puzzled why Christ did not take advantage of the one dramatic opportunity to show Pilate, the High Priests, and the crowd that they were all wrong, by appearing before them as palpable evidence for His resurrection claims, whereas He kindly acceded to Thomas' request to show him evidences that He has risen. It could be said that had Christ acted likewise to Pilate and the High Priests, He could have been vindicated and exalted as Lord. Unfortunately, for us, our Christian faith would have been reduced to empirical/evidential claims. Since empirical/evidential claims sometimes turn out later to be false, how then could we speak of the stability of our Christian faith?

[13]Consider the following case which some may say is a Christian claim: "A ship floats, not because it has displaced water equal to its own weight, but because God sustains it at that point." This claim combines two different kinds of logic, namely, scientific and religious/metaphysical. Consequently, the reasoning is questionable. The scientific explanation is accurate, adequate, and relevant to the problem being explained. (That it may not be psychologically satisfying to the person to whom the explanation is made is another matter.) There is no reason to minimize its truth and say that it is inadequate and quickly add on the metaphysical claim on God. To accept the scientific explanation is not to deny the metaphysical claim; the two claims are not simply related. To force the relationship between the two claims and say that the metaphysical claim has to be accepted in order for the empirical/scientific claim to be true is the say that both are metaphysical claims. This is simply false. To tack God's truths on human problems in this way seems to render God's truths anemic, even ridiculous. As pointed out in the discussion, matters of God's truths, as in the above, are God's voluntary, personal disclosure to us, a disclosure that is more than human knowledge can accommodate because it is The Ultimate Truth. To borrow C.S. Lewis' point, a scientific explanation is like a $1 cheque; it is easily cashable. God's Truth is more like a cheque that is worth millions. It is awesome.

[14]For a discussion of disclosure, see: Ian T. Ramsey, *Christian Discourse: Some Logical Explorations.* London: Oxford University Press, 1965.

An Extended Book Review Essay

THE POST-DARWINIAN CONTROVERSIES

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Based on The Post-Darwinian Controversies: A Study of the Protestant Struggle to Come to Terms with Darwin in Great Britain and America, 1870-1900 *by James R. Moore. London, New York and Melbourne: Cambridge University Press, 1979. This is part three of a four-part essay.*

III. Christian Darwinism

The most compelling and fascinating sections of the entire book are Chapter 11 and the analysis that follows in Chapter 12. Here we have four conservative Christians, all distinguished in science and theology, who for many years did everything they could to make Darwinian evolution palatable to the public at large. The number is really six, if we consider the two American thinkers, James McCosh and Joseph Van Dyke, whom Moore includes as transition figures in Christian Darwinisticism. I daresay many readers might examine these two chapters first to find out how it could possibly be that conservative Christians would actually defend Darwinian evolution, especialy at a time when many scientists were not at all sure about natural selection, and, what's more, at a time when Darwin himself was losing his religious faith. But defend Darwin they did. Moreover, their theological arguments in favor of the Darwinian mode remain unexcelled to our day in acuteness and ingenuity of reasoning, and in understanding of the weighty issues involved. What these Darwinians lacked in numbers they made up in erudition.

Revisionism came to Princeton following the death of Charles Hodge (p 241-251). The influence of his book, *What is Darwinism?,* waned following the publication in 1886 of the book by Presbyterian minister and Princeton tutor Joseph S. Van Dyke, *Theism and Evolution.* Not only did Van Dyke declare that evolution as a biological theory was not atheism after all, but almost in the same breath he added that "if Darwinism should become an established theory, . . .there is no just cause for fear" by Christians (p 244 in Moore). Archibald Hodge, son of the late Charles Hodge, provided the imprimatur of his famous name by writing the introduction to this book. He also found that "evolution is not antagonistic to our faith as either theists or Christians" (p 241 in Moore), although he prudently outlined the limitations of evolutionary theory. Former Church of Scotland minister James McCosh, while president of the College of New Jersey, later Princeton University, discussed Darwinism in a series of books on Christianity and science. The survival of the fittest did not worry him, he was critical of Spencer, and he seemed to favor natural selection as the primary method of evolution. McCosh it was who hit upon a happy means of shielding his Christian readers from becoming upset at the mere utterance of the word evolution—he substituted the word "development," and all was well (p 246-247). He was perpetuating the standard, pre-Darwinian term for evolution. I've always wondered why that euphemism survives today. With Charles Hodges dead, Princeton underwent a *volte-face.* But not completely. Van Dyke and McCosh both required a special divine intervention to account for the appearance of man, and for this reason Moore sees them as transition figures, "The Darwinists nearest Darwin" (p 241).

It seems to me that Moore's four Christian Darwinians fully understood the issues raised by Darwin when they focused their attention on the impact of natural selection itself on the Christian doctrine of Providence. Exactly how does God act through natural law? What is a natural law?

Four conservative Christians, all distinguished in science and theology, for many years did everything they could to make Darwinian evolution palatable to the public at large.

How do particular adaptations represent the actions of God and fulfill His purposes? What has happened to the design argument? These are the sorts of questions that resonate through their discussions. In striving for sound answers, they carried the considerations of theology well beyond the position embraced by Christian Darwinisticism.

In The British Isles

James Iverach, at the Free Church College in Aberdeen, labored for many years to defend the Christian faith against the inroads of unbelief threatened by Spencerian agnosticism and Hegelian idealism. God is never absent from nature, he insisted, and natural selection, which can be "dealt with quantitatively and mechanically," provides a proximate description of divine guidance in nature. The design argument is strengthened, he went on, and because God is always present in nature we are delivered "from the tyranny of chance" (p 257, 256). The Christian Darwinians in Britain saw in Deism a threat to Christian faith, and possibly for this reason Iverach emphasized God's immanence.

Attributing man's unique origin to a particular divine action was to invoke "a certain kind of deism," which in Iverach's view was an entirely outmoded interpretation. "Is there no way of conceiving of the Divine presence and power in the world save that of continual interference?" Rejection of Deism implicit in his rhetorical question meant that he could not accept that man appeared as the result of distinct stages in the natural history of life, stages such as the transition from inorganic to organic, sensation and consciousness, and the higher human faculties. Man is unique in his rationality and self-consciousness, yes, but the differences between man and the lower animals are differences in degree, because man and the lower animals are not distinguished by a difference in origin. In explaining the appearance of man's unique qualities, theologians must not account for the origin of his physical body by one set of causes and his rational faculties by another. Iverach declared: "To me creation is continuous. To me everything is as it is through the continued power of God." But his concept of immanence certainly was not pantheistic, for he referred to the "creative and sustaining activity of the Logos" (p 258-259).

Even more weighty and interesting were the views of the Oxford High Church theologian and church historian Aubrey L. Moore (no forebear of the author, I gather), who did much to reduce the antagonism of the English church toward Darwin. Like Iverach, he was troubled by the influence of Deism. Aubrey Moore, apparently denying any Kantian distinction between the supernatural and the natural, denied any antithesis between evolution and creation. Such a separation would represent "a sort of unconscious Deism" by suggesting that God interfered in nature from time to time to bring forth species and adaptations, as though on other occasions He was like "an absentee landlord" (p 261, 264). On the other hand, we should not suppose, he continued, that adaptations result from certain properties inserted into nature by God at the beginning. "It is of the first importance that a Christian apologist should not use language which seems to invest the world with a power of self-unfolding, for it is this, more than any theory of evolution, which contradicts belief in God," he wrote (p 261-262).

To say that God had things "make themselves" meant that God withdrew from His own creation, Aubrey Moore thought, and this meant Deism all over again. He was worrying about the doctrine of special creation, which, he said, "has neither Biblical, nor patristic, nor mediaeval authority" (p 263). In his view, special creation and catastrophism were "the scientific analogue of Deism," while concepts of development and law were "the scientific analogue of the Christian doctrine of Providence" (p 264, 265). Both Iverach and Aubrey Moore therefore saw in the doctrine of special creation a resurgence of Deism, which they abhorred.

Believing in God's transcendance and immanence, Aubrey Moore found he had fresh cause to exult in the Christian doctrine of the Trinity. In his view, Deism, which had risen afresh out of the Enlightenment to darken Christian faith, was then in abeyance because of the new discoveries in science, and his understanding of the Trinity had been enriched by the Darwinian revolution. "Science had pushed the Deist's God farther and farther away, and at the moment when it seemed as if He would be thrust out altogether Darwinism appeared, and, under the guise of a foe, did the work of a friend," he exclaimed with a flourish (p 268).

Since when is "Darwinism" the friend of Christian theism? What was Aubrey Moore talking about, anyway? Although he was exercised primarily about the dangers of English Deism, I believe that Deism can turn up in our country, but without the name. In his worries about Deism, he was inveighing against what is sometimes called the "God of the gaps." That is, whenever you have no scientific explanation, you simply say that God does it. For instance, when you marvel at a biological structure that excites your admiration by its complexity you exclaim, "Now really, how could biology explain a thing so wondrous; God must have made it as it is." I think Aubrey Moore might have applied his apt phrase, "unconscious Deism," to such talk. Why? Because you are also necessarily implying by your exclamation that the less marvellous structure, which perchance you find is quite explainable by science, is less

dependent on God—and that means that God is absent, or at least less present, a view that is biblically and theologically unsatisfying. Aubrey Moore was aware that the progress of science, by explaining more and more about nature, was making this deistic concept of God less and less necessary. So it is that when a student today takes a course in biology and promptly loses his faith in God, he is really losing his faith in the God of Deism; he had no faith in the God of Christian theism to start with. Similarly in the story about Napoleon, Laplace's retort was not so much an expression of French atheism or hauteur as it was an insistence that science deals only with ways and means. In the context of French thought, the hypothesis he did not require was the God of Deism, the God that is called upon only when science has no answer.

What Aubrey Moore had in mind when he said that "Darwinism" was a friend of Christian theism, I think, was this. And what he had to say was rather strong medicine. Just as in the deistic conception of nature, in which God is first present then absent, so it is that according to the doctrine of special creation, God is more active at one time than at another; after all, creation is "special." But Darwin claimed that natural selection acts all the time and everywhere in the biological realm. A Christian could account for such pervasive action, said Aubrey Moore, only as the consequence of an immanent Providence, superintending all events in nature. He did not say that providence and natural selection were the same. The Darwinian theory of evolution was therefore "infinitely more Christian than the theory of special creation," he wrote, because "it implies the immanence of God in nature, and the omnipresence of his creative power" (p 263-264).

For Iverach and Aubrey Moore, the immanence of the *Logos* enabled them to embrace natural selection while nurturing their faith in Providence.

In the United States

The American Christian Darwinians were Asa Gray at Harvard University and his friend and collaborator for fourteen years George F. Wright, who was first at Andover, Massachusetts and later at Oberlin College in Ohio. Wright in 1871 published an article on inductive reasoning, which Gray read. Gray, intrigued, made discrete inquiries as to what sort of preacher this Wright could possibly be, writing so learnedly over there at Andover. Wright, meanwhile, was fascinated to find views so much like his own in articles published by some unknown writer who was supporting Darwinian evolution. These articles were appearing from time to time in various periodicals, including the *Atlantic Monthly*. Gray, not wishing to have his name bandied about, was publishing anonymously. Then in 1874, Gray, aged 64, brought out his anonymous review of Hodge's *What is Darwinism?,* in the periodical *The Nation.* Wright, aged 36, was stirred to action. Making inquires of his own, he was surprised to learn that the celebrated Harvard botanist was his mysterious author. Far from intimidated, he at once wrote a letter that Gray could not resist: "It was your Christian faith and your clearness of conception and statement that, when once I had access to a library where I could find what had been written on the subject, were the most important factors in leading me to my present views" (Gray, *Darwiniana,* 1963, p xx). Gray, drawn gingerly out of his shell, finally had someone he could talk to. The genteel fencing having ended, the two Christians became close friends, and formed an alliance.

The two Christian friends soon had occasion to try out their new alliance. An anti-evolutionist was in Boston on a showy crusade with a mixture of pretentious sounding scientific talk and coarse attacks on Darwin. Ordinarily such displays were beneath Gray's notice, but Wright was thoroughly alarmed that the public would be misled. Wright enticed Gray into joining him in the fray with serious statements on the compatibility of science with Christian theism (Dupree 1968, p 369-370).

Moore points out that evangelical Calvinism was a prominent theme uniting the joint efforts of Gray and Wright to win a favorable reception for Darwin in America. The two friends baptized Darwinian evolution with a stream of articles and books that brought before the public an earnest statement of the theological resources available to Christians for accepting Darwin's theory. Darwin, becoming well acquainted with their Christian stand, followed their publications with appreciation. He wrote letters of en-

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couragement to Gray and often asked him stimulating questions. While the transatlantic friendship between Darwin and Gray is already well known, Moore has emphasized the Christian orientation of their dialogue. He has also brought to prominence the significane of the Gray-Wright partnership, and he has given us a much-needed reminder of the Wright contribution to Christian thought (p 269-298).

Seeing at once that Darwinian evolution was neutral on questions of Christian theism, in 1860 Gray had brought out a 15,000 word, favorable review of the *Origin of Species,* following which he helped to bring out the first American edition of Darwin's book in the same year. He then published assorted essays on various aspects of evolution, each with a theological slant. He discussed the design argument, showing that Darwin's theory was not based on chance and did not mean atheism; examined the doctrine of special creation and alternative evolutionary theories; discussed the species concept; reviewed Hodge; and wrote a series of articles on natural selection and theology. In 1876 Wright talked Gray into publishing these papers as one volume, *Darwiniana,* which introduced the eminent Harvard botanist by name before the public as a professing, orthodox Christian, an advocate of Darwinian evolution, and friend of Darwin. In 1963 his book came out again as a useful reprint.

The question at issue between Darwin and Gray was the extent to which God's Providence could account for the multitude of variations among animals and plants. Gray insisted that Christian theism extended to every part of nature, even to those variations that seemed fortuitous, but Darwin would have none of it. Pressing on, in 1860 Gray developed a metaphor of a stream flowing across a plain by the force of gravity, which represented natural selection, to show how divine design was represented by the channels that were formed, even while natural laws governed their formation. Darwin was not convinced, pointing out the "enormous field of undesigned variability" from which natural selection brought forth a useful purpose. In 1868 he then put forward a metaphor of his own, a stone house built of fragments left by the "omniscient Creator" in various odd shapes, many of which were left-over and useless. "I understand your argument perfectly," replied Gray, "and feel the might of it." Gray in 1876 had the last word on metaphors. This time he did a better job: a sailing vessel moving by the wind, representing variations, but guided by a rudder, which represented natural selection. Moore reproduces these charming—and telling—metaphors in full to bring out the differences between Darwin and the Christian Darwinians in America (p 274-276). But they are too long for me to include here, even in an essay of this length.

And so for about twenty years Darwin and Gray discussed natural selection and Christian theism, replying to each other with letters, essays, and chapters in various books. Darwin, recognizing that "an omnipotent and omniscient Creator ordains everything and foresees everything," but remaining in a quandary about the ultimate meaning of apparently superfluous variations, admitted that he was left "with a difficulty as insoluble as is that of free will and predestination" (p 275-276). Although Gray for his part was not directly contending for the Christian faith,—then again maybe he was,—somehow, in reading Moore's analysis of their altogether engaging dialogue back and forth across the Atlantic, I was reminded of the famous confrontation between Paul and Agrippa. Darwin and Gray did agree that evolution dealt only with efficient causes, that is, with observable events in nature, and Gray was convinced that final causes, God's ultimate mysteries and the ultimate purposes of variations, remained untouched by evolution, "just as they were before," he said (p 274). Moore puts the unresolved issue this way (p 280): "To Gray an evolutionary teleology was but the human conception, a conception thus fraught with enigma and mystery, of the continued and orderly outworking of God's sovereign purposes in nature."

Special creation and catastrophism were "the scientific analogue of Deism," while concepts of development and law were "the scientific analogue of the Christian doctrine of Providence."

Meanwhile, Gray's kindred spirit was turning out a series of pieces on Darwinian methodology in the conservative journal *Bibliotheca Sacra.* Darwin, who read offprints that Wright sent, was pleased to find an accurate account of his theory in 1876, and in due course Wright received a warm letter of thanks. Wright discussed how inductive and deductive reasoning affected the reliability of evolutionary principles. Once again the Baconian presence is manifest, but this time in a statement severely critical of Bacon. Science offers approximations, not certainties—only a "high degree of probability," Wright explained (p 285). In 1881 Wright moved to Oberlin to assume a faculty position in New Testament, and there in isolation among the woods and corn stalks of Ohio, far from his famous friend at Harvard, from the libraries, the convivial oyster suppers, and from the steamers that brought flattering letters from England, he continued his lifework with resourcefulness and devotion. Boldly he took up objections that were raised against Darwinian evolution such as the troublesome questions of blending inheritance and of the origin of variations, questions which were still unsettled in biology. As a geologist, he sought to explain the gaps in the fossil record, and how natural selection could have occurred in the apparently insufficient lapse of time.

