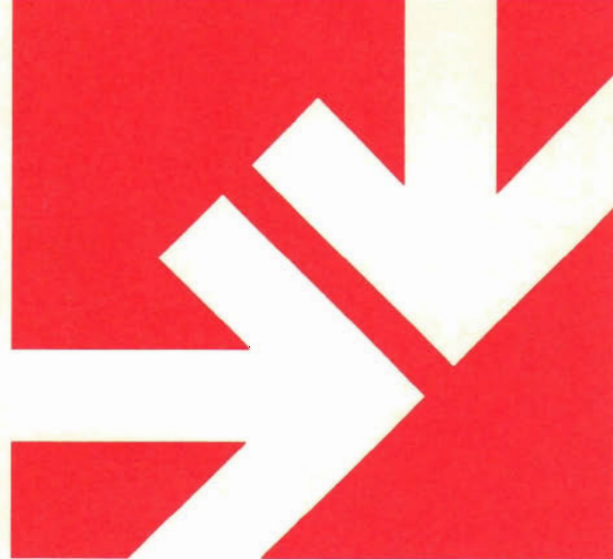


# JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION



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

VOLUME 21 NUMBER 4

DECEMBER 1969

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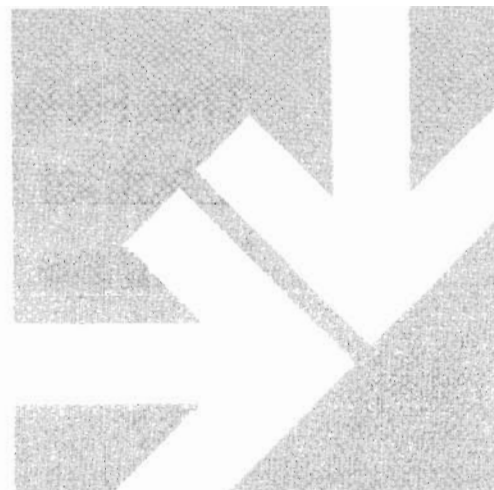
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# JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION



DECEMBER 1969

PRINTED IN THE UNITED STATES OF AMERICA

VOLUME 21, NUMBER 4

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# The Relationship of Science, Factual Statements and the Doctrine of Biblical Inerrancy\*

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## Kinds of Objections

There are three typical kinds of objection made against Holy Scripture either with the intention of discarding Scripture as a whole or of qualifying or modifying its range of authority.

First, it has been alleged that there are *contradictions* in Holy Scripture. The most obvious reference here is to the various places in Scripture where two different numbers are given in two different passages. Stephen speaks of the Israelites being in Egypt four hundred years (Acts 7:6) whereas Paul says the stay was four hundred and thirty years (Gal. 3:17). Or else a contradiction is supposedly found in two divergent ways of explaining the same event. In holy communion Matthew and Paul state that the disciples partook of first the bread and then the cup. Luke reverses the order and puts the cup before the bread (Luke 22:17-19). This is not a scientific problem *per se* but a literary or critical one. We are not concerned in this paper with this kind of problem, judging it as not a problem of science but of literary criticism.

Second, it has been alleged that in certain matters the *moral character* of a supposed Word of God is in contradiction to man's moral sensitivity. The most common reference here is to the command given to Saul to slaughter all of the Amalekites (I Sam. 15:1-5). In recent philosophical theology the problem is raised in a different context. It is asserted that the two propositions; (i) God is love, and (ii) there is evil in the world, are contradictory. This kind of problem is one which belongs to theology or apologetics or philosophical theology but not to science.

Third, it is asserted that either the general view of the universe in Scripture or particular *factual references* are contrary to what we know the facts to be in the twentieth century. That is to say the "bowl picture" of the universe of the Old Testament or the "three-decker" view of the universe in the New Testament clash with our knowledge of astronomy. Or some particular factual reference is contrary to what we now

know to be the case from science. This is the kind of problem we wish to discuss as this does get us into the relationship of science and Holy Scripture. The problem of the relationship of Holy Scripture to scientific knowledge is much larger than our purposes here. We are intentionally cutting this problem down to the problem of factual error in Scripture, as such allegations refer to both science and Scripture.

## The Problem of Inerrancy

The debates in the nineteenth century over the credibility of Scripture created by the growth of the sciences forced theologians to talk about the character of the perfection of Scripture as never before in the history of theology. Part of this discussion was the problem of inerrancy: (i) do the Scriptures teach their own inerrancy? (ii) are there contradictions in Scripture of a scientific nature?<sup>1</sup>

To some theologians this is no problem at all. For example Rudolph Bultmann accepts the authority of the New Testament in the Church but to him the New Testament is authoritative only in its existential layer. The fact that much of the New Testament may be mythological or historical fiction doesn't concern Bultmann's theology at all because it is not in this kind of material that the authority of the New Testament rests. Barth believes that the Scriptures are a *witness* to revelation and to be heard they must be of the same order as our existence. There are then possible errors in Scripture, in fact and in theology, for these reveal that the Scriptures do have a human or worldly character. So even half-a-dozen errors in Scripture would not be any problem as far as Barth is concerned.

However, evangelicals or conservatives or orthodox, have felt that if there is a divine revelation which in turn is given to us in Scripture by divine inspiration, then something must be said about the trustworthiness of Scripture of a very high order. To some evangelicals this meant the inerrancy of Scripture in all matters of fact and history as well as faith and morals. The Scriptures must possess this kind of inerrancy because

\*Based on a paper presented to a meeting of the San Francisco Bay Section of the ASA on May 10, 1969.



faith and morals in Scripture are embedded in the historical or factual and it is confusion to state that there is inerrancy in faith and morals but error in fact and history.

What has caused such agitation among evangelicals about Scriptural inerrancy in both the 19th and 20th centuries is that each in its own way challenged vigorously the complete inerrancy of Scripture: (i) so-called higher or destructive Biblical criticism; (ii) the developments of science and the restructuring of our concept of the universe in its every dimension; and (iii) the rise of religious liberalism at the beginning of the nineteenth century,<sup>2</sup> which accepted the errancy of Scripture as a philosophical and/or theological and/or critical necessity.

However it must be pointed out that historically the inerrancy of Scripture is not the kind of perfection of Scripture the Reformers and post-Reformation orthodox theologians taught. They stressed what they called the *attributes* or the *affections* of Scripture. The theologians had no uniform list but they mention such things as: authority, clarity, effectiveness, truth and certainty, integrity, holiness and purity, perspicuity, necessity, efficacy, sufficiency.<sup>3</sup> The Lutheran list was: authority, perfection, sufficiency, perspicuity and efficacy.<sup>4</sup> The importance of this will be indicated later in this paper.

The careful analysis and definition of such terms as error, contradiction and inerrancy belong to the logicians. In the spectrum of the faculties of a university it is the territory of the logicians to discuss the problem of error on a technical and theoretical level. This paper will be strongly oriented in this direction. (This is an altogether different question from whether Christianity is logical or rational. Logic deals with the relationship among propositions and this is the kind of relationship we are discussing here).

In a general way anticipating what will be said later, the definition of an error and the assertion that there is a contradiction among propositions is an incredibly difficult matter. In almost all discussions on the errancy or inerrancy of Scripture there is little theoretical discussion of the logical character of an error and the logical problems of asserting a contradiction.

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*It must be pointed out that historically the inerrancy of Scripture is not the kind of perfection of Scripture the Reformers and post-Reformation orthodox theologians taught.*

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In logic the definition of an error (a contradiction) is not difficult: A proposition and its negation cannot both be true at the same time. The most obvious application of this to Scripture is to locate two different passages which are speaking of the same event and in which the numbers mentioned contradict each other. As already indicated we are not interested in this particular problem. This is a matter of literary criticism or of logic in its formal meaning and therefore not part of scientific considerations.

At this point I would like to make this observation. I am not a mathematician so I must take the word of

other scholars. The mathematician, Gödel, has shown that when a mathematical system reaches a certain state of complexity it becomes impossible in principle, not in just technical difficulty, to show that a given theorem is consistent with the body of the mathematical system.<sup>5</sup> In reading about Gödel I asked myself the theoretical question: is this purely a mathematical problem, or can philosophical or theological systems become so complicated or so complex that the detection of a contradiction is either impossible or unusually difficult? I do not know if we can go from mathematics to metaphysics and theology, but it at least runs up a red flag in my mind which says that affirming an error or contradiction in Christian theology may not be the simple thing or obvious thing that critics of Christian theology make it out to be. However this is a digression.

### Detection of Error

We are concerned directly with errors in fact. Here again the definition of error is not so difficult but the actual detection of error may be very difficult. If the content of a factual proposition differs from what we know the facts to be, then the proposition is in error.

However when we come to apply this criterion to matters of fact (natural history, history, the sciences, etc.) we find in some instances that it becomes a wretchedly complex matter. Neither at the technical nor the popular level do we operate with a simple calculus of yes or no, true or false, right or wrong, coherence or contradiction, fact or error. We find that we must use a lot of other terms which indicate either how complex the materials are or how sloppy our present ability to verify is. Concretely in our expositions or lectures we use such terms as tension, implausibility, contriety, paradox, the dialectical, problem, difficulty, obscurity, blunder, and probability.

This means that as any scholar reads any document of a factual or historical nature these are the various logical counters in his head. He neither thinks nor writes with a simple system of right or wrong. But besides using such terms as error or contradiction he finds himself also using some of the words listed at the end of the previous paragraph. Therefore in many situations it is the subjective disposition or the prejudices or the cultural slant of a person which determines which of these logical counters he is going to use.

Here is an example with reference to Scripture. A Unitarian may read the Bible and, coming to a certain passage, he says, "There is an error here". Out of the whole range of possible words he could use about the phenomenon he uses "error". As a Unitarian he has a subjective urge to find as many errors in the Scripture as he can, for that in turn is a kind of way by which his own case is reenforced. However, an evangelical scholar with a high regard for Holy Scripture will say that there is no error in the passage, but there is a problem or a difficulty.

Our point here is simply a cautionary one: namely, it is not an easy thing to assert error in an ancient document. Frequently when the critic of Scripture affirms an error in Scripture, there may be more logical justification to call it a problem or a difficulty. We simply cannot assess the trustworthiness or integrity of Holy Scripture by restricting our logical apparatus

to a yes or no, a true or false.

If a person doubts what is said in the above paragraphs let him tune in on a political debate or a debate about economics or philosophy. The attacker of a system finds that it abounds with errors and contradictions because as the attacker he wants to destroy the foundations of the opposition. He therefore speaks of very obvious errors and contradictions which any person with ordinary sense can detect. But the defender of the position thinks that these errors and contradictions are just problems and difficulties which he will eventually iron out even though at the moment he does not see how he shall resolve them.

We do not wish to give the implication that the evangelical Christian can get off the hook any time he wants to by resorting to the complex character of asserting error. We are, rather, suggesting that the assertion of error in any kind of historical or factual or scientific literature is not an easy thing to do. There may be some errors in Scripture. If this is the case we cannot hide behind some casuistry of logic. We only wish to say that those scholars who set out to find error in Holy Scripture ought to have some idea of the complex range of logical terms one may use in dealing with documents or manuscripts or books, and further, which terms out of the possible list mentioned above cannot be divorced from the intent or prejudices of the scholar. There is an ineluctable subjective element here whether we admit it or not.

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*Scholars who set out to find error in Holy Scripture ought to have some idea of the complex range of logical terms one may use in dealing with documents, manuscripts or books, and which terms cannot be divorced from the intent or prejudices of the scholar.*

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### Importance of Context

Attempting to pick out the word which accurately describes a problem passage (e.g., difficulty, problem, ambiguity, or error, etc.) is only the beginning of the difficulties in dealing with error in any given document. The further complication is this: the special nature of a document reflecting certain intentions or goals of the author of the document means that error must be discussed within the context of the speciality of the document.

Within a given context all of the following statements are true even though on the surface the statements appear contradictory: "the general declared war," "the president declared war," "the senate declared war," "the United States declared war" or "the people rose up and declared war on so-and-so." The historian picks out which expression he wishes to use as governed by the kind of historical explanation he is giving.

### Some Biblical Illustrations

This thesis that the concept of error becomes somewhat free-floating in different kinds or species or genre of literature (and in many cases in the divergent levels of explanations of scientific theories) is not peculiar

to Biblical materials but characterizes all literature and history. But for our purposes I shall use Biblical illustrations because I am most familiar with them.

(i) The Hebrews used specific numbers for general quantities. Thus ten could mean some and forty could mean many. There are many more special ways that the Hebrews used numbers but this suffices for our purposes. So if the text says that a certain historical period lasted 40 years or 40 days and we know by independent means that the actual number was 38, there is no contradiction. Even though the text gives a specific number, by literary custom it intended only to express a general quantity.

(ii) Genesis 1 has a series of lists of different sorts such as astronomical bodies, creatures in the sea, creatures on land, as well as lists of plants. These are not intended as exhaustive lists. There is no mention, for example, of comets, planets or galaxies. However there is no error here in the Hebrew listings because the intention of the author was to express *totality* in the manner and custom in which he understood totality, namely, God is Creator exhaustively of everything. An actual scientific set of lists, if such in itself were possible even in the twentieth century, would add nothing to the original intention the author of Genesis 1 wished to convey.

(iii) Luke gives two different accounts of Paul's conversion, which are given in the text as if Paul were speaking directly (Acts 22 and Acts 26). The situations were different, some of the intentions were different, and perhaps other factors were present known by Paul and Luke but not to us. Thus Paul is speaking to a given situation in which he must adopt his presentation. If this is the true state of affairs then one account cannot be pitted against the other. There are other autobiographical remarks in the Epistles which may on the surface seem quite different from what is said in Acts (especially in Galatians 1 and 2) but here again if we get the whole situation in perspective, the accounts are supplementary and not contradictory.

(iv) The manner in which the Scriptures speak of the cosmos is from man's standpoint, meaning his concerns, his relationships, his responsibilities, his spirituality, and his worship of God. They are not intended as objective, impersonal, accounts from which everything anthropic is eliminated.

### Kinds of Explanation

At this point the issue gets a little more complicated as there is a good deal of material in philosophy about what constitutes an explanation. The *Encyclopedia of Philosophy* (eight volumes) has a number of very special articles on the different kinds of explanations there are. The phenomenon of sexuality illustrates the multiple character of explanation. Sex can be explained anatomically, physiologically, psychologically, and sociologically. Granted there is some overlap in each explanation, but in general each one of these disciplines will have its own unique configuration in explaining sex. Such matters as suicide and divorce have very different kinds of explanations when we approach them on the one hand psychologically and on the other hand sociologically.

Similarly the cosmos can be explained from many different perspectives. The philosopher Heidegger has called them *Entwürfe*—sketches. The Biblical view of the cosmos is a sketch based on man as the central

actor and the point of reference; the scientific sketch of the universe is impersonal, abstract and deals more with laws and models. The two do not conflict, for as sketches they each have a different function.

We must again restate what we are attempting to do. We are affirming that some kind of investigation must be made about error in the realm of symbol and in the realm of fact before we can really speak to the point of possible errors in Scripture. We have further attempted to point out that in some instances the affirmation that there is error may be very difficult—and we are referring here to scholarship in general, not just to Biblical materials. Nor are we attempting to provide an easy out for Biblical difficulties. We are demanding that the critic take a look at the whole problem of error and realize its complexities before he starts assigning errors in Scripture.

### Possible Errors Related to Science

There are two kinds of possible errors in Scripture which are related to science. The first is that the general way in which the universe or the world or some part of it is represented is contrary to our present scientific understanding of these things. Right now the "hot copy" item is Bultmann's rejection of the New Testament picture of the universe as a three-story house. The second is that in some specific reference to fact there is contradiction between what Scripture asserts and what science claims to now know. Let us look at each in turn.

### General Representations of the Universe

The first objection we have already partially answered in our above discussion of the difference between the sketch of the cosmos made by science and the sketch or sketches we have in Scripture. However I think it is possible to make a distinction between the structural and cultural forms that revelation comes through, and the revelation itself. The revelation does not dignify the structure into the category of the revelational.

I will present what German scholars call a "thought-experiment." I think it is possible to teach the doctrine of creation from the point of view of the cosmological systems of Ptolemy, Newton or Einstein. I think the kinds of things Scripture wants to say can be said in context of any of these three theories without dignifying the theories as such as revealed truth. I know that there are always difficulties with "husk and kernel" theories or divisions between "form and content." I am aware of how dangerous this can get when we see the way in which Bultmann (in my opinion at least) destroys genuine New Testament theology when he makes a distinction between mythological form and existential content, or between what is said (*Gesagt*) and what is meant (*Gemeint*). However if revelation comes in a pre-scientific, pre-critical period in history some sort of distinction has to be made. A revelation couched in terms of perfected science as of the year 3,000 A.D. would have been a meaningless and confusing revelation. Therefore it is valid to make a distinction between the structural or literary forms in which a revelation comes and what the revelation itself teaches. We make this distinction in the New Testament when we learn the revelatory content of a parable without stating that a parable is the perfect form of teaching because Jesus used it. As a matter of fact it

was used by the rabbis before Jesus. One of their common expressions was: "I will parable to you a parable."

The point at which I am driving is this: when we make a distinction between the modality in which a revelation comes and the teaching of the revelation itself, there is no contradiction between modern scientific pictures or models and Biblical revelation. Hence there is no scientific error at this point. How far we can push this I do not know; I at least suspect that if a pre-scientific world view were strongly animistic or polytheistic or mythological, it could not serve as a structural form through which a true revelation could come.

### Statements of Fact

There are some difficulties, however, with reference to particular statements of fact. I can suggest only a few.

In Genesis 30 mandrake plants are considered aphrodisiac plants (sexual stimulants). The plant has no such powers.

Also in Genesis 30 is recorded how Jacob thought he was determining the kind of offspring from his flocks by his use of peeled rods. This is contrary to what we know of genetics.

Genesis 2 records the four rivers of Paradise but modern geography knows of no such configuration of rivers that Genesis 2 speaks of (Pishon, Gihon, Hiddekel, Euphrates).

Certain persons, such as Esther and Darius (Daniel 6), are not known to historians where they think they have enough information to make such a judgment.

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*A revelation couched in terms of perfected science as of the year 3000 A.D. would have been a meaningless and confused revelation. Therefore it is valid to make a distinction between the structural or literary forms in which a revelation comes and what the revelation itself teaches.*

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If there were 600,000 men in the Exodus escape (Exodus 12:37) then it is calculated there were somewhere between two and three million people in all. Generals who are specialists in such kinds of mass movements of people declare it is an impossibility. Furthermore if Joshua had an army of 600,000 men there would have been no real contest in taking the various cities of Palestine. Three million people themselves would have just walked over everybody without a battle.

These are the kinds of materials where Biblical statements may clash with modern scientific knowledge.

How does an evangelical react to this? There are a few things that can be said.

(i) Not everything the Scripture records is what the Scriptures teach. Or as Charles Hodge put it in the last century, we must make a distinction between what the writers believe as persons and what they wrote as Scripture. Maybe all of the Hebrew authors of the Old Testament thought that the heavens were an inverted bowl supported by pillars. But they did

not teach this as God's revelation. With reference to mandrakes the Scripture does not approve or disapprove of mandrakes. It simply records how the patriarchs felt about mandrakes. So there is no factual error here as there is no Biblical teaching about mandrakes that would clash with our modern knowledge of botany.

(ii) Perhaps we do not know either exactly what certain Hebrew words mean or perhaps we don't know all the thought-patterns of the Hebrews. The word *elep* translated by thousands may also be translated by "family" or "tent group." So instead of 600,000 warriors in Israel, demanding a total population of some figure over 2,000,000, we arrive at a figure of about 27,000 which then is a reasonable number.

Or else the Hebrews used inflated numbers to express the power of the glory in the action of God (cf. here also the large numbers in Genesis 5). It is a common expression in English to say that "a million people were there" in referring to a parade or a fair or a sports contest when we all know that maybe only 10,000 were there. Hence such occasional use of large numbers in the Old Testament may not have been intended to be taken literally but may have been, rather, "mathematical hyperbole".

