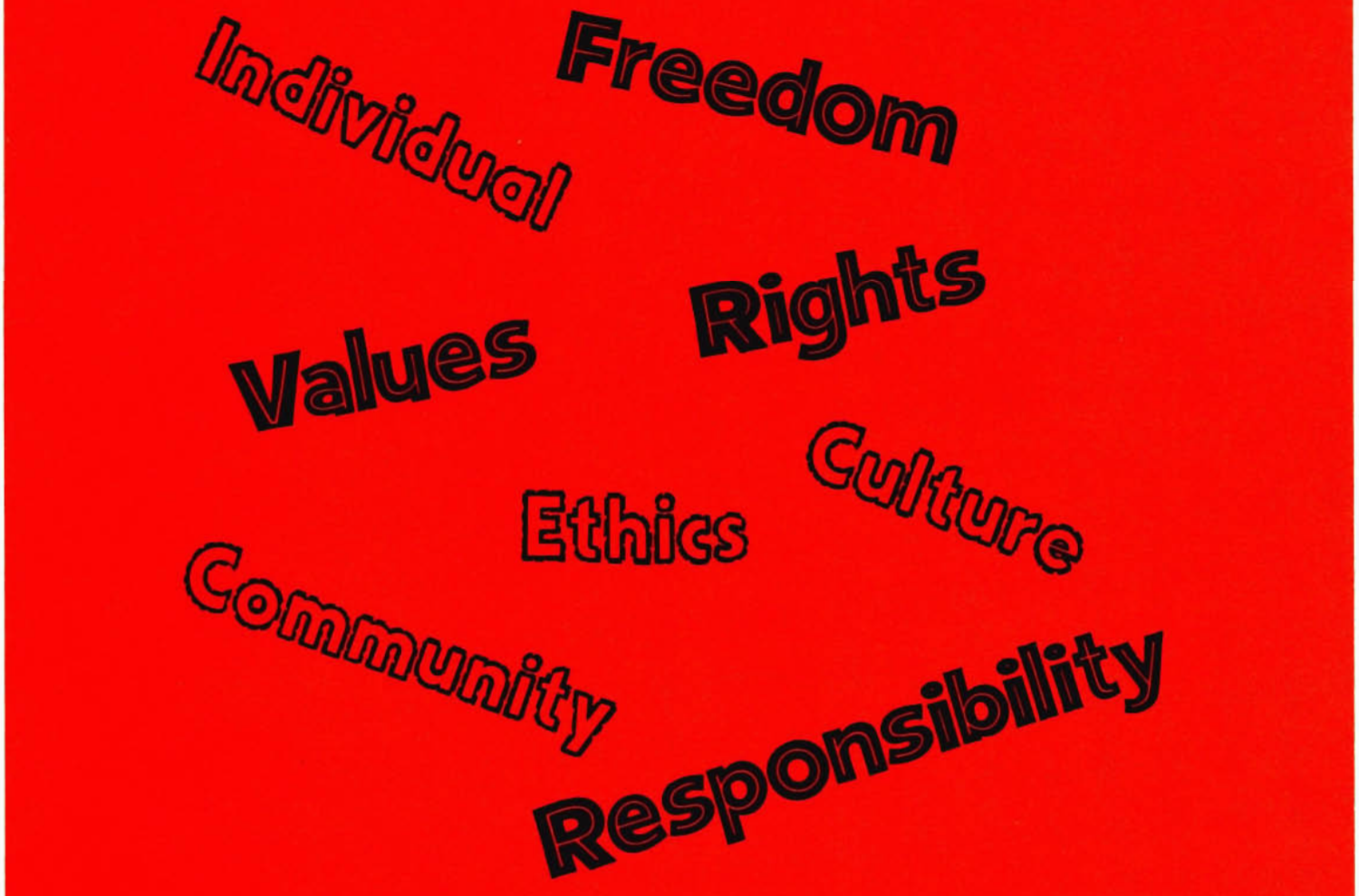
JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION

An evangelical perspective on science and the Christian faith



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

VOLUME 27 NUMBER 3 SEPTEMBER 1975

MEMBER EPA EVANGELICAL PRESS ASSOCIATION

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INDICES to back issues are published as follows: Vol. 1-15 (1949-1963), *Journal ASA* 15, 126-132 (1963); Vol. 16-19 (1964-1967), *Journal ASA* 19, 126-128 (1967); Vol. 20-22 (1968-1970), *Journal ASA* 22, 157-160 (1970); Vol. 23-25 (1971-1973), *Journal ASA* 25, 173-176 (1973). The *Journal ASA* is indexed in the CHRISTIAN PERIODICAL INDEX. Present and past issues of the *Journal ASA* are available in microfilm at nominal cost. For information write University Microfilms, Inc. 300 North Zeeb Road, Ann Arbor, Michigan 48106.

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JOURNAL OF THE
AMERICAN
SCIENTIFIC
AFFILIATION

SEPTEMBER 1975 PRINTED IN THE UNITED STATES OF AMERICA VOLUME 27, NUMBER 3

VALUES AND RESPONSIBILITIES

Responsible choice is the essence of human action. Such responsible choices demand the acceptance of a value system.

Therefore values are of ultimate importance for Christian living. They guide decisions and actions in the practical affairs of life. They set meaning and purpose to the framework of human existence.

Yet such values cannot be empirically derived from experience. Nor can they be effectively imposed in authoritarian fashion from without. For each person they must be freely chosen.

Nevertheless Christian values reflect an absolute objective reality expressed through a living relationship with the risen Son of God, and can be neither wholly relative nor subjective.

Christian discipleship calls each of us to a radical holiness that embraces both the stars and the dust of the earth.

R.H.B.

What Is a Christian's Responsibility as a Scientist?

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STATEMENT of John A. McIntyre

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The question under consideration is limited to the responsibility that a Christian assumes directly because he is a scientist. Many Christian responsibilities to family, church and community are not discussed unless the scientific component of the Christian's life is directly involved.

What Kind of Work?

Perhaps the first responsibility for the Christian as a scientist is the selection of the kind of work that he will do. Often there appears to be little direct guidance for making this selection. However, there are constraints that often limit the range of possibilities. Such a constraint would be the condition of the job market. A Christian will view these constraints as indications by God concerning the place in which he should devote his professional life. For example, a decade ago there were many teaching and research positions in universities. Scientists who accepted these positions inevitably devoted most of their efforts to performing research and maintaining the highest professional competence in their field. Today the positions available often have more relevance to the problems of society and a scientist might very well develop his administrative and social capabilities instead. As Christians we know that God will supply our every need as we adjust to the situations in which we are placed.

Within these constraints, however, there is usually a range of possibilities. How does a Christian decide in a responsible way what type of work to do? I believe that the Scriptures give us definite guidance. As members of the body of Christ, we each have received different gifts that we are to use for the glory of our Lord. We should therefore select work that utilizes our gifts in an optimum way. We then face the question,

The Bible indicates that the Christian's responsibility is limited to his own acts.

"How do we best use our gifts?" Students often ask me this question and my answer has been that their gifts usually will be used most effectively when they are doing what they most like to do. We usually desire to do what we do well. Paul, for example, wrote about his calling, "For necessity is laid upon me. Woe to me if I do not preach the gospel!" Some scientists like to teach, some enjoy most their time in the laboratory, while some prefer to associate with people in business relationships. A Christian scientist should determine which situation is most attractive to him and attempt to find employment which will then permit him to function most effectively.

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STATEMENT of Richard H. Bube

Dr. Bube is Professor of Materials Science and Electrical Engineering at Stanford University, past President of the ASA (1968), and the author of The Human Quest: A New Look at Science and Christian Faith, *(Word 1971).*

Being a scientist is a difficult calling for anyone today. Perhaps in past years it may have seemed to many that scientists could be simply scientists, investigating the marvels of the natural world with scarcely a thought for the results of their investigations, trusting to the "innate goodness of human nature" (that great and universal fallacy) to put the results to a humanitarian and productive use. There was a kind of Pollyannish optimism that the problems of the human race could be rather immediately solved by the application of scientific research and technology. Once a few of the more serious material needs of the human race could be removed, this same "innate goodness" would express itself in appropriating the results of science for the good of all mankind. It is difficult to see how anyone can retain this misguided optimism today. Of course Christians have always had biblical reasons for rejecting it.

Who Dares to be a Scientist?

A realistic assessment of the world situation today suggests that it is only a Christian who has the basic faith foundation adequate to be a practicing scientist. The Christian is well aware that every advance in knowledge with the potentiality for good has a potentiality for evil that is proportional to the good; that while men of good will are attempting to harness the potentiality for good, others are even more busily engaged in harnessing the potentiality for evil. If every advance of knowledge is capable of bringing as great evil as good, why not simply cease the search? In an impersonal universe in which we happen to be in existence simply as the consequence of meaningless Chance, such a course of action would certainly seem the most reasonable. It is only in a universe in which God is sovereign, that the individual dares to be a scientist, facing the needs of the moment with all the humane skills available in spite of overwhelming pessimism about man's ability to resolve the problems of this world – sustained by the knowledge that the Christian man or woman of science is called to be faithful, and not necessarily to be successful in all they attempt.

Producing Faithfully

The responsibility of the Christian scientist follows from this call to be faithful. The unique responsibility of the Christian scientist arises from the fact that as scientist, he is a *producer* of knowledge. For this reason the scientist is in a different position from other profesionals such as lawyers or doctors, who mediate the consequences of existing knowledge but do not produce it themselves. The lawyer administers the law on behalf of his client, perhaps even without concern for the guilt or innocence of his client, because he is acting as a servant of society that sees the greatest equity in a system of law uniformly applied to all men. The doctor administers medicine on behalf of his client, without concern for the moral status of that client, because he is acting as a servant of a society that sees the greatest equity in a system of medicine applied uniformly to all. But the scientist has more difficult decisions to make. What he does may affect the lives of future generations for years to come.

The scientist, as a producer of knowledge, cannot sit back and let others make all the decisions about its investigation and use. Furthermore, his responsibility does not begin only when the potentiality for good or evil has been brought into existence, but his responsibility begins back when the potentiality is still only an unrealized speculation. The scientist must feel immediately responsible for the direction and goals of his work; he cannot abdicate and place his responsibility on the shoulders of others in authority over him, such as his supervisor, his employer, his company board of directors, or his government. Any time that an individual scientist devotes his talents in a direction that violates his basic moral conscience, he has given up his choice position as a responsible professional in society, and has become instead a technical prostitute.

The difficulty of being responsible cannot be used as an argument against being as responsible as possible.

The Orders of Responsibility

The scientist has first of all the responsibility of deciding whether to proceed in a given direction and then how to proceed; both of these decisions may involve profound moral and practical issues quite incompatible with the limited or profit-focussed motives of his employer. Secondly, once he has decided to proceed, the scientist takes on the responsibility to follow through with efforts to guide the use of the new knowledge in a humanly beneficial way. Scientists resist becoming politicians and activists, but for many there may be no other choice. To attempt to evade this responsibility through simplistic definitions of spheres of responsibility has had enough past failure to discredit it completely.

The Christian scientist is responsible first of all to God, and then to all other humans presently living and destined to live in the future until the return of Christ; only after these responsibilities are weighed, does his immediate responsibility as a paid employee by industry or government deserve his careful attention. The first responsibility, of course, is to God, who calls him to service not primarily in the Christian witness he may share with colleagues or co-workers but in the calling of being a practicing scientist; God's claim is upon the whole man and every aspect of his being. The second responsibility is to other human beings; this is not in competition with responsibilty to God, for it is in responsibility to fellow human beings that God commonly calls us to live out our responsibility before Him.

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McIntyre's Statement
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Selecting an Employer

Having selected the type of work he should do, the Christian scientist must next select his employer. Except for the few cases where conscience interferes (a pacifist should not work for the Defense Department), all legitimate employment should be considered to be appropriate. The selection should be based on the opportunities available for the exercise of the gifts of the scientist. Jesus, for example, was a carpenter in a small town for ten years of his life. For Protestants there is no division between laity and clergy because of the type of employment; or in evangelical terms, there is no division between those in "full-time" and "part-time" Christian service. Christian scientists, then, should select their employment on the basis of professional opportunity. If Christians follow this rule, they will all be using their gifts in the most effective manner.

Professional opportunity should not, of course, be defined too narrowly. The professional rewards of training young Christians and watching them mature in a Christian school cannot be matched by the dollars received for a different kind of employment. If one does not enjoy teaching, however, he should trust the Lord to provide men who do find professional fulfillment in this work and not feel a personal obligation to train the young.

Furthermore, if Christian scientists are employed in all types of work, they will be distributed throughout society. Jesus must have had such a situation in mind when he described Christians as the "salt of the earth." Salt is effective as a preservative only if it is distributed uniformly throughout the body it is to protect. The evangelical Christian community has suffered terribly because only certain employment was considered proper; the defense of the faith has often depended on former atheists such as C. S. Lewis who had no inhibitions about being a teacher in a secular university. While the number of outstanding evangelical Christians in the sciences has been increasing during our generation, the situation is still desperate in the arts. It is essential that Christians not withdraw from secular society; we are to be *in* the world though not *of* the world.

Responsible for Employer's Acts?

In a sinful world it is inevitable that an employer's acts will sometimes offend the conscience of the employed Christian. How responsible is the Christian for these acts? The Bible indicates that the Christian's responsibility is limited to his own acts. When soldiers asked John the Baptist what they should do, he said, "Rob no one by violence or by false accusation, and be content with your wages." There is no indication here that they should leave their positions or even repent for their participation in the activities of the Roman government. Jesus paid taxes and thereby supported the sinful government of his day; yet the Bible asserts that he was without sin. Even the description of the church as the body of Christ indicates that each member of the body is responsible only for itself. There is no way for the eye to be responsible for the foot although an imperfectly operating eye can cause damage to the foot. It is clear, then, that a Christian who is part of an organization must perform his duties conscientiously but he is not responsible for the acts of those over whom he has no authority.

A Christian, however, is responsible for his own acts. When ordered to do an act, the Christian must remind himself of Jesus' admonition, "Render, therefore, to Caesar the things that are Caesar's and to God the things that are God's." The legal canons recognize this limitation on loyalty to the employer when they say that the attorney should not perform any act that is contrary to his conscience. If ordered to write a computer program for illegal purposes, the Christian would refuse to do so.

Christian Verbal Witness

Finally, one might ask about the Christian's responsibility to speak of his Christian faith during employment hours. The primary consideration is that the hours at work belong to the employer. There are situations, however, when it is appropriate for the Christian to introduce the gospel as part of his professional duties. When teaching science, for example, it is perfectly legitimate to discuss the limitations of the scientific method and the need for a Christian faith. In fact students often critize those professors who refuse to reveal their presuppositions when they present the subject matter of their course.

Extra-Professional Responsibility

We now come to the responsibility of the Christian scientist outside his profession. In most respects his responsibilities differ little from those of any other Christian. Because of his scientific training, however, the Christian scientist can minister to the Christian community in a unique fashion. Through the education of Christians in scientific matters and by acting as an intermediary on scientific issues between the Christian community and the secular world, the Christian scientist can use effectively both his professional training and his Christian commitment. Every Christian scientist should be a member of an organization such as the American Scientific Affiliation that performs just these functions.

The Christian should be sensitive to the needs of his own community and to society at large. Because of this sensitivity, the Christian particularly must guard against neglecting his professional duties as a scientist while working in the community. The activities of a professional scientist are of course not restricted to the research laboratory. Advising the government, educating the public, and even writing articles such as this are all legitimate activities. The ethical considerations arise if one neglects the duties for which he has been employed. If the scientist has been employed as a research scientist, he should devote the time necessary to be a good research scientist.

Summary

In summary, the Christian scientist is responsible to use the gifts that God has given him. He is loyal to his employer and conscientious in performing his duties. While he is not responsible for the actions of his employer, he will attempt to influence these actions for the common good. And, finally, he will put his scientific knowledge at the disposal of the Christian church and of society.

Bube's Critique of McIntyre's Statement

One of the most striking absences in McIntyre's statement on the responsibility of a Christian scientist is any discussion of the relationship between the practicing scientist and the consequences of his successful research and development. Except in indirect ways, McIntyre leaves untouched this central issue in such a discussion of responsibility.

Some of McIntyre's statements are not so much wrong as misleading if interpreted simply. For example, he suggests that the selection of an employer should "be based on the opportunities available for the exercise of the gifts of the scientist." Certainly this should be *one* of the considerations, but hardly the decisive one in making ultimate decisions. Suppose a scientist has to make a choice between a project in which his theoretical and experimental skills would be admirably matched to making a Doomsday machine, and a project with a medical application suitable for his talents, but not likely to offer quite as much in the way of scientific development. Hopefully in such a case, McIntyre's criterion would be overruled, and the scientist would weight his direct foreseeable contributions to human welfare more heavily than the purely technical development of his talents without regard to consequences. This is not an unimportant issue. Many, if not most, promising scientists have chosen employment on the basis of the opportunities afforded of developing their skills with scarcely a thought to the effects of their possible success on the rest of the world. It seems to me wholly consistent with Christian goals to work to raise the social conscience of the scientist or would-be scientist.

Another example of the need for care in interpreting McIntyre's statement relates to his argument that Christian scientists should be in "all types of work" so that they can be effective as Christian salt. But surely there are some types of work from which a Christian must exclude himself: for example, work in occupations whose principal purpose must be judged sin. An opportunity for employment in which the principal goal was the development of instruments to kill human beings, or the perfection of products harmful to consumers but profitable to producers, or the investigation of techniques destined to be used to dehumanize men and women, must certainly all be avoided by Christians.

The fact that John the Baptist did not advise soldiers coming to him to leave their positions can hardly be used as ultimate evidence that an individual's participation in an organization with immoral purposes is not a matter for his Christian concern. It has been on just such interpretations of Scripture that slavery has been defended – for otherwise "surely Jesus or Paul would have condemned it." We must recognize that the Christian Gospel works itself out in heightened social awareness of its full implications, and the absence of specific condemnations of social practice in the Bible cannot always be taken as ultimately normative.

It is perhaps significant that McIntyre rules out *illegal* activities for the Christian, but he does not explicitly make a similar statement for *immoral* activities. Although a Christian scientist will certainly not ignore the legality of an action, he will find the domain of legal actions larger than the domain of moral actions. To base Christian decisions on legality rather than on a living relationship with the living God is to adopt legalism beyond all justification.

A person's responsibility for group actions is commensurate with his authority and ability to change those actions.

In his argument that the church is an institution in which "each member of the body is responsible only for itself," and that "the Christian's responsibility is limited to his own acts," McIntyre appears to be misinterpreting "responsibility" to mean "guilt." The two are related but they are not identical. To say that I do not directly bear the guilt of immoral acts of someone else in an organization to which I belong is not the same as saying that I am not responsible for doing something about those acts. Paul's exercise of Christian discipline in I Corinthians 5 is a call to members of that congregation to act responsibly with respect to the behavior of a member. In I Corinthians 12:26, he says, "If one member suffers, all suffer together; if one member is honored, all rejoice together."

The relationship between individual and group responsibility is not easily assessed in detail, and depends of course on the specific group involved. To claim that a man is responsible only for his own actions, and never for those of the group in which he lives, or even for the consequences of his actions, is far too broad a claim to make. It would absolve the man who does not use a weapon to kill, but who makes the weapon available knowing that others will use it in this way. (The maker of the weapon should be *responsible* for what happens to it; if he knowingly passes the weapon along to men who are certain to use it wrongly, then he is also *guilty*.) It lays the foundation for a society in which each individual continues on his own way, prevented by blinders and tunnel-vision from detecting the inhumanities resulting from a group of individuals all concerned only with their own immediate moral purity. A far more Christian perspective is to recognize that a person's responsibility for group actions is commensurate with his authority and ability to change those actions. The responsibility of a first-century Christian under the Roman Empire for the excesses of Rome is far less than that of a 20th-century Christian in the United States for the excesses of that government. The responsibilities of the individual for the actions of his government is much greater in a functioning democracy than it is in a totalitarian dictatorship. And yet, even under the latter condition, a Christian scientist in Hitler's Nazi Germany working on armaments or gas cremation furnaces could not consider himself free of responsibility and absolved from all guilt because he was only following orders or fulfilling the terms of his employment. A lawyer might choose to defend Hitler in order to demonstrate that government by law is the best that human beings can devise. A doctor might choose to heal Hitler because he had sworn to heal all persons alike. But are there any grounds on which a scientist could make the perfectly legal choice of developing rockets and bombs for Hitler and still remain free of the responsibility and the guilt of Hitler's future use of those weapons?

McIntyre's Rebuttal to Bube's Critique

I agree with Bube on the issue on which we chiefly disagree, as stated in the first paragraph of his critique. So let me begin by explaining why, in my view, the responsibility of a scientist for the application of his discoveries is greatly restricted if not absent altogether. To be specific, I will use an example with which I am familiar. Suppose a nuclear physicist works for the Atomic Energy Commission. How responsible is this physicist for the use of his discoveries?

There have been at least four areas of application that use phenomena associated with the atomic nucleus: weapons, power, medicine, and civil engineering (explosives). Because of its current interest, let us consider for discussion the social implications of nuclear power. Whether nuclear power is good or bad depends on issues such as the following: the effectiveness of security measures for preventing the theft of nuclear material, the dangers of storing radioactive waste, the probability of a serious nuclear plant accident, the hazards of air pollution by coal-burning power plants, the acceptability of strip mining, the importance of the United States having an independent source of energy, and the wisdom of maintaining a society using large amounts of energy. On issues such as these, the nuclear physicist has no special insight or contribution to make. The issues are concerned with the values held by different parts of society, and the resolution of these issues should be carried out by the political processes of society. It is improper, therefore, for the nuclear physicist to claim a special hearing for his opinions because he happens to be at one end of the complex technical and political process which takes the information developed by the physicist and transforms it into electricity in the home of the consumer.

The selection of nuclear physics also happens to apply to the example that Bube gives in his critique concerning the choice of working on a Doomsday machine or on a medical project. The phenomena of nuclear physics have been used for the hydrogen bomb (the present equivalent of the Doomsday machine) and for nuclear medicine (which is leading to impressive advances in the medical treatment of many diseases). Since the knowledge he develops in the field of nuclear physics will be used for both weapons and medicine, should a Christian scientist work in the field of nuclear physics? Furthermore, when does a weapon cease to be proper (a club for a policeman) and become improper (a Doomsday machine)? Are all nuclear weapons improper? Again, the answers to these questions are hardly the special province of the physicist. If society decides what the answers should be, is the physicist to refuse to participate because he has greater wisdom?

Here we come across a basic problem. In an organized society can each professional group decide for the rest of society what is right and what is wrong? We find longshoremen refusing to unload ships from Russia when the decision about trading with Russia has been assigned by the American people to the State Department and not to the longshoremen. Should the nuclear physicists be the ones to decide whether the United States is to have a nuclear power program? Benjamin Franklin had some wise words to say about this issue as the issue applies to printers,

In an organized society can each professional group decide for the rest of society what is right and what is wrong?

> Men have many opinions and printers print them as a part of their business. They are educated in the belief that when men differ in opinion, both sides ought equally to have the advantages of being heard by the public; and that when truth and error have fair play, the former is always an overmatch for the latter. Hence they cheerfully serve all contending writers that pay them well, without regarding to which side they are of the question in dispute. . . . If all printers were determined not to print anything till they were sure it would offend nobody, there would be very little printed.

Cannot the nuclear physicist, just as the printer, trust the American people, through the political process, to arrive at a proper decision? Of course the American people make mistakes, but is it better to have these decisions made instead by those who happen to be in strategic positions such as the longshoremen, the nuclear physicist, or the printers? Each of these groups sees the world from a limited perspective and, if our society is to avoid the tunnel-vision that Bube rightfully deplores, the final decisions on matters such as foreign policy, nuclear power programs and censorship of the press must reside with representatives of all the people.

If then, the scientist has no special contribution to make to any of the applications of his scientific discoveries, he has the freedom to decide where he wishes to direct his efforts outside his professional life. Often, because they already have personal contacts with men dealing with applications of their own scientific work, nuclear physicists have become interested in the problems associated with these applications. Thus, some nuclear physicists are experts in weapon systems and disarmament problems, others have become concerned with the questions of safety associated with the nuclear power program, others have monitored the development of methods of using nuclear explosions for the extraction of oil from rocks. Other nuclear physicists, however, have contributed to discussions such as this one about the responsibility of scientists, others have written about science and religion, and others have tried to bridge the generation gap. My contention is that the nuclear physicist working in these latter fields is acting just as responsibly as those working on weapons systems, nuclear power, and nuclear explosives, which fields happen to be applications of his scientific specialty.

I agree with Bube's statement, "To claim that a man is responsible only for his own actions, and never for those of the group in which he lives, or even for the consequences of his actions, is far too broad a claim to make." Because of my agreement with these remarks, I noted in my initial statement that "except for the few cases where conscience interferes (a pacifist should not work for the Defense Department) all legitimate employment should be considered appropriate." I would therefore say that a scientist working for the Defense Department is responsible for the use of military weapons. However, is the professor who teaches ROTC (military) students in his classroom also responsible for the use of these weapons? And is the

scientist who does medical research for the Department of Health, Education and Welfare (HEW) also responsible? For after all, HEW is an arm of the same federal government that directs the activities of the Defense Department, so that the medical scientist is also working for an employer, the federal government, that uses the military weapons. Finally we get back to every taxpayer (pacifists and all) who pays for the weapons. Is a pacifist, who opposes as best he can the military activities of his government, to be held responsible for those activities? We have the example of Jesus who was sinless and therefore not responsible for the actions of the Roman government whose actions he could not control. The question of responsibility is indeed a complex one.

Bube also raises the question of the proper action of a Christian scientist under Hitler. This question introduces the problem of the possibility of revolt against the government. Since the problem of the proper justification for revolution is a difficult problem in its own right, I do not wish to bring it into this discussion.

Finally, I would like to correct any impression I may have made that a Christian's actions should be based on purely legal concerns and not on moral factors. In my Statement, I wished to introduce such moral considerations when I remarked that (1) "a pacifist should not work for the Defense Department", (2) "the Christian must remind himself of Jesus' admonition, 'Render, therefore, to Caesar the things that are Caesar's and to God the things that are God's.' The legal canons recognize this limitation on loyalty to the employer when they say that the attorney should not perform any act that is contrary to his conscience.", and (3) "While he is not responsible for the actions of his employer, he will attempt to influence these actions for the common good." I agree completely with Bube that "to base Christian decisions on legality rather than on a living relationship with the living God is to adopt legalism beyond all justification."

Bube's Statement

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The third responsibility to one's employer, in the light of the two prior responsibilities, may lead to heavy decisions indeed; it tears from the scientist all the pragmatic excuses by which he can rationalize participating in work designed by its very nature to be harmful to his fellow man. It may force him to leave an employer rather than fail his responsibility to God and man; it may even force him to leave the practice of science itself. It seeks to assure that the scientist will be not only as responsible as his employer desires, but as responsible as his relationship with God and man demands. Here we have another application of the familiar tension between Acts 5:29, asserting the basic principle that men must obey God rather than man, and Romans 13, asserting the basic principle that Christians should submit as good citizens to the authority they find themselves under. In the final crisis, however, for the Christian it must always be a choice of God's word over man's word. The scientist truly owes much to his employer, but he owes more to God.