On Scientific Method

Wright put forward his basic—and strongest—argument against special creationism, an argument, I think, that had not been made before. He claimed that special creationism was anti-scientific. "The simple assertion, 'so God has made it,' would be suicidal to all scientific thought, and

would endanger the rational foundation upon which our proof of revelation rests," he wrote in 1882 (p 287). I think we might pause for a look at the first part of his statement, certainly on the face of it rather a strange thing for an orthodox Christian to be putting out concerning the beliefs of fellow Christians. He was suggesting that the special creationists were posing some sort of threat to the whole enterprise of science. Moore points out that they were rejecting what Wright called "secondary causes" as explanations for the origin of species. If this position were adopted in practice, Wright seemed to be saying, science would no longer be possible. What did he mean? Surely not that people would quit studying biology—Aristotle did supremely well at biology without any concept of evolution. No, I think Wright could only have meant that the special creationist position, if generally accepted as the predominant view, would fatally damage the scientific method of investigating nature. This is the method, as we know, that arose during the Renaissance.

I would like to go beyond Moore's discussion by suggesting a line of reasoning Wright might have followed to his conclusion. How could he think as he did? After all, he probably realized that the founders of modern science also believed that "God has made it." The answer that comes first to mind is that one must always distinguish between the final or ultimate cause, "Why?" from the immediate or efficient cause, "How?" This is something the special creationists were not doing, Wright might have said. Like many answers that have the ring of truth, this one was a long time in achieving recognition.

George F. Wright (1882): "The simple assertion, 'so God has made it,' would be suicidal to all scientific thought, and would endanger the rational foundation upon which our proof of revelation rests."

During the Renaissance the Christian naturalists posed two fundamental questions of far-reaching consequence. How has the great Author of all things constituted the world? And, supposing the world to be so constituted, what is the cause of phenomena? Striving to free themselves from Aristotelianism, they developed a mechanistic view of nature. God made the world out of corpuscular matter and local motion. God made this corpuscular matter to be completely inert, completely free of any inner, self-directing agency. God invented, or fabricated, the world out of this corpuscular matter to be like a machine with moving parts that are interrelated and act on one another. (I am far from suggesting that these three sentences represent a "Christian" scientific model of the world, as there is no such thing; nor indeed are they a scientific conclusion since scientific models change from age to age.) Local motion, created within the mechanism, is responsible for the motion of the parts. This metaphor turns up in varying forms in Andreas Vesalius, Galileo Galilei, William Gilbert, certainly in William Harvey, of course in Bacon, especially in Robert Boyle (after the Renaissance) and culminates in Isaac Newton. The human body is a *fabrica,* the Earth is a magnet, the heart is a pump, the solar system is a clock. The cause of an action of a part comes from inside the mechanism, not the outside; the cause is the immediately preceding motion of another part. "Matter and motion," said Boyle somewhere, is more honorable to God than even the idea of nature.

Listen to how Boyle put the matter. He was the Honourable Robert Boyle of Christian piety, the *Sceptical Chymist* of Boyle's Law fame, charter member of the Royal Society of London, devout naturalist and author of the *Christian Virtuoso,* and the appointed Governor of the Company for the Propagation of the Gospel in New England. In 1686 he wrote:

> He must be a very dull inquirer who, demanding an account of the phenomena of a watch, shall rest satisfied with being told, that it is an engine made by a watchmaker; though nothing be thereby declared of the structure and coaptation of the spring, wheels, balance, and other parts of the engine, and the manner, how they act on one another, so as to co-operate to make the needle point out the true hour of the day.

If you believe that God made those material corpuscles to be completely inert; if you believe that out of those inert corpuscles God invented the world to be like a machine with moving parts—animals, atoms, gases, plants—that are interrelated and act on one another, then you will assume that, because matter is totally inert, this mechanism lacks any inner necessity or any self-directing agency, and therefore it will not act capriciously. The mechanism will not suddenly run off and do what it wants, and you will assume that you can therefore find out how the mechanism works by studying the parts. If you prefer twentieth century terminology to the language deployed by these Renaissance luminaries, you say that nature is fully contingent.

Not so, implied the nineteenth century special creationists, and now I come back to what vexed Wright. If species are specially created, he might have reasoned, they are not related to other species, and they are "fixed" in isolation. Therefore they cannot "act on one another," as did the wheels and spring in Boyle's watch. You can never be sure but that God has the same arrangement—isolation and independence of action—with every other part. Therefore each part would receive its causation directly from God, instead of from the local motion that God created within the mechanism. If the parts are not interrelated, we cannot be sure that they act on each other. We cannot be certain that we can establish reliable cause and effect relationships, or that natural law describes their behavior. In other words, feared Wright, you would then have to look upon a natural process, not as a causally-related sequence of events defined by science, but as a collection of discrete entities, each requiring a divine impetus of some sort; concepts of natural law would no longer be efficacious or even necessary.

"We may conclude," declared Wright, "that Darwinism has not improperly been styled 'the Calvinistic interpretation of nature'."

This, I think, is why Wright drew the conclusion that special creationism was basically anti-scientific. Could you ever rest assured that nature is fully contingent? If we allow for special creation as an exception, maybe nature is partially contingent, which is not the same thing. On the contingency of nature, the Renaissance divines entertained no doubts at all, for they were fully persuaded that the Almighty had installed regularity and uniformity when He invented the world.

What Wright meant by the last part of his sentence, on "our proof of revelation," I think might be this. If special creationism were correct, then historical explanations in general would be in jeopardy, including those involving Christian belief and even the canon of Holy Writ. Perhaps historical documents of all sorts were specially created. He seemed to think that to throw doubt on Darwinian evolution was to doubt the veracity of God, and that is a rather strong position indeed. I do not want to put words in Wright's mouth, but only to suggest that a good way of grappling with these complex issues—why special creation is anti-scientific, and the differences between Darwinian evolution and special creationism—is to take account of those vibrant ideas that have come down to us from the Renaissance. But now I should get on with what we know Wright did say.

Evolution, like Christianity, argued Wright, must find agreement with the observed facts. A theologian certainly ought to be able to tackle Darwin's powerful stone-house metaphor which had baffled Gray, he thought, and so he tried his hand with a metaphor which likely occurred to him by what he could have watched any day at Oberlin. In 1882 (Darwin died that year, Gray in 1888) he devised a symbolic sawmill to show that, just as left-over wooden chips served many useful purposes, plant and animal variations may serve domestic uses while partaking in a comprehensive Providential design unknown to man (p 291, 335). Here, he was warming to his Calvinist interpretation of teleology.

Wright found he did not require any new theology to accommodate Darwinian evolution. Ordinary Calvinism would do. Believing that divine sovereignty "comprehends" all of nature, including man, he developed five ingenious analogies between Calvinism and Darwinian evolution (p 293-298). (1) Natural selection involves both the extinction and the origin of species; the catechism teaches man's fall and redemption. (2) Darwinism and Calvinism agree on the unity and common origin of mankind, the former requiring the inheritance of variations, the latter teaching that man's nature was foreshadowed in Adam. (3) Predestination and freewill cause perplexity for the Calvinist, and for the Christian Darwinian so does the consistency he sees of evolution with design in nature. (4) Darwinism and Calvinism are both hypotheses because each is founded on probable evidence. (5) Darwinism and Calvinism agree on the reign of law throughout nature—in the history of each God has acted by natural means. "We may conclude," declared Wright, "that Darwinism has not improperly been styled 'the Calvinistic interpretation of nature' " (p 295).

(to be concluded)

The creationists are to be praised for their desire to provide an alternative to a thoroughgoing atheistic, materialistic, naturalistic evolutionism. But recent-Earth creationism is not the only alternative to such evolutionism. ...We do not need the flight-from-reality science of creationsim. We need more of the vigorous approach to both nature and Scripture that we found in men of the nineteenth century like William Buckland, Hugh Miller, Thomas Chalmers, and John Fleming. May I plead with my brethren in Christ who are involved in the young-Earth movement to abandon the misleading writing they provide the Christian public.

Davis A. Young
Christianity and the Age of the Earth, Zondervan (1982), p. 163.

"Have Dominion": The Christian and Natural Resources

In recent years both Christians and non-Christians have become increasingly aware that natural resources, including our vital energy resources, are limited. And as serious as this fact is for ourselves and for our descendants, it is only part of our general environmental problem. Considerable discussion has, of course, been devoted to these issues, and theologians have added their views, but it seems clear that some fundamental parts of the problem either have not been recognized or have not been properly put together. Theological reflection on environmental issues has not emphasized sufficiently the unique insights that the Christian tradition can provide.

An adequate understanding of the development and nature of our scientific and technological society is a prerequisite for any serious attempt to deal with the complex problems that face us in connections with the environment and natural resources. We must recognize, then, that Christianity has been largely responsible for the advanced state of our science and technology, and thus for our wealth. But having done that, we must immediately recognize also that wealth has not been given to us merely for our own comfort or welfare. Like the Gospel itself, that gift has been given to us to be shared.

Modern science and technology are, in essential ways, products of the Judaeo-Christian tradition. It is no accident that scientific understanding and control of the world developed only in a culture informed by that tradition, for only there was a belief in the goodness of an independent creation combined with a firm insistence upon the rationality of the universe. The development of this understanding and control has had many consequences, one of which has been the *creation* of natural resources. Petroleum, bauxite, uranium and a long list of other materials that we now regard as essential *are* resources only for a technological society. If industrialized societies did not exist, oil would be of very limited value to any nation possessing it—and, if 8,000 feet underground, would be inaccessible and even unknown.

To talk about the superiority of western culture today will, of course, make many people unhappy—and rightly so. Such ideas have been horribly misused many times in recent centuries. But we cannot solve our problems by turning from the understanding of the world that the Christian tradition has given us. We should indeed repent for our abuses of power and for our unwillingness to see the good in other traditions, but we must not deny the intellectual tradition that has allowed the human race to conquer diseases and understand the stars. To pretend that Native American or oriental religions can provide as much insight into the structure of the universe as can Christianity is simply to swindle a world that needs to understand the universe in order to survive.

We will not misuse our power to the extent that we recognize that we are creatures, and not the Creator. God, in creating the universe, intended that petroleum and bauxite and uranium would be available to people, as part of His gift in creation. In the same way, the science and technology that allow us to find use for these materials are gifts, parts of the Christian understanding of the world that comes from God's outpouring of Himself in the Incarnation. Our superior understanding of the world *is* a gift, no more something we can boast of than of our created existence or the salvation Christ has wrought. The superiority is God's.

God does not give us gifts to be used only for ourselves. The Gospel is given to us, not simply so that we may assure ourselves of our salvation, but so that we may proclaim salvation to the world. And the ability to understand and control the world is to be used for all people of the world, whether or not they have adequate intellectual or material resources. Our possession of superior understanding does not license us to exploit the rest of the world in order to maintain our standard of living. Instead, it lays upon us an obligation to share God's gifts with the world, even as the Word of God, Who is the source of our understanding, gave Himself for us, so that we might share in His life.

For as the climax of creation, God created humanity in His image, and the words "Let them have dominion over the fish of the sea, and over the birds of the air, and over the cattle, and over all the earth, and over every creeping thing that creeps upon the earth" (Gen.1:26) tell us something of what it means for us to have been created in God's image. Through their participation in the Word which gave rationality and understanding, human beings were made able to be God's representatives for the rule of creation. Through His saving work, the Word re-creates that image. It is only through the Word that we are able to "have dominion", and it is only by following the example of the Word in His self-emptying that we will act as God's representatives in the dominion which we exercise.

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Behaviorism and the New Worship Groups

Recent years have brought new interest in the informal, often small worship group experience. Not unlike Wesley's class meetings, such groups emphasize spontaneous praise, exhuberant fellowship, and quest for greater spiritual depth. Some feel that these groups will function as a precursor to widespread revival, much as the pietists preceded the Wesleyan revival and the American Great Awakening.

Many behaviors found in the new worship groups are amenable to behavioral analysis. Behaviorism provides insight into the factors underlying much of the unusual behavior found in such groups. Relationships discovered by scientific analysis do not necessarily undercut or minimize the spiritual significance to participants, or negate the spiritual reality of the experience.

The Holy Spirit and behavioral psychology do not belong to separate worlds; at least sometimes they reflect different levels of explanation for the same event (Bufford, 1981). Psychological factors cannot be excluded merely because the context of living has changed from private life to worship and fellowship. Not all that occurs in worship groups is supernatural, but rather can be subject to naturalistic study. Understanding behavioral influences aids both interested observers and participants in worship groups.

Prayer

Collective prayer is of central importance in nearly all worship groups. Prayer is often loud and lengthy, sometimes with many voices speaking simultaneously. Often confusing to visitors, prayer fully involves those participating, seen in the intense expressions and tears on individuals' faces. During prayer words and phrases are repeated many times, while hands may be raised, or there may be laying on of hands and singing.

During prayer, group identification develops, behaviorally understood as social reinforcement for participation in specific behaviors. The unspoken communication may be that similarity in worship behaviors is a sign of spirituality, which results in acceptance by the group. While not always the case—some groups allow unusual variations in modes of prayer—many groups expect conformity, which is followed by reinforcement.

Several forms of reinforcement can be observed. Responses, such as "Amen" and other such expressions are common. Affectionate touching often occurs during or after prayer. New members, through covert shaping, eventually produce sanctioned prayer behaviors, while existing members are intermittently reinforced for their frequent (but not too frequent) prayers, the length of which is determined by group norms.

In contrast, the individual who uses unusual phrases and words is likely to find that few Amens accompany his prayers, and sometimes he or she prays in silence. Subsequently, those prayers become less frequent, being subject to extinction. There is plenty of opportunity for modeling others who pray more consistently with the worship group's norms. The non-conformist or newcomer is also less likely to be met with expressions of affection after the prayer or at the conclusion of the meeting.

While this process is not always problematic in itself, it can become dysfunctional to genuine spirituality if the group is less than fully scriptural in its teaching, particularly if some minor doctrine is elevated unreasonably. Too often, conformity to prayer behaviors can cloud the importance of essential beliefs and balance in doctrines taught. Interpretation of the Bible can be influenced by the strong *esprit de corps,* sometimes to the neglect of the intellect. This helps explain why many cultic groups influence young people.

Prayer is powerful, but accompanying activities and contingencies are also powerful. Biblical injunctions to private prayer and meditation, combined with statements regarding the need for discernment, are healthy correlates to the group prayer experience. The individual who is aware of such influences is less likely to be unknowingly influenced by nonbiblical views. Conversely, the participant who is aware of those influences in prayer is more likely to use his or her responses to encourage more Christlike perspectives in other participants, while ignoring and thereby extinguishing undesirable statements regardless of accompanying mannerisms.

Feelings, Acceptance, Evangelism, and Elitism

Respondant conditioning also occurs in worship groups. Certain words and actions become associated with the pleasant feelings from group acceptance, while fears from ostracism are avoided. It may be that the raising of hands with palms upward, or a special tone of voice with positive feelings, are easily confused with spiritual experience.

There is, of course, nothing wrong with such behaviors, providing that the distinction between feelings and spirituality is maintained. Unfortunately, many individuals come to believe that such feelings are an expression of God's approval, regardless of the cognitive content of the experience or the meeting. Such feelings are as likely to be conditioned with non-Christian beliefs as with Christian beliefs, as a careful cross-cultural study of religions reveals.

Contingencies are often used to produce desirable consequences in groups, most notably acceptance of the individual. The focus upon "building up brothers and sisters" is often overlooked in the institutional church, and is an important contribution of the new worship groups. Acceptance and enthusiasm provide a cohesiveness not found elsewhere, and can contribute to the growth of Christians. Again, this may be contrasted with many churches where passiveness (i.e., sitting in pews) is reinforced.

Many of the new worship groups encourage personal evangelism by the membership. Those who witness are reinforced for sharing their faith by enthusiastic responses to testimonies, affirmation that increases the likelihood of similar behavior in the future. Such influences may be systematically used in a variety of contexts to encourage evangelism (Ratcliff, 1978, and Bufford, 1981). Associated skills, particularly assertiveness and use of the Bible, can also be learned by taking advantage of group contingencies.

A problem that sometimes develops in such groups is elitism among group members. This writer attended one group in which he noted one person who prayed louder and longer than others, with more accompanying physical behaviors than others. As was suspected, this individual was found to be the leader of the group. These extra actions may be understood to be dominance cues, implying hierarchical control. Such control is maintained by manipulating contingencies.