(iii) There are two possible solutions to the four rivers of Genesis 2. The older solution is that the four rivers are four great canals dug out by the ancient Babylonians or inhabitants of Mesopotamia to facilitate the irrigation of the land. In recent years Renckens, a Dutch scholar,<sup>6</sup> has presented a different solution. He claims that the chapter is not expressing literal fact or straightforward prose history. It is a chapter written according to our modern expression of "poetic license". Water in the Middle East is very scarce compared to such states as Washington or Oregon or tropical countries with their daily downpour. About 75% of the land in the Middle East is desert or semi-desert. Egypt is 95% desert. Therefore one of the ideas of heaven itself in the Middle East is a glorious supply of water. So Genesis 2 is not literally about four ancient rivers or four ancient canals but a reference to the unusual supply of water given to the first man to show the goodness of God and the wonders of Eden. If Rencken's interpretation is correct then there is no conflict between Genesis 2 and its four rivers and our modern knowledge of the geography of the Middle East.

(iv) With reference to other problems of factual statements of Holy Scripture and their alleged contradiction by modern science we can say "wait and see." This is not a question-begging procedure or a theological "cop out." Modern archeology is usually dated as of the year 1798 when Napoleon invaded Egypt and had with him not only soldiers but a number of scholars who investigated many of the great antiquities of Egypt and published their findings upon their return to France. The great American archeologist, Albright, said that it was not until at least 1920 that we could really begin an intelligent correlation of archeological materials with Holy Scripture. I have no idea what sort of number to cite here, but certainly a great number of problems of the Hebrew Bible have been cleared up by archeological research. To be honest we have to say that at the present time archeology has also created some problems with the Old Testament. But in view of the past one hundred years or so in

which so many Biblical conundrums were resolved it is not asking too much or shirking real scholarly responsibility to simply say "wait and see." This does not mean that of a necessity Scripture will be vindicated but it does claim that any judgment made now with a spirit of finality may be embarrassed by future discoveries.

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*If there are errors in Scripture or if there are no errors in Scripture is essentially a factual question, not a theological one. And therefore this issue is going to be settled eventually by empirical, factual studies and not by theological presuppositions.*

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### Science and Inerrancy

I must say in summary that my concern about science and inerrancy is not the same concern as that of many of my evangelical friends. They believe that the assertion of Biblical inerrancy is a theological must. A number of reasons are given for this. "If Scripture is the truth of God it must be true in all that it says." "If there is error in Scripture then it becomes impossible to tell what is truth and what is error." "If God truly reveals himself and his plans in Scripture and this is certified by verbal inspiration, then no error can exist without impugning both the doctrine of revelation and inspiration." "If we can't trust all of the Bible perhaps we therefore cannot trust any of the Bible—just as a witness caught in one lie while on the dock will then be suspected with respect to everything else he says." "If the inerrancy of Scripture is denied then we have started a theological program that will eventually lead us to a great deterioration of orthodoxy so that we will end up as some sort of liberal or modernist or existentialist."

I think very differently at this point. To me whether there are some errors or not in Scripture is something determined empirically. We cannot dogmatize facts into or out of existence. They are just "there." If there are errors in Scripture or if there are no errors in Scripture is essentially a factual question, not a theological one. And therefore this issue is going to be settled eventually by empirical, factual studies and not by theological presupposition.

Furthermore an inerrant document is not thereby a divinely inspired document. It is possible to write a text in mathematics or symbolic logic which contains no errors. This does not make these books divinely inspired. An inerrant Scripture would say only that error cannot be charged against Scripture and so challenge its divine inspiration, but as such it does not prove that Holy Scripture is divinely inspired. For this, other categories and other kinds of reasoning are necessary.

Furthermore I think the "all or nothing" way of putting the issue is not the way we would really react. Suppose, for example, after ransacking all possible evidence, we come to the conclusion that Paul's figure of 23,000 in I Cor. 10:8 is in error with the report in Numbers 25:24 which reports 24,000. (I have read the usual explanations or harmonizations of



this passage). I think that less than 1% of the body of evangelical believers would renounce their faith if this were substantiated as an error or if any other error of this kind were shown in Holy Scripture. The reason to me is quite obvious. Christians do not really stick with the Christian faith because of the inerrancy of Scripture but because of their experience of Christ and of the Holy Spirit and of the spiritual content of Holy Scripture which has so effectively spoken to their own hearts.

Furthermore, the problem is not this simple. We cannot assert "I believe there are no errors in Scripture," and then pretend that all is settled or all is at rest. There are some very difficult problems with the text of Scripture. We know from reading the Latin Vulgate and the Greek translation of the Old Testament that some words or phrases have been dropped from the Hebrew texts we now use. In some cases just the reading of the text indicates that something has been dropped out. We have the difficult problem of deciding on the canonicity of certain books such as Esther. Or in the New Testament we really do not know who wrote Hebrews and so we cannot say with historical certainty that Hebrews is apostolic and therefore part of the canon. I will not extend these remarks, but apart from the allegation that there are errors in Scripture there is an immense amount of material in Scripture that is very ambiguous for one reason or other—historical, moral, factual, or in meaning. Therefore the assertion that the Scriptures are inerrant does not really settle the critical dust. It does not immediately make the Scriptures free from all problems or ambiguities. And these other kinds of problems may be more disturbing with respect to the integrity of Holy Scripture than any incidental error in a matter of fact. Supposing the critics are right that the Gospels are not really historically reliable accounts of the life of Christ, but are about 90% invention of the early Christian Churches; or that Acts has very little history in it but is primarily a propaganda document written to reconcile conflicting parties in the Church or to vindicate Paul to later congrega-

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*I am somewhat bewildered by some of my evangelical friends who think all is safe if they can show that all the proposed errors or contradictions in the Scripture can be challenged and shown to be problems or difficulties rather than errors. Nobody can play the game of infallibilities in the 20th century and win.*

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tions; or that Colossians and Ephesians are really at least second or maybe third generation documents and not Pauline at all; or that II Peter is a purely second century fabrication; or that John's Gospel is some sort of literary mutation drawn from many non-Christian sources (which is about the position Bultmann takes in his commentary on John which is supposed to have sold more copies in Germany than any other single volume that is a commentary on some book of the Holy Scripture). All of these things could be said

without claiming that there is any error of fact. Yet if such theses were generally true, they *would* destroy any evangelical or orthodox version of Christianity.

Problems, difficulties, ambiguities, etc., can do far more damage to faith and to one's belief in the integrity of Scripture than a sheer contradiction here and there. So I am somewhat bewildered by some of my evangelical friends who think all is safe or all is well if they can show that all the proposed errors or contradictions in the Scripture can be challenged and shown to be problems or difficulties rather than errors.

### The Game of Infallibilities

Nobody can play the game of infallibilities in the twentieth century and win. The Roman Catholic Church thought they had it won with an infallible Tradition (Scripture and tradition with the small "t"), and with an infallible pope, and with infallible ecumenical councils. But now all is in turmoil because historical science has caught up with the Roman Catholic Church. All of these infallibilities must eventually be conveyed in the fallible language of a bishop or a priest to the laity; or, the theologians who study these infallible documents come up with alternate interpretations illustrating that the infallible document is subject to many fallible interpretations; or, as many "concessionist" Roman Catholic theologians are saying nowadays, all the papal utterances and decrees of councils must be seen in their historical context and so corrected or adjusted. For example, the position of justification taken by the counter-Reformation Council of Trent is hard to square with the latest Greek studies of the New Testament. So we are told the decree of the council of Trent was meant to neutralize the one-sided forensic view of the Reformers and therefore must be interpreted in that light. All decrees of popes and councils are historically relative. So the game of infallibilities has really been lost in the Roman Catholic Church.

The affirmation of an inerrant Bible must not lead us to imitate the game of infallibilities. Our exegesis may be good but we can't assume that it is all infallible. Our doctrinal statements may be, in our mind, exactly what Holy Scripture teaches, but we cannot say they are infallible as the Roman Catholic Church pronounces about her *de fide* dogmas. There is an ambiguity in all of life. We are hedged in by all kinds of probabilities and obscurities in our earthly pilgrimages. There are sufferings, tragedies, cataclysms, and accidents which perplex all of us when we attempt to correlate these with divine providence. It is therefore a mark of spiritual maturity, theological maturity, and emotional maturity when we can learn to live with that which is expressed in Luther's famous phrase, "the theology of the cross."

For my own faith the divinity in Scripture is that it is the bearer of revelation. But how this revelation comes through to me and holds me and grips me and sustains my faith in Holy Scripture is that which was mentioned previously: the perfections or affections of Scripture. I find the Holy Scripture is functionally the Word of God to me because of its divine authority, its sufficiency [or "perfection" in the sense that it teaches all we need to know in this life for salvation, Christian living, and the hope to come], its clarity, and its efficacy. These are the qualities whereby we really are factually and effectively held to Holy Scrip-

tures, for in these matters the Scriptures do function as the written Word of God.

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*There is no relationship between the Bible and science as we know it today.* Just about as much relationship exists between apples and rocks as between the Bible and modern science. The differences in content, scope, and purpose are so vast and profound that one has to look very hard to find any similarities or relationship. Indeed, the danger in such a search is that one is likely to come up with apparent similarities and false relationships, as a result of misinterpretation of Scripture and misunderstanding of science. In order to avoid this danger it becomes more important to contrast the differences rather than to compare the similarities which might establish some relationship between the Bible and science.

*Although the contents of both the Bible and science are presentations of the truth, the natures of their respective truths are profoundly different.* The Bible contains the truth of God's Word, the "spiritual," religious, or theological truth vital to the wholeness of human life. It declares Jesus Christ to be the Way, the Truth, and the Life. It proclaims God's great love for people and for His creation. It displays His plan of salvation and reconciliation to a people full of loneliness, greed, self-centeredness, hatred, and to a world full of broken relationships, imbalance, and out of control.

Science, on the other hand, contains the truth of God's world, the physical, biological, psychological, and social truths which describe and correlate the measurable and observable contents of the universe—matter, energy, forces, and processes and relationships of life.

Biblical truth is rather static and claims to be absolute, although its form and means of expression may change in order to convey its message clearly to a changing world. Scientific truths are relative and dynamic, constantly subject to change by expansion and revision.

The Bible witnesses to the living Word, Jesus Christ; this is a conclusion of faith. Science points to understanding of the world; this is a conclusion of knowledge. The purpose of the Bible is not to present scientific truths, and the purpose of science is not to present theological truths. I don't believe that inerrancy of the Bible extends to scientific and historical veracity, but to those theological truths which make it the "only unerring guide of faith and conduct." The

authority of the Bible rests upon the authority of Jesus Christ, the living Word. The validity of science rests upon experimental verification.

*The approach to truth is also radically different.* The Bible proclaims truth through inspiration and revelation. Science discovers truth through an orderly process known as the scientific method, involving inductive logic and empiricism, although some of the most revolutionary scientific discoveries have been made "accidentally" by a combination of intuition and rare insight. Nevertheless, the observations and data upon which these great scientific concepts are based were arrived at through the scientific method.

The Bible tends to "answer questions" beginning with, "Why?" e.g., "Why is man here? Why is man the way he is?" Science tends to answer questions beginning with "How?", e.g., "How did man get here? How did man get the way he is?" The Bible is concerned with ultimate purpose; science is concerned with mechanisms.

**The Bible is a book I approach with reverence—especially in the respective originals because every time I read a passage it seems to be new, it conveys something new to the situation in which I find myself. Somehow it seems to have answers for some of my "scientific" searches, too, though I refuse to look upon the scriptures as a scientific textbook. It contains truth which will reveal itself in new ways always.**

Science is my field of endeavor and also something not stationary. Any theory in scientific thought can only be a model, never an absolute truth. Though our continued guesswork can help us make more models and through them find solutions to specific situations (medical advances) even scientific thought is subject to "fashions" and always to be taken with the idea, that things may look quite different a few years hence.

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The Bible is a witness to the activity of God in the affairs of people and in history. Science is the activity of people probing the nature of the world.

*In conclusion, no significant relationship can be found (by this observer) between the Bible and science, because no such relationship is intended by either the writers of Scripture or by scientists.* However, some case may be made for the Bible giving support to scientific endeavor, and vice versa. For example, God's directive in Genesis for man to "sub-

due the earth and have dominion over all living things" requires pursuit of knowledge (science). And, in the other direction, some archaeological discoveries have given the Biblical record a measure of historical support. But I am not convinced that the establishment of these relationships between the Bible and science is a basic goal of either.

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Understanding the revelational content of the Bible means getting out of the Bible what God put there by inspiration. Understanding the revelational purpose of the Bible means asking the right questions to find out what God put there. The basic guideline to the right questions is the Bible's own teaching about the purposes for which it was written. The right questions are essentially theological questions, taking that term in its broadest sense to include questions about the nature of God, the nature of man, the relationship between God and man, and the relationships between man and man in fulfillment of the God-to-man relationship. The wrong questions are those that seek to establish natural mechanisms for God's activity by looking for these mechanisms in the Bible; there is no information in the Bible, for example, that is either in favor of or opposed to theories of organic evolution. . . .

In view of the scientific data now available, are we forced to the conclusion that there is a basic conflict between the natural revelation pointing toward evolutionary origins for man, and the Biblical revelation setting forth the creation of man by God?

The only conflict that can exist is one between our interpretation of the paleontological record and our interpretation of the Biblical record. Is the paleontological record showing us a pattern of general evolution in which man has a long, continuous history that can be traced back over several million years to primitive manlike animals? Is the paleontological record showing us that man has evolved not only morphologically, i.e., physically, but mentally and culturally as well? Is the Biblical record showing us the scientifically describable mechanisms by which God created life, animals, man, and woman? Is the Biblical record showing us that at one moment of time God created the first man Adam from dust of the earth, and then at a later time He created the first woman Eve from a rib of Adam?

*If these are our interpretations of the paleontological and Biblical records, then conflict is inevitable. No individual could hold both points of view simultaneously. What are the alternatives?*

We could conclude that the Biblical record provides the only scientific data worth considering. On this basis we could simply ignore the paleontological data on the grounds that the apparent pattern and

evidence are intrinsically spurious. These data must then be assumed to be susceptible to interpretation in a different way. There appears to be no position that is scientifically defensible today except one consistent with the broad outlines of evolution.

Of course, each individual can make the choice for himself to adopt openly a scientifically indefensible position. It is possible, for example, to argue, without fear of being proved wrong, that God created the world fifteen minutes before you read this sentence; one need only argue that the world so created has all the signs of being much older, including such obvious features as your memory of previous events, etc. Such positions may be chosen, but it is up to each individual again to choose for himself that position which allows him to maintain personal intellectual integrity. A choice like this must be based upon the totality of an individual's knowledge and experience, and is basically a choice made upon faith.

This is not to say that scientifically indefensible choices made on the basis of faith are never to be adopted. But in such a case alternative evidence of some sort must be present with such overwhelming conviction that no other choice is possible. If one must insist that the Genesis accounts are descriptions of scientifically describable mechanisms, that there were at specific moments of time *fiat* creations of Adam and Eve as the first human beings, then one must deny the apparent evidence of the paleontological record. But it must be clear that such a choice is made on the basis of Biblical interpretation alone, and has no support from science.

The most important question is whether or not the Genesis accounts are descriptions of scientifically describable mechanisms. The only reliable guide to understanding the content of the Biblical revelation is to ask questions consistent with the revelational purpose of the author involved. Is it really consistent with the testimony of the Bible about the purposes for which it was written to demand that the Genesis accounts be intended to convey information about the mechanisms of creative activity? Is it not much more in keeping with the whole tenor of Biblical revelation to see in these accounts the triumphant proclamation of God as Creator and Sustainer of the universe, and of man as the highest creation of God, destined for a life dedicated to serving God but fallen into the depths of sin by substitution of self for God at the center of life?

*The answers to evolutionary questions are not to be found in Genesis. Present interpretations of the paleontological record may or may not accurately describe the mechanisms involved in the origin of man. But such answers as will be forthcoming on these problems will come from scientific studies. The Christian must not react in fear to the fossil record. The reliability of the Bible and the vitality of a life with Jesus Christ do not depend in any way on the proof or the disproof of even the general theory of evolution.*

*Reprinted from The Encounter Between Christianity and Science Wm. B. Eerdmans (1968) pp. 97, 105-107.*

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Much of the conflict between the Bible and science can be traced to a stiffnecked rigidity and arrogance by both zealous Christians and by enthusiastic, but unbelieving, scientists. The scientist, who on the basis of the improbability of a written revelation from God ignores or denies the realm of the spiritual, must recognize that his personal philosophical judgment does not *prove* the materialistic position. The Christian must accept the Bible as the authoritative, written revelation from God, but avoid the pitfalls of extreme literalism and unnecessary allegorizing.

Too many well-meaning people have been too quick to fasten a literal meaning to biblical passages in terms of the science of their day (or even the science of a past day!) and claim that this is what the Bible says. The unreasonable and unjustified defence of Ptolemaic astronomy is a tragic and embarrassing example of distorting and perverting Scripture on the basis of a senseless and damaging literalism. The more recent defence of "fixity of species" is another example. A definition of "species" by an eighteenth century biologist, Linnaeus, was forced into Scripture and has caused untold damage and confusion for two centuries.

On the other hand, there have been all too many who have accepted the *philosophical* speculations of unbelieving scientists and others as "fact". These people, including many theologians, have been too quick to sacrifice the authenticity and authority of Scripture on the altar of "Science". They use hypothesis and theory to allegorize away, not only problem passages, but even the basic truths of Scripture.

To me, one of the best guidelines is that laid down by Paul in I Thessalonians 2:4. The gospel—and I here apply this to its written record in Scripture—is a "trust" from God. We are not to add anything to it nor delete anything from it in order to defend our own theories or our own private opinion of what the gospel is (Revelation 22:18,19). Also we are to speak to please God, not men. To me this means all men, even our fellow Christians as well as our scientific colleagues.

In the area of evolution these principles are particularly important. Any theory of evolution—as a *biological* theory and *not* as a philosophical position—seeks to explain *how* plants and animal got to be the way they are. Biblical creation explains *Who* did it and *why* He did it; it does *not* explain *how*. So long as evolutionary theory and interpretations of Biblical creation keep to their respective fields of inquiry there is no conflict. The Christian must recognize that the God of the Bible is just as holy and just as omnipotent in small insignificant processes as He is in the spectacular and dramatic events. All too often people

condemn "theistic evolution" on the basis of a *deistic* interpretation of both evolution and the Bible. To use the Bible in this way to disprove *all* evolutionary theory is a misuse of a precious trust. Evolutionary theory may be unproven and unproveable in many places—and I believe it is—but, the written word of God is not the weapon to use. The Bible does not disprove evolution as *biological* theory; it does deny philosophical evolutionary materialism. Neither can biological theory be used to invalidate Scripture, although it may cast doubt on some of the traditional (and often unjustified) interpretations of Scripture.

Finally, we must avoid the arrogance of assuming that, because we know some truth from science and/or some truth from Scriptures, we know *all* truth. "Now we see through a glass darkly"; we "know in part" (I Corinthians 13:12). We must honestly admit that our knowledge of spiritual truth and scientific truth is really infinitesimally small. On the basis of that admission, the apparent conflicts between the Bible and science, between Genesis and certain aspects of evolutionary theory become exciting and challenging areas of study and investigation. The conflicts are not ignored or avoided. They are not allegorized away. They are not magnified into overwhelming obstacles. They are simply given a different kind of priority from that implied by the "evolution or creation" choice given us by some theologians and some scientists. But both theological confidence in Scripture and scientific accuracy demand such candor.

Adherence to these principles of integrity and humility are essential; it is also rewarding. No scientist or liberal theologian is going to shake my faith in the Scriptures as the inerrant word of God. No extreme fundamentalist or overly literalistic theologian is going to convince me that there is *no* truth in evolutionary theory. I am willing to face unanswered questions and apparent conflicts with absolute faith in the integrity of Scriptures and the Christ they present. My prayer is that my Lord will keep me from jumping to false conclusions in the face of pressure from well-meaning Christians or from fellow scientists. I do not expect to know all the answers in this life, but the trust of the gospel is too holy, too overwhelming to be belittled by my arrogance or my ignorance. But may I humbly, in the fear of the Lord, continue to seek wisdom as our God has commanded.

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God said in Genesis 1:26, "Let us make man in our image, after our likeness; and let them have dominion over . . . all the earth." In 1:28 He said to man, "Be fruitful and multiply, and fill the earth and subdue it, and have dominion over . . . every living thing that moves over the earth." (RSV) This com-



mission is reiterated in Psalm 8, Hebrews 2:6-8, and in other places.

Before subjection and dominion can be realized, there must be a thorough understanding of that which is to be dominated. Science is man's attempt to gain this understanding, and hence may be interpreted by the Christian as his response to God's commission.

