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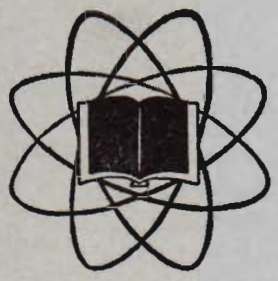

Ethical Decisions of Christians In Science

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

The American Scientific Affiliation

(Incorporated)

The American Scientific Affiliation was organized in 1941 by a group of Christian men of science. The purpose of the organization is to study those topics germane to the conviction that the frameworks of scientific knowledge and a conservative Christian faith are compatible. Since open discussion is encouraged, opinions and conclusions are to be considered those of the authors and not necessarily held by others in the organization.

PUBLICATIONS

The Journal of the American Scientific Affiliation is issued quarterly. Its contents include primarily subjects both directly and indirectly related to the purpose of the organization, news of current trends in science (including sociology and anthropology), and book reviews.

Modern Science and Christian Faith is a 316-page book containing ten chapters on nine fields of science, each written by a person or persons versed in that field.

Evolution and Christian Thought Today is a 221-page symposium by thirteen authors, expressing the attitudes of Christians on this subject a century after Darwin's writings.

EXECUTIVE COUNCIL

The Journal of the

American Scientific Affiliation

Table of Contents

Ethical Decisions of Christians in Science: Introduction to a Symposium 66
David O. Moberg

The Industrial Scientist: Money, Time and Achievement 67
Robert L. Bohon

Ethical Decisions in Social Science Research 71
Roy G. Francis

Personal Decisions in Biomedical Research 74
V. Elving Anderson

New Testament Christianity and the Morality of Capital Punishment: A Rebuttal 77
Dwight Ericsson

Some Ethical Decisions in the Practice of Medicine 79
J. Richard Burton

Psychotherapy and the Patient's Ethical System 82
F. Wilmer Larson

Human Responsibility Viewed by a Theologian 84
Janis Rozentals

* * *

Archeology, Allan A. MacRae 85

Chemistry, Walter R. Hearn 87

Philosophy, Robert D. Knudsen 90

Sociology, Russell Heddendorf 91

An Invitation 93

New Members 94

New Associate Members 95

Editorial 96

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Ethical Decisions of Christians In Science

Introduction to a Symposium

DAVID O. MOBERG*

The scientist engages in a process of decision-making both in his work in the hidden recesses of his laboratory and in the outside world where he is called upon to act on the basis of scientific knowledge. The values upon which his decisions are based come ultimately from outside of science, although many of these values have been incorporated into the scientific perspective and its methodology and theories.

Christianity is not simply a system of ethics. Nevertheless, the Christian's commitments to Jesus Christ have pronounced ethical implications. This symposium introduces certain aspects of Christian ethics which apply to the scientist in his process of decision-making in the contest of modern society. Some of the papers deal with "pure science" while others have to do with Christian ethics in the application of scientific conclusions by the medical doctor, psychotherapist, and, in the case of capital punishment, the scientist as citizen.

The ethics which are basic to the scientific method are, it seems to this writer, strongly undergirded and sustained by the Christian Scriptures. The scientific method involves love of truth, self-discipline by the scientist to control his predilections and verify his findings, humility which acknowledges that scientific knowledge is never complete, a welfare orientation that aims at promotion of the well-being of mankind, and a demand for intellectual honesty which implies control of personal and group biases as well as the avoidance of cheating, lying, "doctoring" of data, and other forms of dishonesty. Philosophers of science and of religion have indicated repeatedly how closely related to Judeo-Christian ethics these scientific values are.

Commitment to a particular theory, at least in the behavioral sciences, often involves an implicit, if not explicit, moral decision. The theory molds one's image of man and of the universe, or at least of that portion of the universe which is directly related to the theory. It compels one to adopt a tentative if not conclusive ontological perspective. It determines what will be observed and recorded and what will be ignored. It dictates the tools and techniques to be used in the research process. It specifies one's definitions of concepts and as a result tends to alienate one from others whose theories on the same subject "don't make sense." A "faith commitment" may hence be as basic to advanced scientific work as it is to personal trust in God through Jesus Christ and commitment of one's life to Him.

Ethics are thus woven into the procedure of the scientist in his scientific work as well as into the application of scientific findings to the problems of modern society and the needs of individual men. A realistic appraisal of the relationships between science and Christianity must include these shared ethical values as well as the historical conflicts which so often are stressed by the critics of Christianity. Christians who demand that their opponents be fair in the intellectual give-and-take pertinent to science-religion controversies must also be fair, recognizing that men in their own camp have not always been ethically consistent. Christians in science must practice what they preach, for "faith without works is dead, being alone." The end does not justify the means.

This symposium grows out of the eighth regional meeting of the North Central Section of the American Scientific Affiliation held at Macalester College, April 7, 1962. The four papers given at that excellent meeting on "Critical Ethical Decisions in Science" form the core of this issue of the *Journal*. The others have been selected or solicited to deal with related subjects.

Numerous additional topics could have been included. Readers are invited to submit manuscripts dealing with these topics. There is, for example, the question of popularizing science for a religious audience. Is it ethical to draw close parallels between modern scientific interpretations of the world and biblical passages which were first written for a non-scientific audience as well as in a pre-scientific age? The use of science in apologetics is closely related. Is it ethical to use illustrations from science which do not really prove the validity of Christianity or the Bible in such a way that readers or listeners are given the impression that these presentations indeed do "prove" the truth of Christian faith? Must one prostitute either science or Christianity in order to demonstrate the close relationships between them?

How do Christian ethical values enter into political decisions pertinent to nuclear fallout? Must the Christian be a pacifist, a militarist, or neither? Should the Christian in the scientific and academic world engage in the bargaining, bluffing, and other tactics which Caplow and McGee (*The Academic Marketplace*) have so thoroughly documented? Ought Christians in scientific laboratories, colleges, and universities use the same hiring and firing policies as are general in their profession? What are the ethics of seeking students for graduate programs in a university?

What are the Christian ethics of testifying in court, publicizing commercial products through "research" findings, or advocating a particular scientific perspective, theory, or idea? What Christian values pertain to the questions of influencing public opinion in a democracy? Can a Christian conscientiously engage in the "engineering of consent" even for ends he believes to be good? How can free will of the individual be

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reconciled with the social and biological determinisms often observed by scientists? *Et cetera ad infinitum.*

We hope this symposium will be a stimulus for further discussion of its topics and related ones and that it will significantly contribute to the improvement of both the scientific excellence and the Christian quality of readers' work. We look forward to receiving letters to the editor and additional articles relevant to Christian values and scientists'. ethical decisions, for such discussion will sharpen our intellects, modify our consciences, and thus increase our effectiveness.

The Industrial Scientist: Money, Time and Achievement *

ROBERT L. BOHON**

Let me preface my remarks on this subject of ethical decisions by pointing out that I am no more an expert on this subject than anyone in the audience. However, the program chairman has been kind enough to give me the privilege of stimulating your thoughts about the problems faced by practicing scientists, particularly those in industry.

My comments are colored by my background, of course. They therefore represent the viewpoint of a physical chemist who received all of his formal education in the State of Illinois, who was employed for six years in a small private laboratory doing contract research, and who has been employed at the 3M Co. for the last five years in the Central Research Dept. I have done a smattering of teaching at Illinois Wesleyan University and have been intimately involved in church life (American Baptist) since my youth. This historical resumé is presented in order to orient you in advance to my prejudices, and to emphasize that I consider it essential to know something about the personal background of a speaker or writer in order to place his stated position on a matter such as ethics in proper perspective.

The Relativity of Ethics

The ethical decisions under consideration are those relating particularly to the scientist's work, his associates, his employer, and his ego. The overlap with other aspects of life are obvious.

We shall be concerned with "ideal human behavior" in the laboratory and with what constitutes the "right" moral decisions for the chemist, physicist, mathematician, analyst, etc., employed in industry. Let me hasten to add that we are immediately on controversial ground, for what is ethically "right" in the 20th century in St. Paul, Minnesota, may not be considered "right" in the eyes of a Soviet scientist, or even in those of our own thirtieth century counterparts.

In other words, our topic is relative *if* we adopt the viewpoint that man has no moral code other than that which he himself can develop. Alchemy was viewed by many medieval moralists as an evil enterprise indeed. It is probably true that the desire to transmute base metals to gold was not always motivated by lofty ideals, but, lacking the curiosity of these early chemists, we would not enjoy the benefits of artificially-generated isotopes today, and we probably would still be cringing from the fear of cholera and the black death. This is not to say that the end justifies the means, but merely to emphasize that as human beings our horizons are extremely limited and we know not what the future will bring.

As an industrial scientist, what are my goals? What are my responsibilities to my employer? to my discipline? to my professional colleagues? And what ethical decisions must I make?

Industry, of course, exists to produce material goods and services that the public will purchase. The goal is to develop and efficiently manufacture items for which there is a need or demand by the public, and to sell them for a profit. Without a profit there is no incentive and the industry must eventually die. As an employee, I have a responsibility to assist the company toward this commendable goal of supplying the physical needs of mankind, in return for which I receive a share of the wealth so generated.

Theft

Let us pass quickly over some of the more trivial ethical decisions every employee faces and which involve little or no controversy.

Petty theft is a common temptation placed within daily reach of all employees. It ranges from the systematic stealing of pencils from the office supply room to wholesale burglary via bulging briefcases, loaded lunch boxes, and even auto trunks.

A more insidious type of theft to which the scientist is particularly prone is that of time: the bull-session on company time, the 60-minute coffee break, transaction of personal business using company facilities and time, late arrival and early departure which is so easy because few companies require clock-punching by technical personnel, day-dreaming under the guise of thinking, etc.

One of the most flagrant, and yet unintentional, ex-

*Presented at the 8th regional meeting of the North Central Section of the ASA, April 7, 1962, as part of a symposium on "Critical Ethical Decisions in Science."

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amples of time-theft which I have observed was by a young technician who persisted in spending hours of company time trying to evangelize the rest of the laboratory and, unhappily, only alienating his co-workers by his lack of respect for his obligations as an employee.

Theft of proprietary information from a company by a scientific employee for the benefit of a competitor is relatively uncommon and is carefully policed by tightly-worded technical agreements and observant lawyers.

Morals

The industrial scientist is perhaps a bit more involved in the secular world than his academic counterpart, but both are subject to the temptations of double standards of morality on and off the job. The classical jokes about office parties and extra-marital activities while on business trips, and even the toil-worn travelling salesman stories do portray some of the more obvious ethical choices presented to scientists, particularly those who choose to climb the administrative ladder or enter the world of technical sales. The latter are also subjected to the pressure for "conformity" and the desire to project an executive image to the boss. Some of this spills over to the bench chemist, but to a lesser extent than might be supposed.

Plagiarism

A more serious problem in industry is the theft of ideas from others. The average industrial scientist is caught in the situation of working primarily on projects which can seldom lead to publication in the open literature because of proprietary restrictions. His primary public outlet is patents, and this means ideas. Where does one acquire patentable ideas? Does the spark of creative genius materialize only out of thin air and hard work, or is it a synthesis of the thoughts of many teachers and fellow scientists, personal background, and maybe even a chance remark by a friend or relative? There is a tremendous temptation to grasp the ideas of others and covertly reduce them to practice without acknowledging the contribution of the one who has knowingly or unknowingly supplied the key. Such problems are not unique to the industrial scientist, of course, and academic laboratories are not unacquainted with men whose ideas have been pirated by fellow scientists!

Publication restrictions are a serious problem to the industrial scientist for it effectively prevents the rest of the world, particularly other industries, from learning what a smart chap he is and thereby creating a type of job insurance in case he ever decides to part company with his present employer. The industrial researcher is always tempted to carry a project to the point where a good publication can be prepared with the hope management will eventually allow release, even though he knows perfectly well that the finishing touches required for publication are of little or no concern to his boss and probably would constitute theft of valuable time in the eyes of the vice-president. I am happy to report, however, that this problem is receiving a sympathetic ear from management in many companies.

Money

Let me briefly mention the problem of money. I don't think the industrial scientist, or any scientist for that matter, has any monopoly on the very human desire to improve his materialistic position. I have the feeling that until recently my professor friends have looked with some degree of disdain on a scientist who would choose, regardless of motive, the industrial laboratory rather than a university. This attitude is contagious and easily contracted by students as pointed out by Richard Kenyon, editor of *Chemical and Engineering News* (March 26, 1962, p. 7):

> But there is a breath of taint discernible in the attitude of the professor in a university supported by industry-furnished tax funds, drawing income from industrial consulting, and training for industrial careers students supported by industrial fellowships—who imbues those students with a general attitude that there is something consistently shoddy about industry.

On the other hand, I question the ethics of a scientist choosing to enter the academic field simply because he thinks it is the more respected profession and not because he truly desires to serve as a teacher.

It also is true that some industrial scientists are mesmerized by the dollar; their behavior is a manifestation of personal greed. It seems to me, however, that this is only rarely the case; there are much easier and more rapid routes to wealth than the laboratory bench!

Administrative Responsibilities

We could engage in a lengthy discussion about the ethics of restraining development and/or marketing of a product of real value to mankind because it lacks profit potential, of circumventing important laws of our land as in the recent price-fixing situation in the electrical industry, or of reorienting a research or development program to achieve personal gain at the expense of the company or of one's associates. These problems lie more in the realm of the administration of a company than in that of the scientific researcher, so we shall omit them here.

I should remind you, however, that an increasing number of today's administrators are technically trained men and women—they have to be in order to understand and guide a business based on science.

Choice of Work

Probably the most difficult area of ethics for the practicing scientist is his choice of work—the "achievement" or "goal" aspect of our topic. In keeping with our assumed relative aspect of ethics, it would seem unethical to me for a Roman Catholic scientist to devote his working hours to the development of a better contraceptive. It would seem equally ludicrous for a teetotaling Baptist to earn his livelihood by working for the liquor industry.

How can the scientist justify his daily labor in the laboratory with his purported goals, and how does he measure achievement thereof? And is the choice of work always his own?

There is the obvious situation, of course, in which refusal to cooperate on a given project means quitting the company (or in less fortunate countries forfeiting one's life). There is also the excuse that one never knows what a project will lead to. The classical example of this is nuclear reactions, which *can* remedy mankind's ageless quest for energy if it doesn't fry him first. Economics, strong social ties in one's present community, or the reluctance to give up a "good" job for the uncertainty of a new one, all provide rationalizations for accepting a task which may seem counter to one's basic beliefs. And then there is the fact that industrial projects can disappear almost overnight; one can always assume that a distasteful assignment may only last a short while, so why worry?

In addition, we may quote the well-worn phrase that "God gave man dominion over all the earth, and that certainly included dominion over that of which the earth consists, namely atoms."[1] By this argument, I suppose, one could justify anything.

The most severe ethical problem which I personally have had to face is analogous to that confronting the Manhattan Project scientists, the German V-2 developers, and indeed all our war-oriented projects, whether in government, university laboratories, or industry. It is one thing to be surreptitiously processing illegal drugs for sale to the world's narcotic addicts (obviously unethical) and another to be helping in your nation's defense effort by producing C.B.R. (chemical - biological - radiological) agents, solid propellants, or nuclear bombs . . . or is it?