While the leader exerts an influence upon participants, the attender also influences the leader in many important ways. Vocal and behavior responses to statements are perhaps the most obvious form of influence, but also mere attendance (or non-attendance) is a contingency which influences the future behavior of the leader. Large numbers of persons attending a group reinforces the current behaviors of the leader (as well as the group), while non-attendance may help produce extinction. Ignoring or leaving may also help eliminate undesirable behavior. This also occurs in churches, where coming to special services may perpetuate and even increase the number of such services. Attending merely to "help others" is a poor rationale that can reinforce inferior preaching, which no one cares to hear.

Tongues and Healing

Two other behaviors are consistently found in many worship groups, which have components which can be understood through behavioral analysis. While not all speaking in tongues and healing may be the product of behavioral contingencies, many of these experiences can be thus described.

In many cases modeling is an important process in the development of tongues speaking. Individuals meet with others who believe in, teach, and practice tongues as a part of worship. Persons are nearly always acquainted with believers who speak in tongues, or at least read a book that mentions tongues, before they manifest the behavior. Through a systematic shaping procedure, speaking in tongues eventually occurs.

For example, the newcomer observes tongues followed by Amens and other forms of praise. These responses, although directed to God, also have a reinforcing effect upon the speaker. Modeling is thus enhanced through observation of such consequences. Praying and laying on hands become discriminative stimuli for such behavior to occur. The targeted individual ventures essentially random sounds (or sounds similar to what has been heard from others), which are reinforced socially. Gradually, more and more sounds are added to the behavior repertoire. Instructions to "let God come out" produce an unconscious vocalization, which is understood to be the gift of tongues.

In some cases, reports of healing are the consequence of behavioral influences, not unlike the contingencies producing speaking in tongues. Strong verbal reinforcement generally follows such reports, which makes similar testimonies more likely to occur. Since verbal reporting is not always an adequate indication of bodily functioning, the person may even be convinced of the healing. Combined with the illogic of "denying the symptoms" found in some groups, the illusion is strengthened. This is in contrast with Christ's teaching, which avoided false reporting of symptoms (even when healing was not complete, as in Mark 8:24), and who often healed persons without the social influence of a crowd.

Speaking in tongues and healing may not always be the product of behavioral conditioning. These experiences are described in the Bible as gifts which are supernatural in origin. However, it is probable that many such experiences in worship groups are the result of such influences. Further substantiating this view, linguistic anthropologist William Samarin (1972) states that in his broad sample of Pentecostal and Charismatic groups, he did not find any examples of genuine language in tongues speaking.

Demon Possession

Many worship groups emphasize teachings concerning demonic activity, particularly demon possession and use of exorcism. "Casting out demons" is frequent in some groups, even to the extent of a special service once each week for this purpose, as was observed in one group by this writer. While not denying the possibility of possession, particularly with persons who are involved with the occult, it is likely that much of what is considered demonic is actually the result of a complex mixture of shaping, modeling, and unintentional reinforcement.

As with speaking in tongues, most people usually observe the "casting out" experience before they find themselves "delivered." This observation provides as opportunity to model the behavior, as well as to observe the discriminative stimuli for the often bizarre mannerisms described as "demon expulsion." At some point, the individual becomes convinced that some problem or set of problems he or she has experienced is the product of demon possession, and begins to desire supposed exorcism.

Once a demon is "expelled," verbal reinforcement is given in the form of verbal praises and smiles by both the group and usually the participant. Testimonies help to solidify the learning, and within a short time such behavior becomes more likely.

While Satan is undoubtedly pleased with Christians acting like those he possesses, the screaming and erratic movements contradict the biblical statement, "For God hath not given us a spirit of fear, but of power, and of love, and of a *sound mind*" (II Tim. 1:7). Modern "exorcisms" produce the opposite consequence in far too many cases.

During the first century, demon possession may have been more common than it is today because of widespread involvement in the occult. Yet, taking the Bible as a whole, demon possession is rare, with almost no mention in the more than 4000 years covered in the Old Testament, and with only three instances following Pentecost. Counselors and pastors should be aware that individuals are not necessarily possessed merely because they say they are or act in a manner that might suggest demonic involvement.

Conclusion

Through the analysis of behavioral influences in worship groups, many characteristic behaviors can be better understood. As a result, those who participate may recognize the influences that can affect their behavior and decision-making. Spiritual development is then more likely to be based upon the wisdom and careful study so often enjoined in Proverbs, rather than mere group consensus.

Likewise, through behavioral perspectives, rigidity and dogmatism is less likely for the Christian. Legitimate variations in practice and belief, within the boundaries of biblical orthodoxy, are thereby less likely to be discouraged. Behavioral influences may be valuable in reaching biblical objectives, or may in other circumstances be dysfunctional to reaching such goals.

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Humanism, Morality, and the Meaning of Life: Some Clarifications

What do Catholic theologian Hans Kung, neo-orthodox theologian Emil Brunner, evangelical apologist Francis Schaeffer, Jewish theologian Martin Buber, analytic philosopher Richard Purtill and atheistic existentialist Jean-Paul Sartre all have in common? Each, along with numerous other theists and nontheists, has claimed that atheistic humanism in some sense leads to meaninglessness.

But what is the actual claim here? And is it true? The purpose of this paper is to analyze various interpretations of this contention. I shall conclude that, in its most apologetically significant sense(s), the claim that life in a godless world is meaningless is by no means a settled issue.

The basic argument for the "mcaninglessness" of humanism is summarized well by Sartre:

> The existentialist is strongly opposed to a certain kind of secular ethic (which says that) nothing will change if God does not exist, (that) we shall find ourselves with the same norms of honesty, progress, and humanism . . . The existentialist, on the contrary, thinks it is very distressing that God does not exist, because all possibility of finding values in a heaven of ideas disappears with him; there can no longer be an apriori Good, since there is no infinite and perfect consciousness to think it. Nowhere is it written that Good exists, that we must be honest, that we must not lie; because the fact is we are on a plane where there are only men. Indeed, everything is permissible if God does not exist and as a result man is forlorn, because neither within him or without does he find anything to cling to.[1]

This argument seems initially plausible to many, but both of Sartre's basic contentions are in need of further analysis. Is it true that if there is no God, there can be no absolute (objective) values?[2] That is, is it true that morality in a godless universe must be considered totally relative? And is it true that if there exist no absolute values, life for the atheist humanist can have no enduring sense of meaning?

Moral Relativism

When claiming that atheistic humanism "leads to" moral relativism, theists are not claiming that most humanists do not in fact believe any moral principles to be absolute. In fact, just the opposite is true. Following the lead of C. S. Lewis, many theists have wished to argue that one of the strongest rational arguments for God's existence can be built on the fact that certain basic moral principles are (and have been) universally affirmed.[3] The claim is rather that the atheistic humanist has no justifiable (rational) basis for maintaining that any moral principle is absolute.

One popular, initially plausible argument for this contention can be stated as follows.[4] In a godless universe, all moral principles have their basis in human thought. But if there is no God, human thought is either the result of deterministic electro-chemical processes in the brain—i.e., the result of mindless forces—or the result of an "indetermisitic" mental process that has its untimate evolutionary basis in the chance permutations of some basic, nonpersonal stuff. In short, if there is no God, all moral principles "come either from chance permutations of some basic stuff or from the working of mindless forces."[5] But surely there exists no *rational basis* for affirming that any moral principle which comes either from chance permutations or mindless forces is absolute. It follows, accordingly, that in a godless universe all moral principles must be considered relative.

The proponent of this argument is certainly correct on one point. If there is no God, human thought does have its *origin in* some basic stuff which is irrational. Does this necessarily mean, however, as the proponent of this argument goes on to imply, that all human thought in a godless world must, *itself,* be considered irrational? I believe not.

Our actions, especially our interpersonal activities, leave little doubt that most of us as humans share a common assumption: the belief that we are self-conscious beings who (a) become aware of certain "empirical" and "psychological" data; (b) analyze, categorize and identify relationships among such data; (c) make "decisions" and act on the basis of this shared assumption that we normally label ourselves the "rational animal." The relevant question, then, is whether an atheistic humanist can be rational in this sense.

Now, of course, it may be difficult to explain how "rational mind" could have evolved from impersonal, inert matter (assuming this is what the atheist humanist contends). But the fact that such humanists may have no adequate causal explanation for man's rational capacity does not mean that the concept of rational thought in a godless world is incoherent (self-contradictory). Moreover, and more importantly, there seems to be no necessity to conceive of evolved rational mind in terms of the traditional dualistic mind/body distinction. Many theists and nontheists alike are beginning to conceive of the human, not as a combination of mental and physical substances, but as a single substance with "mental" and "physical" attributes.[6] But once we stop thinking of the evolution of human reason as a progression from "matter" to "mind," the concept of rational thought in a godless world becomes somewhat less problematic. In short, I see no basis for denying that man *could* have the capacity to reason (in an acceptable sense of this term) in a godless universe.

There is, however, another popular argument for the relativity of nontheistic ethics that must be considered. If morality is solely the product of human thought, it is argued, then there can exist no justifiable basis for one human to claim that the standard of morality he affirms ought to be affirmed by all. Morality must of necessity be considered a purely subjective matter.

In response to this contention, well-known humanist Kai Nielsen argues that

> The nonexistence of God does not preclude the possibility of there being an objective standard on which to base (moral) judgments . . . There are good reasons, of a perfectly mundane sort, why we should have the institution of morality as we now have it . . . Morality has an objective rationale in complete independence of religion. Even if God is dead it does not really matter.[7]

But what is the "objective rationale" that is "independent of religion"? Such objectivity, Nielsen tells us, is founded on ethical statments such as "happiness is good" and "all persons should be treated fairly." Such statements are not only moral principles that most persons intuitively know to be true; they are principles which, if put into practice, are normally most advantageous for all involved.[8]

But suppose that it is pragmatically advantageous for an individual to treat other unfairly and he, therefore, does so. Or suppose that an individual does claim to have radically different moral intuitions. On what basis can such persons be judged morally wrong? Nielsen is aware of such difficulties. He admits that he cannot prove that happiness is good, arguing that he "can only appeal to your sense of psychological realism to persuade you to admit intellectually what in practice you acknowledge."[9] And he ad-

mits that he cannot prove that fairness is always the most advantageous principal to employ, but argues that "to be moral involves respecting (human) rights."[10] Or, as he phrases this point in his most recent discussion, unless such a priniple is affirmed, there can be "(no) understanding of the concept of morality, (no) understanding of what it is to take the moral point of view."[11]

Such reasoning is in one sense question-begging. Fundamental to his case is that we accept his "concept of morality" and "sense of psychological realism." But it is the objective validity of these very presuppositions that needs to be established. There is another sense, though, in which Nielsen's comments point the way to some helpful distinctions.

Nielsen is not defining "objectivity morality" in the manner it is usually defined by theists. For most theists, absolute (objective) moral principles are *a priori* statements that are true for all persons at all times in all places. For Nielsen, absolute moral principles are basically *a posteriori* statements which ought, on the basis of rational considerations, to be *presently* affirmed by humanity (or some relevant subset thereof). Thus, while most theists see "Thou shalt not kill" as a timeless truth that is affirmed by, but not founded on, human reasoning, Nielsen sees this moral principle as a truth that all individuals ought presently to affirm on the basis of rational thought.

But if this is all that atheistic humanists such as Nielsen mean when they claim to affirm an objective ethic, it might be argued that their ethical perspective is really quite relative—relative to the obvious variations in human thought and the amount of relevant empirical data being considered. In one sense, this is true. If moral principles are solely the product of human thought, then a certain amount of this type of relativity must be granted. But this fact alone does not mean that the atheistic humanist cannot affirm objective morality in a meaningful sense. If, given man's present thought patterns and common experiences, there do exist good reasons why humanity as a whole ought at present affirm certain moral principles, then morality is not *totally* relative to the beliefs or attitudes of each individual or group of individuals.

However, if there is no God—no omniscient, omnipotent moral guardian—why ought an individual always act in accordance with those principles which he believes to be most appropriate (morally acceptable) for mankind? Why, for example, should the atheistic humanist who believes that there are good reasons for humanity to affirm that lying is wrong not lie in those specific situations in which he believes it will be to his personal advantage to do so, even if he cannot give a rational justification for such "selective disobedience"? This is indeed a good question, one which rightly causes atheistic humanism some discomfort. But it is not strictly relevant. We are currently concerned with the question of whether the humanist has a rational basis for affirming objective moral norms. The question of whether the humanist can rationally justify total compliance with such norms is a related, but separate, issue. In fact, the latter question only arises if an affirmative answer to the former is assumed.[12]

Someone will surely argue at this point that to base morality on common elements in man's experience (or actions) is to confuse factual and moral issues—i.e., is to deduce unjustifiably that people ought to affirm certain moral norms solely from the descriptive truth that such norms are in fact affirmed. Nielsen is quick to respond to this charge.

> We cannot deduce that people ought to do something from the discovering that they do it or seek it; nor can we conclude from the proposition that a being exists whom people call God that we ought to do whatever that being commands. In both cases we unjustifiably pass from a factual premise to a moral conclusion. Moral statements are not factual statements about what people seek or avoid, or about what a deity commands. But we do justify moral claims by an appeal to factual claims, and there is a close connection between what human beings desire on reflection and what they deem to be good.[13]

It seems to me that Nielsen is correct on two counts. One need only read William Frankena's rigorous discussions on the basis for objective morality to see that neither the theist nor nontheists can directly deduce an "ought" from an "is."[14] And Nielsen is also correct in arguing that both theistic and nontheistic moral systems justify moral claims by appealing to factual statements—e.g., statements concerning the nature of God, shared human experiences or shared moral intuitions. Unfortunately, theists have not always recognized that they stand on equal footing with nontheists at this point. This fact, of course, in no way entails that nontheists do possess an objective moral standard. But a proper understanding of the common relationship between factual and moral statements in both theistic and nontheistic world-views might well cause the critic of atheistic humanism to reassess his beliefs concerning the source and nature of objective moral principles.

We must conclude then, I believe, that atheistic humanism does not necessarily entail moral relativism. It may well be that nontheistic ethical norms must be to some extent relative, and it may be that atheistic humanism offers little motivation for consistent compliance with such norms. But to establish the total relativity of nontheistic ethics, it must be demonstrated that there exists no rational basis for humanity (all rational individuals) to affirm any given moral norm, and this, I do not believe has been (or can be) done.

Meaning of Life

Let us assume for the sake of argument, however, that there can be no absolute values in a godless world. Does it then follow that life can have no true meaning for the atheistic humanist?

The claim that a state of affairs is meaningless can have at least three distinct basic readings. From a strictly logical perspective, a state of affairs is meaningless if, and only if, it is incoherent (a self-contradictory concept). Given this reading, for example, while it is false to claim either that the moon is made of green cheese or that one has drawn a square circle, only the latter is a meaningless statement.

From a "metaphysical" perspective, a state of affairs is meaningless if it has no ultimate purpose in relation to the whole of which it is a part. This appears to be the intent in statements such as, "I know that taking liberal arts courses is enjoyable, but given the increasingly technological nature of our society, humanities degrees are becoming increasingly less meaningful," and "It is commendable for Americans to eat less meat, but given the true extent and nature of the world hunger problem, this sort of activity is not really very meaningful."

Finally, a state of affairs is sometimes said to be meaningless for a person if it brings him or her very little or no sense of personal fulfillment or satisfaction. This appears to be the intent in statements such as, "I never knew a relationship could be so meaningful," and "That was a meaningless discussion."

Which reading does the theist have in mind when he claims that moral relativism leads to meaninglessness? Most argue at the very least that there can exist no metaphysical meaning in a godless world—i.e., that the atheistic humanist can affirm no ultimate, a

priori purpose for the universe as a whole. Kung, for example, argues that "by denying God, man decides against an ultimate reason, support, and ultimate end of reality."[15] This reading, however, has limited apologetical significance. Although it may be that some (or even most) nontheists need to be reminded of the ultimately irrational nature of a godless universe, we have seen that thoughtful atheistic humanists readily acknowledge this fact.

Many theists also wish to argue that, once the atheistic humanist realizes that there exists no metaphysical meaning in a godless world, he will no longer experience any personal meaning. Kung, for example, is also quite sympathetic to this contention.

> If he becomes aware of it, the atheist is also exposed quite personally to the danger of an ultimate abandonment, menace and decay, resulting in doubt, fear, even despair. All this is true of course only if atheism is quite serious and not an intellectual pose, snobbish caprice or thoughtless superficiality.[16]

Moreover, it appears to be this sense of meaninglessness which atheistic humanists such as Nielsen see the theistic critic in question utilizing.