*Wherein the Bible speaks to any aspect of science, it does so authoritatively and with reliability. Man's interpretation and understanding of the meaning of what is said is subject to change, but when correctly interpreted, the Bible's truth is absolute.*

In areas where the Bible does not give specific details, science may be able to elucidate some of these details, but the final elucidation will, without question, support rather than contradict any details scripture does give. For example: we are told that God made the heavens and the earth (Gen. 1:1), great sea monsters (verse 21), and man (verse 27) out of previously unrelated material (*barah*). Then He also said "Let the earth put forth" vegetation (verse 11), "Let the waters bring forth" swarms of living creatures (verse 20), and "Let the earth bring forth" living creatures according to their kinds (verse 24). This says to me that science will not be able to shed much light on the actual creation of the universe, of sea monsters, and of man—all apparently direct, *ex nihilo* acts of God—but may be able to illuminate the processes God set in motion for the bringing forth of the other living beings.

The Christian must be careful to work within the framework of God's inspired work, making no conclusions that are contradictory to scriptural principles. Indeed, if it looks as though evidence at hand warrants a conclusion contradictory to scripture, he can be sure that further evidence is needed. This knowledge should make him a better scientist for he will not be making as many firm conclusions without sufficient supporting evidence.

*Before one is too strongly influenced by the atheistic theories being promulgated by contemporary science, he should remember Paul's condemnation in Romans 1:18-24, 28 of those who seek a source-of-all-things other than God. One working outside the framework of theistic origins cannot hope to reach ultimate truth about origins.*

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*The Christian who is also a scientist must, I believe, accept the basic premise that divine revelation cannot genuinely contradict any truth which is discoverable by other means. Stated more simply, God's Word and God's world cannot be discordant.*

Much of the subject matter of science and many of the truths in Scripture are so far removed from each other that they never come into conflict. The psychological study of animal learning, for example, and Biblical statements about salvation, are in separate

and largely unrelated domains.

There are many other issues, however, in which research findings appear to disagree with statements in the Bible. When confronted with these matters, the Christian must remember the basic premise stated above and seek to deal with the conflict in the following ways.

1. *Collection of Additional Data.* All science proceeds on at least two basic assumptions. First, science assumes that the world contains facts and events which can be accurately observed. Secondly, it is assumed that these observables are related to each other in logical and consistent ways. Using his various techniques, the scientist strives to make precise observations and to discover how the observables are related. When confronted with problems, he tries to find solutions by making further observations and collecting additional data.

2. *Biblical Exposition.* The Bible was written for two purposes. First, the scriptures tell us about salvation which comes "through faith in Jesus Christ" (II Tim. 3:15, RSV). Secondly, the inspired Word of God was given for "teaching, for reproof, for correction, and for training in righteousness, that the man of God may be complete, equipped for every good work" (II Tim. 3:16,17, RSV).

The Bible is not a scientific textbook. Its language is theological and many of its terms (such as "soul," "spirit," "mind," "heart," "righteousness," etc.) cannot be translated into scientific language. The scriptures do not speak, nor do they claim to speak, with precision on matters relating to science. The account of creation, for example, is so brief (only 34 verses from Genesis 1:1 to 2:3) that it must only be a broad general outline of a very complex topic.

As there are techniques and well defined methods in science, so there are rules to be used in the study of scripture. Some of these principles of hermeneutics are as follows:

a. *When possible, study in the original languages (since ideas are sometimes distorted slightly in translation.)*

b. *Always look at the context. This includes consideration not only of the verses which precede and follow the passage being considered, but it also involves a consideration of the historical setting, the culture, and the general intent of the book in which the passage appears.*

c. *Remember the "literary mold." The Bible consists of poetry, biography, history, letters, wise sayings, and direct dictations from God. The literary form governs, somewhat, the meaning of the words and sentences.*

d. *Use cross references, comparing scripture with scripture. If two passages differ in clarity, "obscure passages must give right of way to clear passages."<sup>1</sup>*

In both the collection of scientific data and the exposition of scripture, we must seek to be as objective as possible. It is easy for all of us to approach problems with our minds already made up. We look to the scientific data (and as Christians we look to scripture) to find support for the conclusions which we have already reached. Emotional involvement with our pet ideas, and selective perception as we look to the data, probably contribute much to the heated conflict that surrounds issues such as evolution.

While the accumulation of scientific data and the

careful exposition of scripture may eventually lead to the solution of many problems, it is true that some conflicts persist. What do we do then? The answers given below are not likely to be very satisfactory to inquiring minds, but they may be our only alternatives.

1. We accept the conclusion that at least for the present, the conflict cannot be resolved. In the words of psychologist Paul Meehl, "if a resolution cannot be effected, the problem is put on the shelf as a mystery, not solvable by the lights of nature or of grace but only in the light of glory."<sup>2</sup>

2. When we are forced to decide between science and scripture, the Bible must be considered pre-eminent and science must be brought into line with the authority of the Word of God.

In considering the relation between the Bible and science, one other issue should be mentioned. According to Dr. Myron Augsburger, "in the twentieth century we've made a god of scientific achievement. But even now we are recognizing that it takes more than technology to provide man with meaning and values in life. Faith is an inescapable necessity."<sup>3</sup> Science has produced an avalanche of valuable technical information, but science cannot tell us how we ought to use this data. Research can reveal nothing about right and wrong. Science cannot tell us what we ought to study or how we should behave. We may know a great deal about nuclear power, space exploration, and the ways to control human behavior, for example, but we must look beyond science to decide whether this information will be used for man's benefit or for his destruction.

Value judgments and ethical decisions appear to be based on three major foundations: an individual's subjective feelings, group consensus (as when a code of ethics is adopted) and/or the Word of God. For the Christian, the first two of these must be in subjection to the third. Our scientific endeavors, aspirations, and achievements can only be properly evaluated in the light of divine revelation as found in the Bible.

#### FOOTNOTES

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The relationship between the Bible and science is a subject vitally important to every evangelical scientist, although—considering the diversity of their scientific and religious backgrounds—such persons ever achieving a uniform viewpoint on this subject seems highly unlikely. Nonetheless, sharing the different attitudes held by various evangelical scientists should prove

mutually profitable to all.

*When we speak here of the relationship between the Bible and science, what we are really considering is the relative reliability of Biblical exegesis as compared with scientific investigation, when dealing with scientific (rather than spiritual) problems. Ideally, both methods of study should yield similar conclusions, as they presumably would if employed by a sinless and infinitely intelligent scholar.*

Practically, however, our minds are both affected by sin and rather limited; consequently, information derived from studying the Bible exegetically sometimes conflicts in varying degrees with information derived from studying nature scientifically. For example, some evangelical scholars reject—on the basis of Biblical exegesis—the widely accepted scientific conclusion that all organisms are the product of organic evolution. The evangelical scientist must decide, therefore, which (if either) of the two methods—Biblical exegesis or scientific investigation—he will rely on in preference to the other.

Biblical exegesis is based upon a scholar's reading the Bible, and then drawing conclusions about reality from the meanings of the words written therein. Although this is a relatively reliable method of obtaining information, we sometimes forget that language itself is imperfect and limited in its ability to impart precise and complete information. The unending controversies which have raged about various Biblical doctrines, and about the exact meanings of literary and legal writings, imply that there is a point beyond which further exegetical study of written language yields no more insight into reality. Moreover, exegesis is further limited as a scientific tool, because ancient writings can be interpreted only in terms of the languages and concepts which were available to their authors when writing.

*Because the Bible is concerned mostly with spiritual (rather than scientific) matters, because it was written long before modern science expanded vocabularies, and because by nature it shares the limitations on completeness inherent in all written language, I think that modern scientific controversies can never be decided by relying upon Biblical exegesis alone.*

Scientific investigation, in contrast, is based upon a scholar's making observations of natural phenomena—observations which can be repeated independently by another scholar—and then drawing conclusions about reality from them. This, too, is a relatively reliable method of obtaining information, but is also limited in that it involves natural (rather than spiritual) phenomena. However, since our principal concern is scientific problems, that limitation does not affect our use of this method. Moreover, in comparison with exegesis, scientific investigation is much less limited and much more capable of leading to new, more precise and complete insights about reality. This is because new and different observations of natural phenomena can be made when existing scientific knowledge has been pressed to its limit, whereas exegesis is forever limited to the meanings placed upon words by previously existing societies. Consequently, scientific investigation is a very powerful tool, and—in my opinion—the principal tool which must be employed in resolving any modern scientific controversy.

When both Biblical exegesis and scientific investigation lead to the same conclusion regarding some as-

pect of nature, everyone is satisfied. However, evangelical scientists are quite concerned when these two methods lead to apparently different or contradictory conclusions. What should we think when Biblical exegesis and scientific investigation produce seemingly contradictory results concerning some specific scientific problem, such as that of organic evolution?

Initially, we should re-examine both the scientific evidence and the Biblical material bearing on the problem, in order to determine whether or not the conflict is merely an apparent or superficial one. Many of the apparent conflicts which have arisen in the past have been of this type, including—I believe—the conflict about evolution. Such conflicts may result either from imprecisely or inaccurately stated scientific conclusions, or from linguistically unjustifiably narrow Biblical interpretations; both excesses have often occurred in discussions about evolution.

Then, if the conflict remains unresolved, we should obtain new evidence bearing on the problem. Usually, in dealing with scientific controversies, this new evidence will come from new scientific observations, although sometimes it will come from increased understanding of the languages in which the Bible was written. The conflict can then be re-examined in the light of this new evidence, and three different possibilities may result.

First, new scientific investigations may necessitate changing the commonly accepted Biblical interpretation. This has actually happened several times in the history of modern science; it is currently happening—for many evangelical scientists, as they become aware of modern paleontologic and genetic research—with the evolution controversy.

Second, new Biblical exegesis may suggest a change in commonly accepted scientific ideas. If new scientific evidence can then be generated supporting the suggested change and contradicting the commonly held idea, then the entire scientific community would accept the change. However, if such evidence is *not* generated, all scientists—evangelical or not—should continue to accept the commonly held scientific ideas and re-assess the new exegetical results. This course should be followed *especially* if new scientific evidence continues to support the commonly accepted scientific ideas, as do current paleontologic studies bearing on the evolution and flood-geology problems.

*In modern science, I know of no instance in which Biblical exegesis has initiated significant changes in commonly accepted scientific conclusions. However, Biblical exegesis alone might help an evangelical scientist (but not his non-evangelical colleagues) decide which of two scientific theories—equally supported by available scientific evidence—is more likely correct. For example, scientific investigations indicate that evolution occurred; Biblical exegesis leads me personally to favor a concept of God-guided evolution, instead of a concept of non-theistic evolution.*

Third, the apparent conflict may still remain, in spite of additional relevant evidence. In this case, the evangelical scientist may wait to decide about the problem until continued search for new evidence can resolve the conflict, as some have done with the evolution question. Sometimes, however, events require us to make an immediate though tentative decision about a conflict. In that situation, I personally would temporarily accept the scientific conclusion rather than the

exegetical one, so long as doing so does not sacrifice the few basic spiritual concepts taught by the whole Bible. Because of the past history of scientific conclusions influencing Biblical interpretations, and because of the availability of the scientific conclusions to virtually unlimited further testing, I believe that this is the most reasonable option open to an evangelical scientist faced with a particular scientific question.

*In conclusion, I believe that the evangelical scientist must rely primarily upon scientific investigation, rather than Biblical exegesis, when dealing with modern scientific problems, like that of organic evolution. I offer these thoughts, reflecting my own beliefs, for the consideration of other evangelical scientists interested in this important subject.*

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First of all, it must be stated that the main purpose of the Bible is to show that God is a loving heavenly father and that Jesus Christ came into the world in order to seek and to save the lost. Science, on the other hand, is not concerned with either God or Jesus Christ, but is interested in formulating as complete a description as is possible of the universe.

*Both the Bible and science have been produced by individual human beings. However, they differ in that the Bible is the inspired Word of God, while science has only a human origin. Thus, since God is perfect and man is subject to error, it may be expected that the Bible, when it deals with the physical universe, will give a more perfect picture than that revealed by science.*

F. Alton Everest, first President of the ASA, and more recently Editor of the ASA Newsletter, has written in the preface of *Modern Science and Christian Faith* (Van Kampen 1948): "This volume has been written to demonstrate two things, (1) Between the observations of science and a simple, direct interpretation of the Bible narrative there exists a harmony such as would be expected of a book having the same author as the physical world. (2) There is an appreciable group of reputable men of science who are convinced of the inspired origin of the Bible and who find in it a stimulating, satisfying, and irreplaceable contribution to their scientific pictures of the universe."

This is in marked contrast to the article by Paul H. Seely entitled "The Three Storied Universe," *Journal ASA* 21, 18 (1969). Here the author writes, "The Bible assumes that the universe consists of three stories. The top story consists of a hard firmament which serves to divide a part of the primeval ocean from the other part of that ocean which is on the earth. The middle story, the earth, is where flesh and blood men live. The bottom story, Sheol, is where the souls of the departed live. The Bible assumes that the universe is three-storied; but, we do not believe that Christians are bound to give assent to such a cos-

mology, since the purpose of the Bible is to give redemptive, not scientific truth. The relationship of science to Scripture is this: The Bible gives redemptive truth through the scientific thoughts of the times without ever intending that those scientific thoughts should be believed as inerrant."

It is the conviction of the writer that the above represents Mr. Seely's interpretation of the Bible but that it is by no means the only or the correct one. R. Laird Harris has replied to the above-mentioned article in *Journal ASA* 21, 92 (1969). Dr. Harris points out that the doctrine of the inerrancy of Scripture comes to us from an exegesis of the statements of Christ. He states, "The question is, was Christ correct when He spoke of Heaven, of Hell, of Adam and Eve, of Noah and the Flood, of Jonah and the whale, or was He not? In those areas where the doctrine of inerrancy of Scripture is given up, the authority and truthfulness of Christ is soon given up as well, and this is quite logical for even the critics admit that Christ taught inerrancy."

This problem of inerrancy is a crucial one in Christendom today and it is a problem before the ASA. The first section of the ASA doctrinal statement states that, "The Holy Scriptures are the inspired Word of God, the only unerring guide of faith and conduct." The question may be asked, Why give up the doctrine of inerrancy?

*The writer thinks that in matters where the Bible*

*and scientific results appear to conflict, one should first carefully examine what the Bible has to say, accept it as God's Word, and then examine the scientific results and interpret them in the light of Scripture. Many Christians proceed in the opposite direction. The question is: Which is the better procedure? Perhaps both should be used? However for the Christian the primacy of God's Word should never be lost sight of.*

Scientists who are Christians need to be reminded of Paul's statement to the Corinthians: "For this world's cleverness is stupidity to God. It is written: He that taketh the wise in their craftiness. And again: The Lord knoweth the reasonings of the wise, that they are vain. So let no one boast of man (I Cor. 3:19-21, Phillips)."

This simply points out that all of the best scientific cleverness is simply foolishness in the sight of God. Again one may note that scientific theories are quite transitory. It is of the nature of science to change because man is continually looking for a better description of the universe. Thus it will continue until God calls a halt.

In summary, the writer believes that the Bible is our only unerring guide, that it is accurate in all areas and that it contains the solution to man's deepest need. Science, on the other hand, is always quite fallible, is ever changing, is always ready to test some new hypothesis, yet has proved to be of very great value to mankind. It is the most powerful force in the present age.

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*An absolute, literalist interpretation of the first three chapters of Genesis makes it impossible to relate it to man's origin according to modern studies in anthropology. More disastrously, a literalist interpretation forces one to focus on man's physical origin, rather than on man's relationship to God, the origin of man's spiritual nature—in God's image—and the revealing to man of the beginning of God's continuing act of reconciling man to Himself. Nowhere in these chapters is there stressed man's physical shape except the symbolic formation of Woman from a rib. How important is the biological nature of man? Only to the degree that man's spiritual nature is dependent upon it, should be the answer. Since I do not assume that such a relationship can even be implied, then the size, shape and skin color of man is not important and does not have to be accounted for by a special act of God. It is the implanting of God's image in man which is the point of these chapters.*

*In the past—and to some extent today—there was believed to be a correlation between man's spiritual nature and physical structure. Skin color was the symbol of this correlation. The darker the skin pigmentation the less soul-substance a person had, proving the curse of degeneration on the children of Ham. Conversely, the whiter the skin the more soul one had, the closer to God, one of the elect. Black men are suffering under this false judgment.*

*God's redemptive plan is not more valid because one assumes a special creation hypothesis than an evolutionary hypothesis to account for man's biological structure. The point of Genesis is God's love to man, not biology; man's recognition of God and man's symbol-making capabilities.*

*God's eternal plan for man has been recorded not only in Genesis but also in the book of Revelation, where God revealed to John His plan for the ages, clearly describing God's reconciling work begun in Genesis. Man's biology has little place in all of this—it being the transitory shell in which the real man, man's spirit, lives.*

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I would like to address myself to the particular discipline of social science. This emphasis rules out consideration of the general theory of evolution and the physical world which is the result of God's creative act. Rather, it directs itself to the social world, which is a product of man.

The particular concern here is with a general theory of society. The Biblical description of society is based on the fact of man's alienation from God and resultant sinfulness. In this condition, he creates a society which is merely an imperfect form of what could be if God were to rule. This society is a source of comfort to man in that it meets his perceived needs. In fact, however, it helps to keep him separated from God. In return, society supports the sinful nature of man. This view of man and his relation to society could be supported from scripture and is also in agreement with social views held by Calvin.

Further, it is a view of society which is tangential to that held by the branch of contemporary sociology referred to as the sociology of knowledge. Omitting the question of man's nature, the claim is that society has not a true reality; it is merely a social construction of man. The meaning that society has for man is designed to meet his apparent needs which shift with the particular social position in which the individual finds himself. Strict methods of empirical study are of less value in analyzing a society so conceived, since the critical questions transcend data derived by empirical methods.

This general theory is fundamental for the development of special theories or "theories of the middle range" as they are referred to in sociology. For instance, it is entirely likely that a special theory of social problems could be elucidated. Perhaps a special theory of values and morals could also be developed. The data in the social sciences would be quite congenial for the development of such theories which would also be in fundamental agreement with scripture. While these special theories would be based on the general theory, additional support could be provided at a number of points directly from scripture.

From these special theories, it would be expected that applied theories could be derived. Based on the view of man and society stated above, these theories would deal with concrete problem areas in our society. For example, a basic theory of capital punishment could be derived from the special theory of values which would be in agreement with the general theory. The principle here would be social unity under the will of God. Under the special theories of social problems, applied theories for such areas as juvenile delinquency would be feasible.

The argument being made here is that the Christian approach to problems in the physical world should be different from that used for problems in the social world. For one thing, the

Bible has much more to say about the social world than the physical. Further, the lack of sophistication in the social sciences leaves problems in this area on a higher level of generality where they are more readily approached. Finally, one finds that social science provides much ready support for theories of the social world which are in agreement with Biblical principles. Thus, while the Christian may have to approach physical science from a defensive posture, it is not necessarily the case that such a position would have to be taken in the social sciences. Indeed, the changing nature of the social world would in the long run probably help to validate these theories, as it increasingly conforms to the sinful inclinations of man.

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It is an often-overlooked truism that *not all* science is frowned upon by conservative laity and theologians. People are most happy to have access to antibiotics, better fruits and vegetables and a host of other things. It can also be said that in distant ages science was looked upon with amusement and then wonder but not distrust. Several notable exceptions were, of course, when Galileo Galilei published his masterpiece in 1632 entitled "A Dialogue on the Two Principal Systems of the World" and the other was in 1859 when Charles Darwin offered his book "The Origin of Species by Natural Selection" to the world. Galileo's work *seemed* to place the earth in a subsidiary position to the sun and this was contrary to the current teaching on the subject. Darwin's work *seemed* to conflict with Biblical teaching regarding the origin of man.