Is it ethical for me, a professing Christian, to be busily engaged in developing a more powerful solid rocket propellant? I know its primary, and perhaps sole, purpose is to produce more effective delivery vehicles for nuclear-tipped missiles, which can only result in agony and horrible death for millions of men and women, most of whom probably wish me no harm and are God's children the same as you and I. Why have I not resolutely refused to participate in such a distasteful business in the same way that Kapitza in Russia and German scientists like von Weizsäcker have refused to contribute in any way to the development of the atomic bomb?[2] Do I fear being branded as unpatriotic? Do I see the project as an opportunity for personal advancement? Am I convinced that enthusiastic support of a powerful deterrent war machine is the only hope of survival for a free civilization? Or have I even given the subject any thought at all and merely plodded along as if the question did not exist?

All of these arguments may be applicable to a certain degree, but I would like to quote from Dr. van der Ziel's comments on the Manhattan Project at this point since it expresses my own sentiments very well:

> Does this mean that we should abandon these weapons altogether [and I might add "all weapons"]? Indeed, that is what we *should,* there should be no war, no instruments of war and no preparation for war . . . . The hard fact that we *should* do without them does not necessarily mean that we *can* do without them . . . . Nevertheless, it is also a dangerous stand. The danger is that one goes farther and farther, step by step, without ever coming to the point where one must refuse and stop. In this respect those who take an uncompromising stand perform a real service to those who cannot follow their decision, for it reminds the latter of the fact that there *are* real limitations for them.

In other words, I find myself on the horns of a dilemma. Much of the research I am doing would not be performed for many years without the impetus provided by the armament race, and who can say whether the work will ultimately be a blessing or a curse to mankind? Even if I merely pay taxes, I support military projects. I would *prefer* to devote my working hours to a more obviously humanitarian project, but I cannot escape the conclusion that God can use me in this project as well as in one devoted to creation of a better masking tape. This brings us to the question of motive.

Motive

What is the motive for our work as scientists? Man is naturally curious, and that explains a lot by itself. But if we probe deeper, can we not conclude that the same thing forms the foundation for a man's work as determines his general behavior pattern, his choice of a mate, his use of leisure time, the books he reads, the plays and movies he spends money and time to see, the social groups he calls his own, the church he attends, etc.? It *all* hinges on his world view—his ultimate concern, or if you will, his religion.

It is not uncommon to have scientists working on the same project who represent the humanist, the egotist, and the Christian world views. The humanist is working to help mankind. The egotist is socially unconcerned and is seeking only money, prestige, or power. The Christian, on the other hand is searching to learn God's truth about the universe and thereby to understand its Creator better. All three are working toward the same immediate goal, namely, solution of the scientific problem at hand, but their motives are different. We are reminded of the Scripture references pointing out that God uses *all* mankind to accomplish His purposes. He has bestowed the marvelous gift of intelligence to members of our species regardless of their religious beliefs.

Scientists' Code of Ethics

This brings us to the question, "What is the scientists' code of ethics?" The medical profession subscribes to the Hippocratic oath, a code of medical ethics. What is the engineer, or the chemist, or the physicist, or the biologist to use for his code of ethics?

The need for some guidelines was emphasized by the recent announcement of a "Code for Consultants" issued by the White House (*Chem. & Eng. News,* Feb. 26, 1962, p. 32). President Kennedy crystallized the

[1] St. Paul *Dispatch* (Feb. 17, 1962, p. 2), quoting Dr. Hugo N. Eskildson on subject of Christians working for A.E.C.

[2] Aldert van der Ziel, *The Natural Sciences and the Christian Message* (Minneapolis: T. S. Denison & Co., 1960), pp. 166 ff.

concern of government about science consultants who use their public office to acquire private gain.

If we were forced to express the scientist's code in one word, it would probably be "truth." The scientist must, almost by definition, have an insatiable thirst for the truth. The man who uses selected data, performs the experiment only once, or chooses to ignore an observed phenomenon, is violating the scientific method itself; he is refusing to face the truth.

But the mere word "truth" hardly answers some of the questions we have posed thus far.

You will recall that we assumed at the beginning that our topic of ethics is relative *if* we adopt the viewpoint that man has no moral code other than that which he himself can develop. I am almost convinced that *a priori* this eliminates the possibility of the world's scientists ever agreeing on a code of ethics—at least we seem to be a long, long way from one after the lapse of more than twenty-five centuries of "scientific thought."[3] I cannot agree with C. S. Lewis[4] that mankind has inherited a "Law of Human Nature" which automatically gives us an inner sense of right and wrong.

Now let us make the assumption that a moral code, or system of ethics, has been made available to mankind through the unique event of the incarnation in Christ of the Creator of nature itself—the very subject the scientist is seeking to comprehend. (A corollary is that anyone wishing to understand nature and man had best have a speaking acquaintance with this philosophy in order to be "scientific"!) Can and should the scientist's ethics be grounded in a religious foundation, particularly that of Christianity?

It seems evident to most Bible scholars and consecrated Christians that Christianity has the *potential* to produce a moral mankind in spite of what sometimes seems imperceptible progress in this direction in the so-called Christian world. But how does the scientist translate his Christian beliefs into an ethical code for his profession and for his own behavior on the job?

Is the problem really any different from that of the housewife, or the M.D., or even the clergyman? I think not. The Christian is duty-bound to seek the truth, and so is the scientist. The two approaches are identical: neither wants to live a lie. The principal difference arises in the Christian's willingness to admit the existence of a teleological universe, one with a purpose for life, and to accept the idea that God provided a communications link between mankind and Himself through Christ.

Will the scientist be a "better," more ethical, scientist because he has embraced Christianity as his world view? Well, he certainly has the same tools and resources at his disposal as does the atheist, or agnostic, or communist, or Hindu—plus the fact that he claims to know God the Creator!

The Christian ethic is to love God with all one's soul, mind and body and to love one's neighbor as one's self (Matt. 22:37-39). I can see no way in which whole-hearted adherence to this philosophy and ethical code can do other than to make the individual more receptive to truth, happier in his work, content with his lot in life, enthusiastic about the world around him, appreciative and respectful of the work and ideas of others, considerate of his employer, and resistant to "unethical" temptations.

The Christian ethic can provide the moral guidelines for scientists as well as for any other profession if we will but let it. Our inability to see clearly the answer to specific questions, such as the one I face in working on rocket fuels, is simply evidence that we are still infants who are not mature in our Christian ethic.

The first doctrinal statement of the American Scientific Affiliation reads "The Holy Scriptures are the inspired Word of God, the only unerring guide of faith and *conduct*." So you see, wiser heads than mine arrived at the same conclusion twenty-one years ago!

[3]Hindu and Greek theories date from 500-600 B.C., and Chinese scientific writings extend back to at least 1200 B.C.
[4]C. S. Lewis, *Mere Christianity* (London, 1952). Fontana Paperback.

Ethical Decisions In Social Science Research *

ROY G. FRANCIS**

From time to time, intellectuals parade their anxieties just as other men do. And just as other men, intellectuals seek a vocabulary which justifies their action, in this case parading their anxieties. Unlike other men, intellectuals tend to use a polysyllabic vocabulary in their assertions. This is how we know they are truly intellectuals!

One of the commonest attempts to express basic concerns is to wage polemic on the combined topic of science and religion. In the past, combatants allied themselves in a categorical either-or arrangement. The shouting tended to be loud; there were those who shouted the cause of science, and there were those who shouted the cause of religion. Few intellectuals took a "pox on both your houses" stand: man is both a knowing and an evaluating animal. Recently, however, voices are heard attempting to premise assertions on statements connecting science to religion.

We will presently examine some consequences of distinguishing science as a way of knowing how the world is put together and religion as a way of knowing how, at best, it ought to be arrayed. For the moment, let me allude to some significant differences in *mood* between the two.

From the time of Descartes on, most scientists felt and still feel the mood of doubt to be characteristic of science. One doubts basic facts, ways to get facts, conceptualizations, hypothetical connections between statements of facts, and so on, excepting only that science can answer questions of how. Religion, on the other hand, is seen to be predicated on faith. One has a religious faith; and to those addicted to scientism, science becomes a faith, a religion. In a sense, the scientist has faith in doubt; and the intellectually honest theologian doubts his faith. Those who would bridge the gap between the two are apparently seeking a faithful science.

When man, the active being, is cognizant of alternatives, he is forced to make some choice. I am not here discussing the mechanism of choice. I am merely asserting that somehow or other choice is made. I am asserting, moreover, that the choice between alternatives always involves values. As a matter of fact, a value is that which permits choices to be made.

Types of Values

We are remiss, however, if we lump all values into a general rubric of "value." Often we write as though this were the case—as though the value that leads to a choice of pumpernickel bread for sandwiches is of the same order as that which leads to social martyrdom in defense of the dignity of man. We must begin a hard and stumbling effort to distinguish between various kinds of values that one holds.

As a first approximation, let me resurrect some old words. Let us agree that there is a meaningful difference between "transcendental" and "instrumental" values. If there is a goal to be achieved, it is predicated on a value. This value will be either a transcendental or a relatively transcendental value, according to some differences soon to be noted. In the achievement of the goal, the person may perceive a number of alternative instruments that can be used and/or a number of alternative ways a given instrument can be used. The choices among the instruments or the ways of using the instrument are instrumental.

For example, I may have a value of rearing my son to be a person who respects the dignity of man. This is not the most transcendental value which I hold. Yet it occupies a different position in my thinking from my other values. For given this goal, I must elect strategies as to how best to achieve this goal. In a culture as ours, I may use "money" as an instrument, electing some usages (as in getting him to donate to certain charities) and rejecting others (as in bribing him to behave in a certain way). I may point out parenthetically here that another side issue is the assessment of the values that are rejected as well as of those which are accepted by man.

The distinction between these two realms of values seems to have generated a rather bad "play on words," a sick pun of the word "ought." Consider the classical implications of "ought": when generally used, we tend to connect it with transcendental values. When so connected, we say simply that science cannot tell one what he ought to do. However, with the introduction of so-called scientific management, we find another claim: science can tell management what it ought to do. It turns out, of course, that certain ends are given (e.g., to make a profit), and certain instruments are available, so the "ought" refers to the instrumental value. Unless one makes the distinction we have, it sounds as if we are at last able to have a science of ethics.

In the sociology of knowledge, there are various ways of viewing science. A traditional way is to view it as a body of knowledge. This requires an assessment of the kinds of statements comprising science and how these statements get related to each other. From this point of view, one is likely to read that "the goal of science is a theory. A theory is a generalization of high order which, in some sense, explains observed phenomena."

Yet when we ask a more modern question, "What is it that scientists do?" we find the answer in terms of decision-making. The basic scientific act is a decision. The scientist must decide about the truth-value of some

*Revised version of a paper presented at the 8th regional meeting of the North Central Section of the ASA, April 7, 1962, as part of a symposium on "Critical Ethical Decisions in Science."

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statement which he is considering. The statement may be about the world; it may be a statement about a statement about the world; or it may be procedural, or whatever. Insofar as the scientist can consider different questions, insofar as he can doubt the truth-value of any number of statements, he makes decisions. These decisions resolve possible alternative forms of behavior; certain value premises adhere in the resolution of alternatives. Some value decisions are peculiar to science. Others are not.

The Social Context of Science

All research is conducted in a social situation. This involves us in two considerations: (a) communication and (b) the network of human relations involving and impinging on science.

Social behavior always involves some element of communication. All interaction involves a transaction of meanings. Meanings, themselves, emerge out of and tend to shape interaction. A word has meaning only as it—and to the extent that it—evokes basically the same image on the part of the speaker as it does on the part of the listener. By behavior, one may propose a meaning to a word or other symbol; by reaction, others validate that meaning or reject it. Thus words have shades of meaning varying according to time and place. Moreover, words also change over time. We must stress that these assertions are as true of science as they are of any other form of human behavior. Consider, for example, the meanings possible to the word "correlation": unless it implies the same behavior to you (e.g., how to collect certain data, how to tabulate it, how to manipulate it, how to interpret it) as it does to me, the word has no meaning.

As a strategy to decide about certain sentences, science makes use of a number of people with different skills. There is the patron, whether it is an official in a foundation, a member of some committee created by Congress or some other source of tax moneys, or a commercial enterprise seeking hired help. There are the technicians. There are those who train technicians. There are colleagues. There are editors of scientific journals. There are members of the various scientific associations. There thus are many people involved. Some are concerned with science as a vocation; others are "consumers of science"; others are mere on-lookers.

Critical Decisions in Science

It is in this context that we must view the character of certain ethical decisions of social science. Three decisions related to science in its broader social context and hence not restricted to social science are critical. They are: (1) the decision to study a certain problem; (2) the decision to acquire certain data; and (3) the decision to publish certain findings. In simplest form, the decision is one of action or inaction. In more complex forms, the decision is which of various alternatives one ought to elect. The choice depends on the values that one holds.

A. **The choice of a problem.** The number of problems one may study is, perhaps, infinite. Certain of them are more crucial to one's theory than others. One's theory may hence imply a certain priority. Yet one may properly ask whether or not, since the study will be done in a broader social context, the public which is to be studied has any "say" in the kind of problem to be pursued. It may be that the argument is largely over how the problem is stated, but consider the following example.

Suicide, as a form of behavior, is a topic, but it is not in itself a problem. Aspects of suicide become or do not become problematic depending upon which theory one uses. One may observe, for example, that older people are more likely to commit suicide than younger ones. In some social environments, the *topic* is taboo, the behavior sinful. Does a scientist have the right to impose his views on the people whose behavior he wishes to study? If it were possible, has he the right to force people to talk about and to think about a topic which from the perspective of their values is taboo?

In part, we are facing a conflict of values—the values that motivate a scientist and those of the larger society. But note that the value-conflict is a muddied affair. What value is motivating the scientist? Is his decision flowing simply from abstract commitment to knowledge for its own sake? Has he some idiosyncratic psychological need which is being satisfied by his interest in the topic? Is he seeking fame in his field, power in his department? Of the possible values on which his action is premised, which is superior to those of the public he would study?

Moreover, since knowledge goes in two directions, a society may decide that certain kinds of knowledge are unworthy of man, that some kind of danger lies hidden in the knowledge itself, as in physics with the possibility of destroying the universe itself.

Specifically, though, one may quarrel with a research problem simply because it gives certain power to certain people, contrary to, say, democratic values. Consider studies in political behavior. A person may be asked his opinion on certain issues only to find later that he has given those he opposes materials that can be used against his own interests. Consider market behavior, and the whole range of subliminal communication. In a democracy, is it proper to study and find out how people can be manipulated without their knowing it? The choice of a problem may well involve a value decision.

B. **The selection of data.** A hypothesis whose data cannot be gathered cannot be tested. If a hypothesis is a proposed solution of a problem, the inability to test a hypothesis implies an inability to work on a certain problem. The availability of data is crucial to modern science.