> When (moral relativity is) conceded, theologians are in a position to press home a powerful apologetic point: When we become keenly aware. . .that life does not have a meaning which is to be found, but that we human beings must by our deliberate decisions give it whatever meaning it has, we will (as Satre so well understood) undergo estrangement and despair. . .without God there can be no one overarching purpose; no one basic scheme of human existence in virtue of which we could find a meaning for our grubby lives. . .there are no purely human purposes ultimately worth striving for.[17]

However for the theist to attack atheistic humanism in this manner is problematic on two counts. First, although it may be the case that many humanists who recognize that there exists no metaphysical meaning in a godless universe experience a loss of personal meaning, this is certainly not the case for all such humanists—e.g., Nielsen. Of course, one might believe personally that humanists such as Nielsen aren't experiencing meaninglessness in this sense because they are guilty of "snobbish caprice or thoughtless superficiality" but it is difficult to see how such a charge could be established in a non question-begging manner.

Moreover, and more importantly, a descriptive "head counting" approach to the question of meaning in a godless universe cannot, but its very nature, be of much apologetical value. How a given humanist does (or would) in fact respond to the belief that he lives in a universe with totally relative human values is, of course, relevant to the existential adequacy of humanism for such a humanist. But the claim that most (or all honest) atheistic humanists do (or would) in fact respond to a "relative" universe in a despairing manner is much too subjective to function as the basis for a strong rational (logical) argument against the adequacy of atheistic humanism, itself.

The significant apologetical question is whether such humanists *can* justifiably affirm an enduring sense of personal meaning. Or, stated somewhat more formally, the crucial apologetical issue is whether a humanistic world-view which attempts to affirm both totally relative values and the possibility of enduring personal meaning is a coherent (logically meaningful) conception of reality.

It is difficult, however, to see how the critic of atheistic humanism can presently resolve this issue in his favor. Since there appears at present to be no widespread scientific (psychological, physiological) support for the claim that a belief in an objective value system is a necessary condition for experiencing what we normally labeled "personal meaning," it seems that the critic in question must either (a) continue to base his case on the weight of human testimony or (b) attempt to demonstrate a logically necessary connection between the concept of personal meaning and the concept of metaphysical meaning. I have already argued, however, that "head counting" is too subjective and inexact to function adequately in this context. And (b) must, in the absense of objective (scientific) defining characteristics for the concept of personal meaning, be considered question-begging, since it is difficult to see how a logical connection between the two concepts in question could be demonstrated without assuming initially that some necessary connection existed and explicating the relevant terms on the basis of this assumption.

Summary

In closing, it is important that I clarify what has and has not been argued. I have not attempted to argue that if "God is dead," it really makes no difference. I personally believe that to embrace consistently and fully a nontheistic world-view requires a radical reworking of the traditional concepts of morality and personal meaning. Moral absolutes (in the a priori, timeless sense of the term) can no longer exist, and personal meaning can no longer be tied to such ultimate cosmic values. Moreover, it seems to me that it is important and justifiable to make certain that atheistic humanists understand these facts.

What has been challenged are the claims that such humanists *must* espouse a totally relativistic ethic and that, given total relativism, they *cannot* justifiably affirm an enduring sense of personal meaning. Much more convincing, objective argumentation is necessary, I have argued, before these apologeticaly crucial claims can be affirmed.

[1]Jean-Paul Sartre, "The Humanism of Existentialism," *Philosophy: A Literary and Conceptual Approach,* edited by Burton Porter (New York: Harcourt Brace Jovanovich, Inc., 1974), pp. 70-71.

[2]Since there appears at present to be no generally accepted distinction between 'objective moral principle' and 'absolute moral principle', both terms will be used interchangeably as synonyms for 'nonrelative moral principle'. We will see later, however, that the theistic critic of humanism defines all three of these terms in a more restrictive sense than do many humanists.

[3]See, for example Hans Kung, *On Being a Christian* (Garden City, New York: Doubleday and Company, Inc., 1976), pp. 73-79 or Richard Purtill, *Reason to Believe* (Grand Rapids, Michigan: Wm. B. Eerdmans), pp. 91-98.

[4]Purtill, pp. 96, 98.

[5]See, for example, Richard Bube, "The Significance of Being Human," *Journal of the American Scientific Affiliation* 31 (March, 1979), pp. 37-43.

[6]Kai Nielsen, "History of Ethics," *Encyclopedia of Philosophy,* vol. 3 (New York: Macmillan Publishing Co., Inc., 1967), p. 108; *Ethics Without God* (London: Pemberton Books, 1973), p. 63.

[7]Nielsen, *Ethics,* pp. 48-64.

[8]Nielsen, *Ethics,* p. 56.

[9]Nielsen, *Ethics,* p. 62.

[10]Kai Nielsen, "On Religion and the Grounds of Moral Belief," *Religious Humanism* (Winter, 1977), pp. 33-34.

[11]Purtill, for one, fails to make this distinction.

[12]Nielsen, *Ethics,* p. 56.

[13]William Frankena, "Is Morality Logically Dependent on Religion?" *Religion and Morality,* edited by Gene Outka and John P. Reeder, Jr. (Garden City, New York: Anchor Books, 1973), pp. 295-317.

[14]Kung, p. 75.

[15]Kung, p. 75.

[16]Nielsen, *Ethics,* pp. 48-49.

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Creation vs. Evolution: The Ultimate Issue

The argument of this Communication is that the ultimate issue in the debate between scientific creationism and evolutionism is neither scientific nor practical in nature. Rather, it is epistemological and, in the nature of the case, theological. As such, the debate can be effectively carried on only within a philosophical context that considers the entire matter with respect to its overall presuppositions, implications, and applications, both to the field of science and education. After some brief remarks concerning the more obvious issues in this debate: the scientific integrity of creationism and the movement to establish it in public schools, we address ourselves more specifically to the theological veracity of creationism and the epistemological necessities that derive from it.

Scientific Integrity of Creationism

Thus far the public side of the debate between scientific creationists and their evolutionary counterparts has centered on the scientific integrity of creationism and the legitimacy of its being established in public schools as a normal curricular offering. These points are naturally involved with one another. Creationists contend that scientific creationism, considered from a purely scientific standpoint, has as much and as cogent evidence to commend itself to the scientific mind as the evolutionary system currently in general acceptance. Therefore, goes the argument, scientific creationism ought to be constituted alongside evolution as an aspect of school curricula.

Evolutionists, arguing from an entrenched position of strength, maintain that the "facts" presented by creationists require a theistic commitment for their interpretation, since just as many, if not more "facts" may be presented in support of their own perspective. Creationism is a religious conviction, and to implement such a perspective in public schools would be a violation of the tradition of church/state separation.

This line of argument forces creationists to deny the religious nature of their convictions and to insist all the more fervently on the purely scientific strength of their case. This usually involves the sponsoring of debates featuring noted scientists from both sides, and the marshalling of creationist scientists as witnesses at hearings and trials on the constitutionality of introducing scientific creationism into public schools. The debate then atrophies into a contest of experts, with the courts and the public left to judge the merits of the case of either side, based on the credentials of the participants and the strength of their arguments.

To argue from this "purely scientific" approach represents a serious contradiction of the creationist cause. Any scientific system claiming a creationist cosmology as foundational necessarily involves the idea of a Creator who stands behind and over the universe as we encounter it. This assumption is not tangential to the creationist cause, despite disclaimers to the contrary. Rather, as evolutionists are quick to point out, the matter of a God and, therefore, of religious convictions of some sort, is very much a part of the warp and woof of creationism. To insist otherwise is to carry the debate into the evolutionist court, where the strength of history and scientific opinion is virtually certain to carry the day for evolution, backed by the church/state argument, regardless of how tenuous that theory may appear to creationists.

On the practical side, to augur for the introduction of scientific creationism into public schools by means of legislative or judicial decree involves another contradiction of creationist convictions. Such an approach tacitly grants the right of the state to determine the parameters of education for all the children of the land. It recognizes the state's claim to be the pedagogical authority and makes all the children its wards, at least in this foundational area of orientation and preparation for life. Students of Scripture, the final authority for evangelicals in all matters of faith and life, will search in vain to find such a commission given to governments, as many Christian educators have consistently argued.[1] It is rather the church and the home—and schools deriving from them, as indeed American public schools were in the beginning—that have been given this responsibility. As a strictly practical consideration, therefore, it would seem that creationists would be better-advised to focus their efforts on equipping these biblically-recognized agents of educational responsibility to instruct the children of believers in the creationist perspective to the maximum possible degree.

Thus, the most intense activity on the part of creationists to create an audience for their views has been in arenas in which they not only compromise their basic convictions but virtually guarantee the futility of their efforts in courts and legislatures whose rational abilities are governed by their own evolutionary and church/state convictions. But, in a more fundamental sense, such an approach avoids confronting the ultimate epistemological and theological matters that are, finally, the real issue in this debate.

Veracity of Special Creation

For creationists, therefore, the first question to be addressed concerns the biblical and theological veracity of special creation, the first principle of scientific creationism. If this is indeed the teaching of Scripture—and we shall, for the sake of argument, express the belief that it is—then this conviction must be allowed to guide all our scientific activity and educational concerns. If we are willing to compromise on the necessity of divine creation *as that is explicitly spelled out in the Bible,* then we will finally have no leg to stand on when it comes to arguing the rest of our case. If, on the other hand, we are willing boldly to assert this conviction as critical to our creationist cosmology, and on the basis of Scripture alone apart from scientific evidence, then we will have charted a course for consistency and truth in our every endeavor. We dare not detach ourselves from the biblical statements on cosmic origins merely for the sake of preserving the "scientific integrity" of our cosmology. We must assert that special creation is so not because the evidence demands that verdict but because the Bible clearly teaches it. On such a basis we will be able to marshall the effective epistemological weaponry with which to enter the debate against evolutionists.

Consistent exegesis of the pertinent texts reveals that the Scriptures set forth special creation as that cosmogony which best describes the origins of our universe. No exhaustive exposition can be offered here. Instead we mention here only two exegetical indicators that seem to point in the direction of special creation. These are the use of the Hebrew word *bara* throughout Genesis 1 and 2 and in other passages related to cosmic origins, and the necessity of thinking in terms of the creative periods, "days", as being very close in resemblance, if not identical, to the twenty-four hour periods with which we are familiar.

In the Hebrew Old Testament no less than eighteen different verb forms are employed to convey the idea of "making" or "creating." Each of these has subtle shades of usage which make it particularly apt for each context in which one or another of these verbs appears. Thus, to make a house is *banah,* to build, while to make a clay vessel is *yatsar.* Each of these, along with all the other verbs and their various forms, while suggesting a basic idea of making one substance out of others, carries peculiar nuances of suggestion relative to the maker, the materials involved, the product which results, and so forth.

When we come to *bara,* we expect that the same principles of peculiarity will obtain. This verb appears in various forms 54 times in the Old Testament. A careful study of each context reveals some interesting generalities which, in turn, shed light on the particular usage of this verb throughout Genesis 1 and 2.

In the first place, almost half (26) of the times *bara* appears it is used in reference to the events of the creation period. This is by far and away a greater usage to describe the origins of the cosmos than the next closest verb form, *ahsah.* and, while *ahsah* is a more common form and can be used to mean "to create," the writers of the Old Testament seem more concerned to limit its usage to the description of the *products* of *bara* activity and to the making of articles out of existing substances through a process of work and refinement. The suggestion is, therefore, that the use of *bara* to describe creative activity had a *special connotation* of situation and events in the minds of the writers of the Old Testament.

This suggestion of a special connotation—a special creation, if you will—involving the use of *bara* is strengthened by the fact that of the 54 appearances of *bara* in the Old Testament 48 of them have God as the subject (the six not involving God as subject are not translatable by English equivalents of "to create" or "to make" but seem rather to suggest the idea of marking something off for a special purpose). Thus, it is suggested that *bara,* a word used primarily to describe the events of the creation period, is meant to imply an activity of bringing something into being that is strictly a divine prerogative. Only God can create in the special sense of *bara.*

In considering the creation events that this word is used to describe, therefore, there is very good reason for thinking in terms of a *special* situation, a *unique* creative period that required a uniquely divine work. Thus, when we talk of "special creation", we need not limit ourselves to a process involving the normally observable laws of science, as a theistic evolutionist might wish to hold. Indeed, the evidence seems strongly to recommend an "unnatural" series of events, a special creation.

When we come to the word for "day" (Hebrew, *yom*), a similar scrutiny is required. The word *yom* has a variety of meanings suggesting duration of time. Among these are the normal 24-hour period, the life of an individual, or a generation or more. How can we know what Moses meant to suggest in Genesis 1? The attempt to arrive at a conclusion favoring a 24-hour day is exacerbated by the appearance of the sun and moon as measures thereof only later in the creation week. Yet, since we are dealing with a special, divine creative effort, we need not rule out the 24 hour period. What is impossible with men is not so with God.

If Moses had meant to imply a long period of time, and if he had meant to leave that clearly ascertainable for subsequent generations, would he have chosen the word *yom*? Were there other words at his disposal which would have been more effective at leading us to think in terms of epochs or ages instead of days when it comes to the creation events?

The answer is yes. Had Moses wished us to think in terms of long periods of years involved in the creation week he could have used the word *cheled.* The word is old enough for Moses (it appears in Job 17:14) and clear enough to convey a long duration of time (cf. Psalm 39:5 where the NIV translates it "span of years"). Yet Moses chose to bypass this term in favor of *yom.* What did he mean to convey?

By using the analogy of Scripture, whereby we allow the Bible itself to be its own best commentator, we can arrive at a conclusion to this matter. In Exodus 20:8-11 God Himself is speaking to Moses concerning the law of the Sabbath. He says men are to work six days (*yomim*) and rest on the seventh day (*yom*). The reason He gives for this commandment is because such an arrangement will recall to the minds of God's people His special creation and, hence, who is their Creator, the Provider of their work and the Object of their rest. God says, "For in six days (*yomim*) the Lord made the heavens and the earth, the sea, and all that is in them, but He rested on the seventh day (*yom*). This is God's reasoning for blessing the seventh day (*yom*) as one of rest. Either God was deliberately confusing the whole matter or He was very clear in what He meant to convey. In the light of God's illimitable power to do all things—even those that are greater than we could ask or think—it seems more consistent to accept the evidence for a special creation encompassing a six-day period than to expect that God, if He did create at all, could only have done so through natural processes over great periods of time. Such a conviction requires eyes of faith, without which it is impossible to please God. To compromise on this point is to open ourselves up to a charge of inconsistency in our basic organizing principles and to the ultimate destruction of our biblical approach through some vain longing for "scientific respectability".

The Ultimate Issue

Taking the evidence for special creation at face value, based on a commitment to the reliability of Scripture, we are now prepared to address the ultimate issue in the debate between creationism and evolution.

Accepting an unclouded biblical basis for scientific activity, a basis that includes a special creation as we have argued, we are prepared to approach the evolutionist in a manner sufficiently perspicuous and consistent to provide a cogent defense for our scientific thinking. With the matter of cosmogony resolved, and with a commitment to cosmic origins that is derived by faith in the Word of God, we present ourselves as unashamedly standing on a purely revelational foundation for our position. We are saying, in effect, that God has spoken and has revealed His truth to us in a propositional manner that allows us to have *absolute,* if *incomplete,* insight into the composition and purpose of the universe of which we are a part. We are saying that *we can know truth* and, knowing we can perform operations on and in the universe that will yield predictable results. The point is that, within a biblical worldview, *we can have certainty of knowledge* in scientific activi-

ty and logical thought. Since we resist the temptation to "naturalize" even the most fundamental truths about the cosmos, we are prepared to be guided by God's statements about the purpose of that cosmos and its proper use regardless of what it is discussing and without the need of adapting these things to make them palatable to finite human understandings. Our absolute confidence in God's absolute revelation allows us a large measure of consistency in the whole realm of scientific knowledge.

The precise point to make here is that this is a claim which the evolutionist *simply cannot make.* His basic presuppositions not only are inconsistent, but many of them are, in fact, "borrowed" from the Christian worldview. And when he is exposed as standing on such an unstable foundation, the evolutionist is vulnerable to embarrassment in the critical area of epistemology and all the implications deriving from it.

The evolutionist maintains, purely on the basis of faith—as evolutionists Robert Jastrow, B. F. Skinner, and others have pointed out[2]—that the universe as we find it evolved out of a condition of chaos through an orderly process of orderly development characterized by change in the direction of progress. The governing principle for this evolutionary process has been and is chance, a sort of cosmic whim that intervenes into history effecting unique circumstances and/or events that advance the orderly progress of the cosmos. Chance is both unknowable and unpredictable; yet it is the best explanation the evolutionist can offer for cosmic development.

Chance, however, being what it is, cannot be relied upon and, indeed, should be viewed as the enemy, not a building block, of science. For if chance, pure chance, reigns supreme in the universe, hovering over the evolutionary process, poised to strike at a time and in a manner that cannot be predicted in advance, then we cannot be *absolutely certain* about any of the results of our scientific activity. We cannot know with certainty what the product of any chance intervention might be. What might have been yesterday need not be so tomorrow in the kingdom of chance.