Today, over a hundred thousand scientists labor away and hardly one of them wonders if his work will have any effect upon religion. Most of them couldn't care less. Many of these workers in the sciences are sincere and dedicated Christians believing in the confessions and the creeds of their respective churches. Only a small handful of Christian scientists deal with controversial areas such as origins and evolution. No scientist in his *daily work* as a scientist ever deals with matters of morals, with the soul or with the after-life. They certainly *think* about these matters but—"after working hours". I venture the opinion that they are conducting themselves *properly* by keeping these areas separate. In my own work, I am attempting to unravel the ancestry of a group of thirty-five species of plants. They are all listed as separate taxa in the textbooks but my studies thus far prove that about half of them have the triploid number of chromosomes in their cells and they also show spore abortion. Without going into technicalities, we can *positively* say that about half of the species are *not* "good" species but have arisen as a result of hybridization. This type

of research is "evolutionary" and might offend those who believe in the fixity of species. It is interesting to note that a great many conservative Christians have also given up this doctrine (fixity of species) but they are not willing to "go all the way" in evolutionary doctrine. What I will prove in my research will be a "fact" but my findings will really have *nothing* to say about the *ultimate* origin of all plants. Science has a great deal to say about the origins of many taxa of a factual nature but it cannot speak with the same certainty (although some over-zealous disciples do) of the ultimate origin of living things.

Speaking frankly, it is much too early, *in history*, to write the final chapter on evolution. Personally I have no fear, should it be eventually *proven* (if indeed it is possible) that man came from the lower forms because, if is *proven*, that is the way it was.

*I have the firm belief that in matters of science, it will be the scientist who has the last word and not the theologian. How could it be otherwise? We all recall many firmly-held beliefs of the middle ages which were thought to reflect true Biblical teaching and which have now been discarded. It is not unreasonable to guess that some of the ideas we now hold, will also be found to be in error as time goes on. What these doomed beliefs will be, no one knows! Special Creation may be one such but at present we simply do not have the definitive data needed to be dogmatic. Please*

*bear in mind what was alluded to previously. The origin of many present-day taxa has been traced and for them, the idea of Special Creation is no longer tenable.*

Possibly we should all ask ourselves what we consider to be the bare essentials of the Christian religion? Can we say that God gave us the Ten Commandments and that we must keep these to merit His grace? If so, couldn't we stop arguing about original sin and all the many other so-called "sins" not connected to the Comandments? Can't we agree that Christ was divine and that he is our Redeemer? If we believe in a Heaven and a Hell, why do we have to *insist* that one goes to either place immediately, as some say. Does it really matter? And, in a similar vein, believing as we do that we *do* go to one place or the other, why must we insist that one's "soul" goes there. Is there *anything* wrong with the "body" going someplace?

*I am forced to be pragmatic about religion and what I see about me leaves little hope that all Christians will adopt the above line of thought. My concern for the welfare of the Christian church leads me to think, however, that we must stay flexible in all non-essentials. Inflexibility in the past has lead to ludicrous consequences. I trust that many of you will think along these lines in the coming years.*

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If someone says that a Christian view of the world is a metaphysic, I have no wish to argue about terms. Certainly it has often added ideas of a traditional metaphysical sort to its system; indeed, it has too often been a Christianized Platonism or something else. However, to the extent that a Christian view is to be identified with systematic theology, it is in critical ways different from those great speculative metaphysical schemes of the past. Also, it is hardly justifiable to arrive at the Creator-creature relationship so important to the Christian way of seeing the world, by starting from some metaphysic essentially different in its fundamentals, although it may have facets which prove suggestive in those areas of the relationship where we may wish the luxury of some speculation. Let me, then, merely point out that I prefer caution in calling a Christian philosophy a metaphysic. But I am not willing to be as lenient in talking of a Christian science. I deny that there is a Christian physics or a Christian biology. There are Christian philosophies *about* these, however.

It is my conviction that a Christian physics is neither more nor less than a *good* physics, a physics doing what any science should. Any science worth its salt should be as coherent as possible

and as open to critical test as is humanly possible. A Christian can ask no more of it than any scientist can ask: how is it standing up to test and how suggestive is it for future work. Some Christians believe that their faith demands something different, in part at least. They may believe that biological or geological theories, say, of a sort hardly popular among non-Christians are required by their belief. If they mean that scientists are short-sighted in the theories which they develop, this is often too true and if they can offer alternatives which are empirically heuristic and which give some indication of corroboration I will applaud. But I do not wish the substitution of one prejudiced outlook for another. If a Christian believes that he must develop unpopular theories, he must realize that, as far as his science goes, an analysis of the results of his theorizing has to stand up to critical empirical test within the realm of nature. I am not, however, sure that the Christian faith in its broad sense gives us more than general leads as to what such theories might be any more than atomism or mechanism as philosophies have done. Above all, I am confident that, if a more specific sense is implied, as with exegesis of some Scriptural passage, the theory which one believes to follow from this exegesis must, if it is scientific, do what any good scientific theory must do: it must be corroborated by our experience in the laboratory or in the world outside it. If it can not be, it is not scientific. It is a theory of some other sort. I see some of these around in our day but they masquerade as scientific when they are not. As example I might mention the theory that much of our geological record is the product of a universal flood not too long ago or the theory that the gaps in the fossil record are capable of explanation only if we introduce

special creative acts of God somewhere within them.

To return to the matter of the relationship of the philosophy of science to the Christian faith, may I make a few general remarks and then several suggestions? I am convinced that the relationship will reveal itself as partly negative but as salutary nonetheless. The negative aspect is that those who work in this area will very often see the failures of the church applying itself to scientific matters in the past and even in our day. Too commonly we shall see that the church has presumed to build God in the image of its ideas of a science which proved transient and on the foundation of a metaphysic which is essentially non-Christian. We shall recognize, and be disturbed by, the inhibitions placed upon scientific theorizing and practice in a quite infelicitous manner by the church. And we shall see that we are not alone, that science has been inhibited by a variety of metaphysics, by ideologies, by political structures and that escape here is most difficult. Indeed it is not possible to avoid, being human, some prejudice within scientific work, but we must always permit experiment and testing as a counter-influence. The one inescapable restriction is that, always, some moral code will place some bound upon what sorts of experiments may be performed; we do not wish absolute license in playing with people or societies, we do not wish Nazi-like death clinics or atomic bombs dropped on a people to see what happens to them.

The relationship has a potentially positive side also and indeed it has been actualized in part. I expect to see more Christians finding their way into the philosophy of science in order to contribute to its work in both its narrow and broader senses. Above all, I am sure that our faith can foster an interest in science and help us work toward a more refined and useful Christian philosophy of the scientific task.

As a philosopher of science, I cannot help but recognize that everyone's view of the aim of science, and thus of some of its methodology both in theory development and in practice, is always colored by a world-view, by what we believe about nature, our place in it, and the origins of values. A Christian then must see the world and himself as a creature of the God of Scripture, as things originated and sustained by this God, just as the non-Christian must really begin logically with the denial of this insight. Hence, if the world is God's, then any other way of seeing it misunderstands it. The practical result for the Christian should be action on this pre-supposition: working in science, and thinking about science, as activities glorifying God.

For the Christian, then, nature stands in complete dependence on God; God doesn't depend on nature. God is not to be found limited by the world. Never forget that God creates a world consistent with His nature and that any kind of world which we find must be that sort of world. God cannot, therefore, be proscribed by our subjective ideas as to right and wrong or good and bad, nor can God, in any way, be limited by our incomplete theories about nature. God is not to be fitted to the Procrustean bed of our rationalism or our empiricism and surely He is not to be added as a veneer to some other world view as in vitalism or personalism or mechanism or what have you. The Christian must always remember that scientific laws

are *his* theories: only the lawfulness of nature is God's or, as Kingsley put it, nature manifests the "customs of God" and we must painfully seek out the details of these, never being sure that we have got them quite right. Of course, our *knowledge* of the relationship of any created thing to the Creator is imperfect, although we may try to see it in some scheme of total dependence. We are not left, however, with a "wholly other" since the Bible seems to provide us with analogies or suggestive pictures of God and His creative activity. It is these which afford us the opportunity to speculate on the details of this activity. In some ways a mechanistic model of the universe—in whatever new sense we must use that term "mechanistic" in our day of relativistic quantum mechanics—with God as designer and mechanic may prove useful. In another context a kind of Berkelian thought-model may be helpful to our understanding. Donald McKay's clever work in England and Mascall's studies of models and images are well-known examples of such studies. It is the task of the philosophical analyst (including some of those interested in aspects of these speculations which impinge on the philosophy of science, as well as some theologians), to assess such model-building in the light of systematic exegesis or in terms of the scientific matters which they raise. An example of the latter is the problem raised by a contingent model, in which God is a "God of the gaps," for scientific methodology. Just how does one work up a theory of the paleogenesis of living forms if the gaps in the fossil record are taken to be unsuited to scientific theorizing?

If it is clear that for a Christian scientism is impossible, that science must be seen in its proper place in Christian epistemology, it is likewise important to remember that this proper place is only generally recognizable. We know some matters where science cannot serve us as more than an informant (as in ethics) or as a goad to clearer thinking (as in systematic theology). But just how far science can take us in understanding nature on the basis of its own ideas and methods is not known. It is crucial that we have not set up artificial barriers ahead of time. If there are different Christian philosophies, a spectrum of theologies, and variant systems of exegesis, it is as true that not all of these foster science as well as do others. I am all for removing false barriers to science and for examining very carefully any inhibiting philosophy or theology or specific exegesis to see whether it can show cause for such proscription. Let me hint at what you will find by returning to the more usual question of the relationship of science to metaphysics.

I do not doubt for a minute that scientific work involves what one might call metaphysical presuppositions, but I am confident that these do not logically generate particular scientific theories. Scientists are committed to the assumption that their memories are reliable, for if they were not, they could never either develop a theory nor repeatedly test it. Scientists believe too that others can experience what they do, for if this were not so, no theory could be publicly testable. Again, scientists are committed to there being some events which are "causally" related, with science seeking to ascertain what the relations might be, for otherwise they could never have criteria as to how to test their theories. All of these assumptions permit

us to work in science, to develop a methodology. There are, however, yet other commitments necessary to scientific theorizing itself. Must we not believe that the events covered by our theory may be causally related in whatever way the theory suggests? Must we not ask what the world must be like if some events in it are caused and if other persons like ourselves are members of it? And must we not ask if the world which is publicly experienceable is the same as, or continuous with, our sense perceptions? But do you see anywhere the specification of any particular scientific theory by these? I do not.

The restriction of scientific theorizing by metaphysics is not *logical*, it seem to me, but *psychological*. People *believe* that some metaphysics requires some specified scientific theory. The result is to make necessary what is only contingent and historical accident and is to influence illicitly the scientist's account of the aim and strategy of science and the relationship which he sees among varied theories. Does this apply also to theology? I believe it does. Certainly theology helps explain why the metaphysical *a priori*s which I called necessary are in fact such. It also forbids certain interpretations of what a theory means. But I do not see theology as legitimately limiting scientific theorizing (unless, of course, one includes in theorizing the testing of theories in a manner forbidden by a theologically-based ethic).

When one turns to specific exegesis of certain Scriptural passages matters are a little harder. Exegesis might suggest specific theories in some science or, at least, delimited classes of theories. But the ultimate test for any scientific theory is how well it fits what we know from experience in the physical world and how well it stands up in future. If it cannot do that it is a failure as a scientific theory and if we cannot even see if it fails because testing is impossible, it is not a scientific theory at all! An example of the latter is the theory that the world was created fairly recently with the appearance of great age: such a theory requires that, no matter how hard we look, the evidence always fools us. The former type of theory is often found in the history of science, as when Galileo's opponents pointed out that Psalm 93:1 forbade the motion of the earth and that certain other passages indicated the motion of the sun so that Aristotle's or Tycho's model of the solar system were possibly true, but Copernicanism was likely false. I find, however, very few good scientific theories which are the product of exegetical stimulation. I am not hopeful for improvement. Indeed, I continue to look instead for exegesis being prodded into re-examining itself by scientific advance. As long as that condition obtains we are likely to hear the skeptic cry, "I always said you could find a convenient, but rationalized, escape when matters became too hot." I am not sure that the situation is entirely avoidable, although one would wish that exegetes had more foresight in seeing that the terms of the Biblical text or the context allowed much more flexibility than they have been wont to believe at a given time. It has, however, been partly, and perhaps largely, due to science that exegetes have had their eyes opened both as to the breadth of Biblical meaning and to the dis-

tinctions between the nature of scientific explanation and that of theology. Therefore, I look for further developments in this direction, for we can hardly say that the process is complete if for no other reason than that science has not ceased providing us with the challenge of startling but well-corroborated theories of interest to the Biblical scholar.

Reprinted portion of a paper "What Is the Philosophy of Science?" *The Gordon Review* 10, 119 (1967).

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The discussion of the relationship between the Bible and Science has been bedeviled by one basic fact: if both are viewed as presenting factual accounts of earth-history on one and the same scientific-historical level a mutual clash, if not mutual cancellation, seems unavoidable. Faithful exegesis of texts which "say what they mean and mean what they say" can terminate in the conclusions that earth-history and human genealogies must be compressed within 6000 or so years, that all was created between the mornings and evenings of six literal days after which God rested, that man (and woman made from his rib) lived in an angel-guarded Paradise whence four explicit (but undiscovered) rivers ran, and where grew the trees of life and of the knowledge of good and evil. And, after the complete discontinuity created by a worldwide Flood, all human kind and multitudinous and varied fauna spread across an earth which incautious exegesis has at times described as over-arched by a solid "firmament," characterized by four corners, and circled by the moving sun.

From the scientific side others have insisted with equal honesty that a vast array of interlocking evidence demonstrates the earth is aeons old, that life evolved into growing complexity, that no obliterating discontinuities are evinced in the strata, that man appeared hundreds of thousands of years ago, and that Biblical exegesis produced a frustrating network of cosmological dogma which had to be forcefully breached by science.

Confronted with these agonizing dilemmas, Christians have tended to polarize into either (1) fundamentalistic positions which in effect smuggle scientific contraband into Scripture and wrench scientific data into conformity or (2) reverse the procedure and wrest the Scriptures into conformity with science. The former include the "flood geologists" who postulate a radical methodological and chronological error in modern science, the latter include (among others) both those who advocate a yawning theological and geological "gap" between the first two verses of Genesis and those who extend the days of creation (evening and morning included) into "periods" or reinterpret them as days of "revelation" rather



than of creation. And yet others, veering into neo-orthodoxy or liberalism, seek to salvage "spiritual values" by assigning a "purely religious," a-scientific role to much of Scripture.

This writer confesses he has no crystal-clear solution which reconciles all the difficulties without a clash or which will wholly redeem honest thought from all suspicion of wishful thinking. He is convinced, however, that there is no hope of avoiding a fatal clash if the Biblical and scientific data are placed on the same factual-scientific plane, and if divine revelation is interpreted as completely purging the text of every relativity involved in its cultural-historical setting. It seems preferable, rather, to view science and Scripture as presenting different but not wholly competitive models of reality: Scripture provides a background of meaning wholly inaccessible to science, but not without a meaningful interlacement. Creation is thus an essentially Christian concept which precludes any concept of an autonomous, sheerly accidental and "naturalistic" process of evolution, but it does not exclude evolution as a divinely ordained means or confine faith to "fiat" or even "progressive" creationism. It is the atheist whose options are restricted. To adopt Lever's imagery, the unbeliever must believe that the music heard on the radio is an accidental concatenation of sounds, but those who accept the "inaudible data" of the Biblical revelation, are assured that the whole is divinely composed and orchestrated from first to last. For "Creation" may lie beyond and behind time though its variant structures unfold through time and space and lie open to empirical investigation. The sudden burst of trumpets, like the sudden appearance of new life-forms, may or may not indicate an element of "progressive creation," but the ultimate reality of creation remains untouched by the test-tube

and the Christian investigator is free to follow the evidence wherever it leads, whether to fiat creationism, to progressive creationism, or to an evolutionary continuum.

While not unaware that apostate presuppositions have their impact in allegedly objective science, and aware also of the legitimate demand for faithful Biblical exegesis "let the chips fall where they may," this writer cannot but suspect that modern modes of scientific-historical expression are particularly inappropriate for early Genesis. He has come to tentatively favor Dooyeweerd's thought that the days of Genesis express "cosmic" rather than astronomical or geological time and Ramm's suggestion that the order of creation is topical and moderately concordant rather than sequential and precise, and concludes that the moulding of man from the dust of the earth does not preclude an evolutionary process. Early Genesis seems rich in the allegorical expression of reality rather than scientific history, the genealogies scarcely serve the alien purpose of a datable sequence, while the Flood may have been "universal" only from the viewpoint of the narrator. And, not to exaggerate but to clarify a point, if the ancients really thought God was disposed to rest one day from His creative deeds, if the Psalmist really thought the sun went round the earth, or if the details of Judas' death are really contradictory, does this negate James Orr's definition of inspiration as "plenary for the end for which inspiration is given . . . imparting in a complete and infallible way the mind of the Spirit on the great subjects of God's revelation"? As this writer sees it, inspiration did not necessarily breach or exclude some occasional elements of the prescientific thought-forms of ancient culture, while science and Scripture both yield faithful "models" of reality, each valid in its distinctive sphere.

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I would like to be able to say that while the purpose of the Bible is to teach us faith and practice, there are secondary or peripheral matters in the Bible which do not have scientific objectivity. Such an assumption would help remove certain difficulties in understanding the Bible. For example, I could then understand that the Biblical statements about the virgin birth are only indications of the glory of Christ and his special relation to the Father. It would not be necessary to hold that he was actually born of a virgin. The statements about the virgin birth would then merely constitute the vehicle carrying the truth of Christ's greatness. The incomprehensibility of a virgin birth would thus be avoided.

Passages referring to devil's being cast out could be understood if peripheral matters could be found in the Bible. It could be maintained that the "devil" statements mean only that the persons referred to were mentally ill or epileptic, and that this is the

Bible's way of teaching God's power over the deepest psychological problems of man.

Even if we accept the idea that the Bible contains peripheral matters, important questions remain concerning the two examples cited. Whether or not Christ was actually born of a virgin *might* make a difference in the Biblical description of the relation between mankind and God. Similarly, if the devils mentioned in the New Testament actually exist, they are supernatural beings. Consequently, many of us consider the actuality of their existence to be a fact which must be included in our faith, a faith in the supernatural. The relevant question in this discussion is not the actuality of the virgin birth or whether or not devils exist, but whether or not one can categorically state that these ideas are peripheral.

Consider two other types of Biblical passages. Concerning one type, all Christians would agree that there are no peripheral elements. Such passages might be found in the epistles. Concerning the other type, almost everyone would agree that there are peripheral elements if the Bible can contain peripheral elements. Some of the passages containing minute details of Old Testament history might be in the latter category.

These three types of passages must be considered when one considers the problem of peripheral matters. The basic question is, How can one know what in the Bible is peripheral? Anyone can devise a set of criteria

for deciding what is peripheral material. But can he prove that his criteria are correct? Lack of such proof is a denial of II Peter 1:20 ". . . no prophecy of the scripture is of any private interpretation." If determining the criteria for distinguishing the peripheral is left to each person, then the Bible is "true" only in a subjective sense.

Suppose there *are* reliable criteria for distinguishing the peripheral. Let us consider the possible sources of such criteria. The source could be the Bible, or it could be extra-Biblical.

An extra-Biblical source would possess an authority more fundamental than the authority of the Bible, since there cannot be two courts of last resort. If we postulated this source to be a *human* source, we would then be making Biblical teaching dependent upon man. Since man is fallible, such a source of criteria is also fallible, and does not meet the condition that it be reliable.

Could the source of extra-Biblical criteria be a divine source? Christians do not claim private revelations from God concerning what part of the Bible is peripheral. Is it possible, however, that God speaks to us about the Bible in, for example, our scientific results? It has been suggested that God has given us two non-contradictory, infallible sources of information, the Bible and nature, and that studying nature can help us understand the Bible. This suggestion is not denied here, but for two reasons such a suggestion does not give us a means whereby we may determine what in the Bible is peripheral.

(1) A logical difficulty arises if we use one infallible source to decide which "facts" of the other infallible source are peripheral, i.e., not necessarily objectively true. Even if we were to purge Source A of all that is inconsistent with Source B, we would have no defense against one who decided to purge from Source B all that is inconsistent with Source A. If one source of information can judge the other, we would ultimately be forced to decide which source is primary. (We cannot make one source primary in one area, e.g., in natural science, on the grounds that the other source does not speak on natural scientific subjects. Such a procedure assumes an answer to the very question being investigated.) But a decision concerning which source is primary is of human origin, and therefore fallible.