No Simple Answers

It should not be supposed that simple answers are available for the responsible living of a Christian scientist in today's world; the absence of such simple answers in an imperfect world cannot be taken, however, as a rationale for seeking no answers. The fear of failure to be wholly responsible cannot be taken as the basis for failing to be responsible at all. Nor can it be supposed that being responsible always follows the same pattern; it may call one into greater scientific devotion in order that the full systems effects of potential developments may be understood before it is too late, or it may call one out of scientific work itself in order to function in guiding future research, development and technology.

It must be emphasized that the difficulty of being responsible cannot be used as an argument against being as responsible as possible. The results of basic scientific research in any field can be used for evil as well as good; but the scientist who produces the knowledge has a responsibility to see that it is used for good instead of evil to the best of his ability. Such difficult decisions are not present in most of applied science and engineering, however. Here the goal of the research is clearly chosen; a scientist cannot absolve himself for working on an instrument of destruction on the grounds that knowledge of techniques gained in this way might be used for human preservation. Nor can a scientist working to develop profitable devices without regard to the effect on the environment or without consideration of the benefit of his work to those who are not rich and powerful, absolve himself by claiming that after all he is only being a trustworthy employee.

Summary

The responsibility of a Christian scientist is both a burden and a challenge; both an ever-present uncertainty and restlessness of soul, and an opportunity for fulfillment of the human purpose. It demands that in some appropriate way each scientist be responsible both for his own work *and* for its consequences.

McIntyre's Critique of Bube's Statement

There are many features of Bube's statement with which I am in agreement. His first two paragraphs eloquently state the Christian's realistic but pessimistic view of a world that does not acknowledge God. And the final two paragraphs express perhaps the most important point, that there are no easy answers to the question of responsibility.

However, I do not understand Bube's contention that "the unique responsibility of the Christian scientist arises from the fact that as a scientist, he is a *producer* of knowledge. In this way he is different from all other professionals, who are users of knowledge but not producers of it."

It is difficult to see that the scientist plays any unique role.

Let us examine, however, the process of the production of knowledge. In the production of knowledge, there must first be the decision to support with funds the search for knowledge; only then can the scientist begin to work. There is a definite relationship between

the amount of funding for research and the effectiveness of scientific research. (If there is no such relationship, then the scientists have been misleading the funding agencies of the federal government for a long time.) It is difficult to see in this process of knowledge-creation that the scientist plays any unique role aside from the fact that he directs the spending of the money (based on, perhaps, highly complex scientific considerations). Why, then, is the scientist, who produces new knowledge on demand, a different kind of producer than the engineer who produces a new bridge on demand? Or different, for that matter, than Verdi who composed Aida for the celebration of the opening of the Suez Canal? Rather, it would appear that the scientist shares with other creative people the same responsibilities.

Bube's Rebuttal to McIntyre's Critique

Knowledge is not salvation as the wisdom-religions of past and present claim, but it is power. The user of knowledge has responsibility that it is used properly. The engineer is constrained by his responsibility to build a safe and serviceable bridge; it makes a difference whether the engineer uses existing knowledge to build a bridge or a device to extract confessions from prisoners under torture. The composer is constrained by his responsibility to create a beautiful and challenging work that will uplift man's spirit; it makes a difference whether the composer uses existing knowledge to produce such a musical work or instead writes an obscene musical to degrade human beings. The Christian engineer will refuse the "demand" to build a torture device. The Christian composer will refuse the "demand" to compose an obscene and blasphemous work.

To think of science as "research on demand" reduces the professional to the level of an unthinking technician.

Thus the scientist's position does not differ from that of the engineer because the latter is free of responsibility for his work; rather both scientist and engineer share in the responsibility to pursue their respective tasks with the consequences in mind.

Now it is true that the scientist cannot carry out research without funding, but it is also true that new knowledge cannot be obtained without the scientist. Both the individuals who plan what funding will be available, and the individuals who plan what to do with that funding are uniquely responsible for the production of new knowledge that may result. Since the scientist usually plays some role in both areas (by refereeing proposals and serving on advisory committees as well as by participating in research) he is doubly responsible.

It is probably very difficult if not impossible to exercise such proper responsibility if science is thought of as "research on demand." But such a concept reduces the professional scientist to the level of an unthinking technician. It is the challenge for the creative Christian scientist to make the best possible match between his abilities, the funding available, and the benefit of the human race. If he feels that such a match has become impossible, and that he must work in areas which he personally feels are necessarily detrimental to human beings, then it is time for that Christian responsibly to drop out of science.

Kibitzers' Comments . . .

1. I have difficulty limiting the discussion of responsibility on the part of a Christian who is a scientist to his role as scientist (McIntyre). Responsibility seems to me to be a quality of our lives as persons which can hardly be isolated in terms of some specific role; e.g., will a Christian who is a scientist take a job that involves regular Sunday work? Here his responsibility as a scientist overlaps his responsibility as a Christian and a churchmen, does it not?

When scientists have selected the type of work in which "they are doing what they most like to do" (McIntyre), how does one divide his time and energy between this work which he enjoys as a scientist and his responsibility to his family? These questions are raised simply to illustrate my point that responsibility is ours as persons in our several roles.

2. McIntyre seems to reason that (a) Scripture gives the scientist definite guidance as to the work he should do; (b) most people work most effectively doing what they like to do; (c) having sought employment in terms of what is attractive to him, the scientist has selected the type of work that he *should* do. This reasoning is hardly compelling. I just do not see much of the cross of Christian discipleship in it.

3. McIntyre makes what seems to me to be facile judgments from time to time that would warrant at least a footnote of support and elaboration. For example, he says, "In evangelical terms, there is no division between those in 'full time' and 'part time' Christian service." Are matters that simple? Is there no call to the ministry, no office of ministry? What is the meaning of ordination? Affirmations like this could stand a bit of qualification, it would seem, such as "in my view," or "it seems to me," that there is no division between full time and part time Christian service.

4. McIntyre says, "The Bible indicates that the Christian's responsibility is limited to his own acts." In my judgment, it does nothing of the kind. On the contrary, it ties my responsibility as an individual in with the sin of the whole race, going back to the first Adam. "By the one man's disobedience the many were made sinners" (Rom. 5:12 ff.).

5. I feel more comfortable with Bube's approach to the discussion. As for his affirmation that "it is only the Christian who has the basic faith foundation adequate to be a practicing scientist," this seems a little much to me. Would it not be more tenable to say that the Christian has the most adequate faith foundation

to be a practicing scientist. After all, Einstein was hardly a Christian but somehow he managed rather well to practice science, did he not?°

6. Does the scientist really have, as Bube suggests, "more difficult decisions to make" than the lawyer or doctor? Some of the decisions the Supreme Court justices have had to make recently seem rather difficult, in fact, so much so that many people have had reservations about former President Nixon's candidates for that bench. As for doctors, are they not scientists, and are not medical questions such as those related to abortion, euthanasia, etc., which face doctors some of the most difficult of all to resolve?

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My agreement with both Bube and McIntyre is deep and wide; my disagreements might well be reconciled across coffee cups, were that possible. My contribution, for lack of space, is purposely terse. Bube says that "it is only a Christian who has the basic faith foundation adequate to be a practicing scientist". What does this mean? Had he said "practicing Christian scientist", we could hardly disagree, for it is now a tautology, assuming the foundation is Christianity itself. Perhaps he means that the scientist must assume in his chosen field a regularity sufficient to provide the clues for discovery of so-called laws of science. But this kind of presupposition (or faith) is the same for all scientists, Christian and non-Christian. Thus the non-Christian scientist would have the necessary faith-foundation.° But, more seriously, Bube has the Christian scientist responsible not only to God as ultimate Wisdom and Power, but "to all other humans presently living and destined to live in the future until the return of Christ". What a heavy load, if that were true! One wants to ask, does this make it worse than being responsible to God only? And how intense is the responsibility? I should think this conviction might quickly empty the ranks of scientists of the Christians among them, for they would live under the threat of some evil application of their contributions to science. I believe, rather, (with McIntyre) that the Bible teaches the principle of limited responsibility ("to his own acts"). It seems to be partly a matter of God's design, the "Maker's instructions": separation of the personal from the impersonal, the respondable from the un-respondable.

While a man's knowledge is not the only parameter in ethical decision, it does qualify his act: "Whoever knows what is right to do and fails to do it, for him it is sin." (Jas. 4:17) Newton, I'm told, suppressed certain scientific knowledge he was virtually sure would be put to evil use. But alas, the calculus which he (and independently Leibniz) invented, has been used to guide many a bomb to its human target. And, with thousands of others, I have taught many students their calculus. Must I lie awake nights wondering whether any of these will use it for wicked purposes?

I believe that God does not load the scientist, or anyone else, with responsibility for what his superiors, including his country's officials, develop from the scientific knowledge he has discovered--except, of course, those superiors and officials for *their* decisions. If we believe in police action (and I do) to restrain the lawless, then we can hardly oppose manufacture of efficient weapons. The root of limited responsibility, it seems to me, lies in the fact that the Biblical ethic reflects the character and will of God. "You shall be holy, for I the Lord your God am holy" (Lev. 19:2). And Jesus repeats this command. But the human race is so depraved that "none is righteous, no, not one"; so the fulfillment of the demands of the Biblical ethic is impossible without outside help. As Paul wrote "the mind that is set on the flesh is hostile to God; it does not submit to God's law, indeed it cannot" (Rom. 8:7) There is thus no area free from the necessity of God's redemptive grace.

McIntyre says that "if ordered to write a computer program for illegal purposes, the Christian would refuse to do so." In most cases I could think of, I would agree. But in *all* cases? To agree to this seems to set legality above morality, which I doubt McIntyre wants. The duality of Caesar's things and God's admitted, the only question is how to distinguish one from the other. The mother of Moses disobeyed the law of the land in preserving him; Moses himself later opposed Pharaoh who was the law of the land; Daniel disobeyed his ruler by continuing his worship; and the disciples did similarly with their preaching the gospel. The last-named gave the eternal principle for all such cases: "We ought to obey God rather than man". Here I must agree with Bube that morality supercedes legality (and I believe McIntyre holds it, too). It is well to keep the difference in focus. Each supplements the other, each reinforces the other's authority. As J. N. D. Anderson puts it,

> The demands of morality may be said to be maximal, while the requirements of the law must be confined to what is, by comparison, minimal. Morality, for example, enjoins us to love our neighbour as ourselves; but law must content itself with trying to prevent any such speech or action as injures our neighbour's legitimate interests. Again, morality . . . concerns itself not only with what can be seen and judged by men, but also the thoughts, motives and feelings which no-one except God can know or evaluate.

One final nose-tweak: both Bube and McIntyre apparently believe that research can be done only from (sizable?) funding. It's just as well that some scientists didn't know this, for it might have curtailed their discoveries. But we all know that "big" science is not necessarily good, nor "little" bad. There are ways of getting some research done, when there is no one to pick up the tab. (George Washington Carver, come back to teach us how you did so much with so little! And Banting and Best, show us your little lab under the stairway where, although poor in funds, yet rich in ideas and energy and determination, you finally gave us insulin, boon to all diabetics!)

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°*Note by Bube:* I hope that the context shows that I am speaking not about philosophical grounding, but about the ambivalence of science. If there is no sovereign God, we better not expose still greater possibilities for evil.

My reaction to this Dialogue is that there are larger issues to be decided first. For example, *Daedalus* in a recent issue published two huge volumes on the future of higher education in America, which directly impinges on all Christian career professors in our universities and scientists too. The most obvious conclusion of those many articles is that the career of a university professor is no longer the paradigm of security. As universities cut back, they cut back in the science department, and they will cut back Christian professors too! Young people are being counseled today to be adept in three or four skills to keep themselves viable on the job market. If a university career is no longer the paradigm of vocational security, it means Christians interested in science must take account of the situation as it is now. Perhaps in these days Paul would have added to tent making, being a carpenter and a short order cook! With the complications of our society, Christians must think of God's calling in the light of the transitions that university education and the job market are now going through.

A second impression of a larger issue is that of the nature of a university. During the sixties the activists claimed that the universities should be agents of social change. One cannot speak of social change in a university without a theory or theology of social change. I have evangelical friends who are in accord with the thought of the sixties and still want the universities to be such agents of social change. Then there is the concept of the university which looks upon it as a scholars' paradise, isolated from political and economic pressures so pure research can be followed without external pressure. Social change in that kind of situation is much different from the first instance cited. In short whatever we think is the kind of social change that a scientist should help along, will be determined by the kind of university we think is the ideal university.

Thirdly I think Bube has put his finger on the very sensitive issue of the nature of modern science. We can now go down roads, roads by which we cannot come back. The use of radioactive materials may create conditions we cannot ever correct in many life times. Genetic engineering can go far enough that reversibility is not possible. The ethical responsibility at this juncture is crushing. We have a good idea of the destructive forces in radioactive material but we may need it as part of the solution to the energy shortage. Or to remedy one genetic defect that seems so deleterious may create something even worse which will appear two or three generations later. At this point to say, "Let us pray," is not a trite religious cliche but mandatory for the awesome possibilities we are dealing with.

The fourth consideration is the matter of responsibility both men discussed. Nazi Germany and American Watergate showed how good men in obedience to the wrong person have no excuse for the evil deeds they do, no matter how much they might have believed in the justice of their cause.

But responsibility is not pinpointed. It vectors in on the scientist because whatever has been prepared up to this point he must now execute. We can name a scientist and say that he did this inhuman thing. But we know responsibility is a never-ending web. And this is true of Christians and Christians as scientists. I think the man who is a Christian and a scientist must understand the web of responsibility in such a setting. This means that he may have to go back in this web to a president, a senator, a governor and say that the buck not only stops here, its starts here. Only as they see the web of responsibility can Christian scientists express their own responsibility in the way it counts, in the way it is fair and in the way it cuts off the evil act at its initiation.

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We need to understand science and technology that is relevant *to the human condition. However, we in the scientific community have been brought up in a different tradition. We have a justified pride in our intellectual independence and know—for we often have to battle to maintain it—how essential this independence is to the search for truth. But scientists may sometimes tend to translate intellectual independence into a kind of mandatory avoidance of all problems that do not arise in their own minds—an approach that may cut them off from the real and urgent needs of society, and often from their students as well. As a result, science has become too isolated from the real problems of the world and a poor instrument for understanding the threats to its survival. . . .*

To resolve the environmental crisis, we shall need to forego, at last, the luxury of tolerating poverty, racial discrimination, and war. In our unwitting march toward ecological suicide we have run out of options. Now that the bill for the environmental debt has been presented, our options have become reduced to two: either the rational, social organization of the use and distribution of the earth's resources, or a new barbarism.

Barry Commoner
The Closing Circle: Nature, Man and Technology, Bantam, N.Y. (1972), pp. 190, 191, 295

Is Scientific Research Value-Free?

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Is scientific work truly objective and religiously neutral? Does a person's own presuppositions about reality, his own world-view, have anything to do with his scientific investigation? Does a Christian researcher leave his faith at the laboratory door?

In the 20th century the overwhelming response to these questions has been that true science by its nature is secular, objective, value-free, without presuppositions. But increasingly there are heard objections to this by Christians and non-Christians alike. The question was a major issue at the 1972 annual Convention of the American Scientific Affiliation.

The question is of key importance to researchers and teachers who are Christians. If it is true that all science is religiously conditioned, then the challenges before us are so great that the priorities of the Christian scientific community ought to be redirected. If science is secular, religiously neutral, then Christians who are claiming otherwise should quit their disturbance and direct their energies constructively.

In this paper I will specifically mean by "science" the natural sciences such as physics, chemistry, biology, and related fields. Yet the arguments I will use would seem to apply with even greater force to the social and behavioral sciences.

It should be made clear that in speaking of Christian values in science I'm not now talking about Christians in their personal relations with other scientists, not about the need for integrity in science, not Christian motivation for scientific work, not moral issues in the application of theoretical science to practical situations. I'm talking about values in the very inner structure of science itself, what science is, and the ways the scientist must inevitably go about his work of discovery.

By values I mean whatever a person cherishes as giving fullest meaning, purpose and coherence to his life and direction for the most meaningful decisions of life. Values, then, are not religiously neutral since they deal with the deepest issues in life, with what a person gives his life to. Values are not logically derivable from scientific work, nor can values be proven by logical or scientific means. Values are extra-scientific, pre-scientific.

The Common View of Science

The commonly held view of scientific research is that the great advances of science in modern times have come under the positivistic ideal of science, in contrast to the metaphysical clouding of science in previous centuries. Science has been freed from philosophic and religious preconceptions that make true science impossible. Further, science is free from the biases of the personal observer: the test of valid work is that experiments and observations can be duplicated by any other person using the same methods at any other time and place. The scientific enterprise starts with a clean page on which are written only the facts that are utterly clear before our eyes. Added to those facts are only those evident patterns the facts show, and minimal conceptual inferences formulated into laws and theories. Only with rigorous use of this scientific methodology can we be sure to have true and universally valid knowledege, not merely the quicksand of personal opinions.

This understanding of scientific work is very powerful and appealing. How can anything be said against it?

Objections to this View

There are, however, some things to be said against this scientific approach to knowledge, some things that strike at the very heart of the matter, at the very taproot of this kind of tree of knowledge. The biblical revelation is basically counter to this picture of science. In the Bible God reveals to us that all of reality is in the hand of God, and that nothing we see can be understood apart from Christ, in whom all things consist and in whom all things hold together (Col. 1:16, 17). This means that scientific knowledge is not only incomplete without faith in Christ, but is also distorted, not only in its applications but especially in its inner meaning.

Scientific work is inescapably underlaid with a religious viewpoint of some kind or other. By a religious viewpoint I mean a view of science that implicitly or overtly deals with such fundamental issues, among others, as the meaning of physical reality, the nature of man and his purpose on earth, the place of science

in human life, and the limits of scientific knowledge. These issues are handled by scientists in a way that gives place and honor to Christ, or in a way that denies him. In all his work man will either praise Christ or give his honor to an idol substituted in place of Christ. That fundamental religious antithesis is inescapable also in science. There is no neutral ground.

Two Idols

Is it true that modern man who does not bow before Christ worships an idol in his scientific work? Indeed it is, and in fact there are two easily identified idols. One is science itself. As the physicist Richard Schlegel says in his book, *Completeness in Science*, "*Indeed, in an effective way, science is for many the religion of our age.*"[1] (Emphasis his) Scientific knowledge is considered the only true knowledge, knowledge of what the universe really is, distinguished from pseudo-knowledge built on superstitions, myths and competing religious claims. An appeal to science is an appeal to ultimate authority.

But there is another idol, too, closely related but often competing with the idol of science. That is the worship of the scientist and mankind generally. This is the central thrust of the religion of humanism. Man is praised and glorified for his brilliant scientific achievements, whether in molecular biology, or the physics of elementary particles, or the fantastic achievements of travel to the moon. Eulogies to the greatness of man are in the headlines whenever there is a major breakthrough in science or technology.

It is not surprising that the major conflict of our age is the conflict between these two idols which have displaced God in science. The humanist struggle to free man from the straightjacket of scientism is in direct conflict with the scientific ideal of conforming all of life to scientific analysis and scientific conclusions. The twin idols of the autonomy of man and the autonomy of science can only result in total combat between man and his "frankenstein."

Subjectivistic Views

The fact that scientific research cannot be truly objective and value-free is being increasingly recognized by non-Christian scientists. Thomas Kuhn in *The Structure of Scientific Revolutions* argues that scientists can do their work only from the viewpoint of one or another "paradigm", a pre-theoretical framework without which even scientific observation becomes impossible[2]. Holders of different paradigms can scarcely communicate with each other, because paradigms are incommensurable. This is a subjectivistic view, and has been received better by practicing scientists than by philosophers of science. Yet in his analysis Kuhn has correctly seen the intertwinement of the scientist as a person with his scientific work.

Kuhn and others follow the tradition of Herbert Butterfield, especially of his classic work, *The Origins of Modern Science*. Butterfield argues that the observations or evidence do not themselves thrust upon the scientist conceptual patterns of interpretation that are univocal and necessary. Instead the scientist needs to choose deliberately which alternative conceptual framework to use for his interpretation. He says that one could not ". . . escape from the Aristotelian doctrine merely by observing things more closely . . . (but) it required a different kind of thinking-cap, a transposition in the mind of the scientist himself."[3] This is a choice the scientist makes that is not dictated by the observations and experiments. We can't even say that after we have the data at hand we can choose our conceptual framework. As Kuhn documents, even the data themselves can significantly depend on our conceptual framework, not only which experiments we choose to perform and which research we consider meaningful, but even the numbers we obtain from an experiment.[4]

Is it true that modern man who does not bow before Christ worships an idol in his scientific work?

Further evidence for the fact that science is not purely objective is the circular relation between data and scientific conclusions. Conclusions enter the search for data through the vehicle of hypotheses which are tentative or potential conclusions. Hypotheses determine which experiments are to be undertaken, and how they will be undertaken. When data support a hypothesis, the place of the hypothesis as a firm scientific conclusion is strengthened.

A field that has already been widely researched abounds in hypotheses which shape further research. A new field of enquiry has few hypotheses, yet even here there is need for some criteria by which to identify results that appear anomalous or uninterpretable. Butterfield points out that the competing astronomies around 1600 so disoriented people that the idea was put forward ". . . that one should drop all hypotheses and set out simply to assemble a collection of more accurate observations. Tycho Brahe replied to this that it was impossible to sit down just to observe without the guidance of any hypothesis at all."[5] This is especially significant coming from Brahe, who came closer than perhaps any other scientist to being a pure observer of phenomena.

R. N. Hanson follows Wittgenstein as he writes in his 1969 book, *Patterns of Discovery* that seeing and observation are "theory-laden" undertakings.[6] He writes to show that causal relations are also theory-laden.[7] Hanson's work is valuable in pointing out the error of the objectivity school of thought in science, though he himself falls into the Charybdis of subjectivism.

In the social sciences, too, there is recognition that pre-scientific assumptions are a necessity for scientific work. Social scientist Clyde Kluckhohn has written in 1966 a journal article entitled, "The Scientific Study of Values and Contemporary Civilizations," in which he says, "All discourse proceeds from premises and . . . is limited by those premises. This is equally true of physical and biological science. The important thing in all cases is that the independent critic should be able to scrutinize the premises as well as the data."[8]

I have shown that a number of prominent modern writers take the position that scientific work necessarily includes hypotheses or conceptual systems or paradigms that give coherence to scientific thought and provide a meaning-framework for data. Choice between these

alternative conceptual systems cannot be made on the basis of data only, though their articulation may be shaped by data. We conclude, then, that these scientific conceptual systems contain input which cannot be arrived at by scientific methods. In short, the scientist brings to his research preconceptions about the nature of reality that he cannot avoid using in his scientific work. He may not be consciously aware of this fact, nor be able to articulate what his preconceptions are because they may be the common working assumptions of other scientists in his field. Yet, on the basis of this reasoning the dogma of scientific neutrality and objectivity is reduced to a myth.

Historical Evidence

If there is any doubt that such extra-scientific preconceptions are a vital part of our science, history will show us that it is so. We can recognize this as true by thinking back to the scientists of a hundred years ago, who were no less scientific than we. Yet their scientific work was deeply embedded in conceptions such as ether theories, vitalism, and the whole Newtonian conception of mechanics. Scientists do not accept these and other views today, not because they have been disproved by the data of crucial experiments, but rather because they have been replaced by different commonly-held extra-scientific views. In this connection it is well to recall that Copernicus' picture of the solar system did not fit the data better than that of Ptolemy, and was not accepted on the basis of the data.

It is of historic importance to note that Einstein did not accept quantum mechanics and the picture of the world it presented. He rejected it because he preferred to see the world in a more objective way, with sharp demarcation between the scientist and the materials he investigated. Also Einstein preferred to work for a rationalistic understanding of physical phenomena in the tradition of earlier physics.[9]

Einstein is not alone, of course, in holding the postulated hope that knowledge of the universe may be in principle completely rational. Many want a solid rationalistic base to our knowledge, a place to stand that can be *proved* beyond any doubt, that is not dependent on personal human wisdom, or its lack. In short, many want to know truth about the world and ourselves without needing *faith*, especially without religious faith.

The dogma of scientific neutrality and objectivity is reduced to a myth.

At this time in human history a person may believe that knowledge of the world is bound up in a rationally closed system, or he may believe that it is not so bound. Philosophers are still not able to assure us that it is, though they are trying very hard to do so with their analysis of logic and their work with observational language. But four hundred years after Descartes, the clean logically-rigorous base even for mathematics is nowhere to be found. It has been washed away by the brilliant 20th century mathematicians, even as they were trying to prove its truth. Noteworthy is the Incompleteness Theorem formulated by the mathematician Goedel in 1931. This theorem shows that in any logical system of sufficient complexity which is internally consistent, one may always describe propositions which cannot be proven or disproven within the system.[10,11]

Facts Not Value-Free

It is common today to hold that empirical facts are the same for all people, and then each person can add to the facts his own personal values. For example, this is the foundation stone on which our public schools attempt to serve families of widely divergent religious beliefs. I have taken the position, in contrast to this, that facts are *not* neutral, value-free. What really is a fact? It is not simply that something exists "out there" clearly for all to see. Instead, for something to be a fact means that persons agree to accept it as valid. It is the general personal acceptance that makes a fact a fact, not that a thing exists clearly by itself apart from human response to it. Thus personal judgment is the key to making a fact a fact. Sets of values do not exist outside of sets of facts, enabling one to make a personal decision as to which values he chooses to attach to certain facts. The world is simply not structured in that kind of way, even though in their unbelief men want to try to separate God from his world as far as possible, which is basically what fact-value separation tries to do.

People who have tried to define fact and values in such a way as to make them separable would apply the same procedure to scientific data and conclusions. But the problematics is set up wrongly. The operations of scientific research do not correspond to the notion of value-free data. Instead hypothesis, world-view, theory all shape the approach to research problems, the data that one considers meaningful, and the way data are interpreted and used.

I cannot offer air-tight proof that religious belief enters willy-nilly into every step of scientific work. In fact, to do so would negate my very position that the world is not rationalistic in that way. Yet there is a great deal of circumstantial evidence from analysis of what science really is and how people go about it. There is the testimony of many practicing scientists and philosophers of science. There is confirming information from a historical look at science, since we can see ourselves and our science more clearly in comparison with the work of others done in a different era. Yet in the end, like so many things, there is an aspect of faith involved in the question of which of the two views of science we accept.

Non-Christians in Science

If God's revelation gives values which are the only true and correct input that enable only the Christian to have the correct pre-scientific input to science, then do unbelievers merely waste their time doing research? No, that does not follow. Jesus said that even the children of darkness are wiser in their generation than the children of light (Luke 16:8). This must be understood, though, in connection with Paul's saying that the wrath of God is upon ungodly men who suppress the truth in unrighteousness (Romans 1:18). Unbelievers do not accept the moral law as from God, yet they must obey it or suffer the consequences. In the same way, God's laws for physical things are real and sure. Unbelievers are able to discover God's laws in part—often more brilliantly than Christians—because God has put

How can be we faithful to God as believing scientists? That is the question.

laws like his footprints in the world. An archaeologist can discover the footprints of an extinct creature and make some correct deductions about the creature and his habits. So the unbelieving scientist discovers much that is true. But his understanding will always be partial—like the archaeologist's—and distorted. It is distorted because a person cannot live and work without worshipping, and if he does not worship the God of heaven he will worship science or man or some other idol. For that reason the results of unbelieving science cannot be accepted uncritically without radical reinterpretation. For example, we can benefit from Freud's brilliant discoveries, but we need to re-interpret them, to transform them (Roman 12:2), if we are to understand them with the mind of Christ, who alone is Truth.