The example we gave of suicide as a topic involves the question of the availability of data. In the context of hypothesis testing, however, we can make a stronger point. Suppose one has a hypothesis that certain types

of people are highly likely to commit suicide when placed in certain social situations. Do we have the right to test this hypothesis? Recently, a psychologist at the University of Oregon manipulated mid-quarter grades of his students in an experiment he was conducting. No student knew that he was taking part in an experiment. Some students quit the course when they got failing grades, although they were in fact passing. We must imagine that some "A" students got "F's" in the experiment. Is this a proper use of academic freedom?

We may have a hypothesis that says that adolescents who hate their parents are likely to cheat on exams. Do we have the right to convince students they hate their parents just to see what happens?

When the scientist manipulates or modifies others, he is making an ethical decision. He is as accountable for his behavior as is anyone else. He can make no superior claim unless he holds that nothing can stand in the way of acquiring scientifically interesting data. This kind of ethic justifies physical and psychological brutality in the name of science. Western man has long fought to be freed from tyrants. He has died for such things as privacy of the person, the sacredness of the home, the integrity of human dignity. It makes little difference whether the tyrant is a scientist or a politician or a militarist. In a democracy, the individual is a sacred being who cannot be required to testify against himself, who cannot be deprived of life, liberty, and the pursuit of happiness without due process of law. The scientist cannot claim for himself the right to impose limits on the way he can acquire data—unless he is willing to forfeit the values inherent in a democratic society.

We have often argued that science is indifferent about how its knowledge will be used. Germ theory may generate bacteriological warfare—or it may result in improvements in sanitation and sewage disposal. The application of knowledge follows from its publication, a point we will discuss later, and is predicated on non-scientific values.

Now let us consider another aspect of the ethics of science: who could possibly manipulate the kind of variables studied? Anthropologists and sociologists study cultures; institutions and social systems are part and parcel of their ways of thinking. But if human behavior is a function of social systems, it would take something other than an individual to manipulate them and hence to control behavior. This means that, if science is to be useful, the kinds of data making up the variables being studied implies something about the kind of social unit to whom utility and hence control is to be granted.

Consider, contrarily, the possibility of selecting variables which an individual can manipulate. Here something other than a political unit could utilize the results of knowledge. Consider those statements of a problem which permit certain people in a society to manipulate others: the doctor-patient relation—enabling the physician to manipulate the patient in his own interests, presumably; labor-management relations—enabling management to manipulate the worker for the best interests of management. In selecting data for analysis, the scientist frequently unwittingly determines who can possibly use the results of his inquiry. This, in turn, carries implicit assumptions about how a rational world, using scientific knowledge, ought to be put together.

C. **The publication of findings.** The use of statistical parameters and hypothetical cases ("let's call him A") assist in providing anonymity for subjects of scientific studies. Sometimes the locale is so unique that its identity cannot be hidden: does its revelation not imply an ethical choice on the part of the scientist? Indeed it does: he must choose to be honoring a trust or to be seeking recognition for his work.

But more than that: the publication of social data changes the world one studies. The findings become a part of "culture"; they thereby change that which was initially studied. In addition, "a little bit of knowledge is a dangerous thing." Suppose that a simple way to induce hypnosis could be developed; ought this be made generally available? It would materially change the mating and dating patterns on most college campuses! It is likely to change the pattern of criminality.

Science, as an attempt to look at the world, involves one set of values. But publication and communication beyond scientific peers changes the world and hence involves ethical premises not germane to science. One can know how to open and slam a door without doing either.

We must not think that everyone has equal access to scientific knowledge. In a democracy, unless we wish to have a special class eventually dominate society, access to knowledge must be open to all. This is not only in terms of traditionally published findings; it applies also to the classroom situation. We must admit that, though many researching scientists are hired by universities and colleges, many of them are also engaged in teaching. Now the professor-student relation is a social enterprise. In this relation, the professor frequently modifies other relations which the student might have had.

It so happens that common sense is frequently contrary to social science. The proof that common sense is faulty usually carries the implication that the source of common sense is also faulty. The incorrect notions gathered from one's parents, one's minister, one's friends, flow from two possible reasons. The source may have been in error, or he may have deliberately deceived the student. How frequently must one, in teaching a scientifically defensible position, imply that the student's parents are somehow inadequate?

In a course, for example, in intergroup relations, one cannot possibly discuss all that has been researched. One must choose. On what grounds? On grounds of theoretical relevance? Or because of certain pet values of the instructor?

The fact that we academicians tend to feel that knowledge is pretty good in its own right, and that students ought to have a more rationally defensible view of the world than that of common sense, does not change the character of the issue. It is still a value premise. The fact that the majority of us share a particular value does not mean that somehow the value has become a fact.

This, I think, is the treachery in social science research. Like the adolescent, we may think that just because "everyone is doing it," it is the right thing to do and we are freed from moral responsibility. I like to think otherwise. I prefer to believe that the highest form of human behavior, creative science, is predicated on man's self-awareness as a moral creature with moral commitments and moral responsibilities.

Personal Decisions In Biomedical Research *

V. ELVING ANDERSON**

The choice of a vocation and the preparation for an effective contribution in the field always involve a series of significant decisions. Some special comments appear to be in order, however, when scientific research is considered. Most research is neither as glamorous as some young people might think nor as impossibly difficult as others might assume. Furthermore, a convinced Christian may face a tension between a strong service motive, which leads him away from research, and a desire to extend the bounds of knowledge, which draws him toward it. Some church groups express their ambivalent feelings toward science by an anxious interest intermingled with a suspicious distrust. Such a "climate of opinion" cannot help but influence and bias vocational decisions by capable young people.

The term "biomedical research" is used in the title to indicate that there are no sharp dividing lines between basic medical research and that in other basic fields of biology. Furthermore, all these areas show a close dependence upon chemistry and physics. Clear divisions no longer exist between pure and applied research, or between basic and clinical studies. Thus, a discussion of biomedical research should have some implications for other fields of investigation.

In past centuries medical research was carried out by single investigators as an incidental, yet commendable, activity. Today, research has become a vital necessity requiring many investigators, complex and costly equipment, and large sums of money. The magnitude of the total effort can be seen in the increased national expenditure on medical research, from about $240 million in 1955 to an estimated $715 million in 1960. The popular support for medical research is equally impressive, for the contributions to voluntary health organizations show a public concern greater than for any other broad area of science.

The Choice of Research as a Career

The term "research" does not imply that there is some formula, technique, or "scientific method," which is guaranteed to produce results. One of the most fundamental requirements is the ability to state questions in an answerable form. This requires, of course, thorough acquaintance with a field together with a tendency to be dissatisfied with easy answers. The investigator must also have the mental and physical tools needed to collect the information which will answer his questions.

The choice of a research career is influenced not only by personal abilities and experiences, but also by the public "image" of what a scientist does. Perhaps the best incentive is the example of teachers actively pursuing research. From them students will learn that the boundaries of science move rapidly and will develop a capacity to master new insights and techniques as they arise. Church-related colleges and universities have a particular obligation to encourage and support research by faculty members as an essential part of the educational process.

Wide reading and careful study are essential. Mathematics is so important as the "language of science" that a good background during high school will soon be almost mandatory. Students should be encouraged to read *Scientific American* regularly by the time they are college freshmen; they should add *Science* and more specific journals by the junior year. Some of the recent excellent biographies and autobiographies about scientists also might be included.

Christian young people will want to explore those books which consider the philosophical assumptions of science and the meaning of the doctrine of creation in order to develop personal answers to questions such as these: What is the relationship between God's revelation through the Scriptures and man's world view which is continually changing as the result of research? Is the accumulation of knowledge about the universe one possible way of showing that we love the Lord our God with all our minds? Or is it an optional enterprise which keeps us from other activities which would be more pleasing to Him? The implications of the Christian faith for social concern and service have been considered by many writers, but there is a further need for what might be called "a theology of research."

Finally, it is important to realize that generous fel-

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lowships and grants now help to reduce the financial restrictions imposed by a long period of training. Concern on the part of the federal government, for example, is shown by the provision of $75 million in 1960 for training grants in the medical fields.

The Choice of Research Problems

The time for decisions is not past when a young person has been led to choose research as a vocation. Throughout graduate work he must in a step-wise fashion delimit his interests in order to produce a thesis. After completion of formal training, the major initiative in the choice of a research problem still lies with the individual investigator. Some of the factors involved have been described as follows:

> The individual scientist's selection of a project is largely determined by the interplay of his natural curiosity and predilections, his special talents or technical skills, the focus of his previous training and experience, his personal assessment of the needs and opportunities in his field, and the facilities and research materials that are available to him in the environment in which he happens to be working . . . . Within this framework of factors affecting a scientist's choice, his selection of a particular research project and his plan of attack derive, first, from information gleaned through his personal contacts with colleagues in the same or related field through his attendance at professional meetings, and from literature, and second, from the availability of support under terms which provide the best conditions for work[2].

The two major factors are thus information and support. A serious limitation of the *information* available through literature is the time lag between experiment and publication. The Bio-Sciences Information Exchange helps to bridge this gap through its registry of projects currently in progress. At present BSIE has information on over 30,000 active projects and over 90,000 investigators. Through this means a scientist can find out which other investigators are interested in a given problem.

When research *support* is considered, it is clear that the emphases in current research depend in part upon the value judgments held by the scientists and administrators who approve grant applications. How does one decide which are the most important problems deserving the highest priority in support? Many decisions about the general allotment of funds are based upon the mortality or morbidity attributed to a given disease, or the number of working days lost, or the total cost to the patient, his relatives, and the community. Some arguments, such as the following, appear to be too strongly economic in motivation. "Medical research has saved the lives of more than 1,800,000 individuals in the past 15 years. The annual earnings of these now amount to over $3.6 billion and their tax contribution to the Federal Government to $263 million"[1]. To what extent would a Christian world-view suggest a system of priorities in biomedical research different from the present strategy?

It must not be assumed, however, that good ideas are often rejected because they fail to fit into some master plan. The multiple sources of support, both public and private, make it very likely that well-designed proposals will receive support from one or another agency. Furthermore, the agencies take positive steps "to stimulate work in neglected fields, to initiate new lines of investigation, and to shift the distribution of effort in accordance with emerging needs and opportunities"[2].

The choice of research problem may also involve one in a choice of institution. Traditionally, most investigators have carried out their work in universities. With the rapid expansion of knowledge in the medical fields, however, some thirty countries have created central research organizations. The major health center in the United States is now provided by the National Institutes of Health, which supports work at other centers (an extramural program) and also carries on active research in its own facilities (an intramural program). The nature of such a central organization has been described in a report by an international conference on research.

> The special functions of a central research organization are to keep research as a whole under consideration, to estimate its trends and developments, to direct support where it is specially needed, to undertake work which cannot properly be undertaken by universities or local organizations, to advise government and to act as a focus for national and international co-operation. In addition, it shares with the universities the responsibility for developing research of its own, with the broad distinction that, while the research policy of a university must be framed with due regard to its responsibilities for teaching and the proper distribution of its resources over the whole field of knowledge, a central research organization can concentrate its efforts according to its estimate of the research needs and determine the scale of each according to its timeliness and promise[3].

The importance of the investigator's environment is stressed by the same conference report. "No man can work without tools, without adequate access to the material he wishes to investigate, or when his mind is distracted by irrelevant duties or personal financial worries. Few men can give of their best if they are set to work in an environment which is either indifferent or discouraging to their efforts"[3].

Over a lifetime of research the choice of problems cannot help but reflect an individual's personality and his convictions as to what is important. In any single research problem divine guidance may not be apparent, but many Christians in science are humbly aware of the role of personal faith and prayer at critical points in their careers.

The Choice of Research Support

The major sources of support for medical and health-related research and the estimated expenditures for 1960 were as follows[1]:

	Dollars (In millions)	Per cent
Federal government	$380	53%
State government	20	3
Industry	215	30
Philanthropy	81	11
Endowment	19	3
	715	100

The changes in federal and non-federal support from 1940 to 1960 are indicated by the following tabulation[1]:

	Federal	Non-federal	Total	Federal as a per cent of total
	(In millions of dollars)			
1940	$ 3	$ 42	$ 45	7%
1947	28	60	88	32
1954	107	118	225	48
1960 (est.)	380	335	715	53

Some general implications evident from such data are these:

1. The **proportion** of support for biomedical research which comes from federal sources has increased markedly since 1940, but the change in the last few years has been slight. Federal support is now about half of the total.

2. The **amount** spent from non-federal funds increased eight-fold from 1940 to 1960. The use of federal funds apparently has not discouraged contributions from other sources.

3. The increase in expenditures from $45 million in 1940 to $715 million in 1960 parallels the national expenditure for all forms of research and development, (Medical research was 5 per cent of all research for both 1950 and 1960.)

Some of the complexities involved in research support can be illustrated by a discussion of the problems encountered by foundations:

> Foundations—in common with other donors of research funds—have always been beset by the necessity for difficult decisions, among them: the choice between supporting the man or the project; the question whether to favor long- or short-term grants; when to renew and when to discontinue them (involving decision as to whether or not a given piece of work is in a productive stage or ever will be, and to what degree funds are available from other sources for the man, the institution, the problem, the field); the question whether the advantage lies with fixed grants to the worker or fluid funds to the institution: whether there is greater need to explore new ideas and extend basic research or to make existing knowledge more generally available. The foundations now reflect the growing trend among all supporters of research to consider the man more and the project less[4].

The great variety in types of granting agencies provides a flexibility for adapting to changes in patterns of research. After the development of the Salk vaccine, for example, the former National Foundation for Infantile Paralysis became The National Foundation with wider interests. The recent increase in federal funds for physical and biological research has led some foundations to shift support to the social sciences. The American Heart Association lays emphasis on the support of career investigators, while the American Cancer Society stresses basic research. Pharmaceutical laboratories must continually aim at new products or the improvement and wider use of old ones; and the amount of basic research supported by them is correspondingly less.

Federal support is based upon the assumption that "the health of the people is the greatest resource of the Nation, absolutely vital to its welfare, economy, and security"[1]. A more explicit statement of working principles is provided by two recommendations in a recent Senate committee report:

> *Role of Federal Government in Support of Medical Research.* The Federal Government should supplement private, industrial and State funds, as may be necessary, to support medical research on the scale required to carry out a determined attack on major health problems. The magnitude of Federal support should be neither limited by, nor paced by, the rate of increase of non-Federal sources of support.
>
> *Diversity of Federal Support for Medical Research.* Other Federal agencies besides the National Institutes of Health should continue to maintain strong programs in support of medical research. These programs should not only serve the specific health missions of these agencies and make their operations more effective, but should also utilize their special opportunities to make contributions of particular value to the total medical research effort of the country. The agencies should be given the funds to support both basic and applied research and to sustain both in-service programs and strong extramural programs in support of medical research in non-Federal, nonprofit research institutions[1].

There is apparently no serious question as to the need and wisdom of governmental action in agricultural research, but public disagreement and concern has been expressed concerning the government's role in medical research. Some of the problems raised in the discussions preceding the establishment of the National Science Foundation in 1950 were these: "What are the implications of financing a large volume of the total national program of fundamental research by the War and Navy Departments? What is the impact of extensive federal research contracts on the speed with which new scientists are being produced? What is the division of federal research effort between preparation for war and improvement of the arts of Peace?"[4].