Thus, in an evolutionary framework, we can speak only of *truth for the moment,* of a universe of ultimate uncertainty and constant change in which, on the basis of our presuppositions, scientific activity would be scarcely conceivable and all existence would be reduced to one of fear and survival.

Yet the evolutionist acts as though he does, in fact, know with certainty. He speaks of "laws" of science, of the predictability of experimentation, of progress and the like. In so doing he actually denies that he believes in the ultimacy of chance. Yet he holds on to chance as a basic assumption of cosmic evolution, at least at the philosophical level.

In short, if he is perfectly consistent in following all his presuppositions, the evolutionist has nothing to say and nothing to offer science or human betterment.[3] And if he does purport to speak with certainty and to work for the betterment of mankind through

science, he denies his own basic assumptions and borrows truth from the Christian, who is perfectly at home in an orderly, predictable universe where knowledge in some absolute form can be discovered. The evolutionist shows the fundamental instability of his own cosmology and asserts fundamental reliability of the biblical cosmology in every aspect of his scientific activity. He will never admit this, however, and may seek to avoid the conclusion by qualifying such terms as "chance," "absolute," and so forth; but he cannot avoid the radical inconsistency between his views and his labors except by final reference to his own personal authority.

It is here that the Christian must "go for the throat." By seeking to obviate the practical difficulties of creationism in an insistence upon its scientific integrity apart from faith and the Scriptures, as some creationists have done, the Christian cuts himself off from the only rock of certainty that can give authority, consistency and veracity to his work in any area of life. When, on the other hand, he stands squarely on that truth and challenges the evolutionist to explain why, on the one hand, he *denies* it (at the level of philosophy of science) and, on the other, *depends* upon it (in the practical search for order and meaning in the universe), the Christian succeeds in leaving the evolutionist without an excuse and with an unpaid balance due of indebtedness to the bank of Christian truth. It is only such epistemological toughmindedness that can ultimately serve to dismantle the evolutionary monolith and reassert the necessary biblical foundations for knowledge and science in any area.

The scientific creationist is to be commended for his bold assertion of the biblical cosmology *vis à vis* the dominant evolutionary paradigm. Yet he must remain consistent in his every effort to establish creationism as a revolutionary explanation of the origin and nature of the cosmos. The Christian community, which seeks a biblical foundation for every other aspect of its life, will be satisfied with nothing less than a biblical basis for this endeavor as well. The evolutionary camp, on the other hand, which has succeeded so marvelously through reason and science alone to further its worldview, will only be deterred and finally interrupted when that same weight of Scripture is brought to bear against it in the realms of epistemology and consistent procedure.

[1]Cf. DeJong, Norman, *Education in the Truth* (Nutley, JF: Presbyterian and Reformed Publishing Company, 1969); Rushdoony, R. J., *Intellectual Schizophrenia* (Philadelphia: Presbyterian and Reformed Publishing Company, 1973); Moore, T. M., *The Education of Our Children: Whose Task?* (Memphis: Christian Studies Center, 1979).

[2]Jastrow, Robert, *Until the Sun Dies* (New York: W. W. Norton and Company, 1977), pp. 62, 63; Skinner, B. F., *About Behaviorism* (New York: Alfred A. Knopf, 1974), p. 232.

[3]No one has argued this point more effectively than Cornelius Van Til. Cf. *Apologetics* (class syllabus), pp. 63, 64 and the following remarks:

> On the assumptions of the natural man logic is a timeless impersonal principle, as factuality is controlled by chance. It is by means of universal timeless principles of logic that the natural man must, on his assumptions, seek to make intelligible assertions about the world of reality or chance. But this cannot be done without falling into self-contradiction. About chance no manner of assertion can be made. In its very idea it is the irrational. And how are rational assertions to be made about the irrational? If they are to be made then it must be because the irrational is itself wholly reduced to the rational. (Ibid., pp. 81, 82)

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The Dangers of "Special Creationism" to Christian Faith

In my recent debate[1] with Dr. Duane Gish of the Institute for Creation Research, one of his charges against the scientific theory of evolution was that it is atheistic. In my rebuttal I stated that science is neither theistic nor atheistic; religion is simply not on its agenda.

Gish apparently did not agree with the main thesis in my opening statement: "The debate about creation and evolution is unfortunately involved in a confusion of the categories of worldviews and mechanistic explanations of how the world originated and developed. The biblical doctrine of creation and philosophical evolutionism are opposing worldviews. The scientific theory of evolution (referred to as evolution from here on) and special creationism are opposing mechanistic explanations. One could (many do, including me) accept the creation worldview and evolution as scientific mechanism at the same time without conflict. We must avoid the extremes of insisting that science somehow demands us to accept only evolutionism as a worldview and that Christian faith in the Creator somehow demands us to accept only *fiat* creationism as a mechanistic explanation."

Responsible scientists should accept evolution at least as a working model for correlating biological data. As a result of this debate I am now firmly convinced that a scientist who accepts creationism as a mechanistic explanation is being irresponsible or unscientific, for creationism cannot be falsified and therefore is unacceptable as scientific theory. Evolution is the only, or at least by far the best, scientific theory to account for origins.

Contrary to the claim of special creationists, evolution is not a threat to my Christian faith, because no scientific theory has anything to say about values such as meaning, purpose, love, beauty, goodness, or evil. Nor can science be any threat to my personal relationship with Jesus Christ.

On the other hand, I used to see no problem if Christians accepted creationism, since naivete in matters of scientific understanding does not make one any less of a Christian. However, I now recognize a number of dangers to Christian faith that creationism poses.

(1) Creationism demands belief in a particular interpretation of Genesis to the exclusion of others. This belief has the danger of basing faith in a personal God and Jesus Christ on this mechanistic interpretation. Belief in special creationism thus can become almost a prerequisite for faith in Jesus Christ. This rigid position raises an unnecessary stumbling block for most people educated in the sciences.

(2) Creationism ignores and obscures the essential message of God in the biblical doctrine of creation. Special creationists seldom, if ever, mention these biblical teachings: God created the universe freely and separately, with a beginning and with a temporal existence which He alone gives it. Everything created is intrinsically good. The universe and everything in it depends moment-by-moment upon the sustaining power and creative activity of a Providential God. We are not the end-products of meaningless processes in an impersonal universe, but persons made in the image of a personal God. The God who loves us is also the God who created us and all things; this establishes the relationship between the God of our faith and the God of physical reality. We can therefore trust in the reality of a physical and moral structure to the universe, which we can explore as scientists and experience as persons. God creates life with physical matter and through natural

processes.[2]

(3) Creationism is a poor interpretation of the creation accounts in the Genesis text. There are unsolved inconsistencies, unanswered questions, and problems with a literal interpretation, e.g., the appearance of highly developed terrestrial vegetation on the third day before the creation of the sun and moon, the appearance of birds before terrestrial "creeping things," the appearance of great sea monsters before the beasts of the earth and cattle (mammals implied), and the quite different sequence of Genesis chapter 2 compared with chapter 1. Henry Morris has listed 25 inconsistencies between the geological column and the order of creation in his literal interpretation of Genesis.[3] Examples of unanswered questions include: Who are the daughters of the sons of earth which the sons of Adam took for their wives) Didn't these unions pollute the human gene pool with nonhuman genes?

(4) Creationism is bad theology. The "Omphalos"[4] argument that the earth and the universe merely appear old and were created with this appearance, or that the sediments with apparently old fossils were placed in that order by the Creator makes God a malicious and willful deciever. Special creationists also have effectively a Deistic view of God as the "Watchmaker" who created the world at one time and is allowing it to literally run down and dissipate back into chaos, according to their interpretation of the second law of thermodynamics. The danger is that Deism leaves no room for the biblical view of an immanent, personal God Who provides for, maintains, and continually upholds everything in the universe. Special creationism thus ignores the biblical doctrine of Providence and replaces it with Deism, an unchristian view of God.

For these reasons special creationism should be rejected: its dangers to personal, biblical Christian faith, and its role as a pseudo-scientific threat to science education.

[1]September 28, 1981, at San Diego State University; first debate with Duane Gish was February, 1978, sponsored by Fuller Theological Seminary, Pasadena, CA.

[2]Albert, Jerry D., "A Biochemical View of Life," *Journal of the American Scientific Affiliation,* 29, p. 81, 1977.

[3]Cloud, Preston, "Scientific Creationism—A New Inquisition Brewing?" *The Humanist,* p. 9, January/February 1977.

[4]Price, Robert, "The Return of the Navel, the "Omphalos" Argument," in *Contemporary Creationism, CREATION/EVOLUTION,* Issue II, p. 26, Fall 1980.

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VALUE/MORAL EDUCATION: SCHOOLS AND TEACHERS by Thomas C. Hennessy, S.J., ed., New York: Paulist Press, 1979, pp. 253.

With the publication of Kohlberg's work on moral development and, some would say, with the present societal realities, such as increase in public/legal crimes, dishonesty in high offices, and tendencies toward racism, there has been a revival of interest in understanding moral problems, moral judgments, and moral acts. Such an interest has resulted in a number of books published dealing with some aspects of morality/moral problems. *Value/Moral Education: Schools and Teachers* is another book of such a kind. Kohlberg's work is presented and elaborated on and used as a basis on which to develop practical pieces of advice on, ". . . methods of imparting moral and value education at different levels of schooling . . ." (p. 4).

The entire collection of essays may be divided into three major sections: I. Moral Education at the Elementary School Level, at the High School Level, and at the College Level; II. Ideas of Kohlberg, Piaget, and Adler on Moral Development, and III. The Inadequacies of Teacher Education in Matters of Moral Development and An Interview with Kohlberg. In the first section, "Moral Education at the College Level" describes the development of Fordham's interdisciplinary program on Values. Its Freshman Program is ". . . broadbased and sometimes indirect in its approach to value questions" (p. 87) while the Junior Program is direct and explicit. It " . . . discusses precise problems involved in decision-making in areas of ethical, moral and value choices and exemplifies these issues by consideration of one or several specific problems" (p. 88). This is an interesting attempt. The chapter dealing with moral problems in high school is an exhortative and testimonial

type of writing. The author admits that his sociological and psychological interpretations of these problems may be limited. "They are," he said, "offered merely as food for thought to those who take a serious interest in the moral development of youth" (p. 69). Practical applications are offered to teachers and parents regarding moral development problems at the elementary school level.

The essays in Section II are primarily expositions of the ideas of Kohlberg, Piaget, and Adler, and contain nothing that has not already been said in other places. The chapter on Piaget is, however, interesting not because of what the author says about Piaget but because he takes Roger and his indirect approach to counselling to task: "It is attractive since the responsibility for the sessions and for all decisions was clearly that of the client (while the counsellor is absolved of responsibility for them)" (p. 145). In contrast, counselling orientation that flows from Kohlberg's theory encourages the counsellor to ". . . model a position but does not attempt to prescribe it . . ." (p. 149). In the author's view, this is right: "If counsellors refuse to be 'directive' in any sense, clients will go elsewhere and receive the direction they seek. Many of the clients will not go to the clergy for direction but will go to charlatans of various kinds" (p. 147).

The chapter on "Moral and Cognitive Development for Teachers: A Neglected Arena" presents summaries of results of researches on teaching and arrives at one conclusion: "(There is no) adequate conception of the goals of teacher education as well as a system of instruction to achieve these goals" (p. 122). The author quotes Dean J. Goodlad, UCLA: "(Teacher education programmes) must be revamped from top to bottom" (p. 122) and goes on to present his view on cognitive-moral development of teacher education. He claims that results of some experiments connected with this view of teacher education show promise and good results. I hope so.

Perhaps the major puzzle regarding teacher education is the refusal of those responsible for its development to admit the complexities of teaching activities. Having to do necessarily with transmission of knowledge which is by nature critical, teaching is one of the most complex, if not taxing, activities that a human being can engage in, as he entices another human being to enter along with him into the world of human knowledge/activities. Instead what teacher education, more correctly, teacher training, does is to render the teaching acts into discrete competencies, providing teachers with modules, survival kits for the classroom, and teaching skills (strictly speaking, there are none). No wonder researches (mentioned in the chapter) show that these skills are not sufficient to handle teaching tasks in the classroom. What teachers need is a broad educational scholarship that enables them to grasp the social, historical, and philosophical dimensions of their tasks and not merely the continuous refinement of limited classroom procedural operations.

To those of us who admit with a bit of grief that knowledge of the good does not automatically lead to the doing of the good, Kohlberg, in the interview, expresses a ray of optimism:

> The moral and value conflicts of our current history are producing two widely different results. Some people are so confused by the intricacies of the problems that they are perhaps refusing the challenge and not thinking through the issues; they remain at the Preconventional level of moral thinking. But on the other hand, the same moral and value conflicts resonate profitably in many others, helping them to move beyond Conventional moral levels to Principled thinking (p. 242)

For the Christian, however, nothing short of one's necessary dependency upon God, the Holy Spirit, enables him to do the good.

Reviewed by Evelina Orteza y Miranda, Department of Educational Policy and Administrative Studies, The University of Calgary, Calgary, Alberta, Canada.

COMMUNITY AND GROWTH by Jean Vanier, Paulist Press, New York, 1979, xii & 214 pages, $6.95 (paperback).

The community Vanier writes so eloquently about is a reality growing numbers of Americans appear to be fleeing. In the United States, more people live with a gun they trust than with a spouse. Many are afraid to be on the street after dark; instead they hunker down behind locked doors and pulled shades with televised company.

This reviewer's only criticism of the book is that it reads like a stream of consciousness. I could imagine Vanier in the chair across from me discoursing on the various dimensions of community. The potential for boredom and repetition is great and occasionally the author actualizes one or the other. But my overall evaluation is that *Community and Growth* is a superb book well worth reading.

The community of which Vanier writes is not the married one nor the purely civil one. He is the founder of L'Arche, a community open to the married and single, the handicapped as well as others. All who enter must be willing to share their lives and grow together into the fulness of their own personalities. L'Arche has no mission beyond being a place where people can be human together.

For that reason, Vanier's homely wisdom will strike different responsive chords, depending on the experience and background of the reader.

He warns of the dangers of wealthy communities where "we throw up barriers; perhaps we even hire a watchdog to defend our property." Poor people, he points out, have nothing to defend and often share the little they have. That's somewhat idealistic and certainly not the experience of the poor in Calcutta or Rochester. But Vanier later

balances this by pointing out that wealth generally means self-sufficiency, the absence of interdependence and its consequence, love. That does correspond to reality.

At a time when inflation and unemployment make more people than ever heard of Sartre agree with his cynical dictum "Hell is other people," it is good to read an author who is refreshed and fulfilled by others.

He reaffirms the value of the useless, either physically or mentally, because their sufferings give life to others. This is a Christian mystery confirmed in the cross but often denigrated in our throw-away culture. Vanier writes well of the quality of life but never sets it over the fact of life.

In the midst of a long list of gifts such as wonderment, diversity, animation, and availability, he includes the gift of grandmothers and the gift of the poor. He has not only read Paul's letter to the Corinthians but he has also lived and reflected upon it.

Vanier has written an illuminating commentary on the two greatest commandments. It is a book to read and enjoy.

Reviewed by William J. Sullivan, S.T.D., St. John Fisher College, Rochester, New York 14618.

SOLZHENITSYN: THE MORAL VISION by Edward E. Ericson, Grand Rapids: Wm. B. Eerdmans Publishing Co., 1980. xv + 239 pp. with foreword by Malcolm Muggeridge.

Edward Ericson has rendered a valuable service both to Solzhenitsyn aficionados and the general reading public in this excellent volume.

Aleksandr Solzhenitsyn burst on to the literary and world scene in the late '60's and early '70's, first with his brief novel on prison camp life, *One Day in the Life of Ivan Denisovich*, and, subsequently, with his massive expose of the Soviet terror/torture/prison network, *Gulag Archipelago*. His reception among Western readers and critics was, at first, uniformly positive. However, lately, and especially since his open identification with orthodox Christianity and application to the degenerate aspects of Western culture of those same moral principles with which he has scorched the Soviet system, he has become something of an enigma. He has been labelled a prophet, an angry man, and a political subversive by elements from all sides of that spectrum. Malcolm Muggeridge, however, may have come closest to the truth when, in an interview with William F. Buckley, he called Solzhenitsyn "the greatest man of the twentieth century."

What Ericson has done in this concise work is to summarize the literary career of Solzhenitsyn by reviewing the large majority of his corpus and emphasizing those themes which recur in each work. His argument is that Solzhenitsyn is primarily a literary, rather than political, figure with a vision that is overarchingly moral and not political.