This Christian view of science sees that all men view science inevitably with one kind of bias or another. All have a religiously grounded belief about what is fundamental in reality. Everyone wears colored glasses through which he perceives the world. It is not that there is a neutral non-color through which the right-minded pure scientist sees things, while others distort their vision by the coloration of their biases.

Understanding Science

If the scientific enterprise is not to be understood as being religiously neutral, objective and value-free, then how are we to understand it? The Bible itself gives us some key insights that we can get no other way. Listen:

> Praise the Lord, O Jerusalem
> Praise your God, O Zion . . .
> He sends forth his command to the earth;
> his word runs swiftly.
> He gives snow like wool;
> he scatters hoarfrost like ashes.
> He casts forth his ice like morsels;
> who can stand before his cold?
> He sends forth his wind blow, and the waters flow.
> (Psalm 147:15-18)
>
> For from him and through him and to him are all things.
> To him be the glory forever.
> (Romans 11:36)
>
> . . . your Father who is in heaven . . . makes his sun to rise on the evil and on the good, and sends his rain on the just and the unjust.
> (Matt. 5:45)

The scientific enterprise deals with all the multivarious ways God upholds the world. The aim of science is to get the best understanding we can of how God upholds the world, of the upholding process itself. The laws of science are God's laws, and we are running away from the truth if we think of them as the laws of nature. There is a world of difference between those two conceptions. They are not laws that man invents, but rather laws that he discovers more or less aptly, as God discloses his laws to the scientist. God's laws for physical things—which we term scientific laws—are understandable to us because God has made us in his image. Yet they are not rationalistic in the sense that in principle we can comprehensively understand them, because God's ways are also above our ways (Romans 11:33-36; Job 38-41).

The area of scientific investigation is not the rule of impersonal laws of nature, but rather the rule of a personal God, as R. Hooykaas has put it.[12] There is regularity and constancy in the physical world because God is constantly faithful (Malachi 3:6; Jer. 5:24). The moving force of the world is not chance, nor fate, nor evil spirits, but the living personal powerful God who reveals himself to us as Heavenly Father.

How are we Christians, then, to think of our scientific work? Not by accepting the world-view of secularized science, which arrives at religious neutrality and scientific objectivity by denying the scriptural God of science and then later trying to add God to the scene again. God's world is a unity, not a patched-up duality. If God is not the beginning of learning (Prov. 1:7), he cannot be brought in at the end to patch up the system.

If we will accept our scientific work as not being secular but as our witnessing-service to our God who is all and in all, then we have our work cut out for us. If this means pursuing some new directions in our Christian scientific work, then let us do it together, communally strengthening each other, and in love correcting each other.

Implications for the Christian

What are some of the implications and constructive consequences of this thesis about our Christian work in science? It will help Christians avoid some of the errors and dead-ends that are problems in unbelieving science, such as:

It sees as futile the search for a rationalistic base for science and all human knowledge. Knowledge is not a logically closed system.

It sees positivism as inherently false and the attempts to patch it up as futile. It also rejects subjectivism, which Kuhn and others embrace after seeing positivism as untenable.

It avoids the reductionism of one kind or another which is inevitable when Christ is displaced as the central meaning of all things by one or another aspect of knowledge, such as mathematics.

It sees that at the most fundamental and theoretical levels divergent interpretations of science are inevitable, arising as they do not only from errors but especially from deeply-held beliefs that themselves are not subject to rational proof.

It sees scientific determinism at all levels to be untenable, as inconsistent with what God has revealed to us about His ways.

It sees the crisis of our age in its fundamentally religious nature as the turning from Christ as the center and source of all knowledge to secularized science, in which one or another created aspect of reality is the foundation of learning.

What is the constructive practical result of this viewpoint? For one thing, though the Christian scientist will use largely the same scientific terminology as unbelievers, he will often use terms with a conscious transformation of meaning. "Scientific law" will mean the scientific attempt to formulate the regularities in God's rule of the world, rather than the evidence of a machine-like self-contained world functioning by an

inner necessity. The term "nature" will not be used in reference to a world "out there" run by self-contained inexorable forces, nor the pantheism of a "Mother Nature." "Causality" has a different coloration to it, as does "rationality," "substance," "evolution," and many other terms.

In general the Christian who recognizes the terminology of science to be value-laden will want to study the various schools of philosophic thought that have contributed value input to our scientific language. He will need to see this in the light of the historical development of science and the personal convictions of the giants of science who profoundly shape the thought-patterns of science. Such insights should also occupy a significant place in the teaching of science by Christians, especially in Christian schools.

Developing a "Christian Mind"

What is the practical difference whether Christians have a radical Christian approach to science or not? Will this result in Christian Biology, or Christian Psychology, or perhaps Christian Physics? The plain fact is that we do not know what will happen because we've never tried it in a sustained way. We need to develop what Harry Blamires calls a "Christian mind," that is, a shared Christian viewpoint. No person can transform a science by himself. Each of us is trained *not* to look at basic issues in our field. Each of us is a specialist in some field or other, and thoroughgoing Christian work in science calls for input from various disciplines, genuinely interdisciplinary work. We do not know what a decade of sustained communal work can bring. It will not likely bring in a Christian chemistry. But perhaps there should be some kind of Christian Psychology, as a Christianly based alternative to psychology that is behavioristic, or Freudian, or existentialistic, or what have you.

Yet the real question is not whether the difficult deliberate work of understanding and doing science Christianly is likely to be worth it in terms of practical results. The real question is what God calls us to do, how he wants us to serve him and witness to him also within the structures of scientific work itself. How can we be faithful to God as believing scientists? That is the question.

I have sketched two interpretive views of the scientific enterprise. One considers science to be value-free. The other purports to be a distinctive Christian view that says science is not value-free. I think it vital that as a Christian community we face this question head-on, and come to communal consensus. The issue eclipses other issues with which ASA may deal, lying as it does at the heart of Christian work and witness in science. A communal consensus does not bind anyone's conscience but it provides direction and impetus for further work. Let us be about it together.

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In the end, Einstein came to embrace the view which many, and perhaps he himself, thought earlier he had eliminated from physics in his basic 1905 paper on relativity theory: that there exists an external, objective, physical reality which we may hope to grasp — not directly, empirically, or logically, or with fullest certainty, but at least by an intuitive leap, one that is only guided by experience of the totality of sensible "facts." Events take place in a "real world," of which the space-time world of sensory experience, and even the world of multidimensional coninua, are useful conceptions, but no more than that. . . .

Einstein, in his letters, preferred to call his theory not "relativity theory," but exactly the opposite: Invariantentheorie. *It is unfortunate that this splendid, accurate term did not come into current usage, for it might well have prevented the abuse of relativity theory in many fields.*

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On Being a Person in a Relative World

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This paper is addressed to the issues involved in the establishment of a personal identity in our contemporary society, particularly to the role of religious values in the development of identity. At the outset I should like to clearly state the proposition that morality is central to identity and that identity is central to morality. To the degree that religion is concerned with morality, then religion is central to identity. These issues I have discussed previously.

However, here I should like to address the problem of moral relativity *as it relates to the integrity of personal identity. As I shall elaborate, I do not believe that the concepts of moral relativity do violence to a life built upon religious faith, and particularly religious commitment. In fact, I propose just the opposite: namely, that a life built upon normative commitments is critical to the development and maintenance of a personal identity in a world of relativity.*

This paper then takes up two themes: the development of a personal integrity in relation to psychological relativity, and the development of a personal integrity in relation to cultural relativity.

BEING A PERSON AS A MORAL ISSUE

World War II convulsed the world both physically and morally. In the aftermath came a determined attempt to assess a world moral order. The Nuremburg war crimes trials were the focus of this re-assessment in which two opposing moral positions were brought face-to-face. The defendants argued that they were implementing the laws of the land; the prosecution argued that certain basic human rights and responsibilities were self-evident and inviolable. The issue was clear: Were there universal norms of human morality or does each society construct its own relative system of morality?

The issue was not new. Philosophers had struggled with the issue until the turn of the twentieth century, only to give up the task and turn to analytic and process philosophy: to analyze *how* men make moral decisions. Social scientists, especially anthropologists, had brought in a multitude of competing social moral systems from other lands and peoples. Sigmund Freud and the pioneers in psychoanalysis had demonstrated the vagaries and inconsistencies of personal moral conduct. But all this work did not directly challenge the world and popular thought until the cataclysm of war, ghetto, and concentration camp made the moral confrontation inescapable.

The issue was made more pointed by the growing realization after World War II that the historic Christian church institutions had not sustained a viable morality for contemporary civilization. In their post-war studies on prejudice, Adorno *et al* discovered that the ideologies of the Christian church actively fostered anti-semitic hostility. This was confirmed and extended in the ensuing two decades of the 1950's and 1960's by a multitude of psychological and sociological studies that demonstrated that traditional Christian morality was not only inconsistent, but more tragically fostered bigotry, authoritarianism, dogmatism, and anti-humanitarianism. It appeared that rather than contributing to the welfare of man, traditional Christian morality had a negative and de-humanizing influence on Western man.

Not only was traditional morality bankrupt and

A prior version of this paper was presented as the convocation address at the Religion in Life week, Westmont College, January 4, 1972.

found wanting in terms of the past. The world was in flux. New decisions had to be made. How were we to decide? Women no longer were dependent on men; divorce became socially feasible. The pill arrived and pregnancy was no longer a Sword of Damocles. The black man in America arose to claim his humanity and found himself barred from the doors of the community church. Children in an affluent age found that the self-ratifying and self-congratulating pose of success in a God-blessed America had covered human misery of a corrupt and oppressive society that poorly tolerated dissent. The traditional moral answers of conventional religious institutions seemed only to perpetuate the status quo and provide no platform for reform and re-assessment.

It was in this context that theologians began the serious task of crafting a "new" morality, a re-assessment of religious moral conventions and an analysis of the new ethical dilemmas posed by a changing society. Bishop John Robinson brought out *Honest to God,* soon to be followed in America by Joseph Fletcher's *Situation Ethics.* The debate was on! Robinson, Fletcher, and fellow-travelers were seen as agents of a moral anarchy soon to devastate the country. As theologians they had betrayed God, man and country. But perhaps the polemics were hasty as well as ill-advised. For the issues Robinson and Fletcher struggled over came closer to home with the polarization over the Viet Nam war and the civil rights struggle. The moral dilemma has invaded almost every significant area of contemporary life.

Personal versus Social Morality

Much of our thinking about morality has been formulated in personal terms. We are fond of quoting Martin Luther, "Here I stand, I can do no other." The individual conscience is pitted against the forces of a society. Yet this misconstrues the essential nature of morality which is simultaneously a personal and social concern.

Clyde Kluckhohn, the late famed Harvard anthropologist summed up the issue well:

> There is the need for a moral order. Human life is necessarily a moral life precisely because it is a social life, and in the case of the human animal the minimum requirements for the predictability of social behavior that will insure some stability and continuity are not taken care of automatically by biologically inherited instincts, as with the bees and the ants. Hence there must be generally accepted standards of conduct, and these values are more compelling if they are invested with divine authority and continually symbolized in rites that appeal to the senses.[1]

No society can function without a specific morality. Morality is not a question of merely prohibitions or musts, but rather the values and definitions of appropriate behavior by which man governs his behavior, and protests against social mores and injustice.

For too long, however, we have seen the morality of a society in static terms. *Morality must be a process,* for society is always in process of change and new moral decisions for human relations must be negotiated.

This ongoing process of moral decision-making is highlighted by sociologist Philip Rieff:

> To speak of a moral culture would be redundant. Every culture has two main functions: (1) to organize the moral demands men make upon themselves into a system of symbols that make men intelligible and trustworthy; (2) to organize the impressive remissions by which men release themselves in some degree from the strain of conforming to the controlling symbolic, internalized variant readings of culture that constitute individual character. The process by which a culture changes at its profoundest levels may be traced in the shifting balance of controls and releases which constitute a system of moral demands.[2]

Morality is not a question of merely prohibitions or musts, but rather the values and definitions of appropriate behavior by which man governs his behavior, and protests against social mores and injustice.

This view of process morality is an explicit recognition that a social morality not only can, but must change with time and culture. To some this might appear as if all values and morality are relative. In part this is so, but it may be more accurate to say that all morality must be relevant. Hence, we must look at different categories of values and moral decisions to see how a process view of morality must take into account both absolute and relative concepts of morality.

First, we can arrange "values" along a continuum from the most relative to the most absolute in the following hierarchy:

1. *Idiosyncratic values*—held only by one person in the group under consideration, i.e., personal preferences.
2. *Group values*—which are distinctive of some plurality of individuals, whether this be family, clique, association, tribe, nation, or civilization.
3. *Personal values*—private form of group values.
4. *Operational absolutes*—values held by members of a group to be absolute in their application of them.
5. *Tentative absolutes*—those operational absolutes found to exist in all societies.
6. *Permanent absolutes*—assumptions that may be asserted but unknowable in any scientific sense.

Now anthropologists no longer hold to the radical cultural relativism of a quarter century ago. Rather, there is a growing consensus that tentative absolutes do exist—a rough parallel to the Mosaic Decalogue. This is not at all at odds with the emphasis of the new morality as the ethic of love, for the Ten Commandments are negative definitions of love. That is, the Decalogue spells out some, but not all, conditions of non-love.

Thus we can affirm an ethic of absoluteness, whether from a scientific base that affirms a certain uniformity of morality, or from a Judaeo-Christian base of affirmation of man's relationships to God. But this affirmation of absolute moral norms involves broad general principles. Specific interpersonal pieces of behavior are not self-evident, but vary with time, place and culture.

Let us look at a few examples. Stealing is violation of human relationship. The use of a neighbor's car, without his knowledge, in a farming community may not be defined as stealing, whereas it probably will be defined as stealing in the city. In certain South Sea Islands, people leave their coats outside their huts in case a passerby needs a coat, but one would be upset if a stranger took one's coat from the cloakroom at the opera. To shoot a horse-thief was appropriate moral

behavior in the Old West, but not the New.

In other words, we are faced with the task of defining what the conditions shall be of love or the Decalogue in our time, in our place, in our society. And how we define our morals will have to assume a sense of moral authority for our behavior until such a time as we re-evaluate our moral stance.

Absolute Norms Relative to Present Issues

Let me put it in brief theoretical terms. We have to apply our absolute moral norms in a manner relative to the society at hand. However, that relative definition must be treated as an absolute standard.

Several examples may clarify the principle. In my town today, we must define what behavior shall constitute stealing. Having agreed on a definition, we all must live by it until we redefine what shall constitute stealing. Another example is the action of the Supreme Court. To it are brought moral dilemmas. The court makes a ruling as to the most appropriate moral resolution in the light of available evidence. We are then incumbent to act according to that ruling until the same dilemma is brought to the court for another evaluation and moral ruling. It is recognized that the Supreme Court is not handing down a "final" decision, but rather the best decision that men can make at this time. In terms of school segregation, the "separate but equal" doctrine of the 1860's was the best moral decision that could be achieved in that context, but a hundred years later in the 1960's, a re-evaluation of school segregation produced a new moral doctrine to be followed. We can expect that the whole issue will be re-evaluated in the decades to follow. It is important to note here that the Supreme Court still follows a set of moral absolutes—the Constitution. The moral dilemma is not one of absolutes, but how they apply absolutes of the Constitution within the framework of the society at hand.

Stages in Moral Development

The relationship between personal and social morals can also be looked at in terms of moral development. The child first learns morality as a very personal, idiosyncratic set of behavior, and only later begins to develop a more generalizable and universal set of values. Lawrence Kohlberg has constructed a scale of moral development that consists of 6 stages:[3]

Stage 1: Obedience and punishment orientation. Egocentric deference to superior power or prestige, or a trouble-avoiding set.

Stage 2: Naively egoistic orientation. Right action is that instrumentally satisfying the self's needs and occasionally others'.

Stage 3: Good-boy orientation. Orientation to approval and to pleasing and helping others.

Stage 4: Authority and social-order maintaining orientation. Orientation to "doing duty" and to showing respect for authority and maintaining the given social order for its own sake.

Stage 5: Contractual legalistic orientation. Duty defined in terms of contract, general avoidance of violation of the will or rights of others, and majority will and welfare.

Stage 6: Conscience or principle orientation. Orientation not only to actually ordained social rules but to principles of choice involving appeal to logical universality and consistency.

It has been shown by Kohlberg and his colleagues that the majority of people sampled in the United States consistently operate in terms of the first few stages of morality. This produces much confusion because our great social institutions such as the courts and our fundamental ethical theology are written in terms of stage 6 morality.

Put in another way, much of the everyday Christian morality has been framed in terms of the lowest levels of morality—avoidance for fear of punishment, rather than in terms of the highest levels of morality—commitment to responsible application of principle.

Much of the everyday Christian morality has been framed in terms of the lowest levels of morality — avoidance for fear of punishment, rather than in terms of the highest levels of morality — commitment to responsible application of principle.

Milton Rokeach, one of the foremost psychologists in the area of values, comments on this dilemma:

> If religious institutions taken as a whole are indeed, at best, irrelevant and, at worst, training centers for hypocrisy, indifference, and callousness, it is unlikely that those who are part of the Religious Establishment will voluntarily initiate the program of radical change that seems called for. . . . If a way can be found to reverse the emphasis between proscriptive and prescriptive learning, children can be taught that salvation is a reward for obeying the "thou shalts" of the Sermon on the Mount, rather than the "thou shalt nots" of the Ten Commandments. Such a simple shift of focus, however, would probably require a profound reorganization of the total social structure of organized Christian religions. And if such a reorganization turns out to be too difficult to bring about because of rigidity, dogmatism, or vested interest, the data presented here lead me to propose that man's relations to his fellowman will probably thrive at least a bit more if he altogether forgets or unlearns or ignores what organized religion has tried to teach about values and what values are for.[4]

Such a pessimistic evaluation is based on the fact that expression and acting out of Christian ideals is itself a culture-bound phenomenon. The social institution of the Christian church is a time and place phenomenon—yet one which readily becomes encrusted with a sense of permanence and "rightness." Thus the church and its morality readily becomes a defense of the status quo. One of the traditional roles of the church has been that of definer, sustainer, and enforcer of moral values. In primitive societies religious institutions represent the major social embodiment of the morality of the culture. The same was true for much of the history of Christianity in relation to Western society. But the fact that the churches of America have come to be bastions for defense of the status quo is cause for dismay. Overlooked is the need for challenge and change in morals, not merely the maintenance of morals. The church in Western society has become primarily an agent for the maintenance of outmoded moralities and has lost its function as a creator of new moralities. Thus it has lost half of its relevance as a moral agent. The "new morality" movement then can be seen as a

renaissance attempt at reclaiming the role of moral innovator in society.

The Christian institutions of our culture have participated in this culturally clouded process of moralizing. Thus, it has appeared that moral decisions had some intrinsic sense of rightness and self-evident validity about them.

But now we face a new world in which cultural innocence has been lost. We can no longer plead ignorant of the fact that moral decisions are not self-evident and that as a culture, as church institutions, as individuals, we ourselves, we humans have constructed our day-by-day moral codes.

The reaction to this awareness in the first half of our century was to proclaim a universal relativism. No man might lay moral claim to any other man's behavior. However, no society has or could exist in such moral anarchy.

Crafting Our Moral Decisions

We now face a profound opportunity to accept the freedom to craft moral decisions for our time and place. To craft moral decisions that do justice to universal and absolute norms of human integrity. Yet with the realization that the moral decisions that we make today will be outmoded tomorrow and that we shall have to again reconsider our moral decisions. We shall have to craft moral decisions today as the best possible means of implementing universal norms, yet with the humility that as we learn and grow, our knowledge tomorrow may force us to reconsider.

Finally, we shall face our moral decisions with integrity. If the consequences of our moral decisions turn out to be undesirable, we shall deal with those consequences, and not punish ourselves for not having been wiser. We cannot forecast accurately the consequences of our moral decisions, but we can commit ourselves to deal with the consequences with the same integrity with which we made the decision.

What has been outlined here is a revised concept of morality that is not static but processual. Morality becomes a question of how we make moral decisions, apply our decisions, and deal with the consequences. It is a morality that takes into account both the absolute and relative nature of morality. It is a morality that takes into account that moral decisions are both personal and social.[5, 6, 7]

The new morality is not a new permissiveness, moral anarchy, untutored relativism or an attempt to escape from responsibility or integrity.

It should be clear that the new morality is not a new permissiveness, nor is it moral anarchy, nor is it untutored relativism. The new morality is not an attempt to escape from responsibility or integrity. However, it should be noted that these are all perversions that can be observed in our contemporary society.

BEING A PERSON AS A CULTURAL ISSUE

Most of us are children of our times, products and reflections of the modern world of scientific thought. Although we may descry more than one world in which we exist, those of us who are academicians, professionals, intellectuals participate and work in a world view infused by the notions of logic, reason, thought, objective and observable data confirmed as true by the published data of others. We live within this western technological, scientific world, and we cannot deny that we are part of it. But let us stop for a moment and look back at the context of now almost three-fourths of the twentieth century. Let us look at the way we have lived and thought and felt. And we may see that the way we have lived, thought, felt, and existed is no more. The age of "cultural innocence" is lost.

A Mono-Valued Culture

Let us look at America at the turn of the century. At that time the majority of the population lived in small towns, or if they lived in urban areas, the ethnic neighborhood community functioned effectively as a small town. People grew up where they were born, married in the place where they were raised, bore children and raised them in the same place, followed a vocation most likely in one's parents pattern, grew aged as grandparents to observe one's grandchildren follow the same pattern and died and were buried in the place where they were born.

This was a mono-valued culture. Everyone lived the same way, felt the same way, thought the same way, and existed the same way. Although these small cultures changed, they changed slowly, imperceptibly, naturally, as if it were meant to be that way.

Born into such a small culture, one grew up with an experience of the world about that was consistent and uniform. Without awareness, the values, styles, morals, the patterns of beingness were taken in by the child, laid down and cemented into this ego-structuring of the world. So that like an arrow shot from a sure bow, the child grew the way he should become and he became a "good" person.

As a result, the person growing up in this "world" acquired an ego structure of reality that was firm and sure. There was an intrinsic sense of rightness and truth. One knew what was right and wrong, acceptable and vile, desirable and loathesome. When decisions were to be made, you did not appeal to logic, to evidence, to experimentation. No, you looked inside yourself, to your feelings, to your own internal sense of "knownness" which cannot be gainsaid by all external new ideas. How can anything convert the reality that is part of yourself?

(Let us pause for a psychoanalytic parenthesis. What I am describing is not just the internalized superego or ego ideal structure. Rather, I am talking about the nature of the so-called autonomous ego structures—the way in which the ego constructs a view of external reality, paints a picture for oneself to portray the world, so that the person can go about the business of living life. One *must* have an "ego-picture" of the world in order to live, to act, to decide, to derive satisfaction and meaning in one's style of being-in-the-world.)

To return to our person of 1900. Being born, grow-

ing up, and living out one's life in a mono-valued culture provided certainty, security, and meaning. When the stranger came to town, when the politician or speculator arrived, he might be greeted with curiosity, but not incorporation. Here was a person from the "outside world", "another world", but certainly not "my world". And the newcomer either became a part of the mono-valued world or was extruded. For two worlds did not exist within the same ego. Sinclair Lewis catches the flavor of cultural constraint in his preface to *Main Street,* where he remarks: "God made the country and Man made the city, but the Devil must have surely made the small town". In other words, the newcomer, representing a different world of existence, brought cognitive dissonance to the lives of our people of 1900. And the ego does not well tolerate cognitive dissonance (at least if not trained to do so.) So that there is constraint to conformity to reduce cognitive dissonance.

To be sure changes were brewing. Young men and women left the small town, and left their urban ghettos and boroughs. They got educated—got smart. They learned that the world view of their upbringing was chauvinistic, was provincial, was naive, was religious. They learned a new world view. They learned a world view of rationalism, empiricism, scientism. Forsaking the faith of their elders, they followed the faith of the new prophets. And so we arrive at the world view of the scientific professional man. This man of the twentieth century was not beholden to the myths, fantasies, superstitions of his religious forbears. He was free. *And he traded the mono-valued culture of the small town for the mono-valued culture of cosmopolitan science.*

But something else was happening. After 1940 the social structure of American began to move at a quickening pace. In a scant quarter-century the established patterns of cultural change accelerated. Children now grow up in a place where they were not born. One out of seven American families moves every year. The typical family will now live in four different houses as a family unit. Children do not follow the vocations of their fathers. It is predicted that technological change will require that workers change vocations every ten years. Your children will move away and you will not see your grandchildren. You will retire someplace different from where you worked. And you will die among strangers.

The majority of Americans now live in the handful of large megalopolises. People who came from different mono-valued cultures find themselves living, working, existing, side-by-side with people who are different from themselves. People whom they do not understand, people whom they do not agree with, people who do not live like they do. And the next-door-neighbor calls into question the very essence of my existence.

"Cultural Cloudedness of Consciousness"

How do I reconcile my cognitive dissonance? How do I make sense out of the fact that other people around me live according to different values, different styles, different morals? What is happening to the world? Is everyone going crazy? Or am I?

So we look for answers, for guidance, for reinforcement, that our way of living life is right, is true, is valuable, is meaningful. And we look to our friends, we look to our church, we look to our psychotherapist.

And we have to decide how to raise our children. But it is a bewildering affair. We can demand that they follow precisely in our footsteps. But that is gauche. So we say make up your own mind, we cannot guide you. The new children grow up sans parental commitment to a style of life, with a carte blanche, laissez-faire opportunity to choose their own life. And our children are lost, bewildered, and confused. They look for a way to be. They reach out grasping for a way of being-in-the-world that will give them direction, certainty, satisfaction and meaning. They join the ecology movement, they support the latest political white hope, the Jesus-freaks, the Hare Krishnas, the organic food club. Or they eschew the freakish, and commit themselves to becoming teachers, engineers, scientists, or psychotherapists.

In all of this, we engage in a style of bewildered behavior, that I call the "cultural cloudedness of consciouness". Most of us, at least of my generation, grew up knowing of only one way of being. And now are confronted with many ways of being. It is now clear that the scientific way of being is but the election of one way of being. But this way is not necessarily better or worse than other ways of being. The scientific-academic way is one way. We are no happier, no more fulfilled, nor better adjusted, nor successful, than the aborigine. Different? Yes. Better? No.

We have grown up with the assumption that there was *one way to be.* And many of us traded off a religiously defined way-to-be for a scientifically defined way-to-be. We have been unaware—our consciousness has been clouded—that there are many ways of being-in-the-world.

But. In order to exist, in order to function, in order to derive satisfaction and meaning from life, we cannot exist in a relativistic ennui. We must be able to construct an ego-picture of the world. We must be able to frame a *weltanschauung*—a world view. And here we face a new task, a new ego-coping skill, a new style of existence. We must learn how to become "multi-cultural". By this I mean, the ability to commit oneself to *a* style of life, with the conscious recognition that it is not *the* style of life.

Heretofore, in the history of the human race, ego development and the ego sense of reality has been based upon a normative view of the world. Now we are faced with the plurality of human existence. There are many ways to be-in-the-world. But I must choose one way to be. And that way must be normative for me, although it may not be normative for others.

How do we decide to live out our lives? How do we pick our way through the jungled maze of existence? How do we make a path through the forest?

In the earliest times, in the primary societies of man, in the major cultures of society, the way to live out life was spelled out in terms of religion. Religion was the overarching superstructure that contained the embodiment of how man should live. Within this context, we can observe that religious frames of reference have served to structure human existence from the earliest times to the present.