Such conflicts may reflect in part lack of clarity about the ideological framework of research. "A democratic government has to consider how far its functioning in the organization of research not only for the national defense but also for the social needs of the people is compatible with the principles of democracy as we understand them"[4]. Further illustration is seen in our popular acclaim of Soviet science and our insistence that we match their efforts, with little acknowledgment of the different concept of the role of government in research in totalitarian countries.

Church-related institutions which are concerned about the separation of church and state face special problems in soliciting funds for research. It would be difficult to maintain a well-balanced program of biomedical research without some use of federal funds. Private funds should be available, however, for the great majority of specific projects.

Some Conclusions

The American Scientific Affiliation has been very much concerned about the need to help young people understand the tensions between science and the Christian faith. There is more than we can do, however, to actively encourage youth with Christian convictions to consider research as one of the fields into which God might lead them. Here are some suggestions for consideration:

a) Prepare a brief annotated guide to some selected

publications about the nature of research.

b) Encourage the wider use of ASA members engaged in research as "visiting scientists."

c) Plan chapter meetings around the theme of research as a career.

Any church-related institution which is committed to some research activity should provide a good environment for the investigators, including appropriate equipment, adequate funds, and freedom of investigation. Scientists who are also active churchmen should be encouraged in their work by the use of their abilities and insights in conferences and meetings, and in some instances by direct financial support. The ASA itself might be able to stimulate research on significant problems which will involve scientists from several different institutions.

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New Testament Christianity and the Morality of Capital Punishment: A Rebuttal

DWIGHT ERICSSON*

The New Testament is a wondrously radical document. It is so radical that very few Christians believe that Jesus, Paul, *et al.,* really expected to be taken seriously. Jesus, by His own testimony, came "to fulfill the Law,"(1) but what He meant by this amounts, for all practical purposes, to abolishing the Old Testament law code. Rather, the statements in the Old Testament become for Jesus points of departure for probing deeply into the heart of man and for determining the kind of character God longs to find in man.

Jesus summed up the entire Law in three words: *Thou shalt love.*[2] Whatever springs from pure love, from a desire for the best for the object of love, is right, no matter how many statutes the expression of that love might violate.[3] One might even say that he whose thoughts and actions, toward God or toward man, are always governed by love can do no wrong!

It is significant that Jesus' greatest disciple, Paul, though a man of action, always on the move, probably galled more by the enforced inactivity of prison than by the insult of it, different from Jesus in so many ways, yet echoes again and again this teaching of his Master, that love should be the controlling force in a Christian personality.[4] He several times expressed the principle that man is completely free before God.[5] The only restraints in man's relations with God and man come from his conscience.[6] There is no such thing as propositional Law; there is only love.

The Principle of the Second Chance

One form which this attitude takes in the New Testament is a principle which might be called the Principle of the Second Chance. This is especially well illustrated by Jesus' reply to Peter when asked how many times one ought to forgive an offender. "Until seventy times seven,"[7] must surely mean, "there is no limit to the number of times one ought to forgive." In commenting on the Lord's Prayer, Jesus said, "If ye forgive not men their trespasses, neither will your Father forgive your trespasses."[8] Equally clear is another statement from the Sermon on the Mount: If one should "smite thee on thy right cheek, turn to him the other also."[9]

The Noachian law[10] is often cited in discussions of capital punishment. Yet it would seem to be repudiated by Jesus when He expresses His attitude toward the *lex talionis,* "an eye for an eye, a tooth for a tooth."[11] The *lex talionis* is no longer to be a principle of action. To be sure, "a life for a life" is not specifically cited here, but unless there can be found a specific exclusion of this application of the *lex talionis* in the teaching of Jesus, one would seem to be under compulsion to reject it along with every other application of that law. Jesus dealt in principles, and the rejection of a principle is the rejection of every application of that principle.

To require a specific statement on every possibility in Christian behavior would necessitate a code book of absurd proportions. The New Testament offers principles for behavior and then leaves it up to the individual to apply those principles. Jesus has repudiated the *lex talionis,* and the Christian must then make the application to every expression of the *lex talionis.* The *lex talionis* represented a tremendous advance over previous systems of punishment. The Principle of the Second Chance represents not just an advance in attitudes toward punishment, but an entirely new approach.

The Nature of Christianity

Not only does a specific teaching of Jesus require the abolition of capital punishment, but the whole nature of Christianity cries out against it. Christianity comes as a redemptive religion. Christ came to "seek and to save that which was lost."[12] He came "to give His life

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a ransom for many."[13] "The whole have no need of a physician, but they who are sick."[14] He came that those sick "might have life, and have it more abundantly."[15] Surely there can be no place for capital punishment in a religion which stresses Life.

Redemption takes place in the present, not in the future, though it has its future aspects.[16] And the redemption which Jesus brings is a redemption of the whole man, not just of the spiritual side of man. To advocate death, even in a limited number of instances, would deny the stress which Jesus placed on Life.

A corollary of this is that the Christian has an obligation to bring Life to whomever he can. The stress in treatment of criminals ought not to be on punishment but on rehabilitation. Restraints of some kind are needed, but the institutions created to deal with criminals ought to serve two functions: (1) They should be used to protect society from men with dangerously distorted minds. This is for the sake of society, not for the punishment of such men. (2) The emphasis in such institutions ought to be on rehabilitation, with the goal of returning them to society as safe and useful citizens. It need hardly be mentioned that the surest form of "rehabilitation" is the New Life in Christ. This is a strong argument for more evangelical prison chaplains.

Criminals have sick minds. They are incapable of a peaceful relationship with other men, and so are rightly restrained as disruptive to society. In many cases, the criminal tendencies of an individual are not his fault, but are an inevitable result of his environment. Some men never have even a First Chance, let alone a Second Chance. Is it fair to punish a man for something that is not his fault? Granted, it may be necessary to protect society from him, but this very "protection" offers a splendid opportunity for concentrated effort at rehabilitation, and it ought not be ignored by those who preach a religion of redemption. Rehabilitation is difficult, but every offender has a right to it. Perhaps some men are beyond redemption, but this is a matter for God to decide, not man.

Applications of Capital Punishment

There is a real inconsistency in the application of capital punishment, both in the theoretical arguments put forward by Christians who support it and in the actual practice of governments. As to the latter, one need only note the fact that the majority of the victims of capital punishment are poor, non-white, and men; this points up the inequality of the application of the law. To this it might be added that the large number of safeguards afforded by our legal system are, in practice, available only to men of relative wealth, for appeals and the various other legal devices to implement them are expensive. Even if these are made available by a court to everyone, the man who can afford to hire an experienced, clever attorney that can devote a great deal of time to the case has a distinct advantage over the man who must depend on whatever legal assistance is made available to him by the local government.

As to the former inconsistency, the theoretical case for capital punishment is usually based on the fact that man is unique among creatures, having been created in the image of God, and hence murder is an insult to that image and a particularly flagrant insult to Him whose image is represented. The ancient Hebrew actually applied capital punishment more broadly than this, as was pointed out in a recent article in this *Journal*.[17]

Hebrew applications of capital punishment may be characterized as including whatever was dangerously disruptive to their society. Within this broad characterization there seem to have been three categories: (1) that which is degrading to man, God's image, which would include such things as murder and some forms of kidnaping; (2) that which threatened the family, which would include such things as defiance of parents and sexual irregularities; and (3) that which was a threat to Israel's religion, which would include such things as worship of other gods and violation of the sanctuary.

The ancient Hebrew, then, was quite consistent in his application of capital punishment. But even if we limit ourselves to the one category referred to in the Noachian law, that which is an insult to the image of God, there is still a great deal of inconsistency, for there are many ways to offer this insult to God. Some of these are even worse than murder because they constitute a continuing insult, whereas murder is only a single act. There could be no better example than the dope peddler, whose product makes animals out of men. And what of the procurer, who retails human flesh, at a nice profit to himself? Are not these, and other men like them, guilty of a desecration of the image of God which is at least as serious as murder? Yet we limit our demands for capital punishment to only a few of the possibilities, notably murder and rape.

New Testament Arguments

In the article referred to above,[18] an attempt was made to demonstrate that the New Testament supports capital punishment. However, a glance at the Biblical references cited will show that there is little of the New Testament in Bube's argument. He offers thirty-four (or forty-four, depending on how the count is made) references to the Bible; only five of these are to the New Testament. This hardly sounds like a discussion of "New Testament Christianity"! Of those five references, one[19] is offered in support of a preliminary point and is not itself concerned with capital punishment. A second[20] actually denies the right to use capital punishment in a particular instance.

This leaves three references as Bube's New Testament basis for capital punishment. But one of these[21] is nothing more than a proverb, probably quoted by Jesus from the common stock of Jewish proverbs of that day, stating that violent men, no matter how good their cause (note that Peter was defending Jesus) can expect to die violent deaths. To say, "The end does not justify the means," is to say very nearly the same thing. Another

of the three[22] is a statement that God (not man) will avenge His persecuted and martyred saints.

This leaves but one passage[23] from the New Testament which might be taken to support capital punishment. Here the reference to the sword is somewhat deceptive at first glance. However, to say that the sword here symbolizes capital punishment is no more reasonable than to say that the policeman's pistol symbolizes the same thing. The sword and the pistol must symbolize the right of government to maintain law and order and to use force for that purpose, if necessary. Whether or not that right includes capital punishment must be decided from sources elsewhere in Scripture, but this passage cannot be cited in direct support of capital punishment.

Conclusion

In summary, then, it has been shown that the New Testament refuses to uphold the Old Testament sentence of death, even upon the murderer. The Principle of the Second Chance requires that a wrong doer be forgiven, though it does not necessarily follow that he should be permitted to continue on his disruptive way unrestrained.

Love demands the best for all men, whether that love draw a response from its object or not, and it can scarcely be argued that "the best" is death. Further, the very nature of a redemptive religion ought to compel the Christian to a ceaseless struggle to bring Life.

The writer is increasingly convinced that the defense of capital punishment arises from the conviction that, in a world under the control of a righteous God, sin must be punished and good rewarded. Indeed, this is quite reasonable. What the defenders of capital punishment miss is that rewards, good or bad, need not necessarily be distributed in this life. To abolish capital punishment on principle is to bring oneself into step with basic New Testament Christianity.

Footnotes

1. Matt. 5:17
2. Matt. 22:37-40
3. Cf. Mk. 3:1-6
4. Rom. 13:8-10; I Cor. 13; Col. 3:14
5. Rom. 14:14; I Cor. 8:4-6, 8; 10:31; Gal. 5:1
6. Rom. 14:15; I Cor. 8:9-13; 10:24; I Tim. 1:5
7. Matt. 18:22
8. Matt. 6:15
9. Matt. 5:39
10. Gen. 9:6
11. Matt. 5:38-42
12. Lk. 19:10
13. Mk. 10:45
14. Mk. 2:17
15. Jn. 10:10
16. I Jn. 3:2-"now"
17. Richard H. Bube, "New Testament Christianity and the Morality of Capital Punishment," *The Journal of the American Scientific Affiliation*, Vol. 13, No. 4, Dec. 1961, pp. 114-116
18. *Ibid.*
19. Lk. 15:21
20. Jn. 8:1-11
21. Matt. 26:52
22. Rev. 13:10
23. Rom. 13:1-4

Some Ethical Decisions In the Practice of Medicine

J. RICHARD BURTON*

Before beginning a discussion of the issues involved, I wish to say that these views may not be representative of those of other physicians. They may not even represent those of the author in subsequent years since they will be continually influenced by his experience in the daily practice of medicine. The paper will not cover all of the ethical problems in medicine but will touch on those encountered chiefly by the physician in the practice of internal medicine. Finally, the question of ethics with reference to Christianity will be made as the various topics are discussed.

Ethics in Medicine

The practice of medicine has followed many codes of ethics during the centuries but the one most frequently quoted and best known is the Hippocratic Oath. In this we find the tone of warmth for one's fellow man as well as a concern for unselfish service by the physician. If the oath is well understood, the problems based on ethical grounds usually become clear and solve themselves.

Medicine however, has changed since the time of Hippocrates. Broader interpretations now can be given this oath to which we all ascribe. In the past, medicine was a healer's discipline. Now it encompasses that of both healer and scientist. In the present day, the physician must not remain only a scientist with his objective indifference, but he must also retain the personality of the healer. He must still maintain the confidence of the patient and be a willing listener to his complaints. Modern medicine combines the compassion and understanding of the healer with the exacting standards of the scientist so that both disciplines are effectively used. If one views the patient without regard to his personality, family, or environment, he will have difficulty in effectively treating the patient.

The close interpersonal contact established in the doctor-patient relationship often surpasses that of the minister or priest. It is in this regard that the physician also

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has a high responsibility. A Christian physician may be the only source of spiritual contact that a patient has. If so, he is responsible for the presentation of a Christian witness and for leading the patient into thoughts of spiritual concern.

The critical decisions encountered in the practice of internal medicine relate chiefly to those involving the patient recently diagnosed as having a malignant disease process, the question of prolongation of life in the incurably ill cancer patient, and the use of new, untried medical therapy on human beings. The internist may also be consulted on questions regarding genetics by patients with family histories of inheritable diseases. He may be called upon to render a medical evaluation and recommendations in cases of possible therapeutic abortion. Other situations requiring critical judgment involve the method of securing post-mortem examination permission and one's relationship to his fellow physicians.

Malignant Diseases

The question frequently arises as to whether or not a patient should be informed that he has a malignant disease. An occasional patient is reluctant to ask and some physicians believe that this information doesn't have to be volunteered unless they ask. Some who are extremely anxious, can be gradually brought to the point of knowledge of their disease. This can be done by stating the likely possibility of malignancy which may be subsequently diagnosed by means of x-ray or surgical exploration. I feel that the patient must be told concerning his illness so that he has some time to settle his business affairs and especially for the non-Christian, to settle his spiritual affairs as well. Many patients already suspect their disease and in the light of the close doctor-patient relationship will accept the diagnosis without a great emotional upheaval. In the event the patient is not told of his illness, the subsequent days become increasingly more difficult, since all treatment and consultation is based on falsehood and the relationship may then deteriorate into distrust and despair.

For the Christian physician this time gives him an opportunity for witnessing since, probably for the first time, the patient will begin to think on spiritual things and his future destiny. A relationship characterized by sincerity and honesty will help greatly during these times.

The thing that frightens many patients the most is fear of the unknown. This fear, according to the Bible, is the certitude of Divine judgment (Prov. 11:4) and is not necessarily that of shortening the present life or of an uncertainty about the future. The Christian physician can counsel here and help his patient in his reconciliation to God through Jesus Christ. Following this, giving him scripture passages of reassurance helps him along in his illness, since he is no longer fearful.[1]

Fortunately, many malignancies are "curable" for a period of time if detected early enough and treated. Even here, however, there may be an opportunity to inquire about the patient's relationship to God.

Prolongation of Life

The question of prolonging life once an incurable disease, either a malignant process or severe illness, has been determined, is a much greater problem. The state of illness at this point is when all possible medical therapy has been applied without results and the patient continues to be in an incapacitated, comatose, or suffering condition. In other words, he is in a hopelessly incurable state. For such a patient there is no escape except by death, yet he lingers on in a condition of suffering and helplessness. For this patient in the pre-antibiotic era a superimposed infection, such as pneumonia or kidney infection, would bring an end to his suffering. Now, with antibiotics, steroids, and vasopressors, we are able to manage these patients, return many to their "previous state," and prolong their life further. Frequently, relatives request that medical heroics will not be used and further pressure is then applied indirectly by them on the physician's clinical judgment.