The book begins with Ericson's statement of this theme:

> Solzhenitsyn writes, of course, of man in action in the cauldron of the twentieth-century world, a world on which politics impinges in an especially vital way, but always of moral man in action, always of man created in the image of God and thus endowed with moral responsibility toward others and for himself (p. 3).

The second chapter is an exegesis of Solzhenitsyn's 1970 Nobel lecture in which this theme is elaborated in the

Books Received and Available for Review

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

Alexander, J.W., ed., *Confessing Christ as Lord: the Urbana 1981 Compendium*, InterVarsity Press

Anderson, J. Kerby, *Genetic Engineering*, Zondervan

Cahn, S.M. and Shatz, D., *Contemporary Philosophy of Religion*, Oxford

Conway, J., et al., *Your Family*, InterVarsity Press

Dillow, J.C., *The Waters Above: Earth's Pre-Flood Vapor Canopy*, Moody Press

Durham, Charles, *Temptation: Help for Struggling Christians*, InterVarsity Press

Dreyfus, R., *Hostage to Khomeini*, Franklin House

Eller V., *The Language of Canaan and the Grammar of Feminism*, Eerdmans

Green, M., *The Day Death Died: Did Jesus Christ Really Rise From the Dead*, InterVarsity Press

Hoffman, J., *With Wandering Steps and Slow*, InterVarsity Press

Grunlan, S.A. and Relmer, M., eds., *Christian Perspectives on Sociology*, Zondervan

McCrossen, V.A., *The Two Loves: Mary Magdalene and Judas Iscariot*, Philosophical Library

Miller, C., *The Philippian Fragment*, InterVarsity Press

Nebelsik, H., *Theology and Science in Mutual Modification*, Oxford

Ohlrich, C., *The Suffering God*, InterVarsity Press

Peterson, E.H., *Traveling Light: Reflections on the Free Life*, InterVarsity Press

Shelly, J.A., *The Spiritual Needs of Children*, InterVarsity Press

Skillen, J.W., *Confessing Christ and Doing Politics*, Assoc. for Public Justice

Solomon, C.R., *Handbook to Happiness: A Guide to Victorious Living and Effective Counseling*, Tyndale

Squiers, E.R., ed., *The Environmental Crisis: the Ethical Dilemma*, AuSable Trails

Torrance, T.F., *Christian Theology and Scientific Culture*, Oxford

Wagner, C.P., *Church Growth and the Whole Gospel*, Harper & Row

White, J., *The Masks of Melancholy*, InterVarsity Press

Worthington, E.L., *When Someone Asks for Help: A Practical Guide to Counseling*, InterVarsity Press

Yamamoto, J.I., *Beyond Buddhism: A Basic Introduction to the Buddhist Tradition*, InterVarsity Press

writer's own words. The emphases in this lecture point the direction for the reviews which are to follow. They are twofold: (1) man is a moral creature and functions properly only in a responsible relationship to God and his fellow man; (2) each man is responsible to develop a global consciousness—both concerning himself and his community—by which he can chart the course of morally responsible action for his own life.

The remaining chapters of the book are reviews of the Solzhenitsyn corpus from his early poetry up to and including *Gulag* and some lesser political writings. Ericson continually points out Solzhenitsyn's concerns to express the humanness of man, to identify those political and cultural (even physiological in *Cancer Ward*) circumstances which threaten that humanness, and to emphasize the need for each individual to discover his uniqueness and to assert it at all costs and against all odds. In each case the author gives an excellent summary of plot and theme, pointing out the distinctives, excellencies, and shortcomings of the work in question, but especially focusing on its development of the overall Solzhenitsyn vision. Certain recent works—such as *The Mortal Danger*, which would have been included in Ericson's section on Solzhenitsyn's political works—are omitted, doubtless due to their unavailability at the time of writing.

I have said that Ericson's book renders a double service. On the one hand it will be valuable to readers of Solzhenitsyn as a guide to his literary corpus and a means of sorting through the often difficult arrangements and themes of his work. On the other hand it will serve to clarify the burden of this great man for readers whose attitudes toward Solzhenitsyn are being formed as much by the Western press as by any real first-hand exposure to his work. Ericson's book is a balanced and welcome addition to Solzhenitsyn studies and to studies in Christian literature in general.

Reviewed by T.M. Moore, President, National Institute of Biblical Studies, Pompano Beach, Florida.

GROTIUS UNIVERSE: DIVINE LAW AND A QUEST FOR HARMONY by William Vasilio Sotirovich, New York, Vantage Press (1978) 101 pp., $5.95.

Hugo Grotius is the founder of international law, a famous Dutch theologian and lawyer. He created a new international ethic and redefined the theory of natural law, that is, laws governing man's moral actions. He wrote more than three centuries ago but author Sotirovich shows how Grotius has influenced the laws of today.

Perfect order is the result of God's presence; disorder the result of the freedom of man. "The existence of the universal church meant the constant presence of Christ, and, therefore, the immanence of God in the world." A prince, accepting God as his Supreme Sovereign, would rule a commonwealth in which mankind would enjoy order and harmony. Biblical passages serve as the final authority for human actions. No system of law could exist without God.

Grotius argues for the existence of God. "By following the chain of causation, we are bound to arrive at a self-existent cause." He gives examples from "the heavenly constellations, the motion of the stars and of the planets, the geometrical figure of the earth, and the structure of the human body." But natural theology did not fully reveal the truth about God; this was done through the supernatural revelation of God in Christ. "God neither does nor suffers miracles to be done without a reason," which were performed by Christ "to give credit to the doctrine." "Grotius used various scientific arguments to prove the possibility of resurrection, even according to scientific laws." Faith and reason were supported by historical evidence.

"He considered wars as an evil imposed by necessity, and discussed the problem of war in order to regulate its conduct." "The state which is the transgressor transgresses the law of nations." "Holy Writ should serve as the basis for settling controversies between nations." "Grotius suggested the creation of alliances, leagues, and confederations," so author Sotirovich concludes, "Grotius must be regarded as one of the chief expounders of the basic ideals that are contained in documents like the League of Nations Covenant, the United Nations Charter, and the United Nations Declaration of Human Rights."

"There are three main justifiable causes for war: defense from injury, reparation for injury inflicted, and punishment of the culprit." "The two basic unjust causes of war are expendiency and fear." Grotius disapproved of captial punishment, killing of captives, hostages, women and children and people engaged in preserving peace: priests, monks, novices, men of letters and workers on the land including merchants and artisans. He condemned looting and destruction of enemy territory, changing local customs and granted the right of the conquered to practice their ancestral religion. To Grotius, animal and human sacrifices were a contradiction of the true law of nature. "Jewish practices were not a part of the Divine law. They were the invention of men."

At first all things were given in common to men. Later, need for private property appeared, but "Divine justice demanded that nations supply the needs of one another and that they regard the products of one region as the products native to all nations." "The oceans and the winds were given free." Man was entrusted with the guardianship of the earth. Maintaining that God's laws were superior to the human laws, Grotius writes, "if the authorities issue any order that is contrary to the law of nature or to the commandments of God, the order should not be carried out."

Author Sotirovich has taught in the California and New York State school systems and worked for the American Bar Association, the city of New York and the National Council of Churches.

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

THE BIG BANG by Joseph Silk, W.H. Freeman and Co., San Francisco, 1979. Paperback, 394 pp, $9.00

"The greatest achievement of modern cosmology is the Big Bang theory" is the judgment of the author, a professor at the University of California, Berkeley. He has produced a well organized and well written, fascinating scenario (his own word) about the aftermath of an explosion that is supposed to have ocurred 20 billion years ago in an infinitely dense collection of radiation and neutrinos (including a few protons, neutrons, and electrons). Any two points of this observable universe were initially arbitrarily close together—a mathematical singularity. The author regards the Planck time of 10^{-43} sec. as "the moment of creation of the universe."

He reviews critically a vast amount of pertinent information with particular emphasis upon recent research, including current controversial issues; he analyzes possible observational tests and alternative theories. He gives reasons for his own preferences and occasionally admits that some phenomena are "mysteries." He humanizes his technical account with quotations at the head of each chapter (unfortunately no references are given, so that the reader cannot judge if they are out of context) and with photographs of some distinguished astronomers (a physicist cannot overlook his giving the wrong year for Newton's death). He notes gracefully, "I am indebted in spirit to George Gamow." I fear that he also imitates my former colleague, who rarely bothered about the quantitative discrepancies between his imaginative, qualitative ideas and actual data. The author is apparently satisfied at time with a "crudest outline," with "very roughly" agreeing, that "this is a fact more or less observable."

The 18 chapters, each with an excellent transitional concluding paragraph, exhibit the unity of his approach. The format is exceptionally helpful. Technical terms are italicized and listed for easy reference in a glossary; the explanations are descriptive, but not always definitive. Supporting reasons are lucid and detailed. Concise explanations are repeated with each figure. (Unfortunately some basic physical terms are accepted without comment as everyday commonplaces. A physics teacher might question a general reader's understanding of concepts such as mass, momentum, energy, pure energy, centrifugal force, exclusion principle of quantum mechanics, etc. A physics student might be confused by statements such as "potential energy is the kinetic energy of motion. . .," "gravitational stresses were capable of tearing apart the vacuum," "radiation density was equal to mass [matter?] density," etc. A chemistry student might be bothered by the notion of the "burning of helium.") The publisher boasts that the book has been written for the non-specialist" and claims that it is "an ideal introduction to cosmology for any reader." I am personally of the opinion that the actual comprehension of a person will be critically dependent upon his understanding of physics. The inquiring mind is invited to explore deeper through an appendix of "Mathematical Notes." "For Future Reading" general references are listed; regrettably, specific references are given only as credits for some of the figures.

The author regards his approach to cosmology as being "conservative," and therefore, his own "preference for the simplest tenable cosmology." He feels that "understanding the early evolution of galaxies lies in our grasp." He claims that "practically all known astronomical phenomena can be understood in the context of the Big Bang cosmology." And yet, throughout his presentation one soon becomes aware of the frequent use of qualifying words.

The publisher's advertisement claims, "Scientists are now finally able to describe the origin and evolution of the universe with some degree of certainty." The author, however, states, "We must reluctantly admit that the Big Bang theory is not a complete theory." "Without an empirical measurement of evolution, cosmological argument cannot carry a great deal of certainty." "We lack the ability to perform precise experiments under carefully controlled conditions in the cosmic laboratory." (Of course, astronomy is essentially an observational science rather than an experimental one like physics.) The author specifies the major lacuna of the theory: it "has not yet resolved three fundamental issues—what happens prior to the initial instant, the nature of the singularity itself, and the origin of the galaxies." Nevertheless, much of the author's *ad hoc* reasoning is apparently guided by his predilection for the theory. For example, he claims without evidence, "Our theory of the protosolar nebula suggests that the formation of the solar system is unlikely to have been a unique event in the history of the galaxy." We soon forget enthusiastic failures of the past (cf. E. Whittaker's "A History of the Theories of Aether and Electricity"). We are easily beguiled by "the fairy tales of science."

The foreword by Dennis Sciama of Oxford University and the University of Texas states clearly the underlying objective of the author: "It is arguable that the most important scientific discovery ever made is that the whole universe—everything that exists—is amenable to rational inquiry by the methods of physics and astronomy." The author himself believes "the whole universe—everything that exists—is also subject to evolution." It is unfortunate that astronomers have appropriated the biologists' restricted concept to apply generally to all celestial pro-

cesses. The term itself is ambiguous in that it seems to imply some entelechy. The author is addicted to its use; he includes it in the book's subtitle, "The Creation and Evolution of the Universe." It encourages him to treat the origin of life, even of "intelligent life," as casual incidents—even though significant scientific gaps still remain between the inanimate and the animate. He is impelled even to conclude, "One is tempted to speculate that life does not seem to be unique to the terrestrial environment."

The use of the term "Creation" in the subtitle is even more misleading; for the initial state is taken as given and agnosticism is admitted as to its source. What is more, man's spiritual life is completely ignored. The author early boasts, "The scientific approach to cosmology is readily distinguished from the mystical or religious viewpoint—science seeks to explain the universe in terms of observable and measurable phenomena." (Not all scientists would agree on the necessity of measurement in science.) Obviously there is no place for any god in his scheme of things. He delights that "we are children of the stars;" he sees no need for any *pater noster.*

Regardless of the validity of any evolutionary process, which would still be possible in a spiritual universe, I find myself happier with the thought, "In the beginning God."

Reviewed by Raymond S. Seeger, National Science Foundation (ret.), Washington, D.C.

GOD HAS SPOKEN by James I. Packer, Inter-Varsity Press, Downers Grove, Illinois, 1979, $3.95.

When God begins to deal with us on a personal level it can be a staggering experience. For God has spoken and we can hear His words addressed to us in verbal messages in the Scriptures. If this shakes us up, the realization that God has taken the initiative to reveal Himself in this way in order to make friends with us is even more staggering. We will, if we are honest, confess to being uncomfortable with these concepts until we allow ourselves the privilege of being found by Him. This is possible since we bear His image and can respond to the Holy Spirit who bears witness to us of the truth of God's written words as it reveals His offer of salvation and friendship through Jesus Christ and His work on our behalf.

The author makes no apology for calling us back to the Scriptures for he contends with cogent reasoning that God opened the lines of communication. This was accomplished without reliance upon subjective impressions but rather with definite, overt divine activity which was verbal in form and cumulative in content.

Packer finds very adequate support for his position that God took the initiative in opening and maintaining communication with us, citing Hebrews 1:1f. This statement establishes in straight forward language that God finds us, shares His secrets with us, shows Himself to us, speaks to us so personally that we must listen and respond with a firm purpose to obey. We join with Abraham, Moses, Joseph, Samuel, David, the later prophets, John, Peter, Paul and a host of others in a joint tutorial, learning by observing His dealings with them and applying to ourselves the careful criticism, the direction and the encouragement He gave to them. Only in this way can we become godly persons, responding to God's offer of friendship in repentance, faith and discipleship. Jesus said it very simply, "You are my friends if you do what I tell you to do," (John 15:14) not laying down the basis of sterile reconciliation but of a vibrant friendship which God always desires to bring to full flower.

Unfortunately, God's call to friendship can be muted to an inaudible whisper unless we come to the place of recognizing that the truth in any matter can be discerned only by our careful attention to revelation in Scripture. Jesus illustrated the force of this spiritual principle when he conversed with Cleopas and his unnamed friend on the road to Emmaus, reiterating all that Moses and the later prophets had said concerning him, explaining to them the things concerning himself in all the Scriptures. He did this, we might add, after gently chiding them for being foolish and slow to believe "all that the prophets had spoken." Their response was, I'm sure, more than a case of distressing spiritual heart-burn but one which included intense joy at witnessing the culmination of many prophetic revelations in Christ's testimony to them. It has always been this way. Time spent in hearing God's word to us, exercising our spirit and conscience, is always productive if we concede Scripture's prior authority.

On the other hand the temptation to stand above the Scriptures always results in a lack of certainty regarding the great issues of Christian faith and conduct. Packer makes a strong case in support of his premise that where uncertainty flourishes we can assume it is due to standing under divine judgement. He cites the prophecy found in Amos 8:11 f. as giving broad support to this contention. It surely appears that in spite of unprecedented study and reading of the Bible by both scholars and lay people in recent years, we can no longer find any consensus as to what to make of what we have studied and read. We are "abandoned to spiritual barrenness, hunger and discontent as the result of losing the conviction that what Scripture says, God says." This position of abandonment is forced on us when we accept the loss of identity between Scripture and God's revelation to us.

While devoting considerable space to dealing with the reasons for the "strange silence of the Bible in the Church today," Packer never loses sight of his stated aim: to prepare the minds of thinking, Christian people to get into

serious reading and study of the Bible, not so much for enjoyment but for the "joy of finding God's way, God's grace and God's fellowship through the Bible—a joy which only His own true disciples know."

It is the conviction of this reviewer, a scientist rather than a theologian, that I test the reality of my Christianity at the personal and practical level.

The systematic development of the subject of Dr. Packers book has given me a solid assist in this endeavour. I appreciate very much this latest evidence of his ability to write convincingly to readers who come from a variety of disciplines.

Reviewed by DeVere Gallup, Houghton, New York.

THE DANCING WU LI MASTERS: *An Overview of the New Physics,* by Gary Zukav, New York, William Morrow & Co., 1979, 352pp. (with index).

Despite its somewhat unlikely title, *The Dancing Wu Li Masters* is must reading for the non-physicist who is interested in the current state of affairs in physics and for the physicist who is interested in the philosophical implications of that physics. The book resembles Robert March's *Physics for Poets* (McGraw Hill, 1970) particularly in its lack of mathematics and in its chatty sometimes humorous style. Zukav is, however, more sophisticated both because he focuses on contemporary physics and because he emphasizes the philosophical implications of this physics. While Zukav is not himself a physicist, an advantage perhaps in this book, his very close collaboration with five physicists makes the physics credible.