However, with the advent of the scientific age, religion was seen as superfluous, constricting, destructive. Science would replace religion. Freud viewed

religion as a destructive force in society. Morality was viewed as synonymous with religious. Culture was oppressive. Morality was a negativistic quality of life. Psychotherapy was an amoral enterprise. Psychotherapy made no demands, held no standards, conducted no judgments. But while psychotherapy, as a science of human behavior, was promoting a nonnormative view of human behavior, it was thereby undercutting the very basis of human existence.

To twentieth-century scientific professional men, the idea of religion was atavistic. Religion was a structure that spelled out the way in which people should live. Psychotherapy was a method that did not spell out how people should live. However, that turns out to be a false conclusion. Psychotherapy is merely an alternative methodology. It is the contemporary faith of the scientific man. In a recent philosophical study, Joseph Margolis concludes: "Psychotherapy, then, is primarily concerned with a technical goal, the preservation and restoration of mental health; nevertheless, its own development leads it, inevitably, to take up the role of moral legislator".[8]

Research on psychotherapy indicates that therapists are not amoral. Psychotherapists do transmit their values to their patients. That is not at question. Rather, the issues are: (1) How does this influence the course of therapy? (2) What are the values a therapist holds and transmits? (3) How does the therapist influence the values of his patient?

Psychotherapy: Religious System of Modern Man

Psychotherapy, then, is the religious system of contemporary modern man. It defines how one should be, how one should live one's life. But is contemporary psychotherapy applicable beyond the pale of scientific twentieth century men? Contemporary studies of nonwestern cultures suggest that scientific psychotherapy is not necessarily the most useful way to respond to problems of the human condition. Psychotherapy is part of a world view. It is useful within that world view. Outside that world view other modes of human guidance may be more appropriate.

In the traditional religious systems of the world, sin is sickness, and sickness is sin. The priest is the physician, and the physician is the priest. Religious systems define the nature of man, how he should live, and how to restore a man to function. Religious systems are systems of human guidance. Psychotherapy is a system of human guidance.

Heretofore discussions on psychiatry and religion have been framed in terms of mono-valued worlds of existence. Representatives from both sides put forth their interpretations of human beings as the more adequate. Or one group would interpret all the perspectives of the other group as merely variants of their own view—we're doing the same thing but use different language. Or both groups would propose ways to collaborate. But the basic problem remained: a man was seen, interpreted, experienced within a mono-valued sphere of being.

This era has come to an end. The various religious systems of human guidance offered man a certainty of life and a security of truth. The modern age of science, with psychotherapy as its handmaiden, offered a new certainty and a new truth. Yet the progress of the scientific study of man reveals that we are inverted upon ourselves. Our science tells us that we cannot know truth. And the psychotherapeutic way is as arbitrary as the religious way.

In order to live life, to decide and act, to extract satisfaction and meaning, I must paint a picture of man. I must commit myself to a way of life. But I cannot and will not confuse a way with the way.

Our fellow psychoanalytic colleague, Allen Wheelis concludes his recent observations on the nature of man thusly:

> At the beginning of the Modern Age science did, indeed, promise certainty. It does no longer. Where we now retain the conviction of certainty we do so on our own presumption, while the advancing edge of science warns that absolute truth is a fiction, is a longing of the heart, and not to be had by man. . . . Our designations of evil are as fallible now as they were ten thousand years ago; we simply are better armed now to act on our fallible vision.[9]

Where does that leave us? We can no longer pretend. The cultural cloudedness has been blown away. We see clearly in our consciousness that we stand naked in the world. Nietzsche is said to have run in the streets, crying, "Fall on your knees and weep, for God is dead." After him the preeminent philosopher of our times, Jean Paul Sartre, looked out on the streets of science. And Sartre saw that science too was dead. After it all, man is alone, desolate, forlorn. He has no where to turn to find out how to be.

What shall we do? Shall we turn out the clergy, depose the scientists, shun the psychotherapist?

Nihilism and pessimism, ennui and despair are one answer. Frantic and frenetic activity to drown out consciousness is another. Or can we go on with our myths of religion and our myths of science, playing a game with our consciousness that we really don't know what we know.

"Multi-cultural Man"

Still another way exists, or is it ways? Paul Tillich called it The Courage to Be. It is the willingness to look at man in full consciousness. It is learning to become a "multi-cultural" man. It is the acquisition of new ego-coping skills not dependent on certainty and truth. It is the recognition that there are many ways to paint a picture of man, and many ways to live in accord with the picture I paint.

In order to live life, to decide and act, to extract satisfaction and meaning, I must paint *a* picture of man. I must commit myself to *a* way of life. But I cannot and will not confuse *a* way with *the* way. To walk through the dim lit forest of life I must hack out a path, while others hack out theirs.

This then leads us to the focus of this discussion. Man does not exist unto himself. We fall in the forest and we are stymied by the thickets. Human societies are bands of wanderers who aid each other. There are various bands of humans, each band describes its path, and guidance and assistance is provided by each band, by one member to another.

In the modern age the human helping profession of psychotherapy has developed within the moral religious world of science and technology. It would be tempting to view the psychotherapeutic structure of helping as normative. But it is not. There are many human systems of guidance. Sometimes these systems involve large bands of wanderers – those who live within the world views of the great religions. Sometimes the band of wanderers are small – and their systems of guidance seem esoteric because they are unfamiliar.

One final question confronts us. To what extent are we bound within the system to which we are committed? How far can we stray from our path through the forest, how far can we stray from our own band of wanderers? How effectively can we help a member of another band struggling along in his way that is not my way?

It is tempting to achieve some definition of which way is best. If our religious system is failing, inept, inadequate, or filled with faults, it is tempting to look with envy and naive admiration at the helpers, gurus, prophets and priests, going along tracks in the forest according to other systems. But is it justifiable to presume that our religious track through the forest is the best or truest? Who shall be the judge? And how shall he judge?

It is tempting to discard the religious ways for the scientific tracks through the forest. But as we now see, that is just another alternative track.

I keep wanting to draw conclusions and make interpretations from my spot in the forest. Yes, I know that misses the point. We *need* to do things our way, we *need* to believe in what we are doing, we *need* to be committed to our path in the forest and to our band of wanderers.

No man can wander successfully through the jungled maze alone. Hence the need to belong and to be committed to a fellow band of wanderers. The Apostles' Creed describes this as "the communion of saints". Further, we must be committed to our way, we must follow our track. This is the essence of the Christological call to "faithful commitment". Here we are tempted to confuse faith with science. Through science we should like to experimentally assess each track in the forest with logical rigor. But science cannot tell us whether one path or another leads to the ultimate goal in the forest. Indeed faith is the commitment to and the willingness to follow our track.

So let us look at ourselves, at our track, at our band of faithful wanderers, with clear consciousness as we trudge through the forest.

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In the search for a new and sounder basis on which to build a stable world, science will be indispensable. We can hope to match the resources and structure of society to the needs and potentialities of people only if we know more about man. Already science has much to say that is valuable and important about human relationships and problems. From psychiatry to dietetics, from immunology to meteorology, from city planning to agricultural research, by far the largest part of our total scientific and technical effort today is concerned, indirectly or directly, with man – his needs, relationships, health, and comforts. Insofar as absolutes are to help guide mankind safely on the long and dangerous journey ahead, they surely should be at least strong enough to stand scrutiny against the background of developing factual knowledge.

Many applications of recent scientific concepts outside science merely reveal ignorance about science. For example, relativism in nonscientific fields is generally based on far-fetched analogies. Relativity theory, of course, does not find that truth depends on the point of view of the observer, but on the contrary, reformulates the laws of physics so that they hold good for every observer, no matter how he moves or where he stands. Its central meaning is that the most valued truths in science are wholly independent of the point of view. . . .

Gerald Holton

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Cognitive Style, North American Values and the Body of Christ

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The Reformation doctrine of "the Word and the Spirit," as outlined by Bernard Ramm, is related to various psychological models of cognitive and personal style. It is suggested that Witkin's distinction between "analytic" and "global" cognitive styles has its parallel in two differing religious styles, which are labelled "Word-oriented" and "Spirit-oriented." The implications of these two styles for the functioning of pastors, parishioners, and Christian workers are examined in detail.

A Personal Introduction

Depending on their ecclesiastical traditions and perhaps on their social-educational background, Christians have tended to view psychology in one of two opposite ways: at one extreme, it may be seen as an instrument of Satan, making claims for itself which properly belong to the Word and power of God, and to be avoided no less stringently than the Adversary himself. At the other extreme, it risks being viewed as the panacea for all ills, with certain Christian counsellors and lay people only slightly behind the world at large in their enthusiasm to mount whatever current therapeutic bandwagon, after only the briefest of nods in the direction of Biblically-based inquiry into the assumptions of the particular technique in vogue. Most of us would not fall neatly into either of these extremes—but it is certainly the case that only recently have Christian social scientists seriously tackled the issue of "Christian theories of personality", or "Christian therapies" in a way that attempts to remain within the conceptual mainstream of psychology and at the same time stay true to Biblical principles regarding the nature of man, his physical and social universe, the ultimate source of his alienation, and the final means of his redemption. Examples of such attempts include work done by Collins, Tweedie, Narramore, and many persons contributing to the proceedings of this association as well as to the recently instituted *Journal of Psychology and Theology*.

Such bridge-building efforts have remained largely in the sphere of clinical psychology—not surprisingly, since the practice of pastoral counselling stands to lose or gain by the influence of the broader clinical tradition. But aside from the work done by people like Malcolm Jeeves *(Scientific Psychology and Christian Belief, The Scientific Enterprise and Christian Faith),* Paul Meehl *(What Then is Man?)* and Donald McKay *(Christianity in a Mechanistic Universe)* I know of no continuing efforts to build similar bridges between Christianity and the findings of *academic* psychological research into the nature of man. Even the writing of Meehl, Jeeves, and McKay (who is actually a neuroscientist rather than a psychologist) is largely on the philosophy of science level, and makes no attempt to relate specific research findings in psychology to the Biblical model of man. To be sure, we have plenty to say to those academic psychologists like B. F. Skinner whose assumptions and recommendations are blatantly at variance with the very core of Biblical Christianity—but we have had almost nothing to say of the many other research traditions whose findings seem neither theologically black nor white, but merely some as-yet-undetermined shade of grey.

As a Christian of some three years, who was converted when within months of getting a Ph.D. in social psychology, I began—and remain—largely on my own without Christian role-models to suggest how to begin integrating my embryonic faith with my discipline. Like C. S. Lewis, I concluded for a time (in fact, for almost a year) that I would probably have to leave the academic life: my entire behaviourist upbringing was beginning to ring more and more hollow in my mind and in my teaching, and if the determinist principles by

Paper presented at the Christian Association for Psychological Studies, Atlanta, Georgia in April, 1974 *and published in* Journal of Psychology and Theology 2, 77 (1974)

which I was trained were no longer sufficient in the light of Scripture to explain human behaviour and misbehaviour, then why remain a social psychologist? If, as was the case, I was becoming less and less willing to tolerate the ethical compromises inherent in the experimental deception practised by social psychologists, what was there left for me to do? It is only fair to say that such conclusions reflected much more the narrowness of my own graduate training than the actual and potential richness of my discipline, for when God in His grace and His own good timing began to point me to other than purely behaviourist research traditions, I slowly began to find my place as a Christian academic working in an avowedly secular university.

What I have arrived at as a result is a principle that applies equally well to my teaching and to my research —namely, that even in heresy much truth may lie, and that it is my mandate as a Christian academic not only to demonstrate to my colleagues and students that Christianity is a force to be reckoned with by psychology, but also the opposite—namely, that there are insights in the psychological tradition which are not only inadvertently scriptural, so to speak, but insights which may have escaped most Christians just because the current traditions and theology of the church may have neglected them. In other words, it is my responsibility not only to expose the inadequacies and inconsistencies of *any* model of man or madness which is less than Biblical, but also to point out—to colleagues, students, and fellow-Christians alike, where the theory and research in psychology are *compatible* with the Biblical model of man. (I don't think, for instance, that Freud should have to have told us that man's mind, redeemed or unredeemed, is capable of tremendous rationalization and self-deceit; the Psalmist, the Prophets, and the Apostles have been telling us that all along.[1] The real issue between Christians and Freudians centers not around the psychodynamic *mechanisms* Freud postulated, but as Paul Tournier put it: "that having shown man to be infinitely more complex than had been thought, Freud was then guilty of oversimplification in the *explanation* of man which he put forward, reducing the whole of his prodigious diversity to a standardized, instinct-based schema."[2])

Having set the stage with the foregoing remarks, let it be said that my purpose in this paper is to build one such modest bridge between what we might call the Biblical and the secular psychologies—between one set of intriguing findings in the social/developmental psychology tradition and a somewhat neglected Biblical doctrine of man as he functions in the Christian body of believers—a doctrine that was lucidly expressed in the past by the Reformers, but which has, to my knowledge, only recently been resurrected and reviewed. I am referring, on the one hand, to the work of the cognitive style theorists on what they call "global" and "analytic" thinking, and on the other hand to the Reformation Doctrine of the Word and the Spirit as it applies to values and personal expression within the body of Christ.

The Word *and* the Spirit

Bernard Ramm, writing in *His* magazine[3], tells us that "the great motto of the Reformation in the sixteenth century was 'the Word *and* the Spirit'. The concept was not new, but the clarity with which it was understood and applied was. In the narrowest sense, *Word* meant the revealed and inspired Holy Scripture; and correspondingly, the *Spirit* meant the Holy Spirit. Both terms, however suggest clusters of ideas. *Word* suggests the truth claims of Christianity, the meaning of the texts of Scripture, and the formulation of the contents of Scripture into theology. It also includes the great historical (space-time) acts of revelation and redemption which are recorded in Scripture." The "Word" concept encapsules the rational, articulated, objective aspect of the redeemed Christian life, whose lynch-pin is the unchanging standard of Scripture and its rationally-evolved theologies. On the other hand, *Spirit,* Ramm suggests, "speaks of the power of the Christian faith, of the richness of personal experience, of faith, of trust, of hope, of the ability to transform life, and the entering of the supernatural into our lives." It encompasses that aspect of the redeemed Christian life which is richly experiential, emotional, personal and interpersonal, embracing the supernatural quality of our ongoing dialogue with God and with our brothers and sisters in Christ.

It is my responsibility not only to expose the inadequacies and inconsistencies of any *model of man or madness which is less than Biblical, but also to point out — to colleagues, students and fellow-Christians alike, where theory and research in psychology are* compatible *with the Biblical model of man.*

Ramm goes on to point out (and I quote him extensively here, because I cannot improve on him) that "a healthy, normative and powerful Christianity is the proper balance and relationship of Word and Spirit. However, the history of the church reveals different periods when this balance was lost. Either too much was said of the Word at the expense of the Spirit, or too much of the Spirit at the expense of the Word."

> At times of intense doctrinal conflict, there is always the temptation to become so precise in our theology that we forget that the *truth* of Scripture needs the reinforcement and enlightment of the *Spirit* of truth. When such a high premium is placed on correct theology, there is the further temptation to define a Christian as the one who believes the right theology—a kind of theological intellectualism of sorts.

This, Ramm points out, is what can happen when the Church becomes "Word-oriented" at the expense of the spirit.

On the other hand,

> at times of spiritual lethargy or powerlessness, or too much ecclesiatical 'overhead', some sort of movement of the Spirit sets in. It is a protest against 'dead orthodoxy' or 'lifeless liturgy' or powerless preaching or lack of a rich devotional life. Pietism arose in orthodox Lutheran Germany to protest the deadness of such an intensely theological understanding of Christianity. Methodism arose in England when the Anglican church was in need of such reform but seemed powerless to bring it to pass.

> Pentecostalism emerged in the nineteenth century when Christianity was becoming more and more defined by denominationalism and when there were serious inroads of rationalism in the Christian church.

Ramm goes on to speak of the sensitive insight the Reformers had into the interaction between the Word and the Spirit: without the Word to inform us, we would not accurately recognize the nature of the Spirit. Furthermore, we would have no yardstick against which to "test the spirits"—not all of which are of God. But without the work of the Spirit, we would be unable to *recognize* the Word as coherent truth which calls for obedience, not just intellectual apprehension. The Word without the quickening power of the Spirit would be just another lawbook or just another historical record of the activities and beliefs of a particular religious group. Thus there is an inextricable interdependence between the two functions, although in the final analysis, the Reformers made the "Word" precede "Spirit" because the Word both circumscribes and validates the kind of Spiritual experiences we have; for no "spiritual experience" which is contrary to the Word—no matter how subjectively rich and real it may seem—is an experience of Truth. We must allow our understanding of the Word to validate our experience of the Spirit and not vice-versa, and while the tendency of the church in the recent past may have been to elevate the Word without regard to the Spirit, just as clearly there is a trend in parts of the church today to do the opposite: to see the experiential as self-validating, and to manipulate theology and the interpretation of the Word to accommodate it.

What Is a Healthy Balance?

Now Ramm has stated that both the needs and the errors of the corporate church in history will influence whether the Word/Spirit interaction leans in one direction or the other, but that the optimal and scriptural situation is for the church to have a healthy balance of both. With this, none of us are likely to disagree. My question as a psychologist is: do we achieve such a balance in practice by assuming that every *individual* Christian is to be equally "Word" oriented and "Spirit" oriented, or do we, in fact, have within our ranks Christians who lean more to being "Word" specialists or "Word-gifted", and others who are more inclined to be "Spirit" specialists or "Spirit-gifted"—the *average* of these two broad tendencies then promoting the needed balance in the church as a whole? Do we, in fact, have "religious styles" akin to the "cognitive styles" of which I will speak presently, with individuals ranged along a sort of bipolar continuum, pure "Word" types at one extreme and pure "Spirit" types at the other? Such a "psycho-Christian" model would further suggest that while either of these extremes would be undesirable and unscriptural, and while all of us ideally have elements of both poles in our functioning, still there is the tendency in some to lean somewhat more to the "Word" aspects of Christianity, others to the "Spirit", and still others, perhaps, to oscillate quite happily between the two tendencies depending on the situation and the need.

A Psychological Treatment

Having posed the question from the doctrinal point of view, let me now jump back to the purely psychological treatment of the issue. The so-called "individual differences" tradition in psychology has approached the question of "personal styles" in a number of ways, all of which seem to share the central notion that some people (or perhaps all people some of the time) function in a way that is characterized by objectivity, abstraction, and differentiation in the intellectual sphere, independence and achievement in the social sphere, self-containment and relative stoicism in the emotional sphere. Other people (or again, perhaps all people some of the time) function in a way that is characterized by intuition, concreteness, and global perception in the intellectual sphere, interdependence and affiliative concern in the social sphere, and freedom of expression in the emotional sphere. It is a distinction made by many different writers using many different terms, some working from a theoretical, others from an empirical base. Jung[4] distinguishes between people who proceed by reliance on processes like *thinking* and *value-ordering*, both of which require volition and judgment, and those who proceed by *sensation* and *intuition*, both of which are involuntary and non-rational. Piaget[5] in his discussions of the intellectual development of children, refers to the functions of *accommodation* and *assimilation*, the former referring to the process of "seeing differences", the latter to the process of "seeing similarities", and Wadsworth[6], one of his interpreters, suggests that although both processes occur in everybody, individuals may tend to be more "assimilators" or "accommodators" in intellectual style. David Bakan, in his *Duality of Human Existence*[7] draws upon a wide range of theory and observation and suggests that all organisms manifest two opposing intellectual/social tendencies, those of *agency* and *communion*.

> Agency refers to the existence of an organism as an individual, and communion the participation of the individual in some larger organism of which the individual is part . . . Agency manifests itself in the formation of separations, communion in the lack of separations. Agency manifests itself in isolation, alienation, and aloneness; communion in contact, openness, and union. Agency manifests itself in the urge to master; communion in non-contractual co-operation. Agency manifests itself in the repression of feeling and impulse, communion in the lack and removal of repression.

Guttman[8] makes the distinction between *allocentric* and *autocentric* egostyles, where the allocentric mode "conveys to the individual that the centers and sources of organization, social bonds, and initiatives are extraneous to him" and have their own objective logic which shapes him at least as much as he shapes them, whereas the autocentric mode "gives each individual recurrent experiences of being a focus or center of communal events and ties." Witkin,[9] working from empirical as well as theoretical work on cognitive style refers to *articulated* (or analytic, or field-independent) functioning when the person can "disembed" a figure from a context perceptually, has a well-developed sense of separate identity socially, and is relatively self-contained emotionally. By contrast, those with a *global* (or field-dependent) style have trouble isolating detail from context perceptually (i.e., they perceive "globally"), have a much greater sense of dependence socially, and are relatively open and expressive emotionally. Paul Tournier[10] speaks of *separation* and *relation*, or of the developmental cycle in which children begin by being unable to see themselves as individuals distinct from

their parents, but later progress to greater and greater individualization *(separation)*, which is ideally followed eventually by freely-chosen, other-oriented *relation*.

All of these systems share in common the notion that there is some kind of tension, or polarity, between the objective, the analytic, the rational, the self-sufficient, the self-contained on the one hand, and the subjective, the synthesizing, the intuitive, the other-dependent, the emotive on the other hand. Some, like Witkin and Guttman, stress the individual differences in style, usually cautioning that there are no "pure types", but rather a continuum from one pole to the other along which individuals can in principle be ordered. Others, like Bakan, stress that the duality is inherent in each of us, and suggest that we must ultimately acknowledge and give play to both aspects. Still others, like Tournier, suggest a development-*cum*-spiritual progression from dependence to independence to interdependence, with pathology equally defined as failure to move from either dependent ("weak") reactions or independent ("strong") reactions to a freely-embraced interdependence with others.[11]

A Continuum of Cognitive Styles

I have chosen in the remainder of this paper to characterize cognitive styles using Witkin's model and terminology, assuming the continuum of which he speaks, and suggesting that there are consistent, parallel individual differences in both cognitive and religious style which are attributable to basic, underlying differences in personality structure, itself dependent on both nature and nurture for the direction of its development. Witkin's model, although not conceptually unique in its broad outlines, has the advantage of having been empirically tested in many hundreds of studies. Let me give some examples with which some of you are undoubtedly already familiar.

In their 1962[12] synthesis of some two hundred empirical studies, Witkin *et al.* conclude that at the perceptual, cognitive, social and emotional levels, individuals tend to function in a consistently analytic or a consistently global way. At the perceptual level, analytic (or field-independent) people show a greater ability than global (or field-dependent) people to isolate a familiar figure from a complex design (Embedded Figures Test), to adjust a rod to its true vertical position uninfluenced by the tilt of a surrounding frame (Rod-and-Frame Test), and to adjust themselves in a tilted chair to true upright uninfluenced by the tilt of an experimental room in which they sit (Body Adjustment Test). At the cognitive level, analytic people score better than global people on the Block Design, Picture Completion, and Object Assembly tasks of I.Q. tests, and are better able to switch to new problem-solving strategies ("set-breaking") when necessary. On the social level, analytic people show less need for guidance and support from others, are less suggestible and conforming, and generally maintain the same sense of self despite variations in the social context. On the emotional level, analytic people tend to be more distant and individualistic, and in situations of emotional conflict they tend to employ relatively specialized defense mechanisms, such as compartmentalization and intellectualization, whereas global persons tend towards simple denial or repression. The basic factor linking these various performance indices seems to be whether items, including the self – can be perceived as discrete and separate from the context (perceptual, intellectual, social, or emotional) in which they appear, of whether such items are only perceived as part of an undifferentiated whole–be it a design, a problem, a social system, or an emotional context.

Without the Word to inform us, we would not accurately recognize the nature of the Spirit. But without the work of the Spirit, we would be unable to recognize the Word as coherent truth which calls for obedience, not just intellectual apprehension.

The work done by the cognitive style researchers has indicated some very stable trends: differentiation of field-independence generally increases with age, although in later life it may level off or even reverse. Although there is substantial overlap in the distribution of male and female scores for the perceptual indices such as the Rod-and-Frame and Embedded Figures Test, there is nonetheless a small but reliable average difference in the direction of men being more analytic or field independent than women, and this difference persists cross-culturally with only a few exceptions to date–that is, within a given culture, men as a group will be more differentiated in their style than women. With regard to the question of orgins, the bulk of evidence so far lays more at the door of nurture than of nature[13]: in North American studies, children whose autonomy is unnecessarily restrictive for their age and capabilities, who are highly socialized for conformity, for whom discipline is erratic and inconsistent, or whose mothers lack self-assurance or self-realization in their capacity as mothers, may find it difficult to develop a separate sense of self and internalized criteria for making judgments and decisions. This manifests in both the perceptual-intellectual and socio-emotional indices of differentiation listed previously–again, the difficulty being a general one of separating self from social context, items from perceptual context, or elements from a logical context.

Cross-cultural studies, of which there are an increasing number,[14] indicate that among traditional (non-westernized) groups there is another stable cluster of cultural-ecological traits which differentiate more analytic from more global societies: at the one extreme, there are groups which are nomadic hunter-gatherers, who also tend to function in small, loose social units, raise their children permissively, minimize sex-role differentiation, and have a non-authoritarian mobile social system. Members of such groups tend to score ***high*** on field independence or differentiation. One can see why: their subsistence mode, in which group survival is enhanced by perceptual acuity and strong individualism, favours the development of a strongly differentiated cognitive style. At the other extreme, there are groups which are re'atively sedentary pastoralists and farmers, who tend to function in larger, highly-integrated social

units, who stress the subservience of the individual to the survival needs of the group as a whole, who raise their children strictly, have more rigid sex-role definitions and a hierarchized, authoritarian social system. Members of such groups tend to score *low* on measures of differentiation. Again, one can see why: in this case, group survival does *not* depend on perceptual flexibility in an ever-changing environment, and strong individualism is dysfunctional in a society where herding and agriculture must be done cooperatively according to inflexible seasonal demands.

Value Labels

Now, in the preceding description, I have tried to avoid placing different value-labels on each of the cognitive styles, but this is difficult, because until recently the nature of the tests used and indeed the flavour of the entire literature have inevitably made field-independent, analytic, differentiated thinking somehow "better" than the field-dependent, global, less-differentiated style. Somehow, almost everything that is good, clever, admirable, and red-blooded-American has gotten attached to the notion of differentiation: field-independent people are more likely to be mature, male, scientific, logical, self-controlled, articulate, and socially and emotionally independent. As one of my colleagues puts it, "We all want to be research scientists and Hemingway heroes"—that is, to be intellectually hard-nosed and socially self-sufficient. It is only as accumulating cross-cultural studies have showed that the style developed by any group seems to be *survival-relevant* to the group that the notion of more-differentiated-equals-more-adequate has started to be more seriously questioned. To be fair, Witkin and his coworkers have periodically suggested that the empirical evidence does not always favour the more differentiated style:

> The characteristics common to field-independent perceivers . . . may or may not contribute to optimal adjustment. Thus, although field-independent people are often able to function with a fair degree of autonomy from others, some of them are strikingly isolated individuals, over-controlled, cold and distant, and unaware of their social stimulus value. We have in fact frequently encountered field-independent performance among hospitalized psychiatric patients who were actively delusional and apparently destined to remain institutionalized for the rest of their lives.

The "Word specialist" has a concern for theological correctness and a love of theological debate, e.g., Francis Schaeffer and John Warwick Montgomery. The "Spirit specialist" finds the essential cement of his faith in personal, ongoing dialogue wth God, e.g., Oswald Chambers, David Wilkerson, and Edith Schaeffer.