Recently, this question was again raised at the American Medical Association meeting in Chicago. Subsequent newspaper comments indicate that the majority of physicians concur that the use of heroic medical therapy in this type of illness is not recommended. This does not mean that the end is hastened by any specific therapy, but it means that the end may occur earlier as a result of a superimposed disease process. Also, this doesn't imply that supportive and symptomatic medical care is withheld. These are continued, and the patient is reassured that he will be kept as comfortable as possible.

The physician's role here, once the condition is determined and responsible relatives as well as the patient have been consulted, is to keep the patient as comfortable as possible. The risk of drug addiction is usually not heeded since the benefits are great and the end is not very far away. The Christian physician has the opportunity here to be a continual witness to the non-Christian patient or a spiritual friend of the Christian patient. He can also give the patient spiritual comfort (Joshua 1:9, II Corinthians 12:9); assurance (John 5:24, I Corinthians 15:19-21); and hope (II Timothy 4:7-8, John 14:2-3).[2] I do not believe that this type of care is contrary to Biblical teaching or that it places the physician in the role of God regarding the destiny of his patient.

Research

A more recent question of growing importance is that of using human beings with known, non-operable cancer as study patients for new anti-cancer therapeutics. Before entering such a program these patients are totally informed of the type and purpose of the study and must consent to it. I believe that the physician, as a scientist, should not deny the trial of these drugs since one someday may prove beneficial. This type of treat-

ment, however, should be carried out at an academic facility where all means of evaluation are available, where large series can be obtained rather quickly, and where the patient usually doesn't have to bear the cost. The practicing physician in the community should be aware of these experimental drugs but not use them until they have been thoroughly studied.

I see no controversy here with medical ethics. For some patients it presents a challenge since by it they feel that they are contributing to medicine and thus gain some personal satisfaction. Cooperation is voluntary on their part. It may result in the prolongation of life and, therefore, additional suffering, but it may also give the possibility of temporary arrest or permanent cure. These patients, in contrast to those above, usually aren't as severely ill with their disease, even though their outlook is just as poor. I believe that the Christian physician can also ascribe to this therapy because there is always the hope of improvement. In properly structured studies any deleterious effect is noted early without much subsequent distress to the patient.

Problems Relating to Birth and Death

In problems of genetic importance, the physician should be well informed of all of the implications concerning the disease state and the possible influence on the marital partners and their offspring. The involved couple should be counseled cautiously and conscientiously; marriage should be discouraged if the possibility of a certain inheritable disease state is strong.

When the question of therapeutic abortion is raised, the ethical lines are more tightly drawn and even standardized by some groups. The internist may be called upon to evaluate some underlying cardiac or renal pathology and thus render an opinion which will influence the judgment of the obstetrician. Many feel that a therapeutic abortion in any sense is a means of destroying one life to save another and that stress of surgery often is just as great as completion of the pregnancy itself. Others feel that the welfare of not only the mother but also the father and other children is at stake and that when these are considered, a mother capable of carrying on her household work is much better than one who becomes more disabled or even dies. This problem remains difficult, is different in each situation, and requires the consultation of several physicians for the most appropriate solution.

Another area frequently encountered by all physicians as well as the internist is that of obtaining permission for post-mortem examination when the patient has expired. This is usually done during an emotionally stressful period and frequently encounters many variable responses. Many misinterpretations by laymen regarding the procedure have to be dispelled before one can deal effectively with them. This period has been used by some physicians to cajole the reluctant relatives by every possible means to sign the permission. I believe that a quiet, reassuring, and explanatory counseling session at this time is most rewarding in obtaining permission from reticent relatives. Here again, the physician as a scientist can equip himself better only if he knows the total disease process of his patient and thus is enabled to serve his other patients more effectively. The ethical decision here is, I believe, to what extent we can go to obtain permission from reluctant relatives. If the facts are quietly and firmly given and permission refused, then it is better to abide by the family's decision.

Professional Relations

Medical ethics involves the interchange which takes place not only in a doctor-patient relationship but also in the physician's relationship to his colleagues. One must always strive to speak well of his colleagues even though some may not be practicing the same quality of medicine as oneself. This policy, too, has been set in the oaths of the past where it was common for physicians always to help one another and be willing teachers of the younger physicians. To speak disparagingly of another physician to a patient will break down that patient's regard for his own doctor. If a physician is practicing poorly, it isn't long before his hospital or a county or state board of ethics will investigate his practice.

Finally, in view of all other areas of ethical conduct, the Christian physician finds himself in no different role from that of the Christian businessman, professor, scientist, or laborer. Each must have his own standard of ethics; if these are deviated from, only he can then account for himself. As a physician deals with other people he must be intellectually honest with himself and his patients. He must also remain objective in his treatment of disease and attempt always to do what is best for his patient's welfare. When problems as discussed above are met, each situation becomes new and relative to that individual patient. Its solution is not found at a single moment in time, but it results from the development of many facets, including the disease process itself and the total patient himself, physically, mentally, and spiritually.

FOOTNOTES

1. Henry, C. F. H., *Christian Personal Ethics* (Grand Rapids: Wm. B. Erdmans Publishing Co., 1957), p. 177.
2. Hanson, H., *et al.,* Symposium on the Care and Management of the Dying Patient. *Journal Christian Medical Society,* May-June 1957, p. 3.

Psychotherapy and the Patient's Ethical System *

F. WILMER LARSON**

What is the good life? Where does it lead? What is the good, the true, the beautiful? I shall share with you some of the thoughts concerning these questions which have been meaningful to me both as one who is a professed believer in the claims of Jesus Christ and as one who engages in the practice of clinical psychiatry.

The questions that I listed above are often on people's minds and hearts. Strangely enough, classical psychiatry has not dealt with them directly. Gordon Allport, a Harvard professor and former president of the American Psychological Association, notes that "psychologists write with the frankness of Freud or Kinsey on the sexual practice of mankind, but blush and grow silent when the religious passions come in view."[1] Allport goes on to argue that the psychologist has no right to retire from the field, since two-thirds of this nation's adults regard themselves as religious people, and nine-tenths affirm belief in some sort of god.

Paul Meehl, present A.P.A. President, says,

> I suppose the viewpoint of the major psychotherapeutic schools in this country on the question of religious factors in counseling is essentially that of classical psychoanalytic tradition. It is pointed out that the therapist's business is not to convert or unconvert people with regard to religion, or more broadly "philosophy of life," and that a therapist who is unconsciously carrying out a missionary activity will be ineffective . . . . Religious material is like other material which is brought up by the patient: If it comes up, one has to deal with it on the same basis as anything else, that is by reflection, clarification, ventilation and interpretation. For example, some patients may bring up religious material as a form of resistance in order to avoid talking about something else. Others may bring it up as part of their intellectualized defense system, or in the effort to seduce the therapist into cognitive combat. This point of view would tend to depreciate the therapist engaging in discussion about value problems or religious questions as such; and if he permitted this to happen, he would be criticized for falling into the patient's defenses.[2]

Shall ethical belief be considered as only "symptomatic"? What shall be grist for the psychotherapeutic mill? What shall be valid material for the psychotherapist and his patient to consider during their hours together? I shall share with you some thoughts expressed by Dr. Orville Walters, Director of Student Health Services, University of Illinois. I shall lean heavily on Dr. Walters' remarks.[3] He makes a strong plea that the psychiatrist himself should become conversant with the claims of Christianity.

Ethical Neutrality

The psychiatrist who is asked to make an evaluation of purpose is likely to cite his status as a scientist, in which role he professes to deal solely with facts, refraining from value judgements and maintaining ethical neutrality in his relationship with patients. I suppose the same psychiatrist would say that the Christian is a proponent of a system of metaphysical constructs. The psychiatrist, by identifying himself this way, seeks to enjoy the vast prestige of science and places the Christian on the defensive in a supposedly new variation of the science versus religion conflict.

Actually, the psychiatrist's identification of himself as a scientist deserves scrutiny. As a physician, he has much in common with his medical colleagues in other branches of medicine. In one respect, however, the psychiatrist is unique. Whether the sufferer is saint or sinner, the surgeon remains the scientist and removes the inflamed appendix. Whether his patient is priest or gangster, the orthopedist reduces and splints the fracture. The psychiatrist, on the other hand, must frequently relinquish the role of scientist and may even have to make a value judgement before he can decide whether he has a patient. He must decide whether the complaint of the patient is in fact a cause for treatment.

The psychiatrist may draw upon the full armamentarium of the scientific method, but he cannot be *only* a scientist. His patient has, let us say, a strong sense of guilt. The psychiatrist must ask himself many questions. Was the deed proportionate to the guilt that followed? Was the act good or bad? Does the patient need psychotherapy for neurosis, or forgiveness for sin, or both? Does he need a psychiatrist or a spiritual counselor? Making such discriminations obviously requires value judgements on the part of the therapist. What code of ethics is to be applied in arriving at such judgements? Shall he apply his own ethical code or some other? Shall he discard the patient's scale of values or abide by it? As long as he functions as a scientist, the psychiatrist can claim with validity to be ethically neutral, for science has no concern with values. When he begins to make value judgements, as I maintain he must when dealing with live human beings in conflict, the therapist forfeits a neutral status.

Ethical neutrality is an abstraction that does not exist in fact for any man. Every man has his own hierarchy of values and in the interaction of psychotherapy where understanding of deep motivation is sought and where issues of ultimate consequences are faced, the value systems of both therapist and patient are inevitably implicated. When the psychiatrist offers to use his professional knowledge and skill in intimate contact with a person in conflict, his activity is no longer only observational, but actively interventional. The psychiatrist may try to preserve the objectivity of the scientist, but

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now he has an active interest in the outcome.

The psychotherapist is thus an involved participant who has elected to follow a certain sectarian procedure of his choice with an interest in the outcome. There are many schools of psychology and psychiatry, each of which makes its own assumptions about the nature of man. Both the choice of the method and its application are tinctured by the therapist's own philosophy of life. In the process of psychotherapy, a relationship is established in which, either by spoken word or by nonverbal cue, the psychiatrist's value system is soon discerned and may even be appropriated by the patient to serve his own needs. This direct or subtle communication of his own world to the patient soon compromises the psychiatrist's imagined neutrality.

When the psychiatrist is seen in this light, the tension between psychiatry and religion may be more clearly recognized. It is not a science-versus-religion conflict but rather an extension of the older naturalism-versus-theism tension.

I think the point is sufficiently made that the psychiatrist himself, either as a professional therapist or as a person, cannot be ethically neutral. I would assert that such neutrality is only a sham and does not in fact exist.

Examination of Christian Faith

The psychiatrist himself, I feel, should also actively consider the Christian faith. For one thing, he is a seeker after truth. Christian theology claims to have knowledge of truth and to be an important aspect of reality. The psychiatrist should acquaint himself with the claims of Christ, for when he deals with patients who are committed in their personal lives to this Person, he must be able to distinguish between devotion and "resistance." If he does not distinguish between specious rationalization and moral conviction, he may do his patient a serious disservice.

The psychiatrist should examine the Christian faith because he is a healer. There is, of course, profound evidence that Christian experience is often extremely therapeutic.

The psychiatrist should examine the Christian faith because he is a philosopher. Everyone has his world view, and Christianity presents a satisfying and logical world view.

The psychiatrist should examine the Christian faith because he is a person. He too has guilt, anxiety, and conflict.

The Nature of Man

When the therapist leaves science behind, his philosophy must compete with a Christian philosophy on an equal basis. Among the diverse and conflicting doctrines of man, none explains as much as the Christian view. In contrast to Freud, who saw man as primarily instinctual and biological, and the neo-Freudians, who see man as primarily social, the Christian approach offers a synoptic view of man, presenting him as a spiritual being with elements in his nature that respond to transcendental reality. The unifocal view of Freud that sees primarily the evil in man and the humanistic views that emphasize primarily the good are exceeded in the broader, more realistic Christian doctrine that sees, beyond man's basic evil, unlimited potential for good through divine redemption and grace. In contrast to the freshly minted theories of human nature, the Christian doctrine of man enjoys a coherence and maturity that has withstood centuries of the severest attack and criticism without essential change.

Conclusion

In closing, let me quote several others on the importance of considering the patient's ethical system in the process of psychotherapy.

David Reisman in *Individualism Reconsidered* says

> increasingly today the new type of analytic work is with people who are not obviously ill—whose "symptom" is their malaise, their whole way of life—people who are troubled about moral issues or ought to be troubled about them. This forces analysts to be concerned with problems of values as part of every task of therapy.[4]

Gregory Zilborg, a well-known convert to Christianity and an eminent psychiatrist, wrote

> suffuse with anxiety, man again is forced to contemplate what it is that he is, what it is that he wants, what it is that he wants to want, and what is his place in relation to his fellow man individually, to society, to himself. These are ontological, metaphysical, and fundamentally religious questions. A psychoanalyst, more than any other professional man, must cultivate a philosophy of values.[5]

O. Hobart Mowrer, who is a research professor of psychology at the University of Illinois, quotes the following young man who had the diagnosis of schizophrenia. The origin of the illness was

> motivated in the first place by fear. A schizophrenic psychosis originates in a break with sincerity and not in the classical assumption of a "break with reality." The patient's social appetite including love and respect for persons in society is consciously anticathected or forsaken, and ultimately repressed with the passage of time, since full satisfaction with society entails more or less communicative honesty, faith, and intimacy.[6]

I feel the epitaph on the tombstone of an infant in a London cemetery reflects the most burning question before the human race today:

> "It is so soon that I am done for
> I wonder what I was begun for."

This may be, this *must* be, a concern in psychotherapy.

Footnotes

1. Allport, G., *The Individual and His Religion* (New York: Macmillan, 1950).
2. Meehl, P., "Some Technical and Axiological Problems in the Therapeutic Handling of Religious and Valuational Material," *Journal of Counseling Psychology*, VI, No. 4, 1959.
3. Walters, O., personal communication.
4. Reisman, D., *Individualism Reconsidered* (Garden City, New York: Doubleday and Co., 1954).
5. Zilborg, G., "Some Denials and Affirmations of Religious Faith," in F. J. Braceland (Ed.), *Faith, Reason and Modern Psychiatry* (New York: P. J. Kenedy & Sons, 1955).
6. Mowrer, O. H., 1960 Convention Proceedings, Christian Association for Psychological Studies.

Human Responsibilty Viewed by a Theologian *

JANIS ROZENTALS**

Since science has only proximate answers to ultimate questions, the basic tension experienced today is not one of science versus theology but rather one of naturalism versus theism.

We have seen that the psychiatrist should examine Christian faith because he is a scientist, a healer, a philosopher, and above all a person, with guilt, anxiety, conflict, and other personal traits. Similarly, all scientists are persons, and all persons are responsible to God.

The theological view on critical ethical decisions in science stresses above all, the fact that every decision involves *obedience*. This is a dimension which has an absolute character. It is impossible to avoid responsibility.