The book consists of twelve chapters which are independent of one another except that they are divided into five groups: (1) an introduction which previews differences between classical and contemporary physics, (2) an excellent introduction to Quantum Mechanics, (3) a survey of both Special and General Relativity, (4) a discussion of the subatomic "zoo", and (5) an attempt to draw out some of the more interesting philosophical implications of Quantum Mechanics for an emerging new view of reality, including the breakdown of the distribution principle in application to quantum transitions and the apparent need to deny local causality.

Among the book's many strengths are its humor, effective use of diagrams and illustrations (e.g., Schrödinger's cat (108), Terrell's illustration of contraction (164), the elevator *gedanken* (185)), extensive reference to relevant experiments and experimenters, and the fact that Zukav addresses the most complex current issues in physics without hesitation or circumvention of the thorny problems they create. Among these issues are the problem of wave function collapse, virtual particle exchange accounts of electromagnetic and strong force interactions, and the currently very significant issue of how to interpret the results of distant correlation experiments in the light of conflicting predictions by quantum mechanics and the Bell inequality.

If the book has weaknesses, they are at least interesting and controversial. First, Zukav pushes the analogy between the new physics and Eastern mysticism too far. This affects not only the format (all chapters are confusingly numbered, "chapter one"), but, more importantly, the content. The connection to Eastern religion is often forced and gives the impression of being tacked on. These comparisons are often either unintelligible or just irrelevant.

Secondly, there are a few places where Zukav's attempt to provide clear and simple explanations backfires. This occurs when he uses lattice theory to explain quantum mechanical transitions (p. 228). More seriously, it occurs in his attempt to explain the Einstein-Podolsky-Rosen effect and the Clauser-Freedman experiment which provide the keys to his discussion of Bell's theorem in the important last chapter.

Thirdly, Zukav could be both more clear and more careful in making what seems to be the most mportant point of the book; that the world is not the way it appears. In the important final chapter he discusses the conflict between the predictions of Quantum Mechanics and those of Bell's Inequality in the light of distant correlation experiments (e.g., Clauser-Freedman, and Aspect). But, he does not adequately explain the Einstein-Podolsky-Rosen *gedanken* or tie it to Bell's theorem, and he does not spell out the five options to the conflict of predictions until the diagram (p. 320) which comes only as a summary.

Furthermore, he could be more cautious in discussing the options available. Four of the options interpret theories realistically and one instrumentally.

1. In the first half of the final chapter (p. 305) as well as in chapters 2 and 4 Zukav seems inclined toward instrumentalism and even says that most physicists take this view (note p. 321). But perhaps because the realistic alternatives are both more interesting and more open to the connection with Eastern thought, Zukav seems to favor these alternatives too much and at times even suggests that *physics* requires them (p. 309). He should recognize the viability of instrumentalism and the compatibility of it with belief that there *is* a physical world independent of observers; something overlooked here (p. 305).

2. Among the four realistic options, one is Einstein's denial of the completeness of Quantum Mechanics. Zukav dismisses this option, citing *only* one experiment and concludes that this "proves" (306, 309, 314) that commonsense is mistaken about the world, that local causality fails, and that the world does not consist of events which are space-like disconnected. This is perhaps a bit too eager or

sensationalistic. Some mention of those experiments which provide opposite conclusions would have been appropriate (Holt *et. al.* [Harvard 1973] and Faraci *et. al.* [Catania 1974]).

3. Finally, among the remaining three options, all of which imply radical world views (faster-than-light communications, superdeterminism, or a branching into many alternative real worlds at every observation or wave function collapse), Zukav spends more time on the "superluminal transfer of negentropy," as he calls it, than on the others. One suspects that his desire to draw connections with Eastern thought are again the basis for this imbalance of attention. However, the implications of this option for telepathy or an organic metaphysics like that of Whitehead are certainly tantalizing. In short the book is readable, sophisticated, and stimulating.

Reviewed by James Mannoia, Westmont College, Santa Barbara, California.

GOD DID IT, BUT HOW? by Robert B. Fischer, Cal Media, P.O. Box 156, La Mirada, California 90637 (1981). 113 pp. Paperback. $4.00.

Robert Fischer has had a distinguished career as Dean of the School of Natural Sciences and mathematics and Professor of Chemistry at California State University, Dominguez Hills, California, and is currently Vice President for Academic Affairs at Biola College, Inc. He has an excellent grasp of both science and the Christian faith, and in these pages shares them in a manner understandable to the average reader. The book is particularly timely in treating many of the issues now of public concern in the interaction of scientific discoveries and the Christian position, particularly those involving creation and evolution.

The book consists of five chapters. Starting with a differentiation between "Who?" "What?" "How?" and "Why?" questions, Fischer goes on to emphasize the freedom of God in acting through human and natural means as well as in ways that are properly classified as supernatural, discusses problems and misunderstandings related to questions of origins and miracles, and finally summarizes the whole issue. Throughout Fischer emphasizes that the biblical God must be conceived of as being "big enough" not only to be able to work supernaturally in cases where natural mechanisms are absent, but also to be able to work in ways normally described as natural and even ordinary to achieve His sovereign purpose. He recognizes and points out that the common creation/evolution debate is often obscured by a confusion of categories between topics on the level of philosophy and topics on the level of science.

The only major shortcoming of the book is a total absence of references or acknowledged quotations. The remark in the "Purpose and General Thrust" introductory section to the effect that the material "is not now presented in any clear written form for consideration by average people," unnecessarily slights the considerable number of books written in the same vein as this one and with about the same level of difficulty, which are and have been available for the last 20 years if not longer.

A discussion leader capable of supplementing this book with a suitable reference list for additional reading can make excellent use of this book as a springboard for the discussion of the interaction between science and Christian faith.

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

When someone else writes a book you've been planning to write for years, it gets your attention. When that someone is Bob Fischer, a longtime friend and respected scientific colleague, your feelings are mixed—happiness that what has been percolating in your mind has finally been put to words. Envy, in a way, but also pride that he got it done before you did.

The title not only articulates the question, but also sets the background for the answer. One of the weaknesses of many discussions in the field of cosmogony is that presuppositions are not recognized or stated. Another is that discussants are seldom sure whether they are Deists or Theists. Fischer happily makes these distinctions clear, and ably defends Theistic presuppositions, showing how they apply in the study of the natural universe and in the study of the Bible. He uses pertinent examples from both science and human history to illustrate that from our Holy, Creating, Sustaining and Loving God comes the operating universe and the answer to the human dilemma within it.

I was somewhat distracted by loose editing—typos, the archaic use of the editorial third person, the involved and largely irrelevant introduction of ideas, the use of indefinities, and of too many misplaced "howevers." But these can all be easily revised in future printings.

Though limited in scope, this book is a provocative contribution to the Bible-Science field in the Ramm tradition. It deserves the attention of serious students for years to come.

Reviewed by J. Frank Cassel, Zoology Department, North Dakota State University, Fargo, North Dakota 58105.

A marvelous little book. If carefully read it will enable a sincere layman to ask truly meaningful questions about the relationship between science and the Christian faith without getting hopelessly tangled due to innappropriate mixing of concepts that belong to quite different levels of conceptual understanding (i.e., comparing science to the Bible rather than to theology or asking a *who* question when the context is more appropriate for a *how* question).

Indeed the author's central thesis is that a major cause of

conflict between the scientific and religious communities was and still is due to concepts appropriate to one level of understanding (i.e., philosophy or theology) being wrongly applied to questions that properly belong in the conceptual framework of another level of understanding (i.e., science).

The book has many excellent features. Particularly useful are the careful definitions given to key words that occur in dialogue between science and Judaic-Christian religion; the definitions carefully take into account the relevant biblical and/or scientific contexts where the words are actually used. Words defined in this way include God, science, scientism, natural, supernatural, inspiration, hypothesis, theory, lay, incarnation, day, create, make, form, miracle, presupposition, paradigm, world-view, and faith. Using these definitions the author nicely develops the basic tenets of Christian theism, pointing out that God is both creator and sustainer of the entire universe including His unique creation, man. He is transcendent to the realm of nature and he is also immanent within it; therefore events that, on the one hand, can be described as natural and/or human activity can equally well be described as originating and continually being sustained by the sovereign will of God.

In the concluding chapter of the book the author states some basic presuppositions that members of the scientific community tacitly indwell (Polanyi's terminology) as they pursue their scientific work. He also lists some basic presuppositions tacitly held by members of the theological community and then points out that these sets of presuppositions from the two different fields are analogous to one another. The author's discussion would be strengthened if he had pointed out that the basic presuppositions of science listed: nature is real, orderly or rational, and understandable (in part) are all derivable consequences of the character of the biblical God. The God of the Bible, the creator and sustainer of the universe, is fully rational and therefore is completely trustworthy and dependable.

Science was born in a culture that first believed in God's dependability in the moral realm and then felt it natural to look for God's dependability in the physical realm. Science, from this viewpoint, can be looked upon as the successful exploitation by man, made in the creator-God's image, of God's rational faithfulness in creating and continually sustaining the physical universe. Also it would be helpful if a fourth basic presupposition were added to both lists, scientific and theological. Scientists tacitly act as if the universe is contingent, that is, nature must be experimented with in order to discover its laws for they could be otherwise; i.e., physical laws cannot be derived from *a prioir* necessitarian reasoning. This presupposition is a natural consequence of the analogous theological presupposition that the creator-God is free in all that He does.

The book has one serious fault. Each chapter should have a list of references so that a serious layman (say a high school teacher) could find detailed documentation for the material presented in the book. This is particularly important if the book is to be used in a school setting. As an example, the book very nicely (and correctly in my opinoin) summarized the strengths and weaknesses of the theory of biological evolution, but the interested reader has no documentation to refer to if he or she wants to check the validity of the author's statements or wants to pursue one strength or weakness in more detail.

If chapter references are provided (either by a supplementary bibliography or in a second edition of the book) I would consider the book very useful for college courses concerned with the integration of science and the Judaeo-Christian faith. The book would also be quite suitable for use in adult public school courses on the science/religion interface as well as church school classes (Sunday School).

Hoping that a second edition includes chapter references I highly recommend this book particularly to laypeople attempting to reconcile their Christian faith with science. The author's approach will help them avoid many mistaken notions that currently are causing much unnecessary and fruitless controversy between advocates of scientific and religious perspectives, i.e., the teaching of both evolution and *fiat* creation as scientific theories in the public schools. The book would also be valuable to scientists who are open to the possiblity that the Judaeo-Christian religion is not an enemy of science but rather provides a complementary way of understanding human experience with respect to this complex yet magnificently ordered universe.

I noticed recently that a college bookstore at a major institute of science and technology was selling magazines on astrology; science seen as a rational endeavor appears to be losing its appeal even to possible future scientists and engineers. Scientists concerned about this trend should be encouraged to find, as this books points, out, that the Judaeo-Christian religion is an ally of all rational activity. Indeed the book gently reminds the scientist that he, as a man, is made in the creator-God's image and is therefore called upon to the best of his ability to seek truth by rational exploration of nature, God's creation, and as a good steward to provide leadership in seeing that this hard-earned knowledge is used responsibly for the benefit of all God's creation.

The book concludes with the interesting and very helpful suggestion that many controversies between science and religion come about because human beings tend to limit God unduly in their thinking. If heeded, this viewpoint can do much to restore a truly meaningful dialogue between the scientific and religious communities.

Reviewed by W. Jim Neidhardt, Physics Department, New Jersey Institute of Technology, Newark, New Jersey 07102

THE CASE FOR LIBERAL CHRISTIANITY by Donald E. Miller, San Francisco: Harper and Row, 1981, 160 pg., $8.95

This is the first major volume by a well known sociologist of religion at the University of Southern California. It is his attempt to make a literate statement relating his own religious pilgrimage to his sociological understanding. For those who know him, it is a stirring witness to the strong integrity of his faith and his commitment to the social sciences. He states that the volume is directed toward three audiences: those who have dropped out of the Christian church thinking the Christian faith intellectually indefensible; those seeking meaning and purpose but who have not yet found an adequate path to trod; and those religious educators seeking a context within which to nurture Christian identity among their students. I think he speaks to those of us who have maintained our Christian identities through the exigencies of religious experiences, life enigmas, and graduate education. To us he speaks in terms that lucidly clarify what we have always believed but only halteringly affirmed, namely, that there is mystery we cannot comprehend, a community that claims us, and a truth that is real in spite of its cultural embodiment. I, for one, could not put this book down. It spoke to my own struggle and said for me what I have not been able to say for myself.

Miller's prime contention is that action in community is the way to reclaim faith. Rationality did not, and will not, lead him, or others, back to the faith. Experience will. But it is a certain type of experience that Miller affirms. It is not contentless mysticism or conventional conversion that provides the missing conviction. It is ritual and participation. Miller writes poignantly of his decision to become a part of a local Christian community (in this case a nearby Episcopal Church) during the time that he was seeking to recapture the vitality of the Christian faith in which he had been reared. More interestingly, he decided that he would participate regularly in that act which was least defensible from a rational point of view, namely the Holy Communion. Further, he decided to repeat the creeds even when he did not fully comprehend their meaning and in spite of having no sure way to prove them. All of this behavior began to make sense to him in social scientific terms. He believed strongly in the social construction of reality and in the importance of world view for identity formation. He experienced his sociology come alive in his own life. He reports that now he worships regularly and sincerely without any need to question the creeds or to explain the Eucharist or to prove the truth of the Christ event. He accepts and participates — with an informed sociological understanding of his behavior.

The book is divided into three sections which evolve from the basic confessional statement noted above. The first section is entitled "Commitment beyond Belief" and includes discussions of the issue of truth embodied in human forms such as creeds and communities, the nature of faith as "troubled" (meaning unproven but necessary) commitment, and a statement of what concerns such a "liberal" Christian should have. The second section is entitled "Constructing Identity" and includes discussions of Christian life style, the moral importance of worship, countering contemporary culture through spiritual discipline, how community functions, the nature of Christian education and going beyond moral impotence. The last section is entitled "Christian Identity in Contemporary Society" and includes discussions of therapeutic morality, secularization, and theology.

The second section might be understood as practical while the third section is theoretical. Those educated Christians (Kierkegaard's cultured despisers) who have abandoned the church and who prefer to make social comment will find little to cheer about in the practical discussion of what it means to have "faith" in Miller's second section. Here he reaffirms his confidence that truth is grounded in social reality and that the social reality in which Christian truth is true is that of the Christian church. He further asserts that worship implies ethics. Life style and commitment are important issues for him and bystander investment will not suffice.

The third section is a comment on individualism, tribalism, secularization, noninvolvement, and theological imperialism. Humanistic psychologists who too easily equate individual fulfillment with Christian salvation will not be happy with his critique. Secular Christians, be they blandly accepting or sophisticatedly critical, will not find solace in his call for keen insight into how culture obviates values. Finally, his not so gentle critique of theological obscurantism will not be welcomed by those who separate religion from faith. He notes that this is an artificial and arbitrary distinction which simply isolates theologians and calls for mutual dialogue between the social sciences and theology.

All in all, this is a valuable volume. As I stated before, I found myself identifying with the author's pilgrimage. Perhaps the book would have been stronger had he retained a personal stance throughout—even in the last section. At times the verve of the early confessional material was missing. Nevertheless, the comment is invaluable and the volume is commended to all those who would care to read a committed comment from a faithing intellectual that is slightly different from that of the more orthodox tomes so current today.

Reviewed by H. Newton Malony, Professor of Psychology, Graduate School of Psychology, Fuller Theological Seminary, Pasadena, California

Letters

Superficiality of Theological Analysis

I am deeply disturbed by the superficiality of theological analysis in D. Gareth Jones' article, "Abortion: An Exercise in Biomedical Ethics" (*Journal ASA*, March 1982). Admittedly, Professor Jones is not a theologian; but if he attemps to analyze the "Biblical Principles" concerning the abortion issue, he has the clear responsibility to research the subject so as to avoid misleading his readership. Specifically, Jones' argument that Exodus 21:22-25 "explicitly distinguishes the killing of a fetus from murder, on the ground that the fetus is not equivalent to an adult human life," has been exploded by the best classical and contemporary biblical scholarship. It is inexcusable that Jones did not consult the Christian Medical Society's symposium volume on the control of human reproduction (*Birth Control and the Christian*, edited by Walter O. Spitzer and Carlyle L. Saylor [Tyndale, 1969]; as an Addendum to my essay, "The Christian View of the Fetus," I dealt with that same interpretation of Exodus 21 as presented at the symposium by Dr. Bruce Waltke—and, as a result of my critique, Dr. Waltke now places the origin of the human person at the moment of conception and supports a thoroughgoing pro-life view.