Other studies, notably Crutchfield's 1958 work with Army Air Force captains,[16] have scaled the field dependence/independence continuum in a way that confirms the notion that while extreme field dependence may be *intellectually* dysfunctional, extreme field *in*dependence may be *socially* maladaptive. Using checklist and Q-sort measures of personality in conjunction with measures of differentiation Crutchfield found that:

> —extremely field-dependent men were concerned with making a good impression, gregarious, affectionate, considerate and tactful
> —moderately field-dependent men were energetic, adventurous, socially poised and non-conforming
> —moderately field-independent men were demanding, effective leaders, took ascendent roles, were self-reliant, and tended to manipulate people
> —extremely field-independent men were cold and distant with others, unaware of their social stimulus value, concerned with philosophical problems, individualistic, and strong.

In short it appears that either extreme of cognitive style is a mixed blessing, at least in a complex society like our own which increasingly stresses technological competence, but at the same time requires people to associate with others in large, highly structured organizations.

Matching Styles

More recent studies[17] have stressed a totally new issue—that of the match or mismatch of cognitive styles between members of significant dyads: it turns out (not surprisingly) that field-independent therapists attract, retain, and have more success with field-independent clients—and similarly for field-dependent therapists and clients. There is also evidence that students learn better, regardless of subject, from teachers whose cognitive styles match their own. At this point, one can only speculate about other possibilities: what about husbands and wives whose styles are matched or mismatched? How, in each case, do they communicate, resolve conflicts and order priorities? (The classic mismatch seems to be the analytic, logical male mated to the global, intuitive female, but the opposite is not uncommon either). Do we tend to choose mates and close friends whose styles are similar or complementary to our own? And what about our church life? Does pastoral work demand one style more than the other, or do pastors of either style attract like-minded adherents, with the result that the entire *ethos* of the church eventually leans in one direction more than the other? How, in short, does the analytic-global distinction in cognitive style relate to our earlier dichotomy bebetween the Word and the Spirit?

Let me state at this point what I am *not* implying; there are studies relating religiosity to cognitive style which suggest a relationship between orthodoxy and field-dependence[18], the idea being that those who are conformist and responsive to authority will feel right at home in the ancestral faith. But such a hypothesis usually fails to take into account the necessary distinction between "extrinsic" and "intrinsic" religiosity[19], the former term applying to persons who regard religious practices primarily as means to other ends, such as social status, friendship, and aid and succourance in times of distress; the latter terms applies to persons who, regardless of the presence or absence of such side benefits, have come freely into a dynamic faith which they see as the lynch-pin of their existence, and for which they are willing, if necessary, to endure considerable scorn on

the part of others. It may well be that, relatively speaking there are more field-dependent people among the extrinsically motivated—although the one study I was able to track down on this showed *no* significant relationship between the two factors.[20] But I do suggest that elements of the global/analytic distinction persist even among the truly born-again, regardless of their peculiar socialization and religious histories. I would further suggest that each style, in its nonpatbological, middle-range manifestation is an enrichment to the Body and helps to maintain that Scripturally-founded balance of which the Reformers wrote. Recall what we mean by the concept of the Word: "the truth claims of Christianity, the meaning of the texts of scripture, and the formulation of the contents of scripture into theology." And the Spirit: "speaks of the power of the Christian faith, of the richness of personal experience, of faith, of trust, of hope, of the ability to transform life, and the entering of the supernatural into our personal lives." Are the Christians oriented to the former, on the average, the analytic ones, and the latter the global ones? Such a notion, to my knowledge, has never really been tested using the standard measure of field-dependence/independence. But without having done so (this is on my research agenda), it may be possible even now to sketch out a cluster of traits that characterizes the performance of each in the Body. Let me suggest a possible profile for the "Word specialist" and the "Spirit specialist" within the church, cautioning again that there are probably few if any "pure types", but using this distinction for the sake of clarity and contrast.

The "Word Specialist"

I suggest that the "Word specialist" has a concern for theological correctness and a love of theological debate. He leans towards the "truth" side of Paul's admonition to "speak the truth in love", and if not careful, he can end up speaking the truth with too *little* love at times. If he has the gift of writing, he may end up authoring commentaries, reference volumes, or apologetic works. If he is a pastor, his sermons will probably emphasize the "observation" and "interpretation" of Scriptural passages more than the "application". At his best, he is apt to be a strong, articulate, respected leader, but if he is not careful and Scriptural, he may end up delegating too little responsibility or using his parishioners to implement decisions he has failed to involve them in. He is the kind of person who has a well-developed, ever-expanding analysis of his faith. For this reason, he is usually not afraid to engage non-Christians in discussion, and may be a highly successful evangelist when dealing with people whose background and interests are similar to his own. The defence of his faith rests particularly on the unity and integrity of Scriptural revelation, and the solidness of the claims for the historicity of Christ's life, death, and resurrection. If he has been converted as an adult, it is apt to have been one of these two things which originally convinced him.

(By way of example, I think of Francis Schaeffer, who as a student originally read the Bible to compare it to other near-eastern writing of its time, and ended up concluding that it was the only system which adequately explained the way the world really was. I also think of John Warwick Montgomery, who as an undergraduate in classics became a Christian after concluding that if he denied the historicity of the New Testament documents any longer, he would also have to throw out all the other writings of classical antiquity, which by the standards of any good historian were much more poorly attested. Both these men, from their writings, would seem to be strong "Word specialists"; such a study of "conversion styles" as predictive of later, lasting "religious styles" merits more intensive study).

While certainly not unaware of the power of God in his personal life, the Word specialist seems more drawn by larger, more cosmic spiritual trends, and for this reason may have tremendous vision for a large, clearly-structured ministry in the form of a growing church, a mission society, an evangelistic organization, or a college. He is apt to build up such a ministry by means of well-defined steps which by their clarity convince workers and supporters that he is worthy of their allegiance and trust. However, because of his articulateness, efficiency, and breath of vision, he may intimidate people who are in need of a warm, intensely personal ministry and who find him hard to identify with, let alone emulate. Because his strengths lean in the direction of the analytic and the abstract, he must be careful not to sacrifice individual needs to larger principles where this is inappropriate. He works best with people whose style matches his own, although he may also realize that he and his ministry need the balance that is supplied by a more-spiritual co-worker or spouse.

Note that I have described my generic "Word-specialist" as if he were a person with a full-time ministry, such as teaching, pastoring, or administering a Christian organization, but what I have said should apply at the more molecular level as well: Word-oriented parishioners, I suspect are attracted to pastors of like style, thrive on listening to strong, analytic teaching, and enjoy building up the organizational aspects of the church and its related para-ecclesiastical work. They show a concern that their children be grounded solidly in Biblical teaching from an early age, and see this as the major responsibility of the church to its young. Although one is tempted to conclude that more men than women are Word-oriented, I do not believe that the dichotomy is all that clear, for even among Christian women who lead fairly traditional lives, I see many who share the above concerns and priorities to the extent that their domestic lives and educational backgrounds allow.

The "Spirit Specialist"

By contrast, the "Spirit specialist", while not necessarily loving or submitting to the Word any less than his analytically-oriented brother, finds the essential cement of his faith in personal, ongoing dialogue with God. He may well be theologically much less articulate, but still recognizes truth from error, not just in principle, but especially in concrete situations in his own personal life and the lives of others. His strength is his freely-contracted, supportive emotional involvement with others, especially on a one-to-one basis, and he must take care at times not to let love compromise essential truth. He often has the gift of discerning spiritual needs and God's power in very down-to-earth personal and interpersonal events, and has a strong sense of God's concern for and power over even apparently insignificant aspects of life. He reads the Word like today's newspaper culling from it not so much

historic truth or systematic theology as a dynamic personal message for his own (or someone else's) needs of the moment. If he writes or preaches, he is apt to stress current application as much as analysis and interpretation of the Word. (Oswald Chambers is a classic example among Christian writers). If he can recall the circumstances of his conversion, he is apt to say that it was a conviction of God's immanence, love, and urgency that initially made him sit up and take notice and *thereafter* sent him back to a deeper study of the Word.

It is his personal love, concern and solid faith towards which others are drawn, and not so much his skills as an analyst or organizer, things for which he may have very little predisposition. His success as evangelist rests as much in the testimony—conscious and otherwise—of his peacefulness, love, and humility. He (or she—because there are a fair number of "she's" in this category) may never score the winning point in a theological debate, yet will win over an opponent through a loving acceptance of him as a person and through a practical, godly concern for aspects of his life that the Word-specialist may miss—aspects such as personal loneliness, temptation, the ups and downs of family life, or personal occasions of joy and sorrow. His spiritual vision is not always far-reaching in terms of clearly-defined goals, and even when it is, he may rely more on a day-to-day trust in God for its outworking. Witness David Wilkerson, Edith Schaeffer, and countless others "buying" a piece of property to begin a ministry without the slightest idea where the funds for it were to come from, yet watching those funds trickle in, mortgage payment by mortgage payment, often no more and no less than needed at that specific moment. (I am not implying that the Word-specialist, in his long-range, careful planning, somehow lacks a degree of faith that the Spirit-specialist has; clearly God calls His people to work in both ways. The real danger lies in lack of discernment: trying to do it one way when the other is called for, or assuming that because *our* personal style has worked for us, then the opposite style cannot possibly be of God).

As a pastor, the Spirit-specialist tends the needs of his flock well, and leans naturally towards a Body ministry, gradually and almost casually involving many co-participants in an organic network of interpersonal support and outreach. However, his more Word-oriented parishoners may easily tire of "all this endless personal sharing", and wonder why he doesn't get more solid, intellectual teaching from a strongly-articulated theology. Eventually, he may take his membership to a church where the leadership, like himself, is more Word-oriented. By contrast, the Spirit-oriented members rejoice in the close personal ties, emotional refreshment, and spiritual emphasis fostered by such a congregation, and see of supreme importance that their children experience God's love through the Body even as they learn the Word. For them, strong Bible-teaching in the Sunday School would not compensate for insensitivity or inflexibility towards their children's personal needs.

Implications of this Dichotomy

What are some of the implications of this dichotomy—or rather, of this dimension, if that is what it is?

It seems significant to me that Paul names the work of "pastor-teacher" as a single ministry. Yet the pastoral function suggests an intensely personal shepherding, and the teaching function an articulate, analytic approach.

Like Ramm, I am personally and scripturally convinced that the ministry of Jesus Christ is to the whole man—body, brains, social and emotional needs, and I suspect that the most fruitful ministries are those whose leadership includes men and women of *both* Word and Spirit orientations, working together in an attitude which recognizes the strengths and limitations of each style. Occasionally there are people who have a "fused style", going from one orientation to the other as the situation suggests and as God leads—and perhaps, as Bakan suggests, it is only socialization which prevents the Word-specialist from recognizing and developing his Spiritual side, and the Spirit-specialist from giving due to his Word-oriented side. Occasionally I have known people discerning enough to realize that they need regular, systematic exposure to activities and people of the style that is *not* their naturally preferred one—but such people are rare. Too frequently we prefer selfconfirmation to the struggle of growth.

Then too, I am distressed by the overemphasis placed by individual Christians and, indeed, whole organizations, on one style to the exclusion of the other. Too often, in the recent past, we have either latched onto or overreacted against the North American deification of the rational, analytic "research scientist and Hemingway hero", and this has fostered Christian bodies which suffer from Ramm's "theological intellectualism", or its opposite—a vague spirituality based more on "good vibes" than on solid, scriptural understanding.

I am distressed, too, by the intolerance I frequently see shown by each type of Christian for the other—and I suspect that the Spirit-oriented Christian is more frequently victimized by this. The Word-specialist who is unhappy in a Spirit-oriented Body is usually articulate enough to have his complaints heard and heeded. Failing that, he usually has a strongly-enough-developed individualism to pick up and go elsewhere if he is dissatisfied. But I have seen many sensitive Spirit-oriented Christians whose needs are ill-met in a Word-oriented setting, and whose very nature, being more dependent on the immediate social context for affirmation, prevents them from seeking out a more Spiritual setting. Furthermore, being less able logically to articulate the *reasons* for their needs, dispositions, and dissatisfactions, they may be branded by themselves and others as misfits, when in fact their Spiritual gifts (of prayer, of encouragement, of love) if recognized and tapped, might enrich and even revitalize the lives and ministries of their churches or organizations.

I think too of the potential contradiction posed by large, structured impersonal Christian organizations whose avowed *purpose* is that of fostering one-to-one, *personal* ministry. One such organization in my city—a High School outreach which was part of an international organization—has recently disintegrated, in part

because it *workers* were chosen for their Spiritual and interpersonal sensitivity, but its *leaders* for their no-nonsense, uncompromising organizational ability. (This is the conclusion of a colleague of mine who has acted as interim vocational counsellor to many of the organization's now-jobless workers). The Word-specialist administrators and their Spirit-specialist workers just couldn't adequately comprehend each other's priorities —although, as is often the case, the Spirit-specialists (part of whose strength *is* interpersonal sensitivity) were more aware of the discrepancy, even while they were less able to articulate a solution.

Finally, it seems significant to me that Paul, in his list in Ephesians 4 of the gifts given "for the equipping of the saints for the work of service" names the work of "pastor-teacher" as a single ministry. Yet the pastoral function suggests an intensely personal shepherding, and the teaching function an articulate, analytic approach. Could Paul be making a plea for each Christian minister (which in the final analysis means each Christian) to set as his or her goal an integration of both these values, these styles, in the personality? For those of us who tend to be Word-specialists by nature, this would mean deliberate exposure to situations and people who can help us develop our Spiritual side; for those of us who are more intrinsically Spirit-oriented, this might call for the self-discipline of scholarship when it would be more comfortable to continue merely enjoying the warmth and supportiveness of like-minded Christians. In either case, whether as individuals or as a Body, it is only as we recognize and value the necessary contribution of *both* styles that "speaking the truth in love, we (can) grow up in all aspects into Him who is the head—even Jesus Christ."[21]

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The Doctrine of Special Creation

Part III. The Ideal Type

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THE IDEAL TYPE

Two problems faced during the 19th century by adherents of the special-creation doctrine were (1) the anatomic similarities between different vertebrates and (2) variability within a single species. Indeed, biologists have sought to understand these matters since the time of Aristotle. The Darwinian solution was a common ancestry with hereditary relatedness. We must now examine the authors' solution of these ancient puzzles. In so doing, we are again back in the decades be-

This is Part III of a four-part paper being published in the Journal ASA *during* 1975. *It is an analysis of* Biology: a Search for Order in Complexity *(Moore and Slusher, eds.,* 1970*) published by the Creation Research Society.*

fore Darwin, where we shall find the most important difference between the creationist and evolutionary viewpoints. The difference is more profound than this textbook implies.

In at least 14 passages the text expresses the view that both similarity and variability were established at the time of the creation. Examples are the Creator's outline of order as seen in groups of plants (p. 183); the assertion that each molluscan type was created as such (p. 237); the primordial separation between echinoderms and vertebrates (p. 243); the idea that a fossil plant form represents a "kind" (p. 393); limited variation within each group of organisms (p. 147, 419, 458); that the *Genesis* "kind" also represents limited variability (p. 393, 403, 410, 429, 430); that man and the ape were created according to the same plan (p. 434); and reference to a fossil ancestral human "type" (p. 437). These passages would seem to be a faithful expression of the first two chapters of *Genesis*. So far so good; but two further passages must cast doubt on this interpretation.

On p. 396, in a section on the life cycles of seed plants, we are told that "the Creator used different patterns or systems in various plants and that none is therefore any more primitive or advanced than the others." And on p. 422, in an interpretation of vertebrate homologies, we learn that

> Creationists believe that when God created the vertebrates, He used a single blueprint for the body plan but varied the plan so that each "kind" would be perfectly equipped to take its place in the wonderful world He created for them.

A question immediately arises: what texts in the Bible would the authors put forward as documentation for "blueprints," "patterns," and "systems"? Of course, there are none. (The famous word "kind" in *Genesis* 1 probably represents only a general, reproductive relationship, certainly not an eternal model. Only *John* 1:1-3 and 2 *Corinthians* 4:18 are suggestive, but in context the meaning of each is entirely different.)

Platonic Idea of Homology

The view expressed in these two passages in the text resembles that held by the anatomists of the early part of the 19th century—particularly Richard Owen (1804-92). He recognized that certain similarities between bony structures of different animals are more important than others. He applied the term "homologies" to these similarities in his book *On the Nature of Limbs* (1849). Owen decided that vertebrate skeletons, including fishes, reptiles, birds, mammals, and man, were modifications of a single "archetype" that existed as a divine reality, wholly apart and beyond nature. For example, the similarity in the bones of the appendages of a dugong, a horse, a mole, a whale, and man seemed to him to be expressions of the *same* eternal archetype for *different* locomotor functions.

Owen's term, homology, remains in modern biology but in a different sense, for it denotes structural similarity as an index of common ancestry. Owen's ideas represent the culmination of a European tradition in anatomy that, in the decades before Darwin, sought to understand uniformities in nature in terms of transcendent principles. This interpretation was derived historically from the thought of Plato.

What texts in the Bible would the authors put forward as documentation for "blueprints," "patterns," and "systems"? There are none.

In the *Republic* (books 6 and 10) and *Timaeus* (30c-31a, 48e-53d), Plato insisted that the "real" world is not the same as our world of sense experience. The former is not subject to time and change, because it contains eternal and immutable "ideas." The latter—the visible world that we inhabit—is less real, because it contains transient and changing copies of these ideas. Similar animals are therefore varying manifestations of a single idea (*eidos*) that has an existence of its own, quite beyond the realm of the verifiable. Furthermore, the regularity we perceive in nature has resulted because the Demiurge (God), a kind of divine craftsman, has imposed order on preexisting Chaos by using these ideas as "models" (Frazer, 1967; Robin, 1967). Objects we see in nature are therefore flickering images of ideas —mere shadows cast by the eternal light on the walls of a cave, according to Plato's famous allegory (*Republic*, book 8).

This is a profound conception. It may be traced, with its Aristotelian modifications, as a guiding influence in biology from Greek times until the publication of the *Origin of Species*. It was a prominent theme in comparative anatomy in France, Germany, and England in the latter part of the 18th century and through the first half of the 19th century. Transcendental anatomists used the terms "archetype," "ideal type," "type," and "unity of plan" when conceptualizing similarity and variability.

Platonic and Aristotelian thought was a powerful tool: through its use morphology became central to zoology and provided much of the empiric data for the later theory of evolution. For example, Platonic doctrine pervaded Owen's explanation of homologies, by which he showed, correctly, that vertebrate skeletons *are* constructed on a common plan. And in his denial of evolution (or transformation) he was quite clear that the source of this similarity was an eternal idea, beyond nature (1849, p. 86):

> The Divine mind which planned the Archetype also foreknew all its modifications. The Archetypal idea was manifested in the flesh, under diverse such manifestations, upon this planet, long prior to the existence of those animal species that actually exemplify it.

Moreover, he even invented a diagram of what this archetype must be like. The authors' explanation of homologies, as shown in their statement on p. 422, quoted above, is strikingly similar to that of Owen, given here—except that Owen, unlike them, acknowledged Plato as the source of his interpretation (1849, p. 2). Moses really did not take up the problem of vertebrate homologies.

The Mollusk Problem

According to the text, only one "type" or "blueprint" was required for the creation of all seven classes of vertebrates (p. 422, 533-535). But apparently the Almighty required (p. 237) a separate blueprint for

each of the five molluscan classes (p. 529). A certain heavenly efficiency might have been introduced into these proceedings if the authors had thought to attribute to the Creator just one blueprint for all the mollusks. And is the human "type" mentioned on p. 434, 437, 439 the same as the vertebrate "type" on p. 422?

The mollusks have posed important problems in morphology since the time of Aristotle. The authors might have consulted what Thomas Henry Huxley had to say about them, even though he became an arch-foe of special creation. In 1846-50, when the young Huxley was taking part in a South Seas expedition, he made a special study of the cephalous Mollusca (squids, snails, slugs) in an effort to understand their basic homologies. In so doing he effectively transformed the Platonic type into the type concept in use today. Rejecting the metaphysical approach, he regarded the "type" as simply an empiric summary of the structural congruities found in a group of related organisms (Huxley, 1852).

I am relieved to see, on p. 447, that the authors did not succumb to the temptation to apply one and the same archetypal idea to both vertebrates and invertebrates. The diagrams showing a generalized salamander and a generalized crayfish reflect, in fact, Huxley's conceptual approach, that is now firmly fixed in modern biology. Each diagram is an empiric abstraction (and is therefore effective as a pedagogic device).

But these diagrams are reminiscent of the controversy in French biology in 1840 concerning the extent to which the idea of the "type" may be applied to both vertebrates and invertebrates. Etienne Geoffroy Saint-Hilaire (1772-1844), who had been making extensive comparative studies of the anatomy of vertebrates and invertebrates (including cephalopods), argued that a single ideal type might do for both groups. Cuvier thought not; and he remarked (1830), with a touch of asperity, that Geoffroy's discussions of anatomic similarity between vertebrates and cephalopods had not gone far beyond Aristotle's. Geoffry, to no avail, insisted (1837) that his view was not really an extension of Greek doctrine.

The *coup de grâce* was delivered to Owen's anatomic application of the type idea in 1858 by Huxley, who showed that embryologic evidence simply would not support its claims. Since then, homologies have been determined in terms of developmental derivation, rather than by adult anatomic similarities. And this embryologic "type" rests firmly on the foundation laid by Darwin, who removed it from the cosmos and gave it an empiric existence in the real past.

Platonic Idea of Species

The authors' view of species is also Platonic in conceptual origin. According to the special-creationists, all species are discrete entities. They are essentially nonhistorical, for their existence is accounted for by separate, independent events *ex nihilo*. There is no connection, or relatedness, between them—certainly not an hereditary one—save an ideal connection between each eternal idea, or "type," that coexists with the Creator. The reality is the unchanging, eternal type, of which visible species are ephemeral manifestations. Variations must therefore be understood as oscillations around an unchanging, metaphysical mean.

The *Origin of Species* may be regarded as an argument against this view of species, that was dominant through the 18th century until the middle of the 19th century. To be sure, the application of the Platonic notion of the "type" took many forms; but this conception may be discussed as essential in the work of the leading naturalists of the time, including Carolus Linnaeus (1707-78), who emphasized the constancy of species; Owen, in whom the special-creation doctrine reached its zenith in England; Agassiz, who was the leading American exponent; Cuvier and Geoffroy, in France; and, for a time, Lyell, Huxley, and Joseph Dalton Hooker (1817-1911), in England. The Platonic type was in fact the only concept available to them for dealing with similarity and variability until the theory of evolution was established (Mayr, 1963, ch. 1, 2).

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The Finch Problem

The concept of the Platonic type may help us understand the authors' interpretation of variability. On p. 454 the authors describe a reexamination that has been done recently of more than 1,200 Galápagos finches at the California Academy of Sciences museum in San Francisco. We are told that "all the assigned species intergrade with one another." Furthermore, if they are arranged according to body and beak size "a perfect gradation would be found betwen the species having the leargest beak, *Geospiza magnirostris*, and the species having the smallest beak, *G. fuliginosa*." This is supposed to be evidence that the Galápagos finches actually belong to the same species.

Apparently, if Darwin had only recognized this gradation he would not have been led astray. But when we consult his *Voyage of the Beagle* (1962, p. 380) we find that it is precisely this gradation that caught his attention:

> The most curious fact is the perfect gradation in the size of the breaks in the different species of *Geospiza*, from one as large as that of a hawfinch to that of a chaffinch . . . instead of there being only one intermediate species, . . . there are no less than six species with insensibly graduated beaks.

Thus the significance of the authors' discovery of gradation in these finches is not at all clear, in view of the fact that Darwin was struck by it in October 1835.

The authors are referring, perhaps, to the study by Lammerts, who considers "these birds as all in one species broken up into various island forms" ["The Galápagos Island Finches," in Lammerts, 1970]. His study should be compared with that of Bowman [1963], who also raised questions about the uniformity of gradation and the relative importance of various adaptive factors. But Bowman did not minimize the importance of the variability, nor did he say the finches all belong

to the same species. I am grateful to H. William Lunt, for drawing Bowman's work to my attention. As for the special-creationist's failure to consult carefully Darwin's published views: I have already had occasion to deal with two such lapses [Aulie, 1968, 1970].

But what is significant is the contrasting view of the variability by special creation and by Darwin. The constancy of species was emphasized by early-day special-creationists, just as it is by the present authors. These constant species were created, we are told on p. 458 (also p. 147), with "much potential variability"—whatever that is. Variability cannot mean any significant biologic activity now occurring—certainly no hereditary divergence—because it reflects merely the designing action of the Creator. Thus, variations are capricious fluctuations in a category of thought.

On the other hand, Darwin was not circumscribed by Platonism. He could fasten his attention not on the mystical, unchanging type but on the visible variant itself as a product of some biologic activity. He could then ask himself (1) why those beaks could be arranged evenly according to size across six separate species of finches, instead of one; and (2) why those six species were now in fact constant? He saw the Linnaean fixity as a problem to be solved. For Darwin the constancy of species was an empiric observation rather than a principle of metaphysics.

I do not object to the use of the Platonic "idea" when the theory of evolution is rejected. Indeed, the Platonic idea is the only alternative to evolution for an understanding of the nature of species. But I do object to the implication in this textbook that "blueprints" and "types" are an accurate exegesis of the Bible. They are not. Owen, who was orthodox in his religion, took care to cite Plato. Were these "blueprints," "patterns," "systems," and "types" coexistent and eternal outside the deity, or were they ideas within the divine mind? In either case their use recalls Plato's Demiurge, wrestling with a recalcitrant Nature while consulting these eternal "models" for the regularity to be imposed. The authors' conception of God should not be equated with Plato's Demiurge, but we should be aware of the philosophic origin of the "type" and be wary of its theologic implications. (To the ancient Greeks, the Platonic system was in essence a dualism composed of eternal form and matter. Creation therefore meant that the Demiurge imposed form [ideas] on an organized *something* that was already in existence. This dualistic view of reality was much discussed in Christianity's earliest period, and implicitly disallowed in the Nicene Creed and the Apostles' Creed.)

To affirm that all things were created by God is not the same as saying that the Creator employed a blueprint for their creation. The former assertion is derived from the Judaeo-Christian tradition; the latter is merely an extension of Greek doctrine.

To affirm that all things were created by God is not the same as saying that the Creator employed a blueprint for their creation. The former assertion is derived from the Judaeo-Christian tradition; the latter is merely an extension of Greek doctrine.

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Newton thought that the regularities and stability of the solar system proved it "could only proceed from the counsel and dominion of an intelligent and powerful Being," and the same attitude governed thought concerning the earth's formation before the theory of geological evolution, concerning the descent of man before the theory of biological evolution, and concerning the origin of our galaxy before modern cosmology. The advance of knowledge therefore made inevitable an apparent conflict between science and religion. It is now clear how large a price had to be paid for a misunderstanding of both science and religion: to base religious beliefs on an estimate of what science cannot do is as foolhardy as it is blasphemous.

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Psychology as Scientism: Alienation by Objectivity

Part II: Man as Object and an Alternative

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In Part I (June 1975) this essay traced the development of a scientistic attitude in psychology's history up to the twentieth century. Part II picks up that history and analyzes psychology as a major cultural force promoting the counter culture of youth as it has been depicted by historian Theodore Roszak and psychiatrist Kenneth Keniston.

An adequate approach to a study of man, one less prone to alienating man from himself, must consider alternatives to the rationalist-empiricist epistemology. Such alternatives are represented in the intuitionist tradition of more subjective disciplines, and in the authoritarian tradition associated with religion and revelation. For the Christian, the spiritual nature of man, knowledge of which is rooted in revelation, is not merely another dimension of human existence, but is the unifying, organizing (and mysterious), aspect of human personality.