(2) If it is possible to determine what is peripheral in the Bible by means of investigating nature, then the Bible does not provide us with a clear guide as to what is sinful, and we are forced to go outside of the Bible for necessary spiritual guidance. To demonstrate this claim, consider the frequently-made assertion that the Bible states that our universe is a three-story universe, with heaven in the sky, man on earth, and hell below the surface of the earth. The three-story idea is said to be peripheral. Yet, if the Bible does indeed contain the three-story idea, the idea should have been accepted by the first readers of the Bible, who would not have known it was a peripheral idea. It would have been wrong for these first readers to contemplate either space travel or an early equivalent of Project Mohole. Anyone contemplating either of these projects should have been warned that these projects are wrong because they imply travel to heaven or hell. Accepting the idea of the peripheral in the Bible limits us in our scientific work. In carrying out

God's command to subdue the earth, we would need to wait for the unbeliever to determine which lines of investigation are not sinful.

*Therefore nothing outside the Bible can determine for us what part of the Bible is peripheral.*

The Bible itself might provide the criteria for determining what in the Bible is peripheral. The Bible could instruct us in this matter in two different ways. First, since in some passages we are shown how other passages are to be used, we might observe an inspired writer separating the non-peripheral from the peripheral. But it is a hopeless task to derive the sought-for criteria from the passages in which other passages are discussed. An idea in, for example, an Old Testament passage which *we* might have considered peripheral, is shown by the New Testament commentary on the passage to be absolutely essential to the message. If we were to attempt to separate the non-peripheral from the peripheral in the Old Testament passages *not* discussed in the New Testament, it would be impossible to use the method of examining how some passages interpret others. Interestingly, even those who claim that there are peripheral matters in the Bible do not attempt to prove their point by citing these explanatory passages.

Second, a Biblical answer to our question might be obtained by examining statements which the Bible makes about itself. The Bible makes no direct statement about peripheral matters. It does, however, describe itself and its purpose. The Gospel of John was written ". . . that ye might believe that Jesus is the Christ, the Son of God: and that believing ye might have life through his name." (John 20:31) Concerning the Scriptures in general, Paul says, "All scripture is given by inspiration of God, and is profitable for doctrine, for reproof, for correction, for instruction in righteousness." (II Tim. 3:16) These are typical of the passages which describe the Bible and its purpose. Can we derive from such statements criteria enabling us to separate the non-peripheral from the peripheral?

In one approach, Paul is said to *define* "all scripture" as that which is profitable for doctrine, etc. The peripheral matters are then those which are not profitable. But those who claim that Christ was born of a virgin maintain that the virgin birth is both non-peripheral *and* profitable for doctrine. They also claim a Christological significance for the smallest, most obscure Biblical detail of middle eastern geography or history. Evidence that there is such a significance has been explained in commentaries, and need not be repeated here. We can conclude that we are unable to derive from Biblical statements about the Bible criteria for separating the non-peripheral from the peripheral.

**We have exhausted the list of possible sources for such criteria. We cannot use the human mind; nor can we use anything in nature which we find and analyze. God has not given us a special private revelation providing the answer. We might find such criteria in the Bible if they were there, but we do not find them. Thus we conclude that *there is no means of identifying any peripheral matters in the Bible. An equivalent conclusion is the following: We cannot state that there are any peripheral matters in the Bible.***

What is the relation between the Bible and science?

With the elimination of the question of the peripheral, we can now state that the Bible *can* speak on any question. A suggested interpretation of a Biblical passage cannot be ruled out because we believe that the Bible is not a textbook of science, or of history, or of any other subject. The Bible teaches what it teaches; whether or not it is a textbook is irrelevant.

Thus, if a botanist is interested, he can use with complete confidence the idea that cedar trees grew in Lebanon 3,000 years ago. How the botanist uses that fact may have no discernible relation to the doctrine, reproof, etc., we are to derive from the Bible. But the fact is given in the Bible, and we cannot state that it is peripheral to what God intends for us to learn from the Bible. This fact is objectively true. The cedar trees were there.

Nothing that has been said here suggests that there are many scientific facts in the Bible. Nor can it be stated *a priori* that any scientific facts we find there are important in our science. When we consider what the Bible actually does say, we will probably conclude that some of the scientific facts recorded there—such as the existence of cedar trees in Lebanon—add virtually nothing to our scientific knowledge.

But more important for our discussion, we will probably conclude that the Bible gives us information related to some of the great scientific questions of our time. One of these questions is concerned with whether or not the steady-state creation theory can be correct. In another question, we ask whether or not

the Bible provides information which can help us decide for or against the general theory of evolution, a theory which has become a unifying principle underlying a world-and-life view. To study these questions careful exegesis is required, but one inadmissible principle of exegesis is the principle that the Bible cannot give us reliable scientific information. We will probably conclude, by comparing Scripture with Scripture, that the "days" of Genesis 1 were long periods. We will also want to compare Scripture with Scripture as we attempt to decide whether or not "after its kind" means there were separate creations of living things, if Genesis 2:4 begins the history of man, with his separate, historical creation being described in Genesis 2:7, and if the English translation of Genesis 2:7 misled some into believing that God added a soul to a pre-existing animal. We may be able to answer such questions correctly if we allow the Bible to speak on science.

**I believe that much of this necessary, careful exegesis concerning origins has already been done. We ought to realize that these exegetical studies show that the Bible denies general evolutionary theory. We Christians have debated the all-important question of evolution, a question of which unifying principle will be our world-and-life view, for too long a time. Other great scientific problems, problems peculiar to our times, await the attention of the Christian man of science. The Bible may be able to aid us in the solution of these problems. We must get on with the task.**

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"What is the relation between the Bible and Science?" Discussions of this and similar questions often suffer from some confusion over the import of the questions themselves and of their answers. My present contribution is simply an attempt, therefore, to clarify a few questions and a few possible answers, in the hope that these (or something like them) will be of interest to members of the ASA.

*First, then, the Bible appears to be a book of fixed content, containing a fixed and finite set of statements, along with questions, commands, poetry, etc. Science, on the other hand, is not a book at all, but is an elaborate and ill-defined complex of institutions, traditions, people, doctrines, rules, and practices. It is unlikely that any simple comparisons between entities of such different types will be fruitful.*

Many people are, however, interested in a somewhat narrower and perhaps more manageable question:

### (1) Can scientific questions be settled by reference to the Bible?

And I think that many ASA discussions in fact revolve around this query. I suggest, however, that (1) can profitably be broken down into two still more limited questions. The first, and easier, of these is

### (2) Does the Bible contain the true answer to scientific questions?

Now consider the following three scientific questions:

(Q1) *Were camels domesticated prior to 1000 B.C.?*

(Q2) *What is the optimum antenna configuration for low power, medium range transmission on the 20 meter band?*

(Q3) *Are any present-day rabbits the lineal descendants of non-mammalian organisms existing some time in the past?*

Most readers of the Bible will agree that it contains an answer to (Q1). And many of these, including many archaeologists who make a special study of such things, agree that the Bible contains the *true* answer to (Q1). It may be worth noting, in passing, that in order to hold this latter view it is not necessary to hold any special view as to the inspiration or inerrancy of the Bible.

I think there are hardly any readers of the Bible, on the other hand, who would claim that it contains any answer—either true or false—to (Q2), regardless of how high a view of inspiration they maintain. The true answer to (2), therefore, appears to be the qualified statement "The Bible contains the true answers to some scientific questions and not to others."

What about (Q3)? (Q3) is relevant to theories of evolution but is narrower than most such theories; i.e., if the correct answer to (Q3) is "no" then most modern theories of evolution are false, though some highly restricted version of such a theory may be true. If the true answer is "yes", however, it does not follow that any modern version of evolution theory is true.

Does the Bible contain the true answer, or indeed any answer at all, to (Q3)? I know of no "principle" which will easily decide this. In particular, it cannot be decided merely by reference to (2) or the answer

to (2). What is needed is a much more *ad hoc* procedure, a reading of the Bible itself with attention to the information actually conveyed there. In my opinion the Bible contains no answer at all to (Q3), but I know that some disagree with me. And among those who disagree, some hold that the Biblical answer is true, while others hold that it is false.

I turn now to the second question which might be derived from (1).

**(3) Does the Bible contain an effectively reliable answer to some scientific questions?**

The phrase "effectively reliable" is a technical one, and I must explain what I intend by it. Perhaps the best way to do this is to explain why we need to ask something beyond question (2). The fact that a book contains the true answer to a certain question is not, *by itself*, sufficient to help a person who asks that question. For, even though the book contains the true answer in fact, the questioner may have no reason to think that it does. He may have no reason for relying upon it in this case. And so the book may be of no use in "settling" his question.

Some notion of reliability, therefore, seems to be necessary. And it is plausible to suppose that truth is a necessary ingredient in the required sort of reliability; i.e., no book will contain the effectively reliable answer to a question unless it contains the *true* answer to that question. The other necessary ingredient is not, however, a property which a book can have *per se*. It is rather a certain relation which a given person may have toward that book, the relation of having a good reason for relying upon the book in this case. *Effective reliability* must thus be a person-relative notion—really it is *effective reliability for Mr. N*—and it is this fact that I have especially wanted to mark by introducing this technical phrase.

We can say, then, that a book contains an effectively reliable answer to a certain question *Q* for a certain person *N* if and only if

(A) *the book contains the true answer to Q,*  
and

(B) *N has a good reason for accepting the book's answer to Q without a prior knowledge of what the true answer to Q is.*

If a certain person, a certain book, and a certain question are related in this way, then the person can settle the question by referring to the book.

We can now reformulate (3) more accurately as

**(4) Is there any scientific question and any person such that the Bible contains an answer to that question which is effectively reliable for that person?**

As in the case of (2), I would suppose again that the correct answer to (4) is "Yes, there are some such persons and questions, and there are also many which do not fit the requirements." And again, so far as I can see, there is no principle which readily distinguishes the cases. We must especially keep in mind the person for whom the question is to be settled and what reason *he* may have for relying upon the Bible in this case. (The person may of course be oneself, but it need not be.) It should come as no surprise to us to find that some people may really have good reasons for such reliance while others really do not.

A last word. A person's views on inspiration are likely to be relevant to requirement (B). But the rela-

tions between them need to be carefully considered. For example, I have argued elsewhere (*Journal ASA* 19, 90 (1967)) that one form of this doctrine commonly held by evangelicals entails that, for *any* person, the effective reliability of the Bible on *any* question cannot properly be higher than the effective reliability for that person of a certain difficult and tenuous science. Perhaps this is a reason for rejecting this version of inspiration (I suspect that it is), but in that case, we should have to examine again the relation of the new version to requirement (B).

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Both Christians and non-Christians alike agree that God's creation, the natural world, is a real and valid fact. Except for some of our philosopher friends, we believe that we can profitably study nature, that it is not capricious, and that it is internally consistent. Now, do we, who believe in the inspiration of scripture, claim any more for scripture, or rather, does scripture claim any more for itself? We read for example, from Paul: "All scripture is inspired by God and profitable for teaching, for reproof, for correction, and for training in righteousness." Also, Peter writes: "First of all, you must understand this, that no prophesy of scripture is a matter of one's own interpretation, because no prophecy ever came by the impulse of man, but men moved by the Holy Spirit spoke from God." And Jesus used the following expression concerning inspiration: "The scripture cannot be broken." Thus scripture declares itself to be valid, dependable, profitable for study, and to be given by God. Cannot precisely the same things be said about the natural world? My thesis is then, that just as we have learned to study and comprehend the natural world, we could profitably use the same methods to study and comprehend scripture.

We can now use this similarity between the natural world and scripture to distinguish between the *inspiration* of scripture and the *interpretation* of scripture. Our commitment as members of the ASA to the inspiration of scripture is nothing more than the scientists' commitment to the validity of the natural world. On the other hand, our *interpretations* of scripture correspond to the scientists' *theories* about the natural world. Among Christians there is ordinarily no disagreement about the inspiration of scripture any more than there is disagreement among scientists about the validity of nature. All of our disagreements lie in the area of interpretation. That is why it is not only unkind but also illogical in an argument about the interpretation of, say, the account of the flood, to accuse our opponents of not believing in the inspiration of scripture.



Turning then to the problem of the interpretation of scripture, what insight can our knowledge about scientific theories give to us concerning the validity and limitations of scriptural interpretations? There are several things about scientific theories that would also apply to scriptural interpretations. First, both scientific theories and scriptural interpretations are man-made and hence are limited in scope and subject to future correction. A good example of such a scriptural interpretation is the Ussher date of 4004 B.C. for the creation of the world. Later, scientific evidence has caused this date to be changed. This example also shows the equivalence of scientific theories and scriptural interpretations. A change in a scientific theory can also produce a change in a scriptural interpretation. We can then conclude that since scientific theories are continually changing that scriptural interpretations will also be continually changing. This close connection between scriptural interpretation and scientific theory emphasizes the importance of the joint meetings of our organization and the Evangelical Theological Society.

Another feature about scientific theories that should be considered in connection with scriptural interpretation is the meaning of their content. This feature brings us into the realm of the philosophy of science, and I hope we will all be further educated about these matters. As an example of what I have in mind here, I will use the theory of wave mechanics which is basic to all of physics. In this theory, the quantity which appears in the fundamental (Schroedinger) equation is denoted by the Greek letter psi. This quantity, however, cannot be measured in any way; yet there are rules which tell us how to find measurable quantities from a knowledge of psi. Since, however, psi itself can never be measured, the question arises as to just what psi is, or "What does psi mean?" Here the philosopher of science must enter into the picture to evaluate the meaning and content of the psi symbol which the physicist finds so necessary for his work.

Now, I wonder if there might not be similar problems in the interpretation of scripture. May there not be symbols in the Bible which should not be interpreted in a literal way? This question can properly be answered only by the philosopher and the theologian, and I will leave it here. However, the scientist can rightfully be skeptical, I believe, of a theology which is more literal in interpreting the things of the spirit than is a mathematical science in describing such a concrete entity as the physical world.

These comments bring me to my final point. Cannot the scientist recommend to the theologian the use of some of the techniques and attitudes that have proved so fruitful in the study of the natural world? When the scientist investigates nature, no holds are barred. Nature is stretched, pulled, and twisted, in every conceivable manner. New, tentative, theories are proposed and put to the experimental test. An atmosphere of experimentation and excitement prevails. Nevertheless, there is, at the same time, a profound respect for the traditional, fundamental, time-tested parts of the science, an example being in physics the law of the conservation of energy. Why cannot the enterprise of interpreting the scripture be carried out in the same manner? Of course, we must not over-

emphasize the experimental and skeptical features of science at the expense of the respectful attitude toward the sound edifice that has already been constructed. At this last point, incidentally, I believe the liberal theologians have erred. But, while our conservative theologians have opposed this fundamental error, for which we may be forever grateful, there has been a, perhaps natural, tendency to oppose also the inventive, skeptical aspects of liberalism, and of science, as well. Such opposition to experimentation in interpretation is a dangerous thing for, if our interpretations of scripture are to develop in a healthy way as new scientific evidence accumulates, we must capture theologically the free-thinking as well as the conservative features of a scientific enterprise. Then, our conservative theology will once again take her place as the "Queen of the Sciences."

Reprinted portion from *Journal ASA* 17, 100 (1965)

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Scripture tries to tell us Who has the creative imagination and ability to initiate and sustain the materials and processes of the world and the purposes for which they appeared. Science concerns itself mainly with observing what exists, how it works, when it arose, and how long it will last. Because scientific methods do not arrive at a Who, we need the Bible to tell us about Him and His intentions.

Wordsworth sensed in nature "a presence . . . a sense sublime of something far more deeply interfused whose dwelling is the light of setting suns . . ." but this is elemental compared to the knowledge of the believer in the God revealed in the book of Romans Who has a plan for good for His own and seeks to make men his children.

This summer I talked with a man who had written a book intended to make religion compatible with modern thinking. He claimed his students were retained for Christianity by his thinking. So I read his book. He judged the Bible, casting aside as folklore any part he felt unacceptable to his ideas. Miracles were exaggerated stories, the God of the Hebrews was largely an invention of their minds to bolster their warlike tendencies, and the evolving mind of man gradually acquired a God satisfactory to the author. The writer judged the Book, he should have let the Book judge him.

*Likewise the Bible should judge science; not telling it what is and how it works but rather why it exists and for what is its purpose. A conversation with another teacher brought from him the comment that Genesis said man could exploit his environment. "On the other hand," I replied, "Genesis says the world was made for man but he must care for it for himself and future generations." Which of us was right?*

Scripture tells us of the "source, support, and end of all things." Written in days when pagan imagination pictured a creation of the world now known to be absurd, the Bible in reserved and stately phrases gave us fundamental assertions without irrelevant and inaccurate detail. The ancients said the world rested on the back of a turtle; the Book of Job states the earth hangs on nothing. The Bible is to be commended for what it does not say as well as for what it does reveal.

*The Testaments do not tell a scientist what his science is but rather what he should use it for. "If a man does not love his brother whom he has seen how can he love God whom he has not seen." This gives all creative thinkers the duty to use any inventive genius for good and not for ill. Atomic energy to desalinate sea water, yes, but to blow the earth to bits, no.*

Now abide faith and science. The scientist has confidence in the value of asking questions of nature, believing nature is reliable. The Christian holds that nature is consistent because it was created by One who abides and has an ability that guarantees the working of natural processes. In addition the Christian does not stand alone in the world but has a Friend in control, Who can, if He wishes, alter the uniform action of forces for man's benefit. On the other hand, he does not expect God to favor him if at the same time a miracle would injure others. A Christian can't expect rain on his field if the same rain would ruin the crop of his neighbor. The Bible gives rules under which any kind of favor can be granted such as "If you ask in my name" and "If you abide in me," both of which mean asking only for such innovations in the natural course of events which will benefit all under their environment.

Finally, Scripture tells us what will happen to all the findings of science. "They shall perish but Thou shalt endure." There will sometime be a climax to our centuries when the "kingdoms of this world shall become the kingdoms of our Lord and His Christ." "The moon shall wax old" but he that does the will of God "abides forever." I feel that the atomic bomb and the population bomb predict that the world cannot always continue on its present career. Only a cataclysmic event like the Second Coming can cure the world's ills. Until then we are grateful for every advance science can make for the benefit of all mankind.

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*The Bible is God's special revelation to man and as such is true. The truth of the Bible, however, can only be fully understood when it is interpreted according to its purpose as God's revelation. That purpose is to bring men into relationship with the living God who is responsible for all order found in the physical and moral realms. The Bible proclaims that God is*

creator and sustainer of the universe—without His continual upholding, all existence would disappear. In keeping with this purpose the Bible in its references to nature is primarily concerned with the question of *why* the universe exists and not with the question of *how* we exist. It is not the Bible's purpose to reveal the details of physico-chemical mechanisms found in nature. Such details are the proper province of scientific method. It is rather the Bible's purpose to point man to the One responsible for these mechanisms' very existence, the One who holds man morally accountable that knowledge of these mechanisms will be used to further good purposes.

It is appropriate here to note that Biblical descriptions of nature are phenomenological; the language of the senses is used without speculation as to how God brought something to pass. The statement "He ascended . . ." is a description of what the Apostles actually saw; conjecture as to how God achieved this miracle or to the possible location of God's infinite dwelling place as above us are clearly absent!

Phenomenological language is particularly appropriate for the Bible to use as it is universal and non-speculative; it does not trap man into seeking mechanistic explanations hidden in the passage. Such language thereby frees the reader to respond to the primary purpose of all Scripture: a further revealing of God's love and justice to, and care for all creation.

*Biblical revelation and scientific explanation are thus seen to be different yet equally valid perspectives of the same God-given reality; the two perspectives are complementary to one another.*

There is always the possibility of tension when the two perspectives focus on the same part of reality. The question of origins is one such area. To me, the Biblical perspectives clearly affirms that:

- (1) There was a beginning to the space-time continuum we exist in.
- (2) God's creative will alone and not the existence of anything else was responsible for that beginning.
- (3) God brought order and life to a formless earth.
- (4) God made man in His own image (thereby uniquely coupling together the realms of spirit and matter) and gave him dominion over all creation which God called good.
- (5) Man at a given point in space-time rejected God's love and lost not only fellowship with God but a harmonious relationship with the rest of God's creation.

I believe<sup>1</sup> that the Bible portrays prehistory by a series of "overviews" couched in the language of man's senses. These "overviews" focus on the meaningful and creative activity of God in bringing order to a chaotic universe. God's purposeful activity is focused upon, not particular physico-chemical mechanisms that God brought about and then employed.