Certain theological assumptions are therefore basic. These include man's relationship to God as a creation. Because man is created, the reality of man depends on *a priori* conditions or transcendental reality. It is impossible for man to avoid this status. Man is either obedient to his Creator or he is disobedient, sinful. Neutrality is impossible. But this does not necessitate a rigid determinism, for such causality can exist only between the objects of creation. There is a relationship of men to God that goes far beyond observation and even beyond rational description and analysis. This is a basic article of faith.

This leads to the paradox of both absolute freedom and absolute dependence on God. Man as a slave of sin has lost his freedom (Romans 7). It is in obedience to God that a person becomes himself and gains his freedom as an autonomous being—the true or genuine existence which involves possessing eternal life. Thus it is truth that has made man free. Obedience is following God's purpose for the entire universe.

There are at least three significant areas of obedience. First, God has commanded us to subdue the earth with the promise that, as we do so, He will bless us. His blessing is hence linked with man's scientific work. Yet all science is subject to human limitations or sin. There is a danger in making the means a purpose in itself.

Second, God speaks through me; I am God's addressee. Through God's encounter with me, the gospel addresses me through Jesus Christ.

Third, man is incorporated into the eschatological community (church) as a result. The Christian is in the body of Christ. He is therefore responsible to the entire Christian community. When we depersonalize the gospel, we pervert it. We must protect obedience. We must safeguard Christian values and transmit them to future generations.

In obedience in our personal behavior as well as in the Christian community, we can rejoice in God's Word and Will. All scientists in this symposium have pointed toward this obedience.

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Archeology

ALLAN A. MacRAE

In recent years the field of archeology has become more and more specialized. Individual scholars devote all their time to the study of Mesopotamia, or of Egypt, or of Palestine, or of some other section of the ancient world. Some in fact even specialize in early Mesopotamia, or in Mesopotamia of a slightly later period. The volume and complexity of the material available is very great, and a full knowledge of the whole field is no longer possible for any one individual.

With all the complexity of the field, it is amazing how unexpectedly contacts with the Bible come to light. One never knows just where something will appear that throws light on a certain Biblical statement, or that has direct interest in connection with some Biblical point.

A very interesting area of discussion is the consideration of the evidence on the long history of the reign of the Assyrian kings in comparison with the Biblical statements. Assyria is the northern section of Mesopotamia. Here many of the rulers were fiercer and more brutal than those of Babylonia. This was quite natural since this northern area was more exposed to danger from animals and from the wild tribes of the mountains. In order to survive, constant maintenance of a strong military force was necessary. Once the Assyrians had attained sufficient power for survival, it was natural enough that this power should be turned toward extending control over neighboring regions. In the period from 900 to 630 B. C., with some intermissions, we find constant forward progress by the Assyrian empire, conquering areas in all directions, and extending its sway further and further. Echoes of this movement are found in the Old Testament, until it reaches its climax, as far as the Bible is concerned, in the conquest of the kingdom of Syria and of the northern kingdom of Israel.

The voluminous material from Assyria contains a number of references to Israelite kings. The Bible contains a number of references to Assyrian rulers. The contexts of these two types of references are often very different, since neither one attempted to give a complete political history of their relationship.

It is interesting to examine these various specific references in order to see what light they throw on the authenticity of the Biblical statements. Without precise information from contemporary sources, it would be very difficult to write such a history as the Bible contains, with the references to the foreign kings in the right order and in the proper relationship to one another. At point after point, Mesopotamian evidence corroborates the accuracy of the Biblical record.[1]

Another phase of investigation consists of examination of the spelling of names. Assyrian names were foreign to the Israelites, and, in addition, were recorded in a type of writing quite different from that used by the Assyrians themselves. When foreign names are expressed in another language and with another type of writing, it is sometimes difficult to recognize exactly what they are. Any comparison of present-day English spelling of Chinese names with the actual pronunciation of these names will show how difficult this is. Yet the Assyrian names in the Old Testament have proved to correspond with the actual original far more accurately than the similar references in ancient Greek sources.

The Assyrian rulers were always seeking for means of maintaining their hold on their conquests. It was one thing to send a great army to overcome a distant region. It was quite another to keep the region under Assyrian control, once the army had departed. Two expedients were used to do this. One was the Assyrian emphasis on "frightfulness." The Assyrian kings tried to terrify their enemies by gloating over the brutality that they showed toward nations that had revolted against them. In no other ancient records do we find such an emphasis on cruelty toward conquered foes as in the Assyrian records. This was intentional on the part of Assyrian kings, in order to terrify their enemies and make them less likely to revolt once they had been conquered. Even a careless reading of the book of Nahum, that great poem against Nineveh, the Assyrian capital, with its vivid description of the downfall of the Assyrian empire, will show how prominent this feature was in the minds of the Israelites. References to no other people in the Bible are in quite the same tone.

The other Assyrian expedient was that of moving whole populations from one area to another. This is abundantly illustrated in the Assyrian record, and it finds many echoes in the Old Testament. Thus we find the Assyrian kings taking the people of Israel and carrying them off to another part of their empire (II Kings 17:6), and bringing in people from other sections whom they settled in Samaria (II Kings 17:24). The Samaritans originated from this mixture of population. It was a very clever idea to mix up the people so that there would no longer be unified groups that might revolt against the Assyrians, but rather many small groups of alien-cultured people in the midst of larger groups of less cultured people who would regard them as the representatives of the hated conquerors, and thus be very unlikely to make common cause with them against the Assyrians.

[1]Reliable translations of many of the ancient Assyrian records are contained in James B. Pritchard, *Ancient Near Eastern Texts Relating to the Old Testament* (2nd edition, Princeton University Press, 1955). Pictures of many of the Assyrian monuments and reliefs may be found in James B. Pritchard, *The Ancient Near East in Pictures Relating to the Old Testament* (Princeton University Press, 1954). A useful selection of portions from both of these volumes is presented in *The Ancient Near East: An Anthology of Texts and Pictures,* by the same author (Princeton University Press, 1958).

The Neo-Babylonian empire, which replaced the Assyrian empire after its downfall, continued the same policy of carrying out movements of population; it was for this reason that Nebuchadnezzar, when he conquered Jerusalem, carried away the people of Judah into captivity (II Kings 24:15-16; 25-11). At one time many scholars questioned the accuracy of the Biblical account of the exile, saying that actually only a comparatively few people had been taken away. Examination of the remains of ancient cities in Palestine has shown a terrible destruction at this time, at place after place, with the burning of the city and only remains of a small settlement on top of it, built a long time after the destruction. The accuracy of the Biblical story of the exile is abundantly verified by archeological remains.

The Neo-Babylonian empire was a period of great glory but one which lasted little more than half a century. The book of Daniel describes the character of Nebuchadnezzar who looked out upon his city and cried, "Is not this great Babylon that I have built?" (Dan. 4:30). German excavators have unearthed more than a million bricks in the city of Babylon, every one of them stamped with the name and titles of Nebuchadnezzar. What other ruler ever thought it necessary to put his name on a million bricks? Surely the pride of Nebuchadnezzar in his great building work, as depicted in Daniel, is no vague picture but a true characterization of this particular ruler.

Twenty-five hundred years ago this year Babylon was conquered by the Persians under Cyrus (539 B. C.). The Persians tried to weld their empire together by reversing the policy of the Babylonians and thus seeming to be the friend of the various conquered nations. Cyrus issued edicts permitting the conquered peoples to return to their own lands, often giving them help from the imperial treasury. One such edict, contained in the book of Ezra (Ezra 1:1-4), shows Cyrus granting the Israelites freedom to return to their own country. This Biblical picture of the Persian attitude exactly fits the archeological evidence.

New light is constantly being thrown upon particular details in the history of the Assyrian, Babylonian, and Persian empires. As we learn more about their leaders, and about the events of the different centuries, new problems appear; upon each in turn new light is shed. It is, in a way, like a comparison of a set of pictures regarding a period of history with a book of words describing the same general time. The Biblical account and the archeological material rarely coincide exactly for any length of time. Instead there are frequent overlappings. There are many points where each of them stands alone without any correlate in the other. But new points of relationship are constantly being observed, and in these points of relationship, when carefully studied, it is always found that the two fit together. No real contradiction has ever been proven.

On the other hand, there is a danger of imagining a relationship between two features which actually have no relationship at all. In such a case, if it is later proved that the two matters are quite unrelated, people may be led to doubt the accuracy of the whole Biblical narrative. It is much wiser to go slowly and to check the materials fully before making statements which may later be proven false.

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Chemistry

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The heading of this column has always been a bit embarrassing to its author because it has often been misleading. Generally, the heading *Chemistry* has been too broad for the material discussed, which because of limitations of the author has dealt only with one aspect of chemistry, the application of chemical techniques and modes of thought to biological problems. Occasionally the author has tried to justify this narrow emphasis by implying that this is probably the area in which chemistry as a science might have its greatest current impact on theological thinking. At other times the author has been carried away by the grandiose thought that he and other chemists are SCIENTISTS after all, and should be capable of discussing the broader implications of science and Christian faith, no matter how little we have read of the history and philosophy of science, or of theology. In those cases the heading of this column has not been broad enough to describe its contents accurately. Perhaps with the editorial reorganization now taking place this column will no longer appear in the *Journal,* or if so it may be under a more honestly descriptive heading, such as "Idle Thoughts of a Christian Biochemist."

For this particular column, written possibly as a swan song, it may be appropriate to include *both* kinds of idle thoughts, some biochemical and some philosophical, the author's reflections after attending the 1962 meetings of the Federation of American Societies for Experimental Biology in Atlantic City.

Scientific Afterthoughts

The rate at which biochemical and biophysical investigations are progressing seems almost fantastic, and produces in a biochemist of my generation mixed feelings of excitement and frustration. The excitement comes from a sense of participation, no matter how vicarious, in solving some of the mysteries of life that have always seemed hopelessly inscrutable; the frustration from trying to acquire enough fundamental knowledge to keep up with the latest developments and to gain an adequate comprehension of at least the most important ones. I have forgotten how far back in recent history the "electronic age" occurred, but I think it immediately preceded the "atomic age," which gave way more recently to the "space age" we now seem to be in. The inevitable impact on biochemistry of support by NASA of projects in space biology is yet to be felt. Comparison of an up-to-date "metabolic map" (they are never really up-to-date; I should have said "the latest edition") with one of ten years ago makes one conscious of the debt we owe to the AEC for making isotopic tracers more or less common reagents for elucidating biochemical pathways. Perhaps various agencies of DOD (Department of Defense) played the major role in sponsoring development of electronics technology, first in the area of radar and other forms of detection and communication and more recently in the area of high-speed computing. At any rate, the impact of this electronic legacy is still being felt in biochemical investigation, particularly in the acceleration of solutions of problems whose complexity made them seem completely beyond our grasp only a few years ago. The automation boom is on in research already.

A dramatic example of acceleration due to the availability of high speed computing machines is the fact that the complete three-dimensional structure of a globular protein, myoglobin, has now been worked out from the data of X-ray diffraction alone, and most of the structural details of a much larger protein, hemoglobin, have also been obtained by the same method. I believe I heard Linus Pauling say once in a lecture that he started doing X-ray studies of amino acids and simple peptides with the hope that in twenty-five years he would be able to use the data obtained in interpreting the complicated diffraction patterns of large protein molecules, but the availability of electronic computers enabled him to do it in only fifteen years instead. At any rate, the alpha-helix, most widely known configuration of polypeptide chains, was first proposed by Pauling, Corey, and Branson in 1951. For myoglobin, of molecular weight 17,000 and containing 150 amino acid residues in a single polypeptide chain, J. C. Kendrew and his co-workers at Cambridge published the first three-dimensional electron-density map in 1958 and a more detailed account in 1959. The first map at 6-A resolution was based on phase determinations for the 400 reflections closest to the center of the diffraction pattern; taking the resolution to 2-A involved measurement of 10,000 reflections for the protein itself and for each of four derivatives, with computing programs for Fourier synthesis being worked out for one of the large electronic computers, the Cambridge EDSAC II. For hemoglobin, a molecule four times the size of myoglobin and containing four heme prosthetic groups instead of one, and two pairs of different polypeptide chains instead of a single chain, M. F. Perutz has published a map in 1960 with detail comparable to that of Kendrew's 6-A map of myoglobin. For an excellent review with photographs of some of the projections and molecular models constructed from them as well as references to the original papers, see A. Rich and D. W. Green, "X-ray Studies of Compounds of Biological Interest," *Annual Review of Biochemistry,* 30, 93-132 (1961). For an exciting semi-technical account of the myoglobin solution, see J. C. Kendrew's "The Three-Dimensional Structure of a Protein Molecule," in *Scientific American* for December, 1961.

Chemists who use organic methods to unravel the

structures of macromolecules may feel temporarily "scooped" by this phenomenal recent success of the physical chemists, but they are also gratified to note that the two approaches are beginning to corroborate each other. Furthermore, at least one paper at the Federation meetings reported on preliminary studies which will eventually lead to the first stepwise chemical synthesis of an enzyme, ribonuclease. The title of the paper by R. F. Goldberger and C. B. Anfinsen of the National Institutes of Health, "Selective Hydrolysis of Ribonuclease," gives no hint that the authors have synthesis in mind, but the abstract, *Federation Proceedings,* 21, No. 2, 253a (1962), outlines seven steps leading to resynthesis of the molecule from peptide fragments of it; synthesis of each of the fragments by what are now conventional techniques will then complete the total synthesis of the enzyme.

The huge attendance at the symposium on Genetic Mechanisms at the 1962 Federation shows the great interest in this area of biochemistry at the present time. Particular emphasis was given to what has become known as "the decoding problem," a field in which the investigators themselves seem rather astounded that the work is going so fast. The "code" referred to is of course the sequence of nucleotides making up DNA or RNA—the giant nucleic acid molecules containing genetic information in linear array, just as these lines of type contain information accessible to you at this moment because they are linear non-random arrays of letters of the English alphabet. The information conveyed by a particular triplet of the four possible nucleotides is that which specifies the positioning of a single amino acid (one of twenty "letters" in the protein alphabet) in a protein as it is laid down on an RNA template in the ribosomes, the protein manufacturing particles of cells. In cells, the DNA of the chromosomes in the nucleus is essentially the master blueprint; this is copied on "messenger" RNA, which carries the information to the ribosomal or "template" RNA, perhaps by becoming part of the template itself. A few years ago a specific "transfer" or "soluble" RNA for each amino acid was found to be an essential part of the process of protein synthesis, since amino acids had to be bound to this transfer-RNA in order to be transported into the ribosome and lined up on the template. From the beginning it seemed obvious that each of these specific transfer-RNA's must contain somewhere in its structure the nucleotide code (or its complement, an inverse kind of code) for one amino acid of the twenty. Although the size of these smallest types of RNA was still considerable for doing nucleotide sequence studies (possibly a hundred nucleotides), it was still considered that exploration of their structures offered the best hope of ever "breaking the code."