Watson's Behaviorism

The dismissal of any mental concepts in psychology came in the twentieth century with Watson's Behaviorism. In an extremely influential article written in 1913, Watson called for the elimination of consciousness as a phenomenon for psychological study. This elimination, he argued, would remove the barrier that existed between psychology and the other natural sciences.[37]

So successful was Watson's argument, academic psychology and Behaviorism became synonymous. Its influence continues in the modified, but equally mechanistic theories of B. F. Skinner and the growing behavior theories of the present day.

A survey of psychology's history, while seemingly belabored in reference to the theme of this essay, is necessary to show how deep and strong the rationalist-empiricist tradition runs in psychology, and to indicate how easy the slip into scientism can be made. In psychology, scientism takes the form of Behaviorism, promoting man's alienation from his experience by relegating human subjectivity to the mystical or artistic realms, declared invalid for a scientific understanding of man.

Koestler has made a similar assessment of psychology's history:

> Looking back at the last fifty years through the historian's inverted telescope, one would see all branches of science, except one, expanding at an unprecedented rate. The one exception is psychology, which seems to lie plunged into a modern version of the dark ages. By psychology I mean . . . academic or 'experimental' psychology, as it is taught at the great majority of our contemporary universities . . . By far the most powerful school in academic psychology, which at the same time determined the climate in all other sciences of life, was, and still is, a pseudoscience called Behaviourism. Its doctrines have invaded psychology like a virus which first causes convulsions, then slowly paralyses the victim.[38]

B. F. Skinner

It remains to bring the scientistic attitude as it is expressed in psychology up to the present. Skinner represents the contemporary extension of this deeply entrenched epistemology. This essay is too brief to provide a detailed critique of Skinner, but some basic postulates can be noted.

Again, Koestler provides a telling criticism of Skinner's writings:

> Nothing in their resounding titles indicates that the data in them are almost exclusively derived from conditioning experiments on rats and pigeons—then converted by crude analogies into confident assertions about the political, religious and ethical problems of man.[39]

Skinner is one of the rare social scientists to express his views in a novel, *Walden Two*,[40] a utopian vision of

society based on his operant conditioning principles of reinforcing (i.e., rewarding) the organism's (i.e., pigeon, rat, or man) most appropriate response (i.e., most appropriate as determined by some supra-agent, experimenter, or social engineer).

The scientistic attitude of Skinner is best expressed in his own words:

> A science and technology of behavior has been so long delayed. We must no longer attribute behavior to intentions, purposes, aims and goals. We can follow the path taken by physics and biology by turning directly to the relation between behavior and the environment and neglecting states of mind.[41]

With this underlying philosophical view added to the whole-hearted adoption of the objectivist approach of the natural sciences Skinner admires, the behavioral technology proposed for society becomes a logical conclusion.

"What we need is more control, not less," Skinner advises, "and this is itself an engineering problem of the first importance."[42]

Do away with intentions and purposes, mimic biology and physics, and turn society over to behavioral engineers. This, in capsule form, is Skinner's Utopia. The frightening question for the end of such a program is not, "Will it work?" The question is, "Granting it will work, will it give us a *human* world?"

The answer is "No!" What Skinner proposes is a society of empty organisms who live, move, and have their being only as respondents to the carefully filtered stimuli of a controlled environment. Such organisms will exist in a world where they will be totally alienated from personal experience, or more precisely, their personal experience will be reduced to that mediated by technological apparatus. Life will become an "instant replay" of some operant conditioning paradigm worked out according to a pre-conceived schedule of reinforcement and contingency situation. The abolition of man will be completed.[43]

Of course, no one is ready to implement to the full Skinner's utopian program. Indeed, his critics are as numerous as his supporters. But what is subtly significant is the degree to which the preliminary steps of Skinner's scientism have infiltrated the consciousness of contemporary man. This infiltration has been carried out in the fifty years Behaviorism has dominated the academic psychology scene, the period Koestler calls the dark ages of the science. The present psychology academic fraternity is composed of research professors, teachers, doctoral candidates, graduate students, and eager undergraduates who are steeped, or about to be steeped, in the implicit assumption of a Behavioristic scientism that reduces man to an electro-mechanical complex. These assumptions are characterized by Koestler as "pillars of unwisdom." Among them he lists the doctrines:

> (1) That all organisms, including man, are essentially passive automata controlled by the environment, whose sole purpose in life is the reduction of tensions by adaptive responses.
>
> (2) That the only scientific method worth that name is quantitative measurement; and, consequently, that complex phenomena must be reduced to simple elements accessible to such treatment, without undue worry whether the specific characteristics of a complex phenomenon, for instance man, may be lost in the process.[44]

Do away with intentions and purposes, mimic biology and physics, and turn society over to behavioral engineers. This, in capsule form, is Skinner's Utopia.

What this infiltrating scientism has done to the experience of man is cataloged by students of the so-called counter-culture. It is to this record we now turn.

Alienation: Man as an Object.

Theodore Roszak and Kenneth Keniston are two of the leading contemporary observers and assessors of alienation in American society. Alienation in Roszak's view has promoted an entire counter culture that is radically reorienting—or attempting to reorient—our society. In Keniston's view, more closely aligned with the theme of this essay, alienation points to a lack of moral will to control the technology we have developed.

For both Roszak and Keniston the cause of alienation lies in a subtle myth. Roszak's myth is that of objective consciousness, which calls upon man "to cultivate a state of consciousness cleansed of all subjective distortion, all personal involvement."[45]

Similarly, Keniston notes:

> . . . increasingly technology dominates by default—because it is *there*, and countervailing values, goals, and purposes are not. The dominance of technology therefore springs ultimately from the failure of positive values in our society, . . . Equally important is our willingness to *allow* it to be the motor, and this willingness is ultimately a matter of ideology and social myth.[46]

The descriptions of behavior within the counter culture by Roszak, and among the alienated youth by Keniston, represent evidence that points to the undergirding of these closely related myths.

The scientistic attitude, expressed in the notion that only a rationalist-empiricist epistemology can lead man to ultimate reality, becomes a third subtle, but widespread myth, which, like objective consciousness and the social myth of technological ego dictatorship, is a midwife to alienation. This is clear in behavioral psychologism, a scientistic attitude that in its eagerness to ape the natural sciences has reduced man's behavior to mere adaptive and coping responses and tyranically "succeeded in emptying man of his essential humanity."[47]

The severity with which these myths alienate demands closer examination. Roszak describes the severity as a loss of wonder. The beauty described by a scientific world view locked in its mode of objective consciousness is

> . . . the beauty of the efficiently solved puzzle, of the neat classification. It is the beauty a chess player discovers in a well-played game or a mathematician in an elegant proof. Such nomothetic beauties are conveniently summed up and indeed certified by a formula or a diagram or a statistical generalization. They are the beauties of experience planed down to manageable and repeatable terms, packaged up, mastered, and brought under control.[48]

Roszak calls science a technocratic trap.[49] This trap

has only recently been uncovered as activities within the counter cutlure bring to light "the negative potentialities of the scientific world vew." Technology has not produced the promised New Jerusalem of science, he declares.[50]

A devolution of science is now necessary, he argues, a devolution that will be resisted as subversive by the technocrats.

> Suddenly it becomes a subversion of progress to assert the commonsensible principle that communities exist for the health and enjoyment of those who live in them, not for the convenience of those who drive through them, fly over them, or exploit their real estate for profit.[51]

The crux of Roszak's critique lies in science's ability to "demythologize" life by promoting wholesale skepticism and moral neutrality.[52] In such a culture, criticism ends when science concludes something is true. There is to be no epistemological inquiry when a rationalist-empiricist scientism reigns. Roszak and his counter culture argue for and represent such a resisting inquiry.

As a result of the objectivist attitude, society is undergoing convulsions that can be described best as "poetic" or subjectivistic oppositions to the prevailing technocratic culture. Demands for political liberation, excursions in mystical Eastern religions, searches for expanded awareness in psychedelic subcultures, and utopian communal experiments are cited by Roszak as the "healthy instinct" resistance of the young to the scientific world view.

In Keniston one finds a less passionate and more clinical analysis of alienation in society. Keniston argues a "cult of the present" has arisen from rapid technological changes.[53] This change has engendered a lost connection with history that forces a demand for instant experience among youth. History is irrelevant. Likewise, technological change has fragmented society by shattering the traditional community.[54]

From a developmental psychology perspective Keniston delivers a devastating thesis. American adult society is so dominated by the "technological ego" that youth is encouraged to play out its fantasies before committing itself to adulthood. In Erik Erikson's terms, youth represents a "moratorium" on psychosocial development. According to Keniston's analysis, youthful alienation has become a tolerated institution.[55] But alienation has become so much a style of life for the young they choose to remain uncommitted to adulthood. Even those who move to adulthood suffer from little alienations.

Keniston casts the ego in the role demanded of it by technology. His psychoanalytic terminology, while pertinent to his thesis, need not delay us. What is noteworthy is his conclusion that

> The self-denying potential of the ego is minimized; playfulness, fantasy, relaxation, creativity, feeling, and synthesis take second place to problem-solving, cognitive control, work, measurement, rationality, and analysis.[56]

To cast the same judgment in Royce's terms, the technological ego is demanding activities that lean dangerously close to a religiofication of the rational. The historic progression is clear: A scientistic epistemology undergrids a social technocracy that demands a super-rationalized ego (I would prefer the concept of "self" to Keniston's ego) that in turn is locked into the scientistic epistemology. A vicious cycle is closed if Keniston's concept of the technological ego is valid.

That it is, seems to be supported by our social order:

> Most desirable positions in our society require advanced and specialized training, and, with it, high levels of dispassionateness, ability to remain cool under stress, capacity to concentrate, to maintain long-range goals yet to adapt readily to new conditions, to deal with remote and distant situations, to abstract, to co-ordinate complex operations, . . .[57]

The human being is seen basically as an empty organism or an impotent organism. With such a sterile model of man, creativity and adventure are impossible.

In short, to be super-rational. This is Keniston's conclusion. It is an accurate description of the "Rocket Man." It is equally descriptive of the neighborhood trash collector, who is euphemistically—and not always in jest—being called a sanitation engineer.

It remains for us to show that this specialized training is basically consciousness training, accomplished in American society by wholesale adoption of the mechanomorphic model of man promoted by scientistic psychology.

The astronauts again provide an anecdote illustrating man's increasing loss of wonder in the wake of advancing technology. The crew of Apollo 8 was so awed by their experience of orbiting the moon (Apollo 8 did not attempt a lunar landing) they chose to read passages from *Genesis*, reporting they were "viewing a scene that imbued them with the marvel of the creation."[58] However, the technological ego later in the Apollo program had apparently dictated reservations on such human responses. Apollo 10, another lunar-orbiting mission, sent back casual and scientifically objective reports. This type of reporting, except in the case of danger or monumental accomplishments such as Neil Armstrong's first step on the moon, has characterized the space program.

Braden uses this contrast in astronaut's attitudes —with the prevailing objective reports—to illustrate alienation resulting from what he calls Western man's "rape of Mother Nature."[59]

But it is not the astronauts alone who are encouraged to develop the alienating technological self-concept. Both the Behavioristic psychology that we have charged with the epistemic error of scientism and the psychoanalytic theory that undergirds Keniston's ego formulations operate on a reactive model of man. That is, their foundation rests on a stimulus-response, or adaptative framework. The human being is seen basically as an empty organism or an impotent organism. With such a sterile model of man, creativity and adventure are impossible. Human behavior is totally explained (and by inference controlled) by the stimulus situations of the environment.[60]

This type of thinking and research permeates the psychological laboratory. Stimulus and response are both limited by one's experimental design and the capabilities of the apparatus being used. Meaningful data

are reduced to what the experimenter can measure in this rigid and extremely confined situation. It is not without significance that the design of American space vehicles is largely the product of so-called "human engineers," trained in psychology.

It becomes an easy transfer from the laboratory to the world of everyday experience. With similar methodological filtration, the experiencing human is asked, not to examine his experience of love, but instead to somehow measure his sexual responsiveness. To a degree, the contemporary preoccupation with sexual responsiveness reflects the influence of behavioral psychology.

In the face of the existential anxieties of life, scientistic psychology aids in shaping man into a conformist,[61] negating and suppressing self-affirmation simply by denying the human organism's autonomy. Like ground control to the stranded astronauts of the film, scientistic psychology says to the experiencing self, "Don't do anything stupid, leave the controls to the stimulus situation on the outside."

Perhaps the clearest example of this rape of experience by scientistic psychology is recorded by Maslow. He cites a report in which a study of female sexuality is welcomed as a rigorous examination of a difficult problem "about which so little is known."[62] The personal experience of women simply doesn't count in the scientistic framework.

What has happened in psychology is best described as a reduction of man to an object by

> methodically and systematically reducing all experience to the kind of experience that can be described accurately in the language of physical science.[63]

Man, in other words, is eliminated as a subject, abolished, an organism without any expression of autonomy. As a result, man is either alienated from the prevailing social definition of adjusted behavior, or forced to deny his subjective experience. He is Camus' *Stranger,* or Kafka's K. of *The Trial.* The same non-fiction expression of alienated man is captured in works such as Roszak's and Keniston's.

Any adequate theory of man must consider an holistic approach that accounts for phenomena in all four dimensions: intellectual, emotional, bodily, and spiritual.

Alternatives to Alienation: The Whole Man and the Dimensions of Knowledge.

> They'll never reach the moon—
> At least not the one that we're after.
> "Sing Another Song, Boys."[64]
> —Leonard Cohen.

Alternatives to the rationalistic-empiricistic approach to reality that undergirds the scientistic attitude of contemporary psychology exist in the views Royce labels as intuitionist and authoritarian.[65]

The alternative to be proposed here would be labelled by Royce as authoritarian because it rests on theological presuppositions. Rather, it is an attempt to integrate or unify the four approaches to reality by trying to deal adequately with the whole nature of man, including what psychiatrist Viktor Frankl calls the meaning, or pneumatic (spiritual) dimension of man.[66]

There are certain parallels in Frankl's dimensional ontology and Royce's epistemological classifications that can be exploited to provide an anthropological view on which an alternative to alienation can be framed. Each of Royce's four approaches to reality emphasizes a dimension of the total man. The rationalistic approach emphasizes the intellectual aspect of human existence, or what Frankl calls the noetic dimension. The intuitive approach emphasizes the emotional, or psychic dimension of man. By emphasizing the corporeal, the bodily aspect of life, the empiricist approach to reality corresponds to Frankl's somatic dimension. Finally, the ideologic (i.e., authoritarian) approach to reality emphasizes the spiritual, or pneumatic dimension.

Based on this nosology, alienation can be defined as the separation of one dimension of man from other meaningful dimensions of his existence. The Behavioristic influence in psychology has engendered a one-dimensional image of man, thus alienating man from his psychic, noetic, and pneumatic dimensions (cognitive psychology, an outgrowth of behaviorism in the twentieth century, won back some room for the intellect and the rationalist approach, but inherits the neglect of the other dimensions).

The counter culture to a large degree represents a rediscovery of the psychic dimension of existence. Existentialism and mysticism, including the surge of contemporary fascination with the occult, are explorations of the pneumatic dimension of man. These searches for alternatives to alienation are undertaken as quests for unity of the person and a harmony of personal experience.

Any adequate theory of man must consider an holistic approach that accounts for phenomena in all four dimensions. What Royce calls religiofication, and what we have labelled as scientism, is the result of isolating one approach to reality and espousing it as the one superior method of gaining knowledge of the world and oneself. We have traced Behavioristic psychology's scientistic error in this regard. We can extend our criticism by noting a scientistic psychology, based on a rationalist-empiricist epistemology, reduces man to two dimensions, the somatic and the noetic. Further, by insisting that mind and brain are synonymous, Behaviorism tends to reduce all of life to the somatic dimension.[67]

The body, or somatic dimension, is the avenue upon which an empiricist epistemology must travel. Descartes pointed the way and psychology has largely taken the route. Philosophy in general has pursued the rationalist route, which is the boulevard of the intellect. Intuitionism and subjectivism, often expressed in poetic and artistic pursuits, travel the psychic route in the search for reality.

The realm of authoritarianism is usually relegated to religion and theology. This is Royce's strategy, although he recognizes that all epistemologies "in the last analysis, get pushed to this approach."[68]

A Christian view must recognize the validity of knowledge from all approaches to reality, but give supremacy to the knowledge made available by the divine revelation in Jesus Christ.

A similar shunting aside of religion and theology is seen in Keniston, who acknowledges the Judeo-Christian tradition as an historical antecedent to contemporary alienation, but mates that tradition with Existentialism's pessimistic view of man in modern thought.[69]

There are three misconceptions regarding the spiritual nature of man that are implicit in contemporary analyses of alienation and require correctives from the perspective of historic, reformed Christianity. These misconceptions can be stated:

(1) The spiritual dimension of man is just one of several facets of human existence. In a similar way, revelation (the authoritarian aspect of historic Christianity) is one among many paths to truth.

(2) The traditional Christian view of man is one of an evil, sinful, fallen organism, resulting in a pessimistic view of motivation and social change.

(3) The notion of God as a Creator of the universe is an irrelevant myth (and as a corollary, the notion of God in the historic person of Jesus of Nazareth is also irrelevant).

To counter these misconceptions requires dealing with them in reverse order. To dismiss the Creator-creature relationship of God and man is an expression of scientistic conclusions at their extreme. The sovereignty of God does not rest on biological philosophizing or cosmological speculation. Creationism is a viable option as a cosmology, and is pertinent to a view of man that is going to regard the whole person, including the spiritual dimension.

Second, the Scriptural assertion that God created man in his own image—the *imago Dei* (*Genesis* 1:26)—suggests pessimism regarding man is a partial view. God is not only Creator, but Redeemer; fallen man can be transformed. To espouse a pessimistic view of man is to ignore the redemptive implications. The restored and regenerated man, transformed by commitment to God in Jesus Christ, represents a positive side to Christian anthropology. Any non-Christian view rejects this transforming possibility and so must acknowledge this only as an historic *Weltanschauung*, as Keniston does. To debate his view apart from a consideration of God as Creator-Redeemer is to miss the root difference in perspectives.

Finally, a Christian view of man, resting on the sovereign Creatorship of God, must recognize the spiritual realm not as a single dimension of man representing only one facet of creaturely existence, but as the unique, mysterious, organizing aspect of human existence, permeating the somatic, noetic, and psychic dimensions. It is this dimension that defines the personhood of man. As such, a Christian view must recognize the validity of knowledge from all approaches to reality, but give supremacy to the knowledge made available by the divine revelation in Jesus Christ.

From this perspective, alienation is rooted in man's estrangement from his spiritual nature, which in turn is ultimately rooted in man's separation from the Creator-Redeemer.

This hasty recitation is an injustice to the theological richness that could be brought to the discussion.[70] It does, however, introduce a perspective that is largely ignored by contemporary psychology. The result of psychology's neglect is a prevailing model of man that is truncated and incomplete, tending to encourage rather than alleviate alienation in all its forms in contemporary society.

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[38]Koestler, *op. cit.*, p. 5.

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[40]B. F. Skinner. *Walden Two*. New York: Macmillan, 1960.

[41]B. F. Skinner. *Beyond Freedom and Dignity*. Cited by Robert J. Trotter, "The ultimate conclusions of a mod behaviorist," *Science News*, Aug. 7, 1971, 100, (6), 96-97. In a cover story following publication of Skinner's work, *Time* magazine referred to it as "the non-fiction version of *Walden Two*."

[42]*Ibid.*

[43]This argument is similar to one not directed at psychology, but at technologic culture by C. S. Lewis in *The Abolition of Man* (New York: Macmillan, 1947). The phrases used here are Skinnerian. In a book that has influenced the scientific community more than his popularized writings, Skinner rejects "mind" and "ideas" as concepts that "lack the dimensions of physical science." See his *Science and Human Behavior* (New York: Macmillan, 1953), pp. 30, 31.

[44]Koestler, *op. cit.*, p. 3. In the appendix of *The Making of a Counter Culture*, *op. cit.*, Roszak, gives frightening examples of psychological experimentation based on these pillars of Koestler's. Roszak argues such experimentation leans to the extremes of dehumanization.

[45]Roszak, *op. cit.*, p. 208.

[46]Keniston, *op. cit.*, p. 365.

[47]Bonner, *op. cit.*, p. 19.

[48]Roszak, *op. cit.*, p. 252.

[49]Theodore Roszak. "Science: A technocratic trap," *The Atlantic Monthly*, July, 1972, 230, (1), 56-61.

[50]*Ibid.*, p. 57.

[51]*Ibid.*, p. 61.

[52]*The Making of a Counter Culture*, p. 210.

[53]Keniston, *op. cit.*, pp. 183ff.

[54]Ibid., pp. 211ff., and pp. 238ff. This aspect of alienation is investigated by Vance Packard. *A Nation of Strangers*. New York: David McKay, 1972.

[55]*Ibid.*, pp. 339, 349. Keniston, a former student of Erikson's, acknowledges his intellectual indebtedness to the theorist.

[56]*Ibid.*, p. 317.

[57]*Ibid.*, p. 319.

[58]Richard Lewis, science writer cited in Braden, *op. cit.*, pp. 233ff.

[59]Braden, *loc. cit.* A fascinating change is overtaking many of the veteran astronauts, a result of their experience in space which is having profound effects on their personal lives. In many cases the changes exhibit resistance to the dictatorship of the technological ego, the astronaut quitting the space program for a more humanitarian task in life. See "The greening of the astronauts," *Time*, Dec. 11, 1972, 100, (24), p. 43.

[60]The criticism of psychology in this essay owes much to Bonner, *op. cit.*; Stephan Strasser, *Phenomenology and the Human Sciences* (Pittsburgh: Duquesne University Press, 1963); and Erwin Straus, *The Primary World of Senses* (New York: Free Press, division of Macmillan, 1963).

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[64]Leonard Cohen. "Songs of Love and Hate," a recording produced by Columbia Records, Inc., circa 1968.

[65]Royce, *op. cit.*, p. 12.

[66]Viktor Frankl. *The Doctor and the Soul: An Introduction to Logotherapy.* New York: Alfred Knopf, 1957. The dimensional ontology followed here is a modification of Frankl's categories posited by Donald F. Tweedie, Jr. in *The Christian and the Couch* (Grand Rapids, Mich.: Baker Book House, 1963) pp. 48-58.

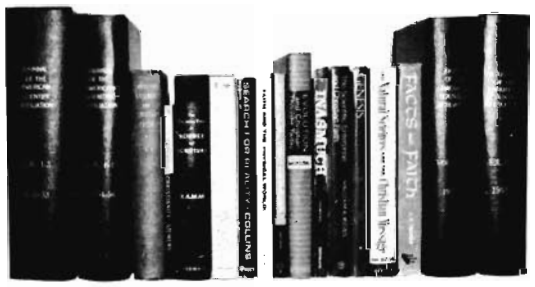
[67]Cf. Straus, *op. cit.*, pp. 105ff.

[68]Royce, *op. cit.*, p. 17.

[69]Keniston, *op. cit.*, p. 393.

[70]See, for example, G. C. Berkouwer. *Man: The Image of God.* Grand Rapids, Mich.: Eerdman's, 1962; and Stuart Barton Babbage. *The Mark of Cain.* Grand Rapids, Mich.: Eerdman's, 1966.

BOOK REVIEWS



HOW HUMAN CAN YOU GET? by Charles Martin, InterVarsity Press, Downers Grove, Illinois: (1973), 160 pp. $1.75.

This is a gem of a little book. Many books deal with humanism and many books focus on Christianity. This book converges on both in an elaboration of what it means to be a human being. The coverage is from an avowed Christian viewpoint.

Why does Martin write on Christianity and Humanism? Because they cover the two main ways of looking at life. Martin hopes that "Christians and Humanists . . . take time off from digging their entrenched positions deeper and look about them."

The book deals with four language systems: *molecule-talk,* the language of science; *me-talk,* the language of personal experience; *us-talk* and *them-talk,* the language of interpersonal relationships; and *God-talk,* the language of theology.

Martin addresses his remarks to the approximately one-third of the population in England who read, God's gift to publishers. The other two-thirds lose little sleep over the human predicament. The third who read are largely students "who read paperbacks as others read shopping lists, and who are extraordinarily well-informed on at least one side of every question." The bookish group is made up of Christians and Humanists, both of whom claim support from the man in the street.

Humanists have considerable excuse for their foggy idea about God because the church speaks with so many incongruent voices. Martin's parody on contemporary Christendom is succinct and right on target. At one end is the group arguing for correct cultic behavior (church attendance, especially at Easter and Christmas, is the absolute minimum). At the other extreme, social involvement is the key (church going and doctrine is optional). Somewhere in the middle is the group stressing doctrinal formulations (the vital thing is to say the right words). Out of this plethora of images the Humanist often perceives God not as Father but as boss—the Victorian paterfamilias made seven times hotter.

Charles Martin, a graduate of London University, is the author of several books, including *Tangle of the Mind, Introduction to Ethics,* and *Christian Origins and History. How Human Can You Get?* was originally intended for Britishers, but its contents are timely for Americans as well. In publishing the book for Americans, InterVarsity did not Americanize the vocabulary so that words like behaviour, programme, spoilt, and colourful remain.

Martin raises some weighty questions, throws in a dash of humor and overall comes up with some pretty spiffy phrases. The further one reads the better it gets. The last two chapters are the capstone and the best of the ten.

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

SPEAKING IN TONGUES: ***Let's Talk About It,*** Watson E. Mills (ed.) Word Books, Waco, Texas: 162 pp. $4.95.

Here is yet another book on glossolalia. Fifteen

Books Received and Available for Review

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

Clements, R. D., *God and the Gurus,* IVP, 1975.

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years ago the charismatic revival burst upon the religious scene, resulting in a steady stream of articles and books that seems now in crescendo. I have diligently followed this literature, but found little change in fifteen years. Most authors are theologians with vested interests in maintaining a pro-tongue or anti-tongue position. Scientific studies of glossolalia have been slower in coming forward. Yet when good scientific studies appear they are seized upon to bolster a pro or con theological position. This rip-off of scientific data to religious ends is all too familiar, even in cases where scientists have explicitly cautioned against the use of their data to sustain ideologies. I am unaware of a dispassionate scholarly theological book on glossolalia, that gives due credence to the available scientific research, to the historical data, and to the religious functions of glossolalia qua religion.

This book make an attempt at such dispassionate analysis. The editor offers us ten chapters on glossolalia from a historical, cultural, religious, theological, anthropological, and linguistic point of view. The editor takes a meliorative position, stating that the religious arguments have been polemical, while what is needed is an analysis in perspective by those who both agree and disagree with the charismatics. Eight authors are theologians, almost all Southern Baptist; one a Wheaton College anthropologist; one a University of Toronto linguist. Thus the author skew is both scholastically and theologically conservative and non-representative.

The bow toward scholarship is deceptive. The editor has assembled a really fine annotated bibliography, relatively comprehensive up to about 1971. Yet there is a singular lack of scholarship by most of the authors. Their work is marred by generalizations and insipid thinking. Two chapters on church history by Bunn and Hinson are cursory. Both ignore the magnum opus in the field: *Enthusiasm* by Monsignor Knox (Oxford, 1955); also omitted in the bibliography. The chapters on theology and religious interpretations do not systematically review either theological history nor religious history, offering instead personal opinion and interpretation. A chapter on anthropology by Mayers is acceptable, albeit cursory. It largely paraphrases my *Journal ASA* review of 1968. Without personal modesty my own review is out of date, superceded by the work of anthropologists like Bourginoun, Gerlach, Hine, Goodman, etc. None of the serious socio-cultural research of the past six years is accounted for. Likewise the psychological studies of Kildahl, Maloney, Plog, etc. are not systematically reviewed.