Science, on the other hand, concerns itself with the task of describing probable physico-chemical processes that can mechanistically explain how the present forms of inorganic and organic matter, or of life itself came about. The scientist assumes the relationships (scientific laws) between energy and matter he discovers today are universally valid for all past times (a metaphysical assumption, an act of faith); he limits himself to descriptions in terms of these relationships, indeed these laws themselves can be thought of as descriptive devices. How and why fundamental laws

In my essay, "The Theologian's Craft" (published in *Journal ASA* 18, 65 (1966)) I have emphasized that the Bible must be regarded as inerrantly true and that the theologian, in drawing doctrine from it, is engaged in the same kind of methodological procedure as the scientist uses in formulating hypotheses (conceptual Gestalts) to explain the phenomenal data he encounters in nature.

In my paper, "The Approach of New Shape Roman Catholicism to Scriptural Inerrancy" (*Evangel. Theol. Soc. Journal*, p. 209, Fall 1967, and included in my new book, *Ecumenicity, Evangelicals, and Rome*, Zondervan, 1969), I have set out explicit hermeneutic corollaries of the doctrine of Biblical inerrancy. In essence, these principles assert that Holy Writ, being God's special revelation to man in propositional form, is perspicuous and self-interpreting; thus, extra-Biblical scientific data can never determine the meaning of the Scriptural text (though, of course, such data can and must pose questions for the Biblical interpreter). Though God is the author both of Scripture and Nature, and therefore the two cannot contradict each other, Scripture has one distinct advantage over "nature:" the Bible is already in propositional form, whereas natural phenomena are not. The scientist has "more room to slip 'twixt the cup and the lip" than the Biblical exegete, for the scientist must begin by propositionally setting out his data (a process subject to error), whereas the theologian finds himself working with propositionally veracious assertions from the outset. This does not mean that the theologian cannot "goof" hermeneutically; but it does mean that scientific propositions must be placed on a secondary level in comparison with Biblical propositions, and must never be employed as a means of criticizing revelational assertions.

In specific reference to evolutionary theory, it follows from the preceding that Genesis 1-3 must be interpreted on its own ground and must not be employed as a source of proof-texts for a scientific theory arrived at independently of Scripture. If the exegesis of Genesis 1-3 allows for a general theory of evolution, then of course the Christian can accept it; but if Scripture is not open to this possibility, then such a scientific theory would perforce have to be rejected by the Christian believer. In my own opinion, the constant reiteration of the phrase "after its kind" eliminates amoeba-to-man evolution. I see no objection to limited evolution within major creative categories or species types, and the non-specific use of the Hebrew *yom* ("day") allows, I believe, for unlimited periods of time corresponding to the special creation of original "species types" (man being one of these types.) A Chardinian redoing of the Christian position in terms of a general evolutionary theory, however, is, in my opinion, entirely unjustified. It is perfectly clear that Genesis 1-3 intends to convey cognitive data, and that the cognitive data go beyond the general assertion "God created the heavens and the earth" (otherwise, why did the Lord bother with all of the stuff in the text after chapter 1, verse 1?). To limit God's intent here to a vague general statement in order to bring the propositional Scriptural text into line with a (still legitimately disputed) scientific theory formulated from non-propositional data, is a wholly unjustified procedure.

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come into being, how and why they are maintained, or how matter (or energy) itself came into being; these are questions which hint of purpose and science by its very nature avoids asking. Further, scientists have been impressed by the evidence for the contingency present in nature, i.e., anything is not possible.

... the paradoxical status of many basic principles and findings of modern physics illustrates vividly the view that order in nature is not simply the creation of the inquiring mind. More forcefully than ever, physics had to recognize that its laws describing this order were not a priori constructions but had to be tailored meticulously to the stubborn, brute facts of nature. These facts are the actual setup, distribution, quantization of forces, and the sharply defined characteristics of the 'fundamental' particles of matter, which simply state that not everything imaginable occurs in nature. Nature is a supreme paragon of drastic limitations of physical possibilities, and the order of the universe is just another aspect of this primordial fact . . . Yet, the fact of limitation remains inextricably present in the order and correlation of things as we see and interpret

them, and of this limitation which can in principle' take on so many various forms, nature itself gives no explanation.<sup>2</sup>

It is the function of scientific method to describe nature and the evidence for contingency. Biblical revelation has the complementary function to yield an explanation of such contingency in the activity of a loving, transcendent, immanent, and personal God. Both are rooted in space-time, in historical events although they focus upon different aspects of the same objective experience.

The "focusing procedures" inherent in the two perspectives may in certain areas completely eliminate simultaneous observation of the findings of the other perspectives; such elimination should not obscure the truthfulness of the differing perspectives. It should lastly be pointed out that when scientists claim a mechanistic description of the universe is all that can be known or that chance alone is the governing force be-

hind the creation of human life, they are extending scientific method and finding far beyond their range of validity and ignoring other equally valid perspectives. Justification for such procedures is not found in the open-mindedness of good science but in additional metaphysical assumptions.

## FOOTNOTES

1. This is for me a tentative solution. In reaching it I found it helpful to ask the question: What type of description of creation would be truly appropriate for God to use in order to communicate meaningfully to people of all ages with their varying degrees of scientific understanding?
2. Stanley L. Jaki, *The Relevance of Physics*, The University of Chicago Press, Chicago (1966), pp. 439-440.

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I wish initially to restate the question presented by speaking only of my discipline—psychology—rather than science as a whole. Given this more limited task, and one with which I feel somewhat more comfortable, I wish to make three observations.

The first relates to the multiplicity of positions within each field. Psychology is an extremely broad and heterogeneous field, as I never fail to rediscover when teaching survey courses; what this means for this topic can be seen in the difference between discussing the relationship between the Bible and psychophysics as against the Bible and psychotherapy. Consider the former. Studying the detection of luminance increments in a homogeneously lighted field as a function of the area and perimeter of the luminance increment hardly seems to be a matter which would affect or be affected by Biblical exegesis or theology. At this molecular level of scientific research, theologians (or Christians) have no more reason for dialog with these scientists than two boys, one of whom is talking about swimming and the other, his dislike of spinach. Yet a vast area of the field of psychology is of this nature—anyone doubting this should peruse such publications as *Psychological Abstracts*, *Annual Review of Psychology*, *APA Convention Proceedings*, etc. Similarly, discussions in the Bible and/or by theologians of God, His nature and attributes, of Angels, etc., is unrelated (or at best, only tangentially related) to the subject matter of psychology.

*My first observation, then, is that there is no relationship between the Bible and much of psychology (its efforts to extend knowledge and the body of knowledge itself). While this is probably an obvious statement, it does enable us to see that the relationship between the Bible and psychology is confined to a very limited area of interface between them.*

A second reflection on the question posed is that neither psychology nor Biblical exegetes or theologians speak with any unity. Psychology attempts to describe, understand, predict and/or control the behavior and/or mind of human beings and/or the subhuman species, and note the immense differences over what we are supposed to be doing. Beyond that, there is practically no position or theory in psychology which does not have its distinguished and scholarly opponents who

take basic issue with the position (theory, methodology, assumptions). Thus one must ask, with which "psychology" are we to discuss the relationship? Similarly, the multiplicity of denominations, theological positions, Biblical interpretations, etc., raises the same problem. For example, much of the Bible is in narrative form; one cannot argue with narrative, only propositions, and propositions can be gained from narrative only by inference and interpretation which no one (I hope) claims to be infallible.

*To state this another way, we accept the need for hermeneutics in understanding what the Bible says, but this implies differences in the end product, i.e., a lack of unity in what we feel the Bible says. Furthermore, attempts to operationalize propositions—a standard scientific procedure—exacerbates the disunity. Given this mutual state of affairs, the best response is a generous portion of humility, not dogmatism, on both sides.*

It seems to me that implicit in many discussions of this question is an equation of the Bible with a fundamentalistic theology and the assumption that the latter is the one true, consistent, agreed upon, infallible statement of truth. Even a casual perusal of the history of theology and the church, and of the great theological treatises of the last two centuries, evaporates this. Theologians rarely claim this themselves, and the disagreements between theology and across history (given only conservative theologians) are more typical than not when one is in the area of anthropology (theological). Humility is a virtue.

A third observation. If one accepts the assumption (and I do) that the Bible is more than great literature, that God exists and reveals himself through it, and in this revelation, a description and understanding of man can be gained, then, insofar as one deals with the more moral questions about man, the Bible can and should be a frequent, valuable, though generally unsystematized source of insight for the psychologist. He could generate propositions about man inferred from the Bible (as he does from his colleagues' recorded observations). When propositions generated from the former disagree with those from the latter, he would carefully examine whether the inferences made from the source (in either case) were unjustifiable, overly narrow, etc. When propositions agree, he would still maintain a tentativeness, aware of his finiteness.

*In summary, my current impressions are that the relationship between the Bible and psychology is limited to only certain areas of each, is confounded by the absence of agreed upon, operationalized propositions from either area, but can be exceedingly productive of advance in both our understanding of man and of the Bible, if we can tolerate the tensions of scholarly study and the frequently necessary tentativeness.*

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The view that I would like to outline here regarding the relation between science and the Bible is a rather simple view, but it is one which over the years has appeared to me to offer a very useful and satisfying

*What is the relation between the Bible and science?*

*I will state my conclusions first and then if you are still interested in reading further an explanation will follow.*

*"I feel that the Bible has very little to say about science except in a general way, but that it has everything to say about the scientist."*

*The surgeon about to perform a heart transplant, the engineer at ground control in Houston who programs the computer for re-entry or the geologist studying the proportions of alkali-feldspar intergrowths in a differentiated granophyric ferriodabase sill in central Oregon can find little help in Biblical exegesis. So why should we think that in the less sophisticated areas of animal evolution or plant geography the Bible can be of any greater assistance?*

*The Scriptures are very remarkable in the manner of their day, but they are still written in the language and a culture far removed from the scientific era of today. For this reason I feel it is a gross injustice to the Scriptures and also to science to make use of them in a manner which I believe was never intended.*

*I believe the Bible to be the Word of God, divinely inspired, and our only rule of faith and practice. It has everything to say to the individual living in today's world. Much of the thinking of the current crop of students and faculties of our leading universities can be characterized by a recent recording "I Swear there is NO Heaven and I pray that Hell's not Real." The message of the Bible has everything to say to these people as well as to the scientist. We must remember scientists are also people.*

*I grow rather weary of the attempts to interpolate the Scriptures into every aspect of the modern scene. It is only as the written Word affects the lives of those who read it that it will have an effect on the science of today and tomorrow.*

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conceptual model for understanding the relation between these two areas.

I regard the Bible and science as two complementary, essentially non-overlapping approaches to truth. The scientific method, based as it is on empiricism, provides a means of ascertaining facts regarding the physical universe and its functioning. We can, through the empirical procedures of science, determine what will work, what will not work, and the consequences of various actions on various other objects or actions that we are interested in. However, as has been often noted, science is silent on the question of values. When billions and billions of dollars are spent developing new weapon systems for destruction, we as human beings may be appalled. However, there is no *scientific* way in which we can determine that this is the wrong goal and that some other goal or value is "right." When the German scientists during the last war used human subjects in research that proved to be very painful and detrimental to the subjects, eventually costing many of their lives, we were appalled. But we were not appalled for scientific reasons. If man is considered nothing more than a highly complex and highly evolved animal, there can be no basis for regarding him as an inappropriate subject for experimentation, any more than we regard the white rat or the guinea pig inappropriate subjects for research. That is, on the basis of science, there is no way to make this decision. Science is impartial regarding values and goals.

Once goals have been determined, science can tell us how to achieve these goals and the influence of various factors upon these goals. But, notwithstanding the fact that scientists are discussing values more now than they ever have and some propose that science may be able to deal with values, science cannot a priori determine

values. Values pertain to men not to science. The empirical method of science is an extremely efficient approach to the search for truth when information of a specific sort from a particular realm is desired. However, it falls short of much of what we would desire to know as human beings. It is my belief that this type of information is provided by the Bible through another means or method of finding truth.

The Bible represents a *revelation* of truth. God, who created the universe and man, realizing that man would not be able to determine the answer to all questions on the basis of empirical and other methods of finding truth, saw fit to reveal certain things directly to man which could best be communicated to him in that fashion. We, therefore, can think of empirically derived truth and revelationally derived truth as being two sources of information. There are undoubtedly other methods of ascertaining truth which might also be included, but since this paper deals primarily with science and the Bible, we will mention only these two. The bulk of the revelational truth found in the Bible deals with values, goals, and unobservables. Thus, it can be seen that the Bible and science complement and supplement rather than supplant or overlap each other. What can be determined empirically by science is not that which is in the Bible. That which is revealed in the Bible is not that which can be studied or derived from the empirical method of science.

This leads to the conclusion that many of the problems debated by some individuals regarding the nature of the relationship between science and the Bible are pseudo problems. For example, does the Bible teach us anything about science? The answer essentially is no. The Bible was specifically written to reveal certain truths to us that



could not be derived scientifically. Indeed, the Bible commands man to work and subdue the earth, which many have pointed out may be interpreted as a command by God to become scientists and students of our universe. The Bible was not intended to supply us with the type of information that we are commanded to discover ourselves.

Does the Bible contain scientific errors? The answer to this is yes and no. The Bible was written to reveal truth about the moral and spiritual realm and is accurate in its information. However, the language and form of communication is that which is most effective for communicating this information—mainly the phenomenological and popular mode of speech. Therefore, some statements in the Bible are not scientifically accurate in a technical sense, nor were they intended to be. However, they are accurate in being the popular mode of expression and in communicating on a phenomenological level the thought and intent in an accurate manner. For example, when the Bible speaks of the four corners of the earth, it no more means that the earth is flat or that we are to assume anything of

this nature than we should assume upon reading the front page of our morning newspaper that the newspaper editor is unaware of the fact that the earth revolves around the sun when he tells us the time the sun will rise and set. The fact is, the editor of the newspaper is seeking to communicate something to us in popular terminology in a way which will make sense and be easily understood by us. He is not intending to comment upon the relation of the planets to one another. Therefore, it can be said that while certain statements in the Bible are not technically scientifically accurate, they are not inaccurate either in that they are not intended to be scientific pronouncements.

**In sum, my view of the relation between the Bible and science is that the Bible was written to reveal certain truths and things to us which we could not discover on our own because of human limitations and that we are commanded by the Bible to search out and find information via the scientific and other methods of inquiry on our own in those areas where this is possible. The two systems of truth supplement each other rather than conflict with each other.**

## Summary

In the December 1968 issue of the *Journal*, Russell Maatman called for an evaluation of the relationship between the Bible and science. He felt, and we would argue quite correctly, that the ASA needed to direct its attention particularly to this key issue in order to clarify its approach to many other secondary issues, especially that of evolution. We agreed with Dr. Maatman and therefore invited leaders of and major contributors to the ASA to write for this Symposium published in the preceding pages. We appreciate the participation of the many who volunteered to contribute to this Symposium, and we continue to invite others to add their voices to this current sharing of convictions and perspectives.

Matters of truth are not settled by democratic vote. Yet one purpose of a survey of the opinion of Christian men of science is to seek to identify not only how individuals may happen to feel subjectively about an issue, but also to search for clues of the guidance of the Holy Spirit in the lives and beliefs of God's people. Insofar as the statistics derivable from the present Symposium are meaningful, their implication is clear. By a factor of more than three to one, respondents have indicated that they consider the Bible and science to provide complementary insights into the nature of the world, rather than holding that the "scientific implications" of the Bible must *always* take precedence over the scientific interpretation of nature.

The majority opinion appears to us to be consistent with the growing realization that the description of the world requires a multi-level approach in which different terms and concepts may be needed to describe the physical, the biological, the psychological and the spiritual. Just as an exhaustive description on one level does not invalidate exhaustive descriptions on other levels, so a description framed in the terms and concepts of one level can be used only with difficulty and uncertainty to deduce detailed terms and concepts of another level. As the Christian rightly rebels against the attempt to discredit concepts with proven experiential validity on the spiritual level by showing that they cannot be

properly derived from physical and biological concepts only, so also he rightly rebels against the attempt to discredit concepts with proven experiential validity on the physical and biological level by showing that they cannot be properly derived from psychological and spiritual concepts only.

Perhaps the most crucial element in this perspective is that the truth of a description does not require that the statement describe exhaustively at every level.

*Can Christian men of science with convictions at opposite extremes of the Bible vs. science question honor their mutual commitment to Jesus Christ and work together for better understanding and service?*

On the one hand there are those who believe that the Bible does not in general teach specific scientific mechanisms and details, and who may feel that some particular scientific hypotheses are generally acceptable. On the other hand there are those who are sure that the Bible does teach specific scientific mechanisms and details, and therefore who know that particular scientific hypotheses are wrong. Those who are unsure should find it relatively easy to live with the convictions of those who are sure; still they must constantly guard against the temptation to belittle and look down on their "more naive" brothers. Those who are sure almost inevitably find it impossible to live with the convictions of those who are not; the issue shifts into one of truth, with those who are sure defending the truth and those who are unsure defaulting in some sense from the faith. Whether or not members of these two groups can live together cooperatively in the fellowship of faith seems to depend almost completely on how able and willing the man, who is sure that he knows the biblically-revealed scientific mechanisms and details, can be in tolerating his brothers, who do not interpret the Bible in the same way that he does and yet insist that they are true to the faith and followers of the biblical revelation.

*This is not the kind of a question a Symposium can answer. But we hope that if it is possible for followers of Jesus Christ to live together in harmony as members of the household of faith in spite of differences, this clarifying perspective on the options available may serve a positive purpose.*

# Man on the Moon

*"By what you have done the heavens have become part of man's world."  
Richard M. Nixon, speaking to the astronauts on the moon on July  
20, 1969.*

*"This is the greatest week since the beginning of the world, the creation.  
Nothing has changed the world more than this mission." Richard M.  
Nixon, speaking to the astronauts returned to earth on July 24, 1969.*

Just sixty years after the Wright brothers set a new world's record of somewhat less than two hours of sustained flight, Neil Armstrong and Ed Aldrin set foot on the moon. At least two-thirds of the world vicariously joined them. They were the representatives of a concentrated and competitive endeavor to overcome the age-long restraint of earth's gravity and to explore lands and planets in the extra-terrestrial universe. What does it mean, and what does it imply for the future?

In the framework of the evolutionary perspective, this landing of men on the moon represents a giant new breakthrough in the development of life in the universe as we know it. "A small step for a man, a giant leap for mankind," Neil Armstrong said as he stepped for the first time upon the surface of the moon. In the movie "2001: A Space Odyssey", science writer Arthur C. Clarke compares in significance the first time a primeval creature on earth purposely threw a bone into the air, with the first time that a modern *Homo sapiens* purposely throws himself into the air and into space.

The evolutionary view, especially in the form advanced by Teilhard leads one to expect major breakthroughs in the evolutionary progress: the emergence of vast new potentialities as the result of some particular small step in the general continuous development. The arrival of man on the moon has been likened by others to the first emergence of life from the sea; the suggestion is implicit that as that first creature became better equipped to live in air rather than in a water environment, so man (or his evolutionary successor) is on the road to developing the facility to live at home anywhere in the universe. Clarke even envisions the advanced consciousness of the future outstripping the confines of space and time.

With the many threats of impending disaster from nuclear holocaust, environmental pollution and overpopulation of this earth, the prospect of new frontiers in space, of new worlds to sustain an expanding mankind, is a possibility that is quickly grasped in the hope of arriving at a new solution. The day after the moon landing, noted world traveller and news commentator Lowell Thomas rhapsodized about his faith that this was just the first of many steps that would eventually break the bonds of relativity theory and permit mankind to visit realms of the universe at present deemed completely inaccessible.

If this projected exploration of space could serve as the focal point for drawing nations closer together in a common venture, then regardless of its other potentialities, it would appear to be a major force for good. Unless, of course, one should happen to notice the obviously unintentional similarity between the words of President Nixon and those of Genesis 11:4, "Then they said, 'Come, let us build ourselves a city, and a tower with its top in the heavens, and let us make a name for ourselves, lest we be scattered abroad upon the face of the whole earth,'"—and wonder. If this exploration of space is turned into a great venture to exalt man and his technological abilities at the expense of his spiritual understanding and needs, if it becomes only the grand vehicle of spreading man's inhumanity across the face of the universe, then where is the glory and where the hope?

There is a third possibility for the significance of the recent space success. It could well prove to have come too late and at too great expense, to be ultimately irrelevant. Like the final bursts of sparks from a piece of fireworks before it is plunged into darkness, this fantastic glory of our landing men on the moon may in the next few decades be eclipsed by an outbreak of personal, social, racial and national strife and suffering of such intensity that the prospect of visiting the moon may be relegated to the category of Marie Antoinette's supposed solution for her starving subjects, "Let them eat cake."

In all these things we see a cry for a vital Christian eschatology. "Since all these things are thus to be dissolved, what sort of persons ought you to be in lives of holiness and godliness, waiting for and hastening the coming of the day of God, because of which the heavens will be kindled and dissolved, and the elements will melt with fire! But according to His promise we wait for new heavens and a new earth in which righteousness dwells." (II Peter 3:11-13).

# Religious Perspectives of Students\*

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*Four items from a student attitude survey of 1,367 students in three church-related liberal arts colleges, a state university, and three Bible colleges were examined to discover expressed opinions on items pertinent to the tensions youth sometimes experience between their church's teachings and what they learn through scientific and educational sources. Theologically conservative students and active church participants were the least likely to feel oppressed and restricted by their churches' teachings on moral issues and philosophy of life and the most likely to disagree with the statement, "The church is losing ground as science and education advance." Theologically liberal persons and those who seldom or never attend church were at the opposite extreme. Several possible interpretations of these findings are discussed briefly.*

Theologically conservative Christians traditionally have believed that there is an antagonism between sound religious doctrine and modern science and education. It is not our purpose here to survey the many variations within that viewpoint nor to summarize the evidence that the increasingly predominant perspective among evangelicals is that there is no inherent conflict between scientific discoveries and Christian faith.<sup>1</sup> Their most common current view appears to be that the apparent contradictions are a result of theorizing and other analyses of empirical facts by scientists, or of interpretations by theologians of the revelation of God in the Bible. Instead we shall examine some empirical data from a study of students which includes relationships between expressed attitudes on items related to the "science-religion conflict."

## METHODOLOGY

In the Spring Semester of 1962-63 four senior students conducted an Independent Study "Student Attitude Survey" on the subject of religion and morality under my direction. The pretested and revised questionnaire consisted of six legal-size pages covering many aspects of background information on each respondent, his personal views about the rightness or wrongness of eighty-two types of behavior which have been identified by one religious group or another as having positive or negative moral significance, the chief influence on his point of view toward each type of behavior, and his attitudes toward thirty items on beliefs about Christianity, religion, morality, church activity, and the like. The questionnaires were com-

pleted by 1,367 students in selected classes in three church-related liberal arts colleges, a state university, and three Bible colleges from the Spring of 1963 to the Spring of 1964 and again subsequently in one of the liberal arts colleges in the fall of 1966. The 180 university questionnaires were distributed in class and completed outside of class for return at a subsequent class period; all the others were administered in the classroom without advance notice to the students that this would be done. The average time necessary for completion of the instrument was 45 minutes. Of the total number of 1,367 respondents, 966 were freshmen, 184 were sophomores, 117 were juniors, 64 were seniors, 31 were in "special" classifications, and 5 failed to indicate their class. The large proportion of freshmen reflects a deliberate effort to cover classes that included a cross-section of all students early in their college careers rather than persons enrolled in advanced courses which tend to attract primarily the students majoring in certain subjects.

A substantial proportion of the students was from theologically conservative schools. All three Bible colleges are fundamentalistic, although gradual shifts toward a more moderate "conservative evangelicalism" are evident in their recent history. One of the liberal arts colleges stands clearly in the evangelical Protestant tradition; one is theologically conservative but aloof from associations with the National Association of Evangelicals, and one is related to a "mainline Protestant" denomination and locally identified as relatively "liberal" in its theological orientations, although "neo-orthodoxy" may be more strongly represented in the faculty of its Philosophy and Religion Departments than religious liberalism. The relatively great strength of religious conservatism in the Midwest is reflected in the composition of the state university's student body

\*Paper presented at the 23rd Annual Convention of the American Scientific Affiliation, Calvin College, Grand Rapids, Michigan, August 20-23, 1968.

as well as in many private colleges of the region. Compared to all American educational institutions, the sample therefore may be assumed to include a larger proportion of fundamentalists and evangelicals than the national student population, and it almost entirely omits Roman Catholics and Jews. This was by deliberate design, for the key problems intended for investigation in the project are associated with conservative Protestantism.

### FINDINGS

Persons whose theological self-classification was "fundamentalist" or evangelical, neo-evangelical, conservative, or orthodox were considerably less likely than the others to agree and more likely to disagree that the church is losing ground as science and education advance. Responses on attitudes toward Jesus Christ and the Bible similarly indicate that persons with the more conservative views on these subjects were more likely to disagree with this statement.

Church participation also is related to these attitudes. Persons who attended church at least once a week at the time of the survey were the least likely to believe that the church is losing ground with the advance of science and education.

On the other hand, it must also be pointed out that a majority of every category of students except those who rarely or never attended church, those with non-orthodox attitudes toward Christ and the Bible and those who classified themselves as humanists, agnostics and atheists disagreed or strongly disagreed with the statement. This suggests that failure to hold conventional Christian beliefs and inactive church participation are both related to believing that the church is losing ground as science and education advance.

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*Persons who themselves have experienced disillusionment with a church as its dogmatism, authoritarian moralism, and fallacious interpretations of Bible chronology, archeology, and history have been exposed by their education . . . tend to be natural reactors against a church that taught them folklore and fictions as if they were "gospel truth."*

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A second item dealt with the question of whether the church lacks value for the upper and educated classes (those best grounded in the sciences and other subjects of education). All categories of theological self-classifications overwhelmingly disagreed with the statement, indicating their belief that the church does have value for the educated as well as the uneducated and for the upper as well as the lower classes. Persons with the most conservative Christian interpretations of Jesus Christ and the Bible disagreed more strongly than did those with liberal perspectives. Similarly those who attended church most often had the highest percentages of strong disagreement.

Advocates of modern scientism, to say nothing of many educated church members, are inclined to

emphasize that churches are far behind the times and impose many outmoded dogmas and medieval superstitions upon their members. Differences between the various theological categories of respondents were not great except that the self-styled liberals, agnostics, and atheists in the study were more inclined to agree than the others, the vast majority of whom disagreed.

This general pattern was more obvious on the response patterns by beliefs about Jesus Christ and the Bible. A majority of those with the most liberal viewpoints agreed that the church tries to impose worn-out dogmas and medieval superstitions upon members, while the opposite prevailed among those who held perspectives closer to Protestant orthodoxy.

A strong majority of the students who never attended church when living at home and the non-church members who were "never" attending at the time of the survey agreed that the church seeks to impose worn-out dogmas and medieval superstitions upon members, but the opposite was true of the other categories. About nine out of every ten persons who attended church weekly, whether members or not, disagreed with the statement.

Similar patterns again prevailed in relationship to feeling restricted by the church in the development of one's philosophy of life. Fundamentalists and evangelicals felt the most strongly that their church was not restricting them, and only among the agnostics and atheists did a majority feel their church was restrictive. Those with liberal views about Jesus Christ and the Bible were more likely than conservatives to feel restricted by their church, and the persons who often attended church were less likely to feel the development of their philosophy of life was restricted than those who attended seldom.

### DISCUSSION

The impact of science and education on the church cannot be determined conclusively from statements about it. Certainly it is evident that among the 1,367 students in this survey and on the basis of the questions used as indicators, the overwhelming majority did not feel that the church has been harmed by the advance of science and education. The students who were themselves the "least religious" in terms of traditional indicators of Protestant beliefs and church participation were the most likely to feel personally oppressed by their church and the most apt to believe that it was losing ground under the impact of modern scientific and educational advancements. Conceivably the psychological mechanism of projection could be operating in their case; if they personally were giving up religious beliefs and activities in favor of what appeared to them to be more scientific and sophisticated philosophies and practices, they could easily feel that every wise and educated person would do the same and thus the church would lose ground before the advance of science and education. Psychoanalytic theory would suggest that their repressed guilt feelings for their personal irreligiosity may be relieved by expressing the opinion that they are in the vanguard of basic social changes.

There is no indication of which comes first in such cases—disillusionment with the church or enthrallment with modern science and education. In other words, no causal relationship is demonstrated by our findings. Some would be inclined to hypothesize that

growth in scientific and educational understanding is the cause of defections from Christian faith and church participation. Persons who themselves have experienced disillusionment with a church as its dogmatism, authoritarian moralism, and fallacious interpretations of Bible chronology, archeology, and history have been exposed by their education are especially likely to accept such an interpretation. They tend to be natural reactors against a church that taught them folklore and fictions as if they were "gospel truth."

Others, however, are more likely to hypothesize that departure from the faith or perhaps, as another version, never having had true Christian faith, is the origin of the belief that the impact of science and education is detrimental to the church. When basic Christian faith is absent, one lacks an integrating philosophy to help reconcile apparent contradictions between traditional Christian perspectives and modern scientific and educational viewpoints.

Either of these interpretations is consistent with the findings of this survey, but neither of them is tested by the data. In either case, it is not surprising that those who are the most closely integrated with their churches, as indicated by attendance patterns, should be the least likely to believe that churches are losing ground to science and education, the most likely to think that churches are good for the upper and educated as well as the lower and uneducated classes, the most apt to disagree with the idea that the church seeks to impose many worn-out dogmas and medieval superstitions upon their members, and the most likely

*Theologically conservative students who are active church participants are least likely to feel oppressed by their church and to believe the church is losing ground under the impact of science and education.*

to feel that their church does not restrict the development of their philosophy of life. Participation in the church is to a considerable extent related to "believing in" the church. This relationship is apparent among non-members as well as church members.

Theologically conservative students who are active church participants are least likely to feel oppressed by their church and to believe the church is losing ground under the impact of science and education. Non-believers and inactive members are the most inclined toward such feelings and opinions.

#### NOTE

<sup>1</sup>The literature on this subject is very extensive. All the publications of the American Scientific Affiliation are related to it directly or indirectly. One of the most recent works relating evangelical Christian faith to modern science is Richard H. Bube, editor, *The Encounter Between Christianity and Science* (Grand Rapids, Mich.: Wm. B. Eerdmans Publishing Co., 1968).

*The Christian understanding of creation as an act of a free and loving divine will is the sole basis for our confidence that our finite life has a meaning, a purpose, and a destiny which no immediate misfortune can eradicate. Christian thought has seldom, therefore, claimed that it knew just how God had created the world, and it has never sought to understand creation in terms of that sort of explanation. . . . The idea of creation is founded on the religious knowledge through faith of the character of God's will; it is a certainty based on the immediate experience of God's sovereignty and His love in the covenant with Israel and in Christ, and the consequent faith that existence, which is known there to come from God, is created in the same love. . . .*

*Christian thought must accept the scientific method, which searches for the necessary interrelations between events, as a valid and important means of understanding the observable world around us. But Christianity can never accept science as a total view of finite reality, especially historical reality. For our historical experience reveals all too clearly that freedom, both human and divine, is interlaced with causal necessity in everything that happens. Since, then, the determined relations relevant to scientific inquiry give us only a partial picture of the mystery of our historical existence, there we are justified in using the categories of freedom, intention, and purpose as complementary means of explanation. For only if at some point the impersonal process and so the structural sequence is transcended in freedom, and only if our explanations go beyond the "how" and include the "why," can there be meaning in human or divine life.*

From *Maker of Heaven and Earth*, by Langdon Gilkey  
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# A Generation in Search of a Future\*

GEORGE WALD

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## Cause of Student Unrest

All of you know that in the last couple of years there has been student unrest, breaking at times into violence, in many parts of the world: in England, Germany, Italy, Spain, Mexico, Japan, and, needless to say, many parts of this country. There has been a great deal of discussion as to what it all means. Perfectly clearly, it means something different in Mexico from what it does in France, and something different in France from what it does in Tokyo, and something different in Tokyo from what it does in this country. Yet, unless we are to assume that students have gone crazy all over the world, or that they have just decided that it's the thing to do, it must have some common meaning.

I don't need to go so far afield to look for that meaning. I am a teacher, and at Harvard I have a class of about three hundred and fifty students—men and women—most of them freshmen and sophomores. Over these past few years, I have felt increasingly that something is terribly wrong—and this year ever so much more than last. Something has gone sour, in teaching and in learning. It's almost as though there were a widespread feeling that education has become irrelevant.

A lecture is much more of a dialogue than many of you probably realize. As you lecture, you keep watching the faces, and information keeps coming back to you all the time. I began to feel, particularly this year, that I was missing much of what was coming back. I tried asking the students, but they didn't or couldn't help me very much.

But I think I know what's the matter. I think that this whole generation of students is beset with a profound uneasiness, and I don't think that they have

yet quite defined its source. I think I understand the reasons for their uneasiness even better than they do. What is more, I share their uneasiness.

## The Vietnam War

What's bothering those students? Some of them tell you it's the Vietnam war. I think the Vietnam war is the most shameful episode in the whole of American history. The concept of war crimes is an American invention. We've committed many war crimes in Vietnam—but I'll tell you something interesting about that. We were committing war crimes in World War II, before the Nuremberg trials were held and the principle of war crimes was stated. The saturation bombing of German cities was a war crime. Dropping those atomic bombs on Hiroshima and Nagasaki was a war crime. If we had lost the war, it might have been *our* leaders who had to answer for such actions. I've gone through all that history lately, and I find that there's a gimmick in it. It isn't written out, but I think we established it by precedent. That gimmick is that if one can allege that one is repelling or retaliating for an aggression, after that everything goes.

And, you see, we are living in a world in which all wars are wars of defense. All War Departments are now Defense Departments. This is all part of the doubletalk of our time. The aggressor is always on the other side. I suppose this is why our ex-Secretary of State Dean Rusk went to such pains to insist, as he still insists, that in Vietnam we are repelling an aggression. And if that's what we are doing—so runs the doctrine—everything goes. If the concept of war crimes is ever to mean anything, they will have to be defined as categories of *acts*, regardless of alleged provocation. But that isn't so now.

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*I think I know what is bothering the students. I think that what we are up against is a generation that is by no means sure that it has a future.*

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\*This article is the record of a talk presented by Professor George Wald, Nobel Laureate, at the March Fourth Convocation at MIT (see *Journal ASA* 21, 51 (1969)), as published in the March 22, 1969 issue of *The New Yorker Magazine*, reprinted by permission; copyright 1969 by *The New Yorker Magazine, Inc.* It has been one of the most widely publicized and reprinted talks of this kind in recent years, and certainly has been one of the most controversial. Newspaper columnist Joseph Alsop has said of Professor Wald, that he is "a deeply idealistic man who knows a great deal about biology and nothing whatever about the world he lives in . . . there are plenty of men who are aware Wald is talking through his hat." In a subsequent article, "America's My Home. Not My Business, My Home," (*Bull. Atomic Scientists* 25, No. 5, 29 (1969)) Wald says that no man should have a political philosophy that won't fit on the face of a button. He offers for his philosophy: "A better world for fewer children."

I think we've lost that war, as a lot of other people think, too. The Vietnamese have a secret weapon. It's their willingness to die beyond our willingness to kill. In effect, they've been saying, You can kill us, but you'll have to kill a lot of us; you may have to kill all of us. And, thank heaven, we are not yet ready to

do that.

Yet we have come a long way toward it—far enough to sicken many Americans, far enough to sicken even our fighting men. Far enough so that our national symbols have gone sour. How many of you can sing about “the rockets’ red glare, the bombs bursting in air” without thinking, Those are *our* bombs and *our* rockets, bursting over South Vietnamese villages? When those words were written, we were a people struggling for freedom against oppression. Now we are supporting open or thinly disguised military dictatorships all over the world, helping them to control and repress people’s struggling for their freedom.

### A Much Larger Situation

But that Vietnam war, shameful and terrible as it is, seems to me only an immediate incident in a much larger and more stubborn situation.

Part of my trouble with students is that almost all the students I teach were born after World War II. Just after World War II, a series of new and abnormal procedures came into American life. We regarded them at the time as temporary aberrations. We thought we would get back to normal American life someday.

But those procedures have stayed with us now for more than twenty years, and those students of mine have never known anything else. They think those things are normal. They think that we’ve always had a Pentagon, that we have always had a big Army, and that we have always had a draft. But those are all new things in American life, and I think that they are incompatible with what America meant before.

### The Army

How many of you realize that just before World War II the entire American Army, including the Air Corps, numbered a hundred and thirty-nine thousand men? Then World War II started, but we weren’t yet in it, and, seeing that there was great trouble in the world, we doubled this Army to two hundred and sixty-eight thousand men. Then, in World War II it got to be eight million. And then World War II came to an end and we prepared to go back to a peacetime Army, somewhat as the American Army had always been before. And, indeed, in 1950—you think about 1950, our international commitments, the Cold War, the Truman Doctrine, and all the rest of it—in 1950, we got down to six hundred thousand men.

Now we have three and a half million men under arms: about six hundred thousand in Vietnam, about three hundred thousand more in “support areas” elsewhere in the Pacific, about two hundred and fifty thousand in Germany. And there are a lot at home. Some months ago, we were told that three hundred thousand National Guardsmen and two hundred thousand reservists—so half a million men—had been specially trained for riot duty in the cities.

I say the Vietnam war is just an immediate incident because as long as we keep that big an Army, it will always find things to do. If the Vietnam war stopped tomorrow, the chances are that with that big a military establishment we would be in another such adventure, abroad or at home, before you knew it.

### The Draft

The thing to do about the draft is not to reform it but to get rid of it.

A peacetime draft is the most un-American thing I know. All the time I was growing up, I was told about oppressive Central European countries and Russia, where young men were forced into the Army, and I was told what they did about it. They chopped off a finger, or shot off a couple of toes, or better still, if they could manage it, they came to this country. And we understood that, and sympathized, and were glad to welcome them.

Now, by present estimates, from four to six thousand Americans of draft age have left this country for Canada, two or three thousand more have gone to Europe, and it looks as though many more were preparing to emigrate.

A bill to stop the draft was recently introduced in the Senate (S. 503), sponsored by a group of senators that runs the gamut from McGovern and Hatfield to Barry Goldwater. I hope it goes through. But I think that when we get rid of the draft we must also drastically cut back the size of the armed forces.

### Militarization

Yet there is something ever so much bigger and more important than the draft. That bigger thing, of course, is the militarization of our country. Ex-President Eisenhower, in his farewell address, warned us of what he called the military-industrial complex. I am sad to say that we must begin to think of it now as the military-industrial-labor-union complex. What happened under the plea of the Cold War was not alone that we built up the first big peacetime Army in our history but that we institutionalized it. We built, I suppose, the biggest government building in our history to run it, and we institutionalized it.

I don’t think we can live with the present military establishment, and its eighty-billion-dollar-a-year budget, and keep America anything like the America we have known in the past. It is corrupting the life of the whole country. It is buying up everything in sight: industries, banks, investors, scientists—and lately it seems also to have bought up the labor unions.

The Defense Department is always broke, but some of the things it does with that eighty billion dollars a year would make Buck Rogers envious. For example, the Rocky Mountain Arsenal, on the outskirts of Denver, was manufacturing a deadly nerve poison on such a scale that there was a problem of waste disposal. Nothing daunted, the people there dug a tunnel two miles deep under Denver, into which they have injected so much poisoned water that, beginning a couple of years ago, Denver has experienced a series of earth tremors of increasing severity. Now there is grave fear of a major earthquake. An interesting debate is in progress as to whether Denver will be safer if that lake of poisoned water is removed or is left in place.

Perhaps you have read also of those six thousand sheep that suddenly died in Skull Valley, Utah, killed by another nerve poison—a strange and, I believe, still unexplained accident, since the nearest testing seems to have been thirty miles away.

As for Vietnam, the expenditure of firepower there has been frightening. Some of you may still remember Khe Sanh, a hamlet just south of the Demilitarized Zone, where a force of United States Marines was beleaguered for a time. During that period, we dropped on the perimeter of Khe Sanh more explosives than fell

on Japan throughout World War II, and more than fell on the whole of Europe during the years 1942 and 1943.

One of the officers there was quoted as having said afterward, "It looks like the world caught smallpox and died."

The only point of government is to safeguard and foster life. Our government has become preoccupied with death, with the business of killing and being killed. So-called defense now absorbs sixty per cent of the national budget, and about twelve per cent of the Gross National Product.

## ABM

A lively debate is beginning again on whether or not we should deploy antiballistic missiles, the ABM. I don't have to talk about them—everyone else here is doing that. But I should like to mention a curious circumstance. In September, 1967, or about a year and a half ago, we had a meeting of M.I.T. and Harvard people, including experts on these matters, to talk about whether anything could be done to block the Sentinel system—the deployment of ABMs. Everyone present thought them undesirable, but a few of the most knowledgeable persons took what seemed to be the practical view: "Why fight about a dead issue? It has been decided, the funds have been appropriated. Let's go on from there."

Well, fortunately, it's not a dead issue.

An ABM is a nuclear weapon. It takes a nuclear weapon to stop a nuclear weapon. And our concern must be with the whole issue of nuclear weapons.

There is an entire semantics ready to deal with the sort of thing I am about to say. It involves such phrases as "Those are the facts of life." No—these are the facts of death. I don't accept them, and I advise you not to accept them. We are under repeated pressure to accept things that are presented to us as settled—decisions that have been made. Always there is the thought: Let's go on from there. But this time we don't see how to go on. We will have to stick with these issues.

We are told that the United States and Russia, between them, by now have stockpiled nuclear weapons of approximately the explosive power of fifteen tons of TNT for every man, woman, and child on earth. And now it is suggested that we must make more. All very regrettable, of course, but "those are the facts of life." We really would like to disarm, but our new Secretary of Defense has made the ingenious proposal that now is the time to greatly increase our nuclear armaments, so that we can disarm from a position of strength.

I think all of you know there is no adequate defense against massive nuclear attack. It is both easier and cheaper to circumvent any known nuclear defense system than to provide it. It's all pretty crazy. At the very moment we talk of deploying ABMs, we are also building the MIRV, the weapon to circumvent ABMs.

## Nuclear War

As far as I know, the most conservative estimates of the number of Americans who would be killed in a major nuclear attack, with everything working as well as can be hoped and all foreseeable precautions taken, run to about fifty million. We have become callous to gruesome statistics, and this seems at first

to be only another gruesome statistic. You think, Bang!—and next morning, if you're still there, you read in the newspapers that fifty-million people were killed.

But that isn't the way it happens. When we killed close to two hundred thousand people with those first, little, old-fashioned uranium bombs that we dropped on Hiroshima and Nagasaki, about the same number of persons were maimed, blinded, burned, poisoned, and otherwise doomed. A lot of them took a long time to die.

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*Take away from me the noise of your songs; to the melody of your harps I will not listen. But let justice roll down like waters, and righteousness like an ever-flowing stream. Amos 5:23,24.*

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Society right now has very few realities for me. They exist, but they're not real to me. When I watch the news every night it's not real to me. I can't believe it. I can't believe a Hamburger Hill. I can't believe a gas bomb attack by police on a peaceful protest in Berkeley. I can't believe spending millions of dollars to send soldiers to West Germany to engage in a war game. I can't believe financed non-production of our crops while millions starve.

I can't believe analysts seriously discussing how decisions are made based on whether Johnson or Nixon feel their place in history is going to be preserved if they make certain decisions while people die. I can't believe the pictures I see of the war and I can't believe the pictures I see of the ghettos. These can't be realities to me. I acknowledge that they exist but I can't allow myself to see them as my real world because, if I do that, then I'm willing to accept them.

The way things should be has got to be the way things are or none of us should be able to sleep well at night. We should lose sleep not out of fear of our economic security or of our property because the Negroes are rioting again. We should lose sleep because we are doing things that are wrong, we're allowing things that are wrong to go on in our society, and we're accepting them.

*Ira C. Magaziner*

From the Senior Oration at Brown University, June 1969, "The Need: A Cultural Revolution." Reprinted from *Brown Alumni Monthly*, July 1969.

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*Beloved, do not be surprised at the fiery ordeal which comes upon you to prove you, as though something strange were happening to you. But rejoice in so far as you share Christ's sufferings. I Peter 4:12,13.*

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That's the way it would be. Not a bang and a certain number of corpses to bury but a nation filled with millions of helpless, maimed, tortured, and doomed persons, and the survivors huddled with their families in shelters, with guns ready to fight off their neighbors trying to get some uncontaminated food and water.

A few months ago, Senator Richard Russell, of Georgia, ended a speech in the Senate with the words "If we have to start over again with another Adam and Eve, I want them to be Americans; and I want

them on this continent and not in Europe." That was a United States senator making a patriotic speech. Well, here is a Nobel laureate who thinks that those words are criminally insane.

How real is the threat of full-scale nuclear war? I have my own very inexperienced idea, but, realizing how little I know and fearful that I may be a little paranoid on this subject, I take every opportunity to ask reputed experts. I asked that question of a distinguished professor of government at Harvard about a month ago. I asked him what sort of odds he would lay on the possibility of full-scale nuclear war within the foreseeable future. "Oh," he said comfortably, "I think I can give you a pretty good answer to that question. I estimate the probability of full-scale nuclear war, provided that the situation remains about as it is now, at two per cent per year." Anybody can do the simple calculation that shows that two per cent per year means that the chance of having that full-scale nuclear war by 1990 is about one in three, and by 2000 it is about fifty-fifty.

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*We have to get rid of those nuclear weapons. There is nothing worth having that can be obtained by nuclear war—nothing material or ideological—no tradition that it can defend. It is utterly self-defeating. . . . Nuclear weapons offer us nothing but a balance of terror, and a balance of terror is still terror.*

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#### A Generation That May Have No Future

I think I know what is bothering the students. I think that what we are up against is a generation that is by no means sure that it has a future.

I am growing old, and my future, so to speak, is already behind me. But there are those students of mine, who are in my mind always; and there are my children, the youngest of them now seven and nine, whose future is infinitely more precious to me than my own. So it isn't just their generation; it's mine too. We're all in it together.

Are we to have a chance to live? We don't ask for prosperity, or security. Only for a reasonable chance to live, work out our destiny in peace and decency. Not to go down in history as the apocalyptic generation.

And it isn't only nuclear war. Another overwhelming threat is in the population explosion. That has not yet even begun to come under control. There is every indication that the world population will double before the year 2000, and there is a widespread expectation of famine on an unprecedented scale in many parts of the world. The experts tend to differ only in their estimates of when those famines will begin. Some think by 1980; others think they can be staved off until

1990; very few expect that they will not occur by the year 2000.

That is the problem. Unless we can be surer than we now are that this generation has a future, nothing else matters. It's not good enough to give it tender, loving care, to supply it with breakfast foods, to buy it expensive educations. Those things don't mean anything unless this generation has a future. And we're not sure that it does.

I don't think that there are problems of youth, or student problems. All the real problems I know about are grown-up problems.

Perhaps you will think me altogether absurd, or "academic," or hopelessly innocent—that is, until you think about the alternatives—if I say, as I do to you now: We have to get rid of those nuclear weapons. There is nothing worth having that can be obtained by nuclear war—nothing material or ideological—no tradition that it can defend. It is utterly self-defeating. Those atomic bombs represent an unusable weapon. The only use for an atomic bomb is to keep somebody else from using one. It can give us no protection—only the doubtful satisfaction of retaliation. Nuclear weapons offer us nothing but a balance of terror, and a balance of terror is still terror.

We have to get rid of those atomic weapons, here and everywhere. We cannot live with them.

#### A Point of Decision

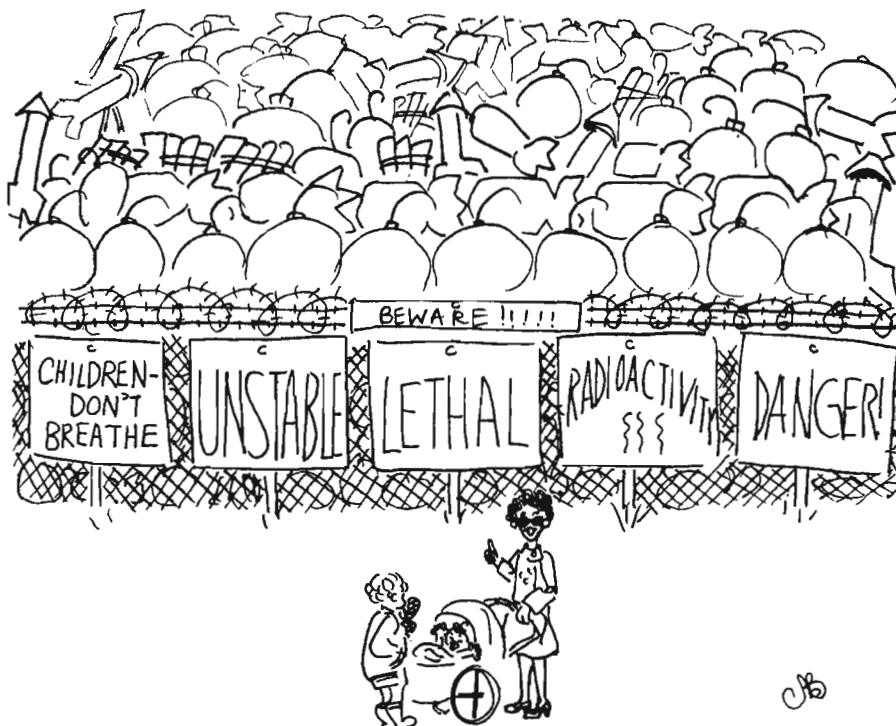
I think we've reached a point of great decision, not just for our nation, not only for all humanity, but for life upon the earth. I tell my students, with a feeling of pride that I hope they will share, that the carbon, nitrogen, and oxygen that make up ninety-nine per cent of our living substance were cooked in the deep interiors of earlier generations of dying stars. Gathered up from the ends of the universe, over billions of years, eventually they came to form, in part, the substance of our sun, its planets, and ourselves. Three billion years ago, life arose upon the earth. It is the only life in the solar system.

About two million years ago, man appeared. He has become the dominant species on the earth. All other living things, animal and plant, live by his sufferance. He is the custodian of life on earth, and in the solar system. It's a big responsibility.

The thought that we're in competition with Russians or with Chinese is all a mistake, and trivial. We are one species, with a world to win. There's life all over this universe, but the only life in the solar system is on earth, and in the whole universe we are the only men.

Our business is with life, not death. Our challenge is to give what account we can of what becomes of life in the solar system, this corner of the universe that is our home; and, most of all, what becomes of men—all men, of all nations, colors, and creeds. This has become one world, a world for all men. It is only such a world that can now offer us life, and the chance to go on.





"They keep us safe!"

## NEEDED: A NEW LOOK AT CHRISTIAN ESCHATOLOGY

Professor Wald's article has been widely read by many people, especially those who are vitally interested in college students and in campus unrest. He writes from a realistic perspective because of his broad contact with students. Perhaps you saw him on national T.V. during the 2nd week in April speaking to students during the Harvard protest against R.O.T.C. He obviously has the feel for students.

I agree with him that a major factor which is paralyzing students today is that they sense there is no meaningful future for them. I agree that in some vague way they feel uneasy about the future. When a man sees no future he starts to malfunction. He starts to question all kinds of things. He challenges all of society's presuppositions. Anyone in contact with students can attest to the above attitudes.

I question whether or not it is the American military and the nuclear stockpiles that are causing the lack of hope. Perhaps these are only symptoms. In general, I wish to call the underlying cause, "Americanism." I sense that we all see no future for America. Perhaps since the depression we have had no future in America *per se*. It has been in outstanding individuals like Roosevelt, Eisenhower and Kennedy. When John Kennedy died much of the hope in America disappeared. The assassinations of Robert Kennedy and Martin Luther King have taken more of a toll than we realize.

Some very perceptive remarks about the role of hope are made in an article called "On Living in a Biological Revolution," by Donald Fleming in the February, 1969 issue of *the Atlantic Magazine*. One statement will suffice to encourage the reader to look at the article.

"In this sense, the greatest revolutionaries of the Western World to date have been precisely the early Christians who dared to affirm in the earliest days of the classical world that something far better was in the process and could be salvaged from the ruins."

Fleming goes on to say that the biological revolution is the main one going on now and that biologists are the people of the future. They know this and this is what is giving them unusual drive and energy in pushing forward in biological research.

Whether or not the biological revolution is *the* revolution of the future is questioned by all of us. But both Wald's and Fleming's remarks bring us squarely to the whole idea of eschatology and whether or not Christians have an adequate basis for hope.

First, let me say that "Americanism" has been the eschatology of many Christians. This has been especially true of second generation Christians who have been reared in an atmosphere of dispensationalism. I have noticed in my student contacts that there has been a serious lack of motivation in many Christians of such vintage. These students, when questioned, show the same symptoms that Wald so expertly points out. Christian theology has little relevance for them. They will dogmatically talk about things like the "rapture" but apparently their eschatology is in material gain and in social climbing.

Another phenomenon which shows that many Christians find their hope in "Americanism" is the massive numbers of theologically conservative Christians who are connected with ultra-right brands of politics. There



is nothing inherently wrong with a Christian being conservative in politics. But when it is the exception to be theologically conservative and politically liberal one must look for other causes, especially when so many Christians would rather "fight than switch" and have looked to men like Barry Goldwater as a political messiah to save American virtues.

Why might it be true that "Americanism" is the essence of eschatology for many Christians? Well, try to imagine your future as one in which you are forcibly drawn out of the battle when the going gets tough and catapulted somewhere into the sky. Most of these Christians' eschatology practically ends right there. Not very motivating, is it? There is no need to prepare for any future. And the future is so ill defined that vagueness is its most characteristic feature. Most Christians secretly prefer living now than in heaven, regardless of how it is defined.

Secondly, one finds among these Christians a feeling that the physical world is evil. Many even think that their bodies are evil. Heaven is an escape of the soul from the known world. Many seem to hate themselves and have a hard time loving themselves.

I believe that many Christians have a perverted doctrine of creation and therefore have no understanding of the cosmic dimensions of the death of Christ. The result is a very narrow sense of individualistic redemption and a truncated idea of eschatology. And this ends in an eschatology that doesn't satisfy the

individual's deepest needs. So he looks elsewhere for satisfaction of these needs and tends to find them in "Americanism".

My plea is for the *Journal ASA* to take the lead in articulating a Christian eschatology based upon Biblical views of creation and redemption. Teilhard de Chardin has made a proposal in which he sees an Omega point in the future where evolution and Jesus Christ meet. Many have rejected this position because it doesn't have an adequate view of the Fall and of the death of Christ.

Perhaps more serious study needs to be made of all the Biblical passages that refer to the redemption of the cosmos. Many are in the Old Testament. Those in the New Testament are Rom. 8:18-25, II Peter 3:11-13, Rev. 21-22 etc. Here we see a new order on a new earth. The New Jerusalem is here on earth rather than in heaven. Continuity between this age and the age to come may be in terms of God's created heaven and earth which is completely redeemed. So let's be prepared to set forth an eschatology which is grounded in the Biblical doctrines of creation and redemption. The *Journal ASA* has a great opportunity here to do creative work in the field of future hope.

**James E. Berney**

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## THE FOOLISH ALTERNATIVE

What a frightening thing it is to face the future today if that future is limited to what one can accomplish by oneself in a single lifespan on earth!

The present world situation suggests that there are two practical courses of action that may be undertaken as alternatives in the future. If these alternatives are evaluated simply on the basis of previous history alone, neither may be considered to be particularly hopeful.

### Continue Armament Buildup

The first course of action is to continue in a buildup of armaments and instruments of warfare, with no foreseeable end in view, in the effort to maintain a balance of potential terror. The argument is that if the potential terror that can be perpetrated by our side is equivalent to or greater than the potential that can be perpetrated by the other side, the net effect will be a deterrent to the use of that terror. The justification given is that it is necessary for our country to defend itself against threatened attack from external enemies, and that there is no way to accomplish this without a continuation of the arms race.

The record of history indicates that any time two nations have continued to build up huge backlogs of potential terror, at some time this unstable stalemate has crumbled, perhaps under the influence of a third power, and the instruments of death have been regretfully put to use. The choice of the first course of action requires the hope that this record will not be repeated, that the continued buildup of arms will lead to a world situation where it will become unnecessary to use them.

### End Armaments Buildup

The second course of action is to bring to an end any continued buildup of armaments and instruments of warfare, all chemical-biological warfare, all research aimed at counter-insurgency in other people's countries, and to restrict any militarily-directed research to measures of defense alone. The non-aggressive defense of the country is a legitimate activity of the government and has a legitimate claim on the scientific talent of the country. Government support of scientific education of students is also a valuable contribution to the welfare of the country, but it may be questioned whether funds granted for military-directed projects are the most appropriate way to achieve this educational goal.

By emphasizing restriction to purely defense activities, it is clear that we admit the possibility that other nations not following this restriction may increase their armaments to the point where their potential for terror exceeds our own. The choice of this second course of action requires the hope that other nations of the world will not take advantage of this possible inequity to enforce their will upon this country. History offers little support for this hope to be fulfilled. The justification for making this choice rests upon the conviction that the continued arms race can lead to nothing except global nuclear war, and that it is possible that some alleviation of international aggravation might be secured by a reduction in belligerent attitudes and actions.

### How Can A Choice Be Made?

In view of this dilemma, how is any choice to be made? Put into the most dramatic and extreme terms, it appears that we may be called upon to choose between possible death and possible enslavement. Has not the rallying cry of our country from

the very beginning been. "Give me liberty or give me death?"

It is not the fact, however, that the choice appears to be between death and enslavement that provides the major guide for making such a choice. For the choice is not only between death and enslavement, it is between killing and enslavement, killing on a scale and with an abandonment truly unique to our present times. And this choice is one that contains its own directive.

It should be clear that the extreme alternatives really are: *killing* or enslavement. A deterrent can be effective only if the enemy is convinced that when the chips are down we will make use of our potential terror to retaliate in kind and destroy him. If it is known that we will not retaliate, that we will not kill when the only motive can be that of global revenge, then any deterrent is disarmed. The whole deterrent-based argument is suspect.

It is appropriately argued that the Christian has a perspective that his fellow humanist, who shares these same concerns, does not have, namely the conviction that no alternative is inevitable because God is there, that He is in charge of the world in an ultimate sense, and that the sufferings of this world are not the ultimate dimension of reality. Such a perspective, however, is in the nature of a personal faith that sustains the individual or a group of individuals in the midst of the most grievous adversity; it is not a self-evident directive for action. The directive for action must derive from an analysis of the situation, and from the answer to the question, "Through what actions of mine can I maintain that God is acting in the present situation?" It is the hope of a Christian that God can and will work His will under the most unpromising of situations, and it is the responsibility of a Christian to be in the place where God can work through him.

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**It should be clear that the extreme alternatives really are: *killing* or enslavement. . . . If a Christian should be forced into choosing between "serving God" through killing, and serving God even though enslaved, does he really have a choice?**

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In this context, the analysis of the problem is not only a choice between killing and enslavement—which activity is more consistent with the Christian faith in the ultimate victory of God's purpose?—it is also a choice between an alternative which is evil, and one which is by historical standards simply foolish. In such a case, I maintain that the Christian is called upon to choose the foolish alternative.

### An Evil Choice

The course of action that calls for the continued buildup of armaments for increasing levels of deterrence can, I believe, be labeled evil. It is evil for at least three reasons: (1) it commits a large fraction

of human ingenuity, concern, and effort to the development of instruments of death and inhumanity, (2) it provides no basis for a resolution of the problems that appear to make the buildup necessary but serves only to intensify the confrontation, and (3) it diverts into military hardware a large portion of the nation's resources that is badly needed at home and abroad for the alleviation of human needs, poverty, sickness and injustice. I cannot see that one can continue on such a course of action while consistently maintaining at the same time that one is trusting that God will set things right.

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**United Press International Release—July 28, 1969**

*Defense Secretary Melvin R. Laird said today the best way to make sure the United States is not the victim of chemical or biological weapons is to maintain its own such weapons as a deterrent. He said the Soviet Union had a "much greater" capability in this area. "This deterrent is important if we want to see that these gases are never used in our time," Laird declared. The Secretary defended the need for a chemical and biological (CBW) program. "As much as we deplore this kind of weapon," he said, "if we want to make sure this weapon is never used we must have the capability to use it." Laird said that the United States must continue to develop offensive chemical and biological weapons.*

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### A Foolish Choice

The course of action that calls for the end of a buildup of armaments and for a restriction of research to items essential to defense and the general welfare, alone—together of course with that fundamental research into the nature of the universe that is the proper concern of society—can, I believe, be labeled foolish. It is foolish because it assumes the possibility of an alleviation of international grievances deeply rooted in history and in national objectives, simply through the refusal of a powerful nation to seek to establish its will throughout the world by force. But if it is foolish, it is also a course of action that is completely open to the will of God. Here is a real challenge for Christian faith.

In the final analysis, if a Christian should be forced into choosing between "serving God" through killing, and serving God even though enslaved, does he really