However, two other independent pieces of research provided the keys with which the code is actually being broken at present, completely by-passing studies of transfer-RNA. One of these was the use of both cell-free polynucleotide-synthesizing enzyme systems and protein-synthesizing enzyme systems of bacteria; it was found that when a single nucleotide precursor such as uridine triphosphate (UTP) was supplied to the former system, the product would be an artificial polynucleotide containing a single nucleotide, in this case poly-U. Severo Ochoa of New York University did the pioneering work on polyribonucleotide synthesis and in fact recently won the Nobel prize for it, but M. Nirenberg of the National Institutes of Health then used these polynucleotides as templates in the second kind of enzyme system and discovered that a homo-polynucleotide, poly-U, led to synthesis of a homo-polypeptide, poly-phenylalanine (poly-Phe). In other words, the triplet of nucleotides which specifies *Phe* in a protein must be UUU, and we have begun to decipher the code!

The second type of research providing keys to the coding problem has been work with tobacco mosaic virus (TMV) carried on primarily at two special institutes for virus research, one at the University of California in Berkeley and the other in Tübingen, Germany. Chemical relationships between the nucleotides in RNA are such that one nucleotide can be converted to one of the others by mild chemical treatment: specifically, nitrous acid converts an amino group to a hydroxyl group, making cytidine (C) into uridine. Although the work is very laborious and time-consuming, even with automated analytical equipment, the principle is essentially simple: RNA from normal TMV is treated gently with nitrous acid, converting some of the C into U and producing a chemically manufactured mutant. The mutant virus is cultivated until enough is available to permit isolation of the now abnormal protein coat around the RNA core of the virus, and this protein is broken down into fragments which are analyzed by careful quantitative methods to see what "damage" the mutation of RNA caused in the protein; many of the abnormal proteins have shown specific substitution of one amino acid for another, and in general (with some exceptions) these substitutions have been in accord with the data from the other type of decoding research. For example, if UUU really codes for *Phe,* then treatment with nitrous acid should never lead to substitution of *Phe* by some other amino acid, since C is always changed to U in the RNA and never U to C. On the other hand, if *Phe* is found to substitute *for* another amino acid in some position in the peptide chain, then the RNA code for that amino acid is likely to be UUC, UCU, or CUU, and so on. Careful analysis has already led to development of a nucleic acid code for about half of the amino acids. A good semi-technical discussion of the background for this research can be found in two articles on "The Chemistry of Life" in Vol. 39 of *Chemical and Engineering News*: "How Cells Synthesize Proteins" (pp. 80-89, May 8) and "Implications of Recent Studies of a Single Virus" (pp. 136-144), May 15, 1961). A reprint of these two articles bound together with a third, "How Life Originated on Earth

and in the World Beyond" (pp. 96-104, May 22, 1961), is available for $1.00 from *C&EN*.

One problem which has often occurred to me in thinking about the mechanism of genetic mutation is that of back-mutations, and one paper presented at the 1962 Federation meetings by C. Yanofsky of Stanford University contained a most beautiful example of a mechanism for this phenomenon. A series of mutants of a micro-organism which lacked an active tryptophan synthetase enzyme were studied, and in one case a mutant arising from one of these mutants was obtained which could grow on a tryptophanless medium, indicating that the enzyme was again active. It was found possible to isolate the active enzyme from both the wild-type and the back-mutant organisms, and a very similar but inactive protein from the tryptophan-requiring mutant giving rise to the back-mutant. By the remarkable technique of "fingerprinting" to locate possible amino acid substitutions (the same procedure used in the TMV protein studies described above), Yanofsky was able to show that the inactive protein was identical to the wild-type enzyme except for a single substitution, and that the back-mutation had resulted in a *second* substitution at a *different* location in the peptide chain, this time restoring enzyme activity to the inactive protein, no doubt by permitting a refolding of the secondary protein structure to make up for the "kink" put in the chain by the first mutation. In other words, the back-mutation was *not* a simple reversal of the original mutation, but a further change which happened to result in a protein which also had the same biological activity as the original enzyme.

I left the symposium on Genetic Mechanisms thinking what a poor time this is for opposition to evolutionary ideas on grounds that they "are only theories without empirical evidence or plausible mechanisms to back them up." Well, mutations are certainly getting a lot less mysterious than they used to be—and we have been able to determine structures of biological macromolecules for only a very few years now. The handwriting is on the DNA!

Philosophical Afterthoughts

The Federation joint meeting has become one of the largest scientific meetings in the world, with perhaps 20,000 scientists in attendance and more than 3,000 papers describing new research findings being presented in a single week. Manufacturer's equipment exhibits at the 1962 meeting emphasized expensive and complicated automated equipment for doing more and better research—and doing it much faster. I heard several comments about how many badges indicated the wearer as being from NIH or some other large research institute, sometimes with a note of annoyance, regret, or nostalgia for "the good old days" when biochemistry was done by individuals or small groups in widely scattered university laboratories. Our science seems to be growing and changing so fast that it almost seems to be getting out of hand, and we are beginning to feel it personally. It is easy to see why the brightest people are attracted to large institutes: in biochemistry it is still easy for an individual investigator to have a brilliant idea on his own, but it is difficult to test it out adequately without expensive equipment, technical assistants, and automated analytical facilities. No wonder young scientists who feel themselves capable of original thinking want to go to huge, well-equipped laboratories where their ideas can get rapid and thorough experimental verification, and where they will be "in" on the latest results from related work of the most active investigators. The trend in this direction seems inevitable, and our pleasant little science begins to feel both the blessings and curses of bigness.

In the midst of thoughts about these problems, about individual research people I talked to at the meetings concerning their personal as well as scientific struggles, and about a few opportunities I had to witness directly or indirectly to colleagues concerning my faith in Jesus Christ, I was struck by the passage about our Lord: "He had compassion for them, for they were like sheep without a shepherd." What an opportunity ASA members have to share the Good News of Christ's redemption with their colleagues! Some of my friends who have always looked to science for personal satisfaction are expressing a growing sense of their own "lostness" in a context which only a fellow-scientist could appreciate. Has the Christian church as a whole made any effort to understand these problems and to minister to the special needs of scientists? Has the church tried to understand enough of the nature of moral choices scientists face in their professional lives to give appropriate guidance and counsel? Has the church valued the work of scientists, respected their frame of reference, and tried to communicate the Gospel in their own language, to speak to their particular psychological and intellectual needs?

There seems to be little evidence for a sympathetic understanding of science or of scientists by the church as a whole, and considerable evidence of lingering suspicion or even hostility left over from battles fought in the past between misguided interpreters of science and theology. Attending a local church in Atlantic City right in the very midst of the Federation meeting reinforced this impression and reminded me forcefully that it is only we who are members of both communities who can bridge the gap between them, and we must do it even at the risk of being misunderstood by fellow Christians as well as by fellow scientists. Is it not true that church-centered Christian education began with the Sunday School movement only about a hundred years ago, and *that* largely out of a need to teach underprivileged children how to read so they could understand the Bible even if they had no other opportunity for schooling? Today I think there is a need to teach enough science to "scientifically underprivileged" Christians to enable them not only to comprehend what goes on around them in a science-oriented culture but especially

to help them avoid inadequate or foolish interpretations of Scripture. This is one great challenge for the ASA; the other is to be Christ's men among scientists, for whom He also gave His life. It is true that the Gospel is to be preached to the poor, and this includes the intellectually poor—but must it be preached *only* to the intellectually poor?

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Philosophy

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Philosophical Anthropology

In present-day philosophy there is a renewed interest in man. This interest arises primarily from the conviction that the attitude of positivistic philosophy, which took the natural sciences as its model, did not do justice to the phenomena of man's life. For the positivist there was little or no place for the study of man apart from the special sciences, as anthropology, sociology, etc. The philosophical study of man was considered to be speculative and unfruitful. Recent thought has reintroduced what was largely eclipsed by the growing empirical sciences—philosophical anthropology. The Socratic dictum, "Know thyself!", is again very much at the forefront of interest.

The viewpoint has taken increasing hold that the positivistic orientation in the special sciences has missed in some fashion or other that which is specifically human and even that which is fundamental to the foundations of the sciences themselves. Thus there has been the attempt to supplement the genetic method, which searches for causes, with a descriptive method. In the field of psychology, for instance, the genetic method was thought to involve the reduction of psychology to physiology. In contrast, a descriptive, phenomenological approach has been developed, which is supposed to view the phenomena of, e.g., the psychological life of man without reducing them to something else. Others, for instance the existentialists, have gone further. They have taken the position that the special sciences, each from its own standpoint, view man as an object. The objective, scientific point of view is supposed to miss that which is "specifically" human. The existentialists say that man, as he is amenable to the study of the special sciences, is alienated from himself, or as others have put it in less technical language, "sick." One of the fundamental interests of existentialism (if not the most fundamental interest) is to overcome man's alienation from himself. In this endeavor they are in their own way carrying on the project of Hegel and Karl Marx.

If there is to be a rebirth of philosophical anthropology, there must be a method which is able once again to open up the area of the "specifically" human. For the existentialist, Karl Jaspers, this method is the transcending method of philosophy in contrast to the objectivating methods of the special sciences. The transcending philosophical attitude is the way to *Existenz,* true selfhood. For Martin Heidegger this method has been a hermeneutic of *Dasein,* the sphere of the typically human, that which has the ability to ask the question about itself.

Of interest is the way in which these methods have had influence within the area of the special sciences themselves. Karl Jaspers did his initial work in the field of psychotherapy, seeking to develop a method that would avoid reductionism and would allow for the phenomena of man in their fullness. Others like Viktor E. Frankl apply an existential method similar to that of Jaspers. On the other hand, the psychopathologist, Ludwig Binswanger, follows a method like that of Martin Heidegger.

A full exposition and critique of the new attempts at philosophical anthropology from a Christian point of view is needed, and some progress has already been made in this direction. One of the foremost interests of Herman Dooyeweerd is to develop a philosophical anthropology along Christian lines. Donald F. Tweedie has recently published a book on the method of Frankl, *Logotherapy and the Christian Faith.* We content ourselves at this point, however, with mentioning a few orientations of the newer philosophical anthropology, some of which are also shared by the newer Christian approaches.

There is a marked critique and rejection of the older dualism of mind and body, which is attributed to the objectifying methods of Rene Descartes and of those comprising the major stream of Western humanistic philosophy who have followed in his footsteps. There is a pronounced emphasis on the unity of man, conceived of in terms of the unity of his bodily functions.

There is also a stress on the self as act, with a consequent attack on the older idea that the body and the soul are substances with relatively hard and fast qualities. By some the human act is thought to have a structure, by others not. There is, however, a definite turn away from the idea that man is a being with a set of fixed qualities to a view that might be called "activistic."

There is also an emphasis on the finiteness of the human self. By finiteness we do not mean human finitude as it is expressed in the Scriptures but the idea that man is integrally bound up with his world and with its situations. Man's self does not hover above the world; in his freedom he is also bound.

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Sociology

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Sociology: A Defense

Part III

In the previous article of this series, the general view was developed that a prime factor of determinism in the life of social man is morality. The need to conform to values patterns his life in ways which are externally controlled. It was seen, however, that even this form of "determinism" is not perfectly provided for by society. Instead, there is much need and opportunity to resist and change molding influences. Yet, the individual has not the right to ignore the patterns to which he is to conform, for to do so would result in anarchy.

This question of maintaining a balance between conformity and freedom within a framework of morality is a critical issue in the sociology of religion. It is particularly well analyzed in a recent article by William Kolb, referred to in the preceding column.[1] For the Christian, Kolb's argument is particularly important because he is disturbed by the lack of objectivity in the field of sociology when attempting to analyze religion and suggests an orientation which is highly favorable to the Christian viewpoint. First, he argues for an image of man based on freedom and moral responsibility in place of the current deterministic views of man. Second, he indicates the complete inadequacy of the present limited view assumed in the sociology of religion. It is precisely the type of reevaluation being done by Kolb which is so essential in sociology today. His article, therefore, also has importance because of the contribution it makes to theory and methodology.

The Judaic-Christian Image of Man

With a true scientific approach, Kolb stresses the point that any concept is valid as long as it fits the observed data. This is a scientific principle too often ignored today because of the ease with which traditional concepts are used to make the observed data support the traditional image. It is Kolb's main hypothesis that the Judaic-Christian image of man more accurately fits that data than the non-Christian image of man.

What does Kolb mean by a non-Christian image of man? Primarily, it is deterministic, omitting the possibility of freedom. The sociological significance of such an image is that the individual must conform to current social standards. The determinism molding the non-Christian image, therefore, is basically social in nature. The question to be raised here is whether such social determinism is truly at the root of sociological theory today. Indeed, Parsons, in the comments which accompany Kolb's article, suggests that such a unified view of social determinism does not exist in sociology today. The field is too dynamic to allow one dominant view to emerge. The argument could also be raised that sociologists are aware of the value of a non-deterministic view of man but have not supported it because the social mechanisms needed to allow deviation to be socially profitable are not well understood. Although some sociological works have preached the value of freedom, they have not shown the means by which it may be satisfactorily achieved. It is suggested here that such general statements favoring deviance and freedom fail to specify constructive functions because they originate in a secular frame of reference which questions authority and threatens society. When based on a non-social, superempirical foundation, however, statements favoring deviance gain their full meaning in fulfilling God's authority. Concepts of freedom would seem to be most clearly specified when based on religious values.

Kolb shows that the deterministic image of man has caused sociology to ignore some basic social values. The individual who cannot be held responsible for his place in society cannot be held liable for his actions. Kolb feels that the problem of juvenile delinquency has been mishandled because the delinquent, as a product of his environment has not been held responsible; it is society which is to blame. Hence, the deterministic image of man becomes a self-fulfilling prophecy helping to cause lack of morality and promoting amorality in sociology and society.

Kolb is very explicit in conceptualizing the Judaic-Christian image of man. He is aware that man and the world are real and knowable. If these are important, then this tradition must seek to know them. He suggests that such knowledge has been gained by the Judaic-Christian view through use of empirical methods and observation. Knowledge becomes existential, historical, and not rational.

The more important characteristics of this image would include the following components. Of the essence is freedom or the conditioned will. Included here is unpredictability, which was considered in the previous column, and uniqueness. Both of these imply that freedom exists in a transcendent frame and cannot be an object of experience or thought. A second characteristic on which Kolb puts much stress is the fact that man has needs which must be met. Such a view is consistent with the freedom of the individual, since, by meeting these needs, social requirements to conform must often be ignored. The key need of man is some sense of meaningfulness. Kolb feels that this may be accomplished best by stressing relations of individual to individual, instead of to groups, and a relationship to a non-empirical entity. Since sociologists have rarely

stressed the need to relate to God as an essential feature of religion, Kolb's emphasis here is significant. The elimination of meaninglessness, according to Kolb, depends upon removal of oneself from the relative world of society and relating to the absoluteness of God. Although the Christian may find this function of God to be somewhat limited, it is nevertheless sympathetic with his conception. Kolb further supports the Christian in his statement of the last two dimensions of the Judaic-Christian image. These are that man is incapable of an adequate relationship with both other men and God, which results in an awareness of sinfulness, and that man is characterized by use of reason and finiteness. With this image as his chief tool, Kolb suggests that the sociological conceptions of religion have not been entirely correct.

The Function of Religion

The traditional view of religion held by sociologists is that it supports the moral system of the society. Conformity to these ultimate values results in cooperation and eventual social harmony. The principal function of religion, therefore, has been stated in terms of the integration of society. Kolb's argument is that it is not possible to conceive of ultimate values without referring their origin back to God. He states that previous attempts to explain the origin of ultimate values have not been satisfactory because they have been based upon an image of man which is socially deterministic. Hence, the values which are accepted by the individual are relative, changeable, and inadequate. Whatever integration is achieved is temporary and dependent upon the concrete situation.

It is for this reason that Kolb has stressed the Judaic-Christian image. Dependence on the non-Christian image results in a distortion of the facts and the statement of a function of religion which is limited. Instead, he suggests that ultimate values can come only from a non-empirical entity to man who acts in accordance with the Judaic-Christian image. It is at this point that his scientific discipline is so well illustrated. He does not argue for his point of view, but rather outlines a model which he suggests fits the facts more closely than the traditional model based upon social integration. This former model would be stated something like this: "We can now recognize 1) that while all ultimate moral value systems have their roots in some religion, not all religions give rise to value systems which include morality—the world may simply be rejected; 2) religion may be a social phenomenon in the same sense that an individual is social but it is not a social phenomenon and need not be a group phenomenon; 3) a religion may fail to integrate a society not only because it opposed an older system of moral values, but because it does not give rise to any system of moral values, because it is not shared, or because the content of the moral values created are not such as to prevent conflict; 4) all religion is not an attempt to resolve the problem of social disruption, although social disruption may be one of the forms that creates the problem of meaning, the answer to which need not be something which will create social order."[2] The Christian can be very sympathetic with such a model, as far as it goes. The sociologist should be aware that it does more accurately portray sect formation as well as the question of function of religion.

Kolb's approach views man as being controlled by God, not society; worshipping God, not society. Using the Judaic-Christian image, society becomes merely one referent in his world of influence. It becomes a means by which values may be achieved but is not an end in itself. It is not a closed system excluding God, but becomes a means by which the individual can relate to God.

FOOTNOTES

[1]William Kolb, "Images of Man and the Sociology of Religion," *Journal for the Scientific Study of Religion,* vol. 1, no. 1, Oct. 1961, pp. 5-22.
[2]*Ibid.,* p. 21 note.

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An Invitation

THE EDITOR

As your new editor shoulders the responsibility associated with his position, he is very appreciative of the excellent work that has been done on the JASA by previous editors. He is also aware of the fact that the JASA must at the same time reflect the purposes of the American Scientific Affiliation and help to direct its progress. Since the *Journal* cannot rise above the level of quality established by its contributors, we are hopeful that all ASA members will give of their best to promote its official publication.

Members and friends of the Affiliation are therefore invited to contribute to the JASA in the following ways:

1. Beginning with the December issue, *letters to the editors* will be published. These are intended to promote the progress of discussion within the Affiliation, not simply to pat ourselves on the back. In what ways do you agree with the writers of this issue? In what ways do you disagree? Perhaps you have comments on articles that have appeared recently in other issues. Of course, this is not the place for heckling nor for libelous slander of the writers! Discussion of the issues should be the focus of attention. No author should ever be made to feel that he is being attacked personally; we remain friends even if we do not agree with each other. The editor naturally reserves the right to publish only representative letters or none at all. They should be received two months before publication date of the next issue to allow time for the necessary editorial work and printing.

2. Submit *manuscripts* for consideration for publication. Perhaps some readers will sense additional topics pertinent to the subject of this issue which ought to be brought to the attention of the JASA audience. Others may formulate answers to the numerous questions raised in President Henry Weaver's survey of "The Most Critical Issue That Modern Science Poses to the Christian Church Today." (This survey was reported in the April 12, 1962, issue of the ASA *Newsletter,* vol. 4, no. 1, pages 1-4.) For the Christian, sharing pertinent ideas with others is one aspect of Christian stewardship.

3. Volunteer your services to the editorial staff to *help evaluate manuscripts* that are submitted. In the future most, if not all, papers submitted will be evaluated by two reviewers. What are your special interests, your qualifications in terms of education and experience, and your viewpoints pertinent to science and religion? Let the editor know these and any other relevant information so that when he receives papers which are pertinent to these interests you can help evaluate them. The editor, of course, will have the final word as to which papers are published, which are returned for revision, and which are rejected. If you would like to serve the *Journal* in some other way, the editorial staff will very likely find a niche for you.

4. *Submit ideas* about manuscripts or papers which others ought to write for the JASA. If there is a significant issue, or a perspective on an issue, which you feel ought to be included in the *Journal,* let the editor know. Also send him suggestions as to persons who might be qualified to write on these topics.

5. Similarly *invite others* who have made a significant contribution to submit their ideas in manuscript form to the editor. Many of the papers presented at regional ASA meetings, for example, are worthy of publication. In the future we hope that all of these, even if still in only crude written form, will be submitted to the JASA for consideration for publication in either their original or revised form.

6. Send your suggestions for *editorial policy and personnel.* By the time you receive this copy of the *Journal,* an editorial staff to help the editor will have been selected by the Editorial Board. Nevertheless, there may be occasional vacancies, and some positions may not yet be filled. Please send suggestions as to features to drop, to retain, and to add. Similarly, we would appreciate your ideas as to whether the JASA should be a popularizing medium of communication written for the general Christian public or whether it should retain a professional orientation toward scholars, scientists, and the leaders in Christian circles. Your suggestions for editorial policies and personnel may be sent either to the editor or to the Chairman of the Editorial Board, Dr. John McIntyre, Sloane Laboratory, Physics Dept., Yale University, 217 Prospect Street, New Haven 11, Connecticut.

7. *Extend the influence of the ASA* by finding new members and new subscribers to JASA. Libraries of educational institutions and scientific laboratories, public libraries, non-Christian scientists who are interested in relationships between science and religion, high school teachers of science, ministers, religious educators, and interested laymen are all prospective subscribers, members, or associate members. Perhaps you ought to give a gift subscription to a friend or to some library in order to extend the Christian witness of the ASA. Gift copies of single issues with articles of special interest to your friends may also be appropriate. Subscriptions, membership applications, and single-copy orders should be sent to the Mankato office.

8. Above all, *forgive* the editor and his staff when mistakes are made. We are but human, so it is inevitable that we will make some mistakes. Perhaps we will reject some manuscripts or letters which ought to be published,

and perhaps some will be published which ought to be rejected. We may make mistakes in our editorials or in the formulation of certain policies which we incorrectly believed to be an improvement. "Let all bitterness, and wrath, and anger, and clamor, and railing, be put away from you, with all malice: and be ye kind one to another, tenderhearted, forgiving each other, even as God also in Christ forgave you" (Eph. 4:31-32).

NEW MEMBERS

Charles E. Anderson, 295 Chestnut Street, San Carlos, California, is a senior engineer with Litton Industries. He holds the B.S. degree from Iowa State College with a major in electrical engineering.

Ronald N. Berry, 1115 Seventh Avenue Southwest, Rochester, Minnesota, received the B.A. degree, with a major in philosophy, and the M.D. degree from the University of Minnesota. He is now on the staff at Mayo Clinic, Rochester.

Max C. Deibert, 258 Melrose Street, Auburndale 66, Massachusetts, is a candidate for the D.Sc. degree at Massachusetts Institute of Technology. In 1960 he received the B.Ch.E. degree at Cornell University.

Charles R. Frame is Principal at Titcombe College, Egbe via Ilorin, Nigeria (under the Sudan Interior Mission). He holds the B.S. degree in zoology from Wheaton College, and the A.M. degree in education from Chicago University.

Donald H. Grove, 5024 Townsend Way, Apartment A-1, Bladensburg, Maryland, is an electronic technician with NASA, Goddard Space Flight Center at Greenbelt, Maryland. He is a graduate of Wheaton College with a B.A. degree in anthropology, and holds a diploma in electrical engineering from Capitol Radio Engineering Institute.

Elbert H. Hadley, 1002 Briarwood Drive, Carbondale, Illinois, is a professor and Assistant Chairman in the Chemistry Department at Southern Illinois University, Carbondale. He has earned the B.S. (University of Michigan), M.S., and Ph.D. (Duke University) degrees in the field of chemistry.

Joseph R. Hoover, 722 West Creighton, Fort Wayne, Indiana, is an intern at the Lutheran Hospital, Fort Wayne. He holds a B.A. degree in physics from Goshen College, and the M.D. degree from Northwestern University Medical School.

Kenneth J. Linder, 218 Eklund Avenue, Hoquiam, Washington, is a teacher (head of the Science Department) with the Hoquiam School System. From Western Washington State College he holds the B.A. Ed. degree as a science-mathematics major.

John Lo, 17 Springfield Road, Morningside, Auckland, New Zealand, is a minister with the Baptist Association of Auckland, New Zealand. He holds the B.A. degree from Hwa Kiu University, and has studied further at Hong Kong University and at the Baptist Theological Seminary, Hong Kong.

John E. Mariner, 614 Hudson Street, Hoboken, New Jersey, is Assistant Staff Engineer for West Virginia Pulp and Paper, New York. He received the M.E. degree from Stevens Institute of Technology this past June.

Donald W. Munro, No. 18, Graduate Circle Apartments, University Park, Pennsylvania, is a graduate assistant in zoology at Pennsylvania State University. In 1959 he received the B.S. degree in biology at Wheaton College.

Walter J. Neidhardt, 227 Lincoln Avenue, Orange, New Jersey, will begin his duties as an instructor at Stevens Institute of Technology this fall. From S.I.T. he holds the M.E. degree, and the M.S. and Ph.D. degrees in physics.

Philip N. Parks, 416 West Elm, Wheaton, Illinois, is employed as a research associate at Argonne National Laboratory, Argonne, Illinois. He holds the B.S. degree in physics and the M.A. degree in nuclear physics from Michigan College of Mining and Technology, Houghton, Michigan.

Frank B. Peters, 1185 Highrock Place, Esquimalt, British Columbia, is Scientific Officer (metallurgist) with the Pacific Naval Laboratory, Defense Research Board of Canada. He earned the B.A.Sc. and M.A.Sc. degrees at the University of British Columbia.

George R. Powley, 503 Airport Road, Blacksburg, Virginia, is a professor and Head of the Department of Electrical Engineering at Virginia Polytechnic Institute. He holds the B.S. and M.S. degrees in electrical engineering from Virginia Polytechnic Institute, and has done additional work in electronics at Harvard University, and in radar at Massachusetts Institute of Technology.

Vincent Sanmarco, Box 61, Buffalo 5, New York, is self-employed as a tutor. He earned the B.A. degree in general science at Wheaton College, and has earned some hours toward the M.A. degree at Western Michigan University.

David Schulert, Route 2, Grand Ledge, Michigan, is Director of Science for the Lansing Public Schools. From Michigan State University he holds the B.S. degree in chemistry, and the M.A. degree in counseling and guidance.

Miss Doris V. Steele, 1908 Alberti Drive, Silver Spring, Maryland, is a chemist with the Non-Metallic Materials Division of the Chemistry Research Department, U. S. Naval Ordnance Laboratory, White Oak, Silver Spring, Maryland. She holds the B.A. degree, with a major in English and a minor in chemistry, from Mary Washington College of the University of Virginia.

John F. H. Stewart, Rural Route 1, Lakefield, Ontario, is a medical missionary to Liberia, West Africa, who is now home on furlough. Under the auspices of the Overseas Department of the National Council of the Protestant Episcopal Church, he acts as the Medical Director of The Agape Medical Center, Cuttington College and Divinity School, Suakoko, C.P., Liberia. He has earned the following degrees: B.A. in biology from University College, University of Toronto; L.Th. from Wycliffe College, University of Toronto; M.D. from the University of Toronto, Faculty of Medicine; D.T.M. & H. in tropical medicine from London School of Hygiene and Tropical Medicine.

Stephen E. Ten Eyck, 2 Willo Lane, Loudonville 11, New York, is a laboratory technician in electron microscopy at The Albany Medical Center. After one year at Albany Medical Center (June, 1962-June, 1963) he plans to go out under the Peace Corps. He has a B.A. degree in biology from Gettysburg College.

Arthur G. Troyer, 1121 Ninth Street, Goshen, Indiana, received the B.A. degree in biology from Goshen College this past June, and plans to enter seminary this fall.

David L. Wheeler, 367 Chase Parkway, Waterbury 8, Connecticut, is a research metallurgist with the Anaconda American Brass Company in Waterbury. He earned the B.S. degree in metallurgical engineering at the University of Wisconsin.

Nathan A. Willits, Ringwood, New Jersey, is Registrar at Shelton College. He holds the B.S.M.S. degree from Rutgers University and the Ph.D. degree in soils from Michigan State.

NEW ASSOCIATE MEMBERS

Phillip Bruce, 2808 Spottswood No. 4, Memphis, Tennessee, is a senior majoring in mathematics at Memphis State University.

O. B. Fearing, 54 Pleasant View Road, Arlington, Massachusetts, is an active member of the Evangel Baptist Church, Belmont, Massachusetts.

Richard B. Gartrell, 5517 Masonic Avenue, Oakland 18, California, is a student at San Francisco State College where he is majoring in speech.

Gerald G. Roth, 4328 North Monticello Street, Chicago 18, Illinois, is a student at North Park College, Chicago, studying in the fields of human relations and philosophy.

EDITORIAL

In the masthead pages of this issue you will note that the *Journal* has a new Editor, Dr. David O. Moberg. With his appointment to this post, the *Journal* should rise to the place it deserves in quality and interest. In my talks with Dr. Moberg I have been highly impressed with his plans and the energy and devotion he is putting into them.

As many of you know, Dave is Head of the Department of Social Sciences at Bethel College in Saint Paul. Among his qualifications for the editorship is the experience of being the author of a number of papers, co-author of a recent book, *The Church and the Older Person,* and author of a new textbook in the sociology of religion entitled *The Church As a Social Institution.*

As I leave the position of Editor I want to express my appreciation for the fine support and encouragement you gave me in this work. With the diversity of opinions in the American Scientific Affiliation it is quite impossible to follow any course without criticism. Yet with our decisions, good or poor, there was very little strong objection; a spirit of patience and tolerance is one of the assets of the ASA membership.

There are so many of you individually that have backed me up in this task that it is impossible for me to try to list them. Two groups I must mention specifically, however. One is the Executive Council with its officers. As a group and individually they have invariably been a source of encouraging support both in the work and in persuading me to continue at times when I thought the editorship should be passed along to someone else. The other group consists of the column writers who faithfully contributed to the *Journal* pages. At times, at least in earlier days, the *Journal* would have been quite lean had it not been for their efforts.

A forward step was taken in the establishment last year of an Editorial Board responsible to the Executive Council for management of the *Journal.* As this group takes over more of the labor of policy decisions, the Editor will have more time to devote to editorial problems.

I would like to leave this by suggesting that each member consider himself a part of a team with the Editor to further the witness of the ASA. He will be doing this work in his spare hours, with no pay, after taking care of a full-time position. The quality of the material published is no better than that you provide for him. If you feel that something is below par—well, he is probably waiting to receive the better paper you could supply.

So, many thanks for the opportunity to have served the American Scientific Affiliation and its cause as Editor of the *Journal* for the past eleven years.

D. N. EGGENBERGER