There is one jewel of a chapter on socio-linguistics by William J. Samarin from the University of Toronto. He published a serious longitudinal linguistic study of glossolalia in 1972: *Tongues of Men and Angels* (Macmillan), which is the major scientific evaluation of glossolalia extant, in my opinion. The short chapter by Samarin in this book summarizes his major linguistic, sociological, and theological observations. It should whet the appetite of the reader to obtain Samarin's book.

To my mind the major linguistic data on glossolalia are now in, i.e., the work of Samarin. The psychological data are still sparse, limited primarily by the biases of population sampling in the reported studies, and the inferences to be drawn from skewed populations. The socio-cultural data, primarily from Bourginoun and Gerlach, is fragmentary and not sufficiently explanatory. Classical history of ecstatic religious experience is well represented by Knox, although the scattered historical sources could profitably be drawn together. A current history of ecstatic religion is missing. As I observe the scene, glossolalia was but the precursor of the revival of mystical religion, which is the larger religious movement beyond fundamentalistic charismatics. For example, we've seen the Jesus movement, eastern mysticism, meditation, group sensitivity encounter, and onward, all of which represents a re-emphasis on the experiential aspect of religion. This larger perspective, of which glossolalia is but a part, is missed in this book.

In sum, this book sets out to place glossolalia in perspective. The goal is noble, but the effort is marred by trite theology, inadequate scholarship, and a myopic perspective.

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THE HOLY SPIRIT IN TODAY'S CHURCH: *A Handbook of the New Pentecostalism,* edited by Erling Jorstad. Abingdon Press, Nashville: (1973), 160 pages. $2.75.

GIFTS OF THE SPIRIT AND THE BODY OF CHRIST: *Perspectives on the Charismatic Movement,* edited by J. Elmo Agrimson. Augsburg Publishing House, Minneapolis: (1974). 112 pages. $2.95.

Professor Erling Jorstad has given us a "reader" relating to the multi-faceted phenomenon known as neo-Pentecostalism. He is Chairman of the Division of History, Philosophy, and Religion at St. Olaf College, Northfield, Minnesota, and has written *The Politics of Doomsday* and *That New-Time Religion: The Jesus Revival in America.*

This handbook draws together much helpful contemporary material from those who have written on both sides of the Pentecostal question. It naturally affords the reader a perspective that is relatively unbiased since several viewpoints are presented. In fact, Jorstad works on the assumption that neo-Pentecostalism is one of the most criticized and defended and yet least understood movements in contemporary Christianity. The editor intends to expose the reader to various writings that reflect the several differing attitudes concerning the nature and significance of the Charismatic revival. He includes writings that present "accurately, clearly, and responsibly" the major themes of the movement (p. 6). His selection of materials is solid and representative of the many viewpoints within the movement itself.

The first two chapters consist of excerpts aimed at clarifying for the reader the history of Pentecostalism and specifically the rise of neo-Pentecostalism in the United States. The third chapter deals with the various controversies that have arisen since the appearance of neo-Pentecostalism. These initial chapters are written by Professor Jorstad himself, but beginning with Chapter Four ("The Mid-Week Prayer Meeting") the role of Jorstad shifts to that of editor, and he exposes the reader to selected and edited readings from various

sources both within and outside of neo-Pentecostal writings.

The controversial issue of "speaking in tongues" is dealt with in Chapter Seven (pp. 77-99). Here the editor presents selections from Don Basham, Larry Christenson and Kilian McDonnell. In its broader aspect, the discussion of spiritual gifts embraces three chapters of the book (pp. 77-134). Of particular interest to pastors is the chapter entitled "What the Churches Can Do" (154-156), a section in which the editor gives some sound advice to those who are having to deal with the issues being raised by the Charismatic revival. These guidelines are brief and to the point but are of sufficient depth that they can become the basis for some genuine discussion and positive action.

Agrimson's book is an anthology of articles that deals with the range of spiritual gifts and the ways these relate functionally to the body of Christ. It, too, attempts to give perspective to the Charismatic movement. The six essays presented in the book are written by recognized authorities in this area of study. The editor contributed the introduction and the concluding essay. Other contributors are Dwayne A. Priebe ("Charismatic Gifts and Christian Experience in Paul"); Paul G. Sonnack ("A Historical Perspective on Some Contemporary Religious Movements"); Johannes A. Schiller ("The Sociology of Charismatic Movements"); John P. Kildahl ("Six Behavioral Observations about Speaking in Tongues"); Arnold Bittlinger ("Baptized in Water and in Spirit"). Kildahl's article is taken from a recent book published by Harper & Row (*The Psychology of Speaking in Tongues*, 1972). Bittlinger is noted for his work in the area of Charismatic renewal, particularly his recent book entitled *Gifts and Ministries* (Eerdmans, 1973).

In 1966 three Southern Baptist Seminary professors attempted to put glossalalia "in the round" by presenting perspectival essays on the phenomenon in terms of its biblical, historical and psychological dimensions (see Frank Stagg, *et al, Glossalalia: Tongue Speaking in Biblical, Historical, and Psychological Perspective*, Abingdon, 1967). Presently Agrimson, who is President of the Southeastern Minnesota District of the American Lutheran Church, has enlarged the focus to include a variety of additional approaches being made to the Charismatic revival. His writers offer the biblical, historical, sociological, psychological, experiential and pastoral dimensions of the subject. This enlargement of scope is itself a witness to the increasing interest in the phenomenon associated with the Charismatic movement, and various new ways being suggested for studying it.

Increasingly, as more and more Christians are becoming caught up in charismatic renewal, numerous books are appearing that treat the subject from the vantage point of widely differing disciplines. Such an approach gives a fresh perspective and will go a long way toward bringing genuine understanding.

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MYTHS, MODELS AND PARADIGMS: *A Comparative Study in Science and Religion* by Ian G. Barbour, New York: Harper & Row, 1974. 198 pp. $6.95.

The subtitle of this book indicates that it is a comparative study of science and religion, but the focus of the comparison is primarily on the roles of paradigms and models in science and religion. In this study Barbour emphasizes three themes. The first is that language has a diversity of functions. Scientific discourse has usually been pointed to as the norm for all other forms of discourse because of its objectivity, but, Barbour argues, "every type of language has its own logic appropriate to its specific purposes." Whereas some have taken this theme off in the direction of conceptual relativism and Wittgensteinian fideism[1] Barbour holds that religious language has cognitive functions and that there is no "sharp contrast between the objectivity of science and the subjectivity of religion."[2] Although religious language has some distinctive functions unparalleled by scientific discourse, the contrasts with science are ones of degree and not of kind. This claim is explored in the second and third themes of the book: the role of models and the role of paradigms in religion and science. An examination of these three themes serves to support the position of critical realism that Barbour advocates in both religion and science.

Critical Realism

Briefly, critical realism with respect to models holds that models are neither literal pictures of reality (naive realism) nor are they mere dispensable psychological aids that have no crucial role in theory making or scientific discovery. The critical realist takes models seriously but not literally. With respect to paradigms the attitude of the critical realist is a mediating one between naive objectivism and conceptual relativism. Critical realism rejects the textbook view of the growth of science and accepts most of the major theses of Kuhn put forward in his *The Structure of Scientific Revolutions*[3] but with important qualifications.

Those who are familiar with Barbour's earlier work *Issues in Science and Religion*[4] will expect a work that is both synoptic with respect to the problems he discusses and synthetic with respect to the conclusions that he offers. If this work is approached with those expectations, one will not be disappointed. In several ways this book is an amplification of some of the issues raised by himself in *Issues* and others in two collections of essays edited by Barbour.[5] The main thrust of *Myths, Models and Paradigms* is the exposition of critical realism via the comparisons of the roles that models and paradigms play in science and religion. Surrounding this discussion are a constellation of related issues which include discussions on the distinctions between metaphor and symbol; the use of analogy in metaphor, myth and parable; the cognitive function of myths; a critique of Bultmann's demythologizing; the adequacy of Ian Ramsey's "disclosure models" and John Hick's version of "seeing as" – "experiencing as" and Barbour's own suggestion of viewing the theory ladenness of experience as "interpreting as." Some of the other specific issues will be commented on after a further elaboration of Barbour's critical realism.

When Thomas Kuhn's *The Structure of Scientific Revolutions* first appeared in 1962, it caused a stir especially among followers of Karl Popper, because it was believed that Kuhn's account of scientific revolutions was too subjective, irrational and led to conceptual relativism. While Popper and his followers had argued that falsification was decisive in overthrowing a theory, Kuhn maintained that falsifications are never viewed as such unless other conditions obtained—i.e., there was a crisis and an alternative theory that handled the anomalies of the present theory was on the horizon. The criteria for assessment of the paradigm are dependent on or relative to the paradigm; thus, any two paradigms are incommensurable. Imre Lakatos, a follower of Popper, rather critically summed up the results of Kuhn's analysis as follows:

> For Kuhn scientific change — from one paradigm to another is a mystical conversion which is not and cannot be governed by rules of reason and which falls totally within the realm of the *(social) psychology of discovery*. Scientific change is a kind of religious change.[6] . . . There are no rational standards for their comparison. Each paradigm contains its own standards. The crisis sweeps away not only the old theories and rules but also the standards which made us respect them. The new paradigm brings a totally new rationality. There are no super-paradigmatic standards. The change is a band wagon effect. Thus in *Kuhn's view scientific revolution is irrational, a matter of mob psychology.*[7]

In response to criticisms like these, Kuhn has modified and clarified many of his views. Barbour's own position of critical realism is a synthesis of the best insights of both Kuhn and his critics. Barbour's position has three prominent modifications of Kuhn's view. First, although Kuhn and Barbour are in agreement that all data are theory-laden, Barbour disagrees that rival theories are incommensurable because of it. Barbour believes that there is "a common core of overlap in observation languages" which allows for a common ground for inter-paradigmatic discussion. This concession would account for the fact that there is a residue of some observation statements and laws which survive scientific revolutions and are incorporated within the new "research programme". This would also tend to account for the textbook version of science which sees science as one uninterrupted line of progress and continual accretions of knowledge. Second, Kuhn has been criticized for his views about the relevance of falsification to the refutation of theories and paradigm shifts, and Barbour agrees with this criticism to the extent that he allows that observation does exert some control over the falsification of theories. The control that observation exercises over theories (falsification risk) is inversely proportional to the comprehensiveness, generality or scope of a theory. Third, Kuhn held that there are no rules for choosing among research programmes, and Barbour agrees with this but suggests that there are criteria for assessment which are not applied in any rigorous way or reducible to formal rules.

The criteria that Barbour offers for the rational assessment are apparently to be paradigm independent, but he offers no argument for this.[8] The criteria (simplicity, internal consistency and systematic interrelatedness, extensibility or fruitfulness, and comprehensiveness) are also the familiar ones.[9]

Barbour's critical realism as applied to models is much indebted to Mary Hesse[10] in his discussion of their status and function in science. As mentioned above, the critical realist takes models seriously but not literally. Barbour argues that the instrumentalist account of the role of models fails to account for the tenacity and commitment that the scientist shows and has for his models, theories and research programmes. Barbour agrees with Kuhn over against Lakatos that scientists make ontological and not just methodological commitments in these areas. But this commitment is not to exclude it or make it immune from criticism. Both of these aspects, ontological commitment and critical reservation are concisely put in this quote from Leonard Nash:

> We must not then take a theoretic model [an imaginative mental construct that attempts to represent symbolically an unknown process] too literally; indeed *we may err by taking the model too literally*. But, as we would realize the full heuristic power inherent in it, *we must take the model very seriously*. . . . If our models are to lead us to ask, and seek answers for, new questions about the world, we must regard them as something more than 'logical super-fluities', 'illicit attempts at explanation', 'convenient fictions', or the like. The lesson of scientific history is unmistakable. To the hypothetical entities sketched by our theories we must venture at least provisional grants of ontologic status. Major discoveries are made when invisible atoms, electrons, nuclei, viruses, vitamins, hormones, and genes are regarded as *existing*.[11]

Falsification

Of the specific issues surrounding Barbour's comparative study one of the most interesting is the issue of falsification in science and theology. In a section titled "on the falsification of beliefs",[12] Barbour neatly summarizes the old debate concerning Flew's challenge to specify the conditions for falsification as a condition for meaningful assertions.[13] One response to this challenge along Wittgensteinian lines is to point out the diversity of functions that language has and that all criteria are relative to the language game in which they occur. Religious language has its own logic appropriate to its specific purposes. This is the response of Wittgensteinian fideism and Barbour rejects it on the same grounds that he rejects conceptual relativism with regard to paradigms.

A more interesting response is to question Flew's challenge itself. This is Barbour's strategy. Barbour, however, confuses two issues here. Flew's challenge embodies a thesis about meaning — an assertion, to be meaningful, must be specifiably falsifiable. That this thesis is untenable is shown by the work of Wittgenstein and Austin. But even if religious assertion are shown to be meaningful because they are part of a language game that is played, it would still leave open their cognitive status. Karl Popper never intended his falsification thesis as a thesis about meaning but he did think that it provided a line of demarcation between science and non-science.[14] It is this issue that Barbour must, and in fact does, address if he is to maintain that the difference between religion and science is one of degree and not kind.

The first part of Barbour's attack is to point out that, *"The demand for the specification of falsifying conditions seems unreasonable*, since it cannot be met by scientific theories, especially those of great generality."[15] A theory that is faced with a falsifying instance may modify some auxiliary hypothesis, make an *ad hoc* adjustment in the theory or simply set the falsification instance aside as an anomaly. "Crucial experiments" are dubbed as such by history and are hardly ever

recognized as such when they occur. But a real problem arises when it is realized that the crucial part of science, first order principles, are unfalsifiable. In this case it is not so much not being able to specify what will falsify them because it is difficult to see, but rather because nothing is allowed to count against them. John F. Miller holds the position that there is a logical similarity between religion and science because they both have unfalsifiable first principles.

> As in religion with its first order non-falsifiable statements, *nothing is allowed to count against* these important first-order scientific principles which have been discussed (causality, determinism, the principle of rectilinear propagation of light, the law of the conservation of energy). Therefore, religion and science are logically similar in this respect: both have within their conceptual frameworks or world-views non-verifiable principles of first order status which are principles *in accordance with which* inferences are drawn and evidence is adduced.[16]

Barbour objects to Miller's thesis on two grounds however. The first is that Barbour believes that, "A prolonged accumulation of anomalies or *ad hoc* amendments would, I believe, bring about reformulations of the principle itself or qualifications of its universality".[17] He notes that Miller bases his case for quantum determinism largely on the writings of Planck, but this now represents a minority view among scientists and philosophers. Thus, not all physicists assume that determinism must hold in the atomic domain. The second reason for objecting to Miller's position is that Miller, along with many others who have written on the subject, have assumed that falsifiability and unfalsifiability are mutually exclusive categories, when in fact a theory's resistence to falsification is proportional to its generality. Thus, on Barbour's analysis it is no longer necessary to see religion and science as either contrasting or logically similar but on a spectrum. And a further consequence of Barbour's view is that it completely obliterates Popper's line of demarcation.

Barbour's views on falsification then amount to this: the specification of possible instances of falsification is an unreasonable demand because it cannot be met. In theories of high generality there is no piece of evidence which "decisively counts against" such theories, but they do "count against" it. Like straws on a camel's back they accumulate to an extent that if another promising beast of burden should come along, it will be noticed that either the camel's back is broken or is breaking. Barbour believes that this is the case in both religion and science. Nothing in them is immune from falsification but we may not be able to specify that future straw which will break the camel's back.

Barbour's views are interesting and important but one wishes that he would have addressed some other alternatives in addition to those discussed. Are, for instance, some of the key interpretive terms, concepts and principles unfalsifiable because they are definitional and not empirical? Or, on Alastair McKinnon's view,[18] does science contain assertations which are both necessary and contentful? Isn't causality really the bedrock interpretive principle which Miller claims it is? Might it not be the case that there are certain beliefs that a scientist cannot abandon without at the same time giving up science? As McKinnon suggests, might not the belief that there is order in the world be such a belief which constitutes the activity of a scientist? These are questions which Barbour does not raise but one wishes he had.

Complementary Models

Of particular interest is Barbour's discussion of complementary models in physics and theology. The use of complementary models in theology might seem to invite all manner of uncritical acceptance and justification of otherwise untenable dichotomies in theology but, from his analysis of complementary models in physics, Barbour suggests rules governing their use which would prohibit it. It is pointed out that the use of complementary models does not a priori preclude searching for a unitary model and it can be used only in situations where the models refer to the same entity and are of the same logical type. This stipulation has an important consequence in that it prevents us from viewing science and religion as complementary, since they are not of the same logical type. Science and religion, Barbour maintains, are attempts at interpreting different aspects of reality and serve different functions.

> For these reasons I will speak of science and religion as alternative languages using alternative models, and restrict the term complementary to models of the same logical type *within* a given language.[19]

Despite these restrictions Barbour does see complementary models in use that do meet these criteria. In particular, Barbour discusses Tillich's use of personal and impersonal symbols in talking about God. Barbour also notes that unlike complementary models in science there is no unifying mathematical formalism that allows at least probabilistic prediction of particular observations in theology. In science the inconsistency is at the level of models, not at the level of the theory. In theology, however, a conceptual unity is provided by theological and doctrinal schemes, in a manner similar to the functioning of mathematical formulae. "But their relation to experience is more ambiguous, and no one would claim for them any kind of predictive power on even a probabilistic basis".[20]

Process Theology

Barbour has a too brief discussion of the Christian paradigm and different models for the relationship between God and the world that should be of interest to theologians and philosophers of religion. Barbour's own persuasion is a variation of process theology which is indebted to Whitehead, Hartshorne and Cobb but is not identical with any of them. These models—monarchical, deistic, dialogic, agent and social or process—are assessed according to the above mentioned criteria for adequacy and the process model is found to be the most adequate. Barbour mentions one of the recent critiques of process theology by H. P. Owen. The objection that Barbour singles out is that a finite God is unworthy of worship and only a necessary being is the proper object of worship. Barbour's reply is that it is God's love and not his omnipotence that inspires and justifies reverence and worship. But this objection is one of the least substantial of three that Owen makes and one would have hoped that Barbour would have addressed the others also.[21]

Model of Divine Action

One aspect of Barbour's book that is, I think, ex-

tremely significant is the application of the insights of philosophy of action to the action of God in nature. It is claimed in recent philosophical psychology that not all bodily movements are human actions; muscle spasms and other involuntary movements are exempt. Bodily movements can be adequately explained in terms and categories of physiology, but human actions must refer to intentions. A collection of bodily movements cannot be specified as an action without a conative intention or purpose and context that interprets the movements. Thus, there are "two ways of talking about a single set of events"[22] that are not incompatible but rather two languages, one being interpretive of the first. This analysis of human action when applied analogically to God's action in nature, results in seeing the scientific analysis of physical nature on par with the physiological analysis of bodily movements, with Divine intentions providing the interpretations of significant events in human and cosmic history. Just as not all bodily movements are human actions, not all events need be expressions of divine purpose, nor would they exhaustively express God any more than the personality of an agent is fully expressed in any sequence of events. Using this model of God's activity, it can be seen that God does not need gaps in nature in order to act, and the causal explanation is as compatible with God's activity as a physiological explanation is compatible with an intentional explanation of human action.

This model of Divine action has limited application in that it does not account for all those actions sometimes ascribed to God. Miracles that contravene the usual regularities cannot be accommodated on this model unless, as it may turn out, these apparent contraventions are really exemplifications of the operations of some as yet unknown mechanism. In short, this model can account only for what can be accounted for in a causal language. Another feature of this model that a classical theist might find objectionable is that God's relation to the world is modeled on a person's relation to one's body and it fits well with a panentheistic model of God. John Compton who so ably presents this model in an article called "Science and God's Action in Nature"[23] presents it in conjunction with a process model of God, but this feature of the model is a neutral analogy and does not mandate a process interpretation.

FOOTNOTES

[1]These two terms, "conceptual relativism" and "Wittgensteinian fideism" are not used by Barbour but they characterize the view that he wishes to avoid. Conceptual relativism holds that reality, truth and meaning are dependent upon the conceptual scheme in which they occur. Wittgensteinian fideism is the application of this view to religious language.

[2]Ian G. Barbour, *Myths, Models and Paradigms: A Comparative Study in Science and Religion* (New York: Harper & Row, 1974), p. 5.

[3]Thomas S. Kuhn, *The Structure of Scientific Revolutions*, 2nd ed., Phoenix Books (Chicago: University of Chicago Press 1970).

[4]Ian G. Barbour, *Issues in Science and Religion* (Englewood Cliffs, N.J.: Prentice-Hall, 1966; Harper Torch Books, New York: Harper & Row, 1971).

[5]Ian G. Barbour, ed., *Science and Religion: New Perspectives on the Dialogue* (New York: Harper & Row, 1968); Ian G. Barbour, ed., *Earth Might Be Fair: Reflections on Ethics, Religion and Ecology* (Englewood Cliffs, N.J.: Prentice-Hall, 1972).

[6]Imre Lakatos, "Falsification and the Methodology of Scientific Research Programmes", *Criticism and the Growth of Knowledge*, Imre Lakatos and Alan Musgrave, eds. (Cambridge: Cambridge University Press, 1970), p. 93.

[7]*Ibid.*, p. 178.

[8]Barbour in *Issues* mentions Ferre in connection with the following criteria. Ferre's argument deals with criteria for judging the adequacy of metaphysical systems. The criteria developed out of an analysis of their function 'to unify and "make sense" out of ranges of ideas otherwise unrelated . . . draw meaning out of "blooming, buzzing confusion" ' Frederick Ferre, *Language, Logic and God* (New York: Haprer & Row, 1961; Harper Torchbooks, 1969), p. 162.

[9]Barbour, *Myths*, p. 143. Cf. Barbour, *Issues*, pp. 144-148, 252-255; Ferre, *Language*, pp. 160-165; and Basil Mitchell, *The Justification of Religious Belief* (New York: Macmillan, 1963).

[10]Mary B. Hesse, *Models and Analogies in Science* (London: Sheed and Ward Ltd., 1963; Notre Dame, Ind.: Notre Dame University Press, 1966); and Mary B. Hesse "Models and Analogies in Science" vol. 5, Paul Edwards, ed., *Encyclopedia of Philosophy*, pp. 355-356.

[11]Leonard Nash, *The Nature of Natural Science* (Boston: Little, Brown and Co., 1963), p. 251. Quoted in Barbour, *Myths, Models and Paradigms*, p. 38.

[12]Barbour, *Myths*, pp. 126-137.

[13]Anthony Flew, "Theology and Falsification" in Anthony Flew and Alastair MacIntyre, eds., *New Essays in Philosophical Theology* (London: SCM Press, 1955; New York: Macmillan, 1964), pp. 96-99.

[14]See Bryan Magee, *Karl Popper* (New York: Viking Press, 1973), p. 43.

[15]Barbour, *Myths*, p. 129.

[16]John F. Miller III, "Science and Religion: Their Logical Similiarity", *Religious Studies* 5 (October, 1969), p. 64. Quoted in Barbour, *Myths*, p. 131.

[17]Barbour, Ibid., p. 132.

[18]See Alastair McKinnon, *Falsification and Belief*, (The Hague: Moulton & Co., 1970).

[19]Barbour, *Myths*, p. 78.

[20]*Ibid.*, p. 91.

[21]The claimed advantage of the process model of God over the classical model is that it more adequately accounts for the relation between the infinite and the finite. It is, however, just this claim that Owen disputes. The reason for this is that "In all its forms, it [process theology] involves self-contradiction. The same being cannot be both absolute and relative, both changeless and changing, both eternal and temporal" H. P. Owen, Concepts of Deity (New York: Herder and Herder, 1971), p. 88. Owen discusses and rejects various attempts to show that this is only paradox and not contradiction and rejects them. It is Barbour's suggestion that christological models are complementary models and that it is the christological model that is one of the sources for the process model. In short, a suggested reply to Owen might be that the process model is not contradictory but uses complementary models in the same way that models are used in explaining the human and divine natures of Christ. This reply, however, must be spelled out and Barbour does not do it here.

The third objection is especially important in light of the emphasis that Barbour places on human experience as the data which religious beliefs can be tested against. (Of course, experience is not uninterpreted but neither is it completely malleable. The relation of experience to the falsification of religious beliefs stands in the same relation as observation does to the falsification of comprehensive theoretical models: experience and observation can count against a position but not decisively unless this negative evidence accumulates and a rival model or belief with promise is in sight.) One of the most significant items of human experience is the feeling of absolute dependence 'which Schleiermacher and Otto rightly took to be differentiating marks of the religious consciousness" (Owen, *Concepts*, p. 89). The argument is that the only justifiable object of such an experience is an infinite God without qualification. A finite God would not make sense of this experience.

[22]Barbour, *Myths*, p. 159.

[23]John Compton, "Science and God's Action in Nature, in Barbour", *Earth*, pp. 33-47.

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Communications

Religion And The Rise Of Modern Science: A Review Reviewed

Seldom in a Christian publication have I found such disregard for the normal (not to say Christian) standards of accuracy and fairness as in David C. Lindberg's review of *Religion and the Rise of Modern Science* by R. Hooykaas, reproduced in the December 1974 issue of the *Journal ASA*. One does not have to be a professional historian, provided one has read the book, to recognize the contrast both in content and in spirit between the original and the caricature that Lindberg has seen fit to present. If his review exemplifies his own conception of a scholarly approach to his material, it is as illuminating as it is self-calibrating.

In the first place, Lindberg by implication represents Hooykaas as claiming that "Christianity or (Puritanism) was *the very cause* of the birth of modern science" (my italics), and proceeds to castigate this as simple minded, naive etc. In the real book, Hooykaas is careful to emphasize (e.g., on pages xiii, 36-39, 101) that biblical religion was only one, though an important one, of many factors which cooperated to overthrow the traditional and rather rationalistic medieval world-picture and to stimulate interest in both experimental science and technology. His claim is merely that the positive influence of biblical ingredients has been underestimated, and the declared purpose of his short book (which is based on invited lectures for a general audience) is to redress the balance in this respect rather than to attempt a complete analysis of all the factors operative.

Secondly, Lindberg describes Hooykaas as "a positivist" who maintains that "science . . . properly pursued . . . recognized that there are no causal connections". This completely misses the distinction, which Hooykaas has made particularly clear in his earlier book on *The Principle of Uniformity*, between the methodological principles of science and their ontological foundation. At a *methodological* level, Hooykaas is quite as well aware as Lindberg that "the search for causal connections was at the heart of the 17th century . . . scientific enterprise". What he argues is that a biblical *ontology*, which traces all physical events ultimately to their origin in God and rejects any 'deification' of natural causes, provides a sounder philosophical basis for this search than the pagan idea of nature inherited from the Greeks; but he in fact expresses no personal commitment to positivism or any other 'ism' of the day.

Lindberg proceeds to more vague and still more unsubstantiated accusations, for which I think the only remedy is to read the book, note the contrasts, and draw the appropriate conclusions. Where, for example, does Hooykaas state or imply that "a new conception of science and of the proper methodology for pursuing it lead . . . *swiftly* to a *dramatic* alteration of the contents of science" (my italics)? He claims at most (and with ample supporting evidence) that it did at certain points fertilize some of the new developments. Again, Lindberg's statement that "when Hooykaas enquires whether Christianity (or Puritanism) provided a climate favorable to science, he insists on a "yes" or "no" answer, which can be applied to an entire age and an entire continent" does gross injustice to the care with which the real Hooykaas frames his questions and the caution with which he stresses their complexity and the tentativeness of his answers.

Perhaps most revealingly unfair is Lindberg's final innuendo, that "a carefully reasoned . . . analysis was never (Hooykaas') real purpose." In point of fact, what Hooykaas has produced has been recognized by many who do not share his theological position as one of the most carefully documented and scholarly short treatments of his subject that have recently appeared. It rests on a lifetime of published research into original sources, which has earned its author election to membership of half a dozen European Academies. In England, *Religion and the Rise of Modern Science* has been adopted as a recommended text for the British Open University. I hope that readers of Lindberg's animadversions will not allow themselves to be deflected from the rewarding experience of reading this stimulating and informative book for themselves.

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A Critical Appraisal: Clark Pinnock

In the past few years Clark Pinnock, presently professor of theology at Regent College in Vancouver, has been the most articulate defender of Biblical inerrancy. His book, *Biblical Revelation* (Moody, 1971), was a major contribution to the long history of this debate. Dr. Pinnock has also distinguished himself not only as an exponent of full inerrancy, but as an exponent in the mold of Benjamin B. Warfield who is cognizant of the difficulties inherent in that position. Pinnock is in fact a notable representative of a more open approach to plenary inspiration and thus his position merits careful consideration. In the recently published *God's Inerrant Word* (ed. John W. Montgomery; Bethany, 1974), Clark Pinnock's critical appraisal of limited inerrancy raises again the question whether his position is consistent. I intend to argue that Pinnock tries unsuccessfully to straddle two horses with one saddle.

On the one hand Mr. Pinnock is willing to go along with J.I. Packer or Richard Bube[1] in considering the context and the intention of each passage before making a decision concerning truth it teaches. In addition Pinnock says it is legitimate to differentiate between soteric and non-soteric truth, as well as between formal error (lack of conformity with reality) and material error (figures of speech). We are led to believe, and Pinnock even states it, that he is willing to accept the modified proposition that Scriptural inerrancy is limited by the "sense intended by the inspired writer."[2]

On the other hand Pinnock lets it be known that restricting inerrancy in this manner is no reason to call his position limited inerrancy. We are told that the apostles (I presume apostles are also being identified with the Gospel writers) received *all* Scripture, including secondary details, in total trust as the Word of God. Each declarative statement of the Bible is accepted as reliable and true. The attitude of Christ and his apostles toward Scripture (the OT) is to be given priority over any unresolved difficulties, because the authority of Jesus cannot be pitted against "a yet-to-be solved and *usually* trivial detail" (italics mine).

The question before us then is whether Dr. Pinnock as a representative of a more tolerant approach to plenary inerrancy is consistent. In direct contrast to Pinnock, I do not see how one can say that his position is one of full inerrancy when the above concessions are made. I must wonder if Pinnock has really thought through the implications of his first two limitations. If anyone is willing to admit that "the question of authorial intentionality is critical," the border line between full and limited inerrancy is crossed. Once it is legitimate to inquire about the particular purpose of each passage, then the Biblical interpreter is automatically engaged in the hermeneutical task of determining the original historical meaning. In many instances his exegesis will involve him in laying bare a number of overlapping and concurrent meanings. All kinds of additional difficulties must be faced when one searches for the original meaning, such as when a redactor's hand is involved, or when an OT text is adapted to suit the author's immediate purpose, or why some material is eliminated and some expanded in one of the Synoptic gospels, or when symbolism, analogy, and historical fact are closely meshed together.

It has always been evident that strict inerrancy became so attractive to many because it could avoid all of these hermeneutical questions by reducing its exegesis to the "plain-sense meaning." But Pinnock certainly does not avoid drawing lines by distinguishing those truths which are "more heavily soteric." The interpreter encounters many passages where a soteric truth is expressed in mythological literary images, or pre-Copernican scientific terms. The creation account is a perfect example of the difficulties that arise in deciding the literalness of the author's intention and what elements he considered essential for salvation.

In defense of Pinnock I must agree with him that there is a danger in correlating inerrancy with only soteric or revealed knowledge, as it is done by Daniel Fuller, Vatican II, or Richard Bube.[3] According to this position Scripture contains material that is non-revelational or non-soteric. In many cases this is material which is taken over from another source which is not corrected by the Holy Spirit: for example, cultural references, historical data, or variant textual readings. This distinction, for instance, allows Bube to claim that the Bible is inerrant when

"error is judged in respect to the criterion of the author's revelational purpose." The danger is not that I find fault with Fuller, Bube, and Vatican II in this regard, but in the ambiguity in separating non-revelational from revelational matters. Too many Christian jump to the conclusion that this separation implies that non-revelational matters are incidental or not inspired; or they conclude that inerrancy is being limited to those matters of faith that cannot be tested by an outside criteria. We have all learned, I hope, that neo-orthodoxy made a fatal mistake in artificially separating *Historie* from *Geschichte,* faith and morals from facts and history. The Biblical authors for the most part make no such distinction–faith and history, past and present are bound together in a pattern of *Heilsgeschichte.* The historical-critical method frequently ends up separating what the Biblical authors so carefully knit together. We are reminded again how different our "mind sets" are.

Pinnock, however, does not want to face the inevitable problem that arises when he says "we freely grant that it is possible to distinguish soteric truth from non-soteric truth in the Bible." Even if we grant, as we should, that Scripture is inspired throughout and that even non-soteric truths are still Biblical truths (i.e., necessary for the pattern of *Heilsgeschichte* but not for salvation), we are forced to make value decisions about theological matters. We are thus engaged again in establishing certain hermeneutical principles–the very thing defenders of full inerrancy have wanted to avoid.

The avoidance of hermeneutical principles is the delusion of Biblical inerrancy. I have yet to find an advocate of full inerrancy, with the possible exception of Van Til, who does not at some point admit a few hermeneutical principles to account for those unsolved difficulties. I could cite numerous examples but a few will suffice. A favorite principle states that where an author used extra-Biblical sources that are in error (i.e., they are in conflict with our understanding of reality), they did so knowingly. Thus Stephen in Acts 7 knew that Abraham left his father *before* his father died, but refers to a commonly known version of Genesis 11:31 that spoke of Abraham's departure *after* his father died. Clark Pinnock is often found depending upon one of two principles: either, he says, all the evidence is not accounted for (evolution, biology) or that any supposed inconsistency or unresolved conflict is spurious. Russel Maatman comes up with a convenient principle to cover a discrepancy between a Biblical text and "secular history."[4] "No part of secular history–political, economic, social, geological, biological, or any other kind–can be used to prove that certain events referred to in the Bible cannot have occurred, and that the account containing them is therefore non-historical." Thus there are no errors, *ipso facto,* because the extra-Biblical source is in error or the Biblical passage is non-historical. What these scholars seem to forget is that each principle of interpretation will be applied with different results, and the history of denominational confessions confirms it.

Pinnock gives the strong impression that he wants to give the inductive method its due and allow the phenomena of the Bible to speak for themselves. Thus he consents to limiting inerrancy in specific ways in order to account for certain unavoidable evidence. But as Daniel Fuller has called to our attention, Pinnock does not really trust the inductive method whenever it does not coincide with a particular predisposed definition of Biblical inspiration. Scientists are fully aware that the inductive method does not produce infallible results, but that does not shake our confidence in the method (only our confidence in man's application of it). We have reason to trust the critical-historical method not because it has or will be infallible, but because it is the best method we have to understand the written records of man. We also trust the inductive method because we have reason to believe there is no ultimate conflict between God and his creation. When historical and literary criticism discovers differences in details or contrasting (or even conflicting) parallel traditions in Scripture, I do not feel compelled to postulate an intricate and artificial harmonization or compose some catch-all hermeneutical principle. I am not troubled, because my confidence rests in God's promise to give mankind a written word of all that is necessary for salvation (John 20:30).

So which side of the fence is Pinnock on? I really am not sure. It does seem obvious that he wants his cake (recognition of certain justified limitation) and eat it too (to call his position full inerrancy). While I completely sympathize with his intentions, I find that his final position is inconsistent and hedges on crucial issues. If I am not mistaken, conservatives and liberals will be less than content with the position as presented by Clark Pinnock; in part because the question of full inerrancy vs. limited inerrancy does not lend itself to fence sitting. That does not mean, however, that limited inerrancy properly defined is not a legitimate middle course. The *Journal ASA* should be commended for its concern to let the whole issue be aired openly in the hope that evangelicals who are unsatisfied with strict either-or positions can develop an alternative one.

1. J. I. Packer, *"Fundamentalism" and the Word of God* (Grand Rapids: Eerdmans, 1970), pp. 96-98; Richard H. Bube, *Journal ASA,* June 1972, p. 81.
2. Clark Pinnock, "Limited Inerrancy: A Critical Appraisal and Constructive Alternative," in *God's Inerrant Word,* pp. 148-149.
3. Daniel P. Fuller, "Warfield's View of Faith and History,". *Bulletin of the Evangelical Theological Society,* XI (1968), 75-38; *Dei Verbum,* art. 11; Bube, *op. cit.,* pp. 81 ff.
4. Russel W. Maatman, *Journal ASA,* June 1972, p. 84.
5. Daniel P. Fuller, "On Revelation and Biblical Authority," *Journal of the Evangelical Theological Society,* XVI (Spring, 1973), 67-69. Reprinted from *Christian Scholar's Review,* II, 4 (1973).

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Response by Clark Pinnock

I have come to appreciate and admire the work of Richard J. Coleman. On several other occasions over the past years he has intervened helpfully in the debates over biblical inspiration and authority. I have reference to his book *Issues of Theological Warfare: Evangelicals and Liberals* (Eerdmans, 1972) pp. 127-135, and two articles, "Reconsidering 'Limited Inerrancy' " in the *Journal of the Evangelical Theological Society* 17 (1974) pp. 207-214, and "Biblical Inerrancy: Are We Going Anywhere?" in *Theology Today* 31 (1975) pp. 295-303. I find him to be fair, accurate, and irenic, and interpret his intentions in the discussion to be the same as my own: to affirm the high doctrine of Scripture so essential to historic evangelical belief, and at the same time insisting that evangelical theologians say exactly what they mean and present the truth in the most coherent and intelligible manner possible. I welcome this opportunity to interact with him. In my response I will focus on two issues.

(1) In his *Theology Today* article, Coleman credits my book *Biblical Revelation* as being "one of the most consistent contemporary defenses of biblical inerrancy". Now he is not so sure of my consistency, for it seems I have crossed over the border between limited and unlimited inerrancy in my more recent work. I do not believe either that my position has changed or that it is inconsistent as these quotations will show. In *Biblical Revelation* I stated: "The infallibility of Scripture is not, in one sense, absolute. Its field is restricted to the *intended* assertions of Scripture understood by an ordinary grammatical-historical exegesis of the text" (p. 71). Similarly I affirmed: "Inerrancy, like infallibility, is relative to the intentionality of Scripture and an artificial standard must not be imposed" (p. 75). In the present book, *The Inerrant Word,* I wrote "In order to be candid and fair, we must admit to limiting inerrancy ourselves, not to a macro-purpose elevated above the text, as in the view just described, but to the intended teaching of each passage of Scripture" (p. 148). If Coleman wishes to define "full inerrancy" as a view that would deny that biblical revelation is in any sense culturally mediated and affirm that every detail of it is flawless according to modern standards, then I most certainly do not hold to it and *never did.* I have crossed no "border" and ride but one "horse". I contend for biblical inerrancy in correlation with the authorial, or canonical intention of the biblical text, and do not wish as Coleman implies to evade the hermeneutical issues. Indeed, as I read Coleman, I find myself agreeing with him when he writes "Scripture is inerrant in whatever it intends to teach as essential for our salvation; whether it includes historical, scientific, biographical, and theological materials. Undoubtedly not everything in Scripture is necessary for our salvation, and those which are cannot be determined by assumption or *a priori,* but by their *context* and by the author's *principal* purpose." *(JETS 17* (1974) p. 213). Though I can see the danger of some exegete using hermeneutics unfairly as a curtain to conceal his denial of Scripture (e.g., a denial of the event-character of the fall of Adam against the plain sense of several texts), I also feel compelled to speak out against those who refuse to distinguish the doctrine of full biblical authority and their interpretation of the Bible. There are some today who, in the name of biblical inerrancy, wish to impose on the whole church their own peculiar views in areas of creation, eschatology, predestination and the like, and they must

be resisted. Within the community of those who hold to plenary biblical authority, there is room for a vigorous discussion concerning a multitude of details which enter into the biblical teaching. Indeed our fellowship ought to be the principle place where an in depth searching of the meaning of Scripture goes on.

(2) The issue on which evangelicals must take a strong stand arises *after* the hermeneutical discussion has taken place and the decisions reached. The decisive question for us today is whether, having determined what the biblical text teaches, we are committed to believing it. The form of 'limited inerrancy' which I vigorously *oppose*, and which it seems Coleman also opposes, is the position which would limit the authority of the Bible to something *less* than the intended teaching of all the biblical passages. This occurs typically when the interpreter adopts a standpoint outside the text and imposes it on the text, employing it as a critical principle in shaping the meaning of the Bible. The 'historicist perspective' of Gordon D. Kaufman is a fine modern example of this, and his approach is perfectly illustrative of metnod in liberal systematic theology since Schleiermacher. We have no right to correct Scripture according to some extra-biblical principle which we have brought to it. Surely the vast majority of evangelicals can agree that this is the key issue, and that we are not divided over it. It would be a sad day indeed if at the very time when evangelical scholars have gained a measure of competence and respect, and are in a position to bear an effective witness to the full authority of the Bible, they should lose interest in doing so and opt instead for the bankrupt methodology of classical liberalism.

At this point I wish to correct Coleman's interpretation of the work of Daniel P. Fuller. From one or two phrases Fuller has chosen to characterise his own position, Coleman had deduced a radical implication Fuller does not in fact draw. In correcting Coleman I am at the same time admitting that my own estimation of Fuller's work has altered. Not that I would admit to any malicious intent or even to a careless exegesis of his writings on the part of Coleman or myself. I believe that Fuller has expressed himself in a less than ideal manner with the result that many readers have concluded that he too wishes to limit inerrancy to the vague entity known as 'revelatory material'. Such a limitation would of course be open to most kinds of manipulation of the Bible performed in liberal theological circles. But I am now convinced, as a result of talking with him, that this is not his meaning, and that he stands firmly for the inerrancy of biblical teaching in each passage once that teaching has been exegetically determined.

As far as I can tell, Coleman and I are on the same side of the fence in wanting to proportion inerrancy to the actual claims of the text. That seems to me a perfectly traditional and correct view. On the other and more weighty matter where we need to be very clear, I am not yet sure where Coleman stands. I can appreciate him not being 'troubled' by an inability to come up with a harmonization of each and every biblical statement which is perfectly satisfactory in every respect. Neither am I troubled by that. But I know what *ought* to trouble us evangelicals: namely, any and all critical conclusions which deny or dismiss some fact or doctrine which we know the Bible intended to teach. That is the limited inerrancy which I oppose, and the border over which I have not and will not pass.

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Modern Adventists Contest Numbers' Article

The article by Ronald L. Numbers that appears in the March 1975 issue of the *Journal ASA* contains many helpful insights and much valuable historical data. It is unfortunate that the service Numbers has performed for his readers is not presented in a balanced context or from an accurate perspective.

To substantiate these statements I am enclosing a xeroxed copy of the statement on science and religion that appears in the Seventh-day Adventist Encylopedia that was published nearly ten years ago. This statement, you will note, is prepared from a historical perspective. *(Selections chosen from this xerox copy by the Editor follow.)*

"If by science is meant organized knowledge about the material universe; and if by religion is meant organized knowledge about the Designer and Creator of the universe and about His will concerning the relationships of moral beings with one another and with their Maker, and the practice of these principles, there is no reason for conflicts between science and religion. Truth, whether scientific or spiritual, whether measurable or beyond the scope of direct human observation and testing, is consistent with itself in all its manifestations. SDA's often refer to these concepts as "true science" and "true religion.

"SDA's recognize the validity of proved scientific principles and data, and believe that an understanding of the natural world contributes, in turn, to a better understanding of the Creator and of His will for man. They consider that nature, in its perfect state, is an expression of the divine character, mind, and will, and that the natural world, rightly understood, is in complete harmony with the revelation of the divine character, mind, and will set forth in Scripture. Verifiable science and scriptural truth are always in perfect accord. . . .

"Science cannot proceed otherwise than from hypotheses, from inferences, which, after evaluation and testing, are retained, modified, or replaced. The best that can be hoped for is a high percentage of verifiable knowledge, verifiable as to its usefulness if not its ultimate truth. This method has resulted in phenomenal material progress. The spectacular success as achieved by science has tended to arouse in laymen unwarranted confidence in even the most tenuous theories proposed in the name of science.

"The study of religion is likewise subject to certain human limitations. Because of these limitations the study of the written Word is fraught with possibilities of error comparable with those encountered in a study of the natural world. The unfortunate conflict that has arisen in recent times between the study of science and religion is not the result of inherent irreconcilability between revealed truth and scientific truth. The apostle Paul said, "Now we see through a glass, darkly; . . . now I know in part" (1 Cor. 13:12). It is not surprising, then, that since human limitations are present in the study of both science and religion, misunderstanding and conflict should sometimes exist. . . .

"While unhesitatingly endorsing the established principles of science and the value of scientific truth, SDA writers have always opposed any hypothesis that seemed to be at variance with the revealed truth of Scripture. Their attitude has been one of caution either in the acceptance of new interpretations of scientific findings that might at first appear to contradict principles set forth in the Bible, or in the abandoning of earlier interpretations of the Bible in the light of clearly established scientific truths.

"In fields as broad and complex as the sciences on one hand and theology on the other, it would be too much to expect that in the dialogue between the disciplines there would not be some mistaken and unfair charges on both sides. A theologian endeavoring to answer allegations that the "facts of science" disprove the Scriptures may not always fully discriminate between verifiable facts and the speculative conclusions drawn from them, and may for a time oppose both. Sometimes, also, conflict arose from interpretations of Scripture which fuller study showed to be invalid (e.g., the rigid fixity of species versus limited change within basic groups).

"From the first, SDA authors have opposed all theories that construe the days of Creation week as long geologic ages, and also theories that presume to account for the complex higher organisms by evolution from simple ancestors, which in turn were supposed to have originated by spontaneous generation."

(Reprinted from *Review and Herald* Publishing Assn., 6840 Eastern Ave. NW, Washington, D.C. 20012

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The article in the March, 1975 issue entitled, "Science Falsely so-Called: Evolution and Adventists in the Nineteenth Century" by Ronald Numbers is bound to stimulate a wide-ranging response. What follows is a counterbalance to many unfounded assertions.

It is obvious to anyone who has studied in the history of science that Ronald Numbers certainly did a masterful job in assembling data from a wide range of sources. It is an extremely well-documented study, and I am sure that it would be most difficult as an editor to turn down such a study. . . .

Here are some of the key areas where Ronald Numbers has committed some "unpardonable" historical blunders:

(1) Seventh-day Adventists are portrayed as anti-intellectual, skeptical of education and the sciences (especially geology), and mostly uneducated themselves. Statistics are cited from the *S.D.A. Encyclopedia* to demonstrate this.

What the author failed to include were any comparable statistics from a single other denomination of the late 1800's as a basis of comparison. By today's standards Adventists were under-educated, but so were Baptists, Methodists, Presbyterians etc. Its sole headquarters being Battle Creek in the 1800's and most of its membership being in the midwest during that period, S.D.A.'s may actually have been more highly educated than the general population of the midwest for that period. It is the mistake of reading 1975 parameters onto the period, let's say, of 1874 when the first S.D.A. college was founded, Battle Creek College, now known as Andrews University.

(2) Adventists are portrayed as eventually filling the ranks of the Fundamentalist army. Adventism is seen as a part of the proto-Fundamentalist movement.

It is a very common misidentification to class all Adventists as Fundamentalists, since there are some points in common between the two groups. But they differed on several fundamental points. Norman F. Furniss in *The Fundamentalist Controversy, 1918-1931* characterizes that movement in the following way: "Ignorance, then was a feature of the movement; it became a badge the orthodox often wore proudly. They believed that faith was God's only demand upon His people and that higher education was of limited value, even a handicap, in seeking the Kingdom." (p.39) Certainly Adventists who had established several institutes of higher education by the 1920's cannot be classed as Fundamentalists.

Numbers states that Adventists were active in the Fundamentalist warfare of the 1920's. Anyone who has checked through more than 40 or 50 books dating back to that controversial period will find the name of only one Adventist mentioned in connection with the controversy: the geologist, George McCready Price. I know this to be true, for I have done so. Since he was the author of 25 books advocating "deluge geology", and opposing organic evolution, his works were continually being used as ammunition in the warfare. In fact, William Jennings Bryan invited Price to appear and testify at the Scopes trial in 1925, but Price declined. Adventists did not have a part either through support or through active participation in any of the Fundamentalist organizations of that stormy decade.

(3) The impression one gains from reading the article is that since Adventists in their chief publication made extreme statements warning against the dangers and fallacies of evolution, therefore they must have been uneducated and ignorant of the facts of such areas as geology.

Again, Numbers has made the historical blunder of isolating statements out of their historical setting. Certainly, having done his dissertation in the area of the history of science dealing with this very period, the author is aware that extreme statements were being made by the public in general, both educated and uneducated, from not just the Fundamentalist or conservative wing, but even from the middle of the road churchmen of all denominations. . . . Statements that may sound extreme to our 1975 ears from the pages of the Adventist Church paper may sound very mild amidst the roar of the storm caused by the publication of the *Origin*.

To label evolution atheistic does not make one uneducated. According to White, Dr. Charles Hodge of Princeton University labeled evolution as "atheistic." (p. 100) Hodge was a theologian of no small stature in 19th century American education.

(4) The Adventist view of Scripture, especially the interpretation of Genesis, is said to be a type of strict literalistic interpretation.

If Numbers had an intimate understanding of Adventist theology he would not have characterized Adventists–either of the 1800's or of today–as being literalists. Certainly their interpretation of prophecy is not literalistic, but rather symbolic. This is another point where Adventists diverge from Fundamentalism or its forerunner Millenialism. . . . Adventist belief of a premillenial advent has many elements that can be classed as a symbolic hermeneutic and not a literalistic.

In regards to viewing the six days of Creation as being literal, Adventists have consistently held to the literal view. If there were just one statement in Scripture pertaining to Creation in which it is stated that the days of Creation are symbolic, then the Adventist position would have to change.

One other area in which Adventist interpretation can be tested is in regards to the Genesis "kinds." Adventists have not held to in the past, nor do they hold to today, the medieval belief of "fixity of species." In the sense that species can and do change, Adventists can be said to accept micro-evolution. Numbers has set up a dichotomy between evolution and anti-evolution, which he calls proto-Fundamentalism. Since they are definitely not in the former, they must be in the latter he postulates. But he is wrong. That is because he has failed to quote from any S.D.A. scientist or science teacher. Most of the quotes are from the pages of their church paper, and one would not expect to have voiced the views of a scientific nature. . . .

(5) The impression is conveyed that not all Adventists were of the same opinion, and some attempted though unsuccessfully to change Adventist interpretation of Genesis. One of these was Dr. John Harvey Kellogg, who was not looked upon with favor.

It is true that "Kellogg and the Adventists parted ways," but it was not because his interpretation of Genesis 1 was at stake. It was because he came to believe in pantheism in later years. More than this he maneuvered the Battle Creek Sanitarium out from Adventist control, putting it under his own wing. That is why he was viewed with disfavor in his views.

(6) A common historical fallacy was made by Numbers in that Seventh-day Adventists are charged with the errors of the Millerite movement, especially that of William Miller, in setting a precise date for the world's end and the coming of Christ.

Numbers could have redeemed himself here by simply stating that nowhere in church papers or official church statements have Adventists ever set a date for the return of Jesus Christ to this earth. . . . It is true that Adventists have their roots in the Millerite movement. It was simply their methodology of interpretation of prophecy that was derived from the Millerites, while many of their beliefs were not held in common by the Millerites, such as the most prominent, the seventh-day Sabbath.

It is implied that since Adventists were wrong in setting a date for the end of the world, they too might face disappointment when it comes to harmonizing Scripture with geology. Certainly today they hold in common the belief along with other evangelicals that the Bible is the all-sufficient, sole revelation of God, and of His will to mankind. Science then is not a revelation of God's will. The author implies that Adventists dismissed science as untrustworthy. What he failed to note is that Adventists did not adopt the view that there is a second reliable revelation called "natural revelation" or "natural theology" as exemplified by William Paley. Nor did they go to the extreme of certain Fundamentalists that science cannot be trusted one whit and is entirely deceptive. . . .

What is being called into question then is the methodology which Ronald Numbers uses as a historian of science. His historical methodology leaves something to be desired on several key points:

(1) Presenting statistics without offering any basis of comparison for evaluating those statistics (other than 1975 standards).

(2) Misidentification of one movement with another because of certain points held in common while ignoring the significant differences.

(3) Failing to place certain statements in the context of the general milieu of the 19th century reaction to Darwinism, thus giving the impression of such statements as being extreme (by today's standards).

(4) Trying to interpret *theological* issues with the same methodology as one would use in interpreting *scientific* issues.

(5) Failing to take into account all the possible factors centering around a certain issue (e.g., the Kellogg controversy), but instead isolating the one which seems to fit the best.

(6) Omitting pertinent information that supports the opposing viewpoint, information that any authority in his particular field of study would certainly be aware of: in other words, taking a very one-sided historical interpretation without even recognizing *other* historical alternatives.

The whole purpose of the above evaluation is to counterbalance the one-sided historical interpretation as presented quite skillfully by Numbers. What is being challenged is his historical methodology. If one's methodology is demonstrated to be faulty, then how can his conclusions be considered trustworthy?

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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.

Members of the **American Scientific Affiliation** 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.*

Associate Membership is open to anyone with an active interest in the purpose of the ASA. *Members* hold a degree from a university or college in one of the natural or social sciences, and are currently engaged in scientific work. *Fellows* have a doctoral degree in one of the natural or social sciences, are currently engaged in scientific work, and are elected by the membership. *Dues:* Associate $9.25, Member $13.00, and Fellow $16.00 per year. A member in any of these three categories can take the *special student rate* of $4.00 per year as long as he is a full time student.

PUBLICATIONS include the *ASA News* (sent to all members four to six times each year); three symposia: *Modern Science and Christian Faith,* F. Alton Everest, Editor, Van Kampen, Wheaton, Illinois (1950) (out of print), *Evolution and Christian Thought Today,* Russell L. Mixter, Editor, Eerdmans, Grand Rapids, Michigan (1960), and *Our Society in Turmoil,* G. Collins, Editor, Creation House, Carol Stream, Illinois (1970). Individual authors are also encouraged to publish independently.

LOCAL SECTIONS of the American Scientific Affiliation have been organized to hold meetings and provide an interchange of ideas at the regional level. Membership application forms, ASA publications and other information may be obtained by writing to: AMERICAN SCIENTIFIC AFFILIATION, Suite 450, 5 Douglas Ave., Elgin, Illinois 60120.

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"Upholding the Universe by His word of power." Hebrews 1:3

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