John Warwick Montgomery
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Reply to Montgomery

I am most surprised at Dr. Montgomery's response to my article. I did research the subject, and I did consult the Christian Medical Society's symposium volume: *Birth Control and the Christian*. I actually quoted it in two places in my article. It is true that I quoted Waltke from that symposium, rather than Montgomery, but surely that does not amount to the "inexcusable."

I am afraid I am not in a position to know what Waltke's present views are, but I fail to see how placing "the origin of the human person at the moment of conception" follows from any particular interpretation of Exodus 21: 22-25. Such a position is not by its very nature, a strict theological interpretation of that—or any other—biblical statement. It is a philosophical-biological mix, requiring definition of "personhood" and "conception." For instance it needs to be asked whether there is a "moment of conception." It is doubtful whether there is; conception is a biological process, not a piece of theological dogma.

By implication, Montgomery appears to suggest that I hold a view other than "a thoroughgoing pro-life view." Whether this is so or not, may I stress—as I did repeatedly in my article—that I have a very high view of human life, including fetal human life. The terms "pro-life" and "anti-life" are superficially misleading, and I am surprised that Montgomery should use such an unhelpful epithet as "pro-life." The issues presented by abortion are infinitely more profound than these terms imply, and I attempted to confront this profundity in a biblically consistent way in my article. I am sorry that Montgomery found it "superficial" and "misleading;" I am even more sorry that his letter failed to address the difficult questions.

Montgomery does not work out how the interpretation of Exodus 21: 22-25 he espouses, leads to the equation of fetal life (from the moment of conception) and adult human life. Nor does he tell us what this conclusion, as opposed to a strict biblical interpretation, may mean in practical terms.

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Up-Grade Book Reviews

The non-review of Allen, Bird, and Herrman (Eds.), *Whole Person Medicine: An International Symposium* by Donald C. Thompson (*Journal ASA* June 1982, p. 113) revealed clearly a case of reading a "most important and seminal work," while looking only for some special ingredient in it; and upon not finding it, condemning the whole book as "a waste of time and money" for whomever is involved with that special "missing" ingredient.

From one who also attended the Symposium in question, may I point out that there is a significant difference between criticizing authors who "leave out the indwelling *power* of the Holy Spirit" (Thompson's emphasis), and recognizing faithfully the authors' contexts in which they take the power of the Holy Spirit for granted.

Nothing of the book's contents was reviewed! Please, let's request that our reviewers make more of an effort to come to grips with who the authors are and what they do write.

James O. Buswell, III, Ph.D., Dean
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Gödel's Theorem

I appreciate Robert A. Herrmann's comments in the December 1981 *Journal ASA* concerning my earlier article "A Positive Approach to Creation." In regard to his major point in connection with the meaning of Gödel's theorem, however, it should be remembered that the accord of "the vast majority of mathematicians" over against "a small contingent of mathematicians" does not necessarily determine either mathematical truth or the appropriate content of mathematics.

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The Cults: Why Now and Who Gets Caught?

I am writing in reference to the article in the June 1981 issue of the *Journal ASA* entitled "The Cults: Why Now and Who Gets Caught?" The "Why Now" part doesn't disturb me, but I am very disturbed by the rest.

I have a long article—one complete newspaper page—written in Classical Arabic, accusing us missionaries of "brainwashing" peo-

ple so that they will turn from Islam to Christianity. And our method is set out in order. First we are nice people who make a good impression and we make friends with the people of this land, then we invite them to our homes and engage in discussion—bringing up religion in general and then comparing Christianity with Islam. In your terms "We heap love, warmth, friendship, and concern on the neophytes—thus making them feel right at home." In biblical terms we think we are "loving our neighbor" (occasionally our enemy but that is much harder) and expressing I Cor. 13 concern.

The article continues: "In the next stage they invite them to Bible studies and teach them their doctrine and songs and have tremendous parties at Christmas." "Other Christians give testimonies of how they have been persecuted and the Lord helped them." "The neophytes are asked about their problems and offered help from the collections of the church." And in your article you say, "During this second stage the cultic group prepares the visitor, now a guest, for indoctrination," and "mobilise guilt and anxiety in the indoctrinees *in order to inhibit their judgemental processes.*" (I don't understand the italicized words.) However, we preach, "All have sinned;" "Out of the hearts of men proceed evil thoughts;" "You are dead in your sins;" and "The wrath of God is upon you." All of which I thought would be used by the Holy Spirit to create guilt and fear of judgement.

You write, "The cult bombards individuals with the idea that self amounts to very little". I preach, "Give your body a living sacrifice;" "He that would save his life would lose it." You write, "The leader is everything." I preach, "Jesus says, 'There is no other way unto the father but by me"; "Unless you hate father and mother you can't be my disciple." You write, "A sense of community dominates the cults ideology." I preach you are a "holy nation," "A living temple built on the phophets and apostles." You write, "Cultic groups develop a we-feeling by stressing the exclusivity of their belief system." I preach "There is no other name give among men by which we may be saved." You write, "The cults impose a harsh standard of discipline." My Bible says that Jesus did too, and my response to that would be "Oh that our church would be more cultish."

As in your stage three, the Tunisian article goes on, "And when the neophyte has believed, he must be baptised and the meaning of this is that his sins are forgiven. He is now a true believer and that which he believed in Islam was blasphemy." (Blasphemy is the word used for unbelievers who worship idols.) "Now he goes about telling others this same terrible doctrine and he must marry only another Christian." You write, "At this point the neophyte must make a total commitment to an absolute system." I preach, "You must make Jesus the Lord of your life. You are bought with a price. You must marry a Christian, etc." We don't demand that a person bring all his possessions, but we preach that all belongs to God and the first church brought all their possessions. As for arranged marriages they work as well as freely contracted ones here in Tunisia and in the Old Testament.

You state that, "most cultists have an uncanny ability to immediately recognize susceptible people and therefore concentrate on them while avoiding . . . others holding to firm religious beliefs." We missionaries spend our time with people who are "open and want to know more" and much less with those who are firm in their convictions and would oppose us. We talk in our churches about visiting newcomers in the community before they have made friends—while they are "susceptible people" in the terms of your article.

You state that visitors are invited to a center where contact with the outside world is reduced. This action increases "the suggestibility of the mind for the cultic ideology and ultimate conversion to the group." We have conferences and church camps to get away from the world and its attractions and present our doctrines with more force and some of them have cheap starchy diets. (Three of my five children accepted the Lord in church camps.)

You quote Enroth as saying that most people who join the cults are between 18 and 22 years old at the time of the first contact. We concentrate on the young because they are the ones asking the questions and we ourselves almost all believed before we were 25 years old when, in the words of Enroth, we are, "involved in a search for identity and a quest for a spiritual reality that provides clear cut answers to their (our) questions." Enroth says, "The average cult member, most studies indicate, is white, college aged, middle class, moderately well educated (some college) and at least religiously oriented." My observation agrees with your own statement that this "fits the image of the average American in the immediate post-high school period," and, we could go on to say, the image of the average young American sitting in our churches. Has a study been done to compare those who joined the cults with those who join our Evangelical churches? Has a study even been done to see how many young people leave an Evangelical church to join a cult?

Your article states that "most cultic groups do engage in some form of spiritual and psychological manipulation." What is the definition of these words that makes them bad? Do not we Christians hope for spiritual and psychological change from our preaching? Is this manipulation? When we say that Billy Graham has the "gift from the Holy Spirit to cause people to see their need," is this something that can be measured as different? I think it is difficult to establish that Peter in Acts 2 was not using hard-sell evangelism. When he said, "This Jesus whom you killed is Lord and Saviour," it was certainly designed to cause guilt and fear and allow the Holy Spirit to convict of sin. Is this psychological manipulation? Sargeant in his book *The Battle for the Mind* analyses Wesley's sermons and concludes that it is, but we would never agree that this is bad.

There are a few differences that you have brought out in your article such as "They are made to feel guilty if they want to be alone or raise questions, or even speak of something pertaining to the outside world." We encourage people to raise questions, be alone with God in a quiet time, and we pray for kings and leaders and try to teach application of the Bible to problems in the world. But for the most part the differences are ones of degree and offer no help on deciding on church action. If we can't tell much difference between the methods of the cults and hard-sell evangelists, maybe it is because there isn't any. To find that the Devil uses God's methods is not surprising.

But that is not why this article disturbs me. It disturbs me because it leads to fear of the cults and says almost nothing about what to do. A denominational magazine, from a very missionary minded denomination, had an article with an even greater fear producing title and effect—"The Eastern Religions Are Out to Get You".

In a church that is very dear to me, I was present for the final result. A letter was read from the pulpit stating that a cult was asking permission to have a street stand in a nearby town of 100,000 people. The pastor then commented, "Don't go near these people. Don't talk to them. If you see them coming go to the other side of

the street. They're set in their doctrine and can't be changed." That is great!—just great! Now lets all get under the pews and sing "Onward Christian Soldiers"!!! I was so angry I could hardly sit still. When we got out I said in an even tone of voice to my family, "Did you hear anything in Church today that bothered you?" My seventeen year old daughter said, "I knew you would be unhappy."

I went to the stand of the cultist and talked to the person. My conversation as a missionary with 25 years of field experience is beside the point, but while I was there, there were 5 or 6 say people who came along and initiated conversations and were well able to defend orthodox Christianity.

In and around that town of 100,000 people there are at least 30 Evangelical churches. They could have easily sent elders and other knowledgeable Christians from their congregations—two by two—to cover all the hours the cultist were there with 100's of people to spare; and people who stopped would have heard the Gospel preached in opposition to falsehood. But No! Under the seats faithful followers of Christ!

Your article certainly does not go that far, but even so the accusation is carried in it that these are under-handed people out to get our youth. Well, it seems to me that we are also underhanded people out to get everyone else's youth, by almost all the criteria you have in your article. There is a pastor in my denomination whose Jewish in-laws have never spoken to his wife—their daughter—since she became a Christian and married him. Obviously he is a horrid cultist in their eyes.

While in the states in 1975 I attended a meeting where three former Moonies told how they left or were "rescued." Two girls told how they were attracted by the love and warmth and at least one had some difficulties in leaving. The Mooney director said that she could go, but tried to avoid taking her where she could leave. I think that she finally left by just leaving her things. The young man was a different situation. He was from a non-practicing Jewish family and had gone to New York where he was studying art. His friend met the Moonies and joined and the boy said, "I went to see, too. If it was good enough for my friend it was good enough for me" He went for a 21 day camp; after which he got his things and decided to stay. His mother was very upset now because he didn't want to come home. So she lied and said that she had a heart attack. Then they locked him in the bathroom when he got home and kept him up all night and I think at the end of 36 hours he accepted to stay with his family. But as he finished his "testimony" he said, "I don't know what I'm doing and what to do now." And he said it in a very sad tone of voice as though inside of him he still wished he was back with the Moonies. I felt sorry for him. When he was in New York living any old way, his mother was not concerned. When he found a group that answered a spiritual need his mother lied and used real "brain-washing" techniques.

Frankly, I am much more afraid of the brain-washing of the mother, than I am of the cults as described in your paper. What if someone starts on me and my family with that?

Therefore, I await some guide lines in your next article or response. I recommend that we take the following position. Physical punishment and threats of it are illegal. Imprisoning—i.e., refusing to let people leave is illegal. The other things you mention are legal. Otherwise limitations on them become limitations on us.

Meanwhile to the streets Christian soldiers! Out from under the pews! We must put on the whole armor of God and witness to these cults. It may be that some Evangelical people will be lost in the conversations and arguments. But if being bought with a precious price is not precious, if sitting now in heavenly places is not comforting, then we have to let them leave. "They went out from us because they were not of us."

The way to beat the cults is to attack. How shall they hear without a preacher? Soldiers of Christ arise!!

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Strengthening Science Education

This is a copy of a letter published in Physics Today, *commenting on the February 1982 editorial.*

In his editorial "What is a scientific theory?" (February, page 128), Harold L. Davis calls for action by physicists in building stronger school science programs, in response to the current interest in creationism, and the laws requiring it to be taught. Something is clearly wrong when scientists will not obey a law enacted by the majority of the people, and go to court to try to escape from having to. The underlying problem has been aggravated by a failure of some educators to recognize, as the APS does in its statement on creationism (February, page 54), that religious beliefs are an element of the human experience. A scientific theory can indeed predict observational data. But it cannot answer a student's questions like "Who created me?" "What is the purpose of my life?". Unfortunately, the science class (consciously or unconsciously) may try to answer: "You are the product of random interactions of molecules governed by physical laws." "Your life is without meaning or purpose." Such atheism has no place in the science classroom. When the science courses are properly neutral on religious matters, then people of religious faith will have no further reason to call for curricula to be modified by biblical teaching.

Where information about the scientific method is not coupled with respect for experience or authority, a young person without a sense of purpose may well feel encouraged to experiment with sexual perversion or drug abuse. All parents with a high regard for traditional values will press for change if this is a result of their children's education.

There are deficiencies in the scientific enterprise that must be rectified. Physicists need to be scrupulously honest. Alienation from science after working in a laboratory where conclusions were drawn from insufficient evidence or where data were falsified, followed by a religious conversion, has led some people to disbelieve valid scientific results and to embrace creationism.

Students often never perceive the elegance and beauty of true science. Complex detail about concepts like relativity, molecules or evolution, which are not intuitively evident from experience in the real world, fills their courses. The creationist alternative then becomes appealing: it is simple, being based on the obvious stability of biological species; it has a circumscribed finality, as an interpretation of an inerrant holy book.

Physicists should interact more with theologians, frequently isolated from the large academic world in small religious colleges. They might then appreciate the anguish or lostness that pastors discern in many young people, who may be their own students in a large impersonal physics class. In turn, the theologians, who educate the pastors of tomorrow, need to be better informed about science. One pastor can call forth hundreds of letters to legislators from a committed congregation; when science is better appreciated, these will urge more sensible actions than anti-scientific teaching.

More attention should be paid to religious writers who respect science. In Darwin's time Charles Kingsley, Asa Gray and George Frederick Wright sought to resolve the apparent conflict between evolution and the doctrine of creation. Today many others continue this work. Affirming the truth of the Scriptures, given for spiritual edification, these writers generally see in evolution an account of how God creates in the actual imperfect world, the very good world of *Genesis* 1 and Eden now being inaccessible because of human sin.

Whether or not they openly acknowledge the Author of the laws of nature, all physicists should cooperate to remedy the weaknesses that have allowed scientific creationism to spread like a virulent disease. Otherwise God will no longer entrust us with greater knowledge of his creation. He will permit victory to go to the creationists, thereby degrading our educational system and withholding from our generation the privilege of sharing in the ministry of Christ—feeding the hungry, healing the sick, and teaching the ignorant.

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"Scientific creationism" is simply and purely very bad science. The literature of "scientific creationism" repeatedly shows complete misunderstanding of geological phenomena, and it is replete with examples of misinterpretation and misapplication of geological data. The literature consistently emphasizes the scant data favorable to the recent creation-global flood hypothesis while ignoring the abundant contrary evidence. ..."Scientific creationism" is out of accord with the facts that we find in God's creation. No Christian should be upset that this poor "creation-science" is having a difficult time gaining entrance into schools. Christians should not want either bad science or a very narrow, not-fully-biblical view of creation representing them—whether in schools or before the public. Christians must learn to accept a broad creationism that does full justice to all the biblical data and that take seriously all the evidence contained in God's creation. There is nothing in the Word that is incompatible with the concept of an ancient, dynamic world.

Davis Young, "Genesis: Neither More Nor Less," *Eternity*, May (1982), pp. 15-19

Founded in 1941 out of a concern for the relationship between science and Christian faith, the **American Scientific Affiliation** is an association of men and women who have made a personal commitment of themselves and their lives to Jesus Christ as Lord and Savior, and who have made a personal commitment of themselves and their lives to a scientific description of the world. The purpose of the Affiliation is to explore any and every area relating Christian faith and science. The *Journal ASA* is one of the 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.

A closely affiliated organization, the **Canadian Christian and Scientific Affiliation,** was formed in 1973 with a distinctively Canadian orientation. The **CSCA** and the **ASA** share sponsorship of the publication. **CSCA** subscribes to the same statement of faith as the **ASA** and has the same general structure. However, it has its own governing body with a separate annual meeting in Canada.

Members of both organizations endorse the following statement of faith: (1) *The Holy Scriptures are the inspired Word of God, the only unerring guide of faith and conduct.* (2) *Jesus Christ is the Son of God and through His Atonement is the one and only Mediator between God and man.* (3) *God is the Creator of the physical universe. Certain laws are discernible in the manner in which God upholds the universe. The scientific approach is capable of giving reliable information about the natural world.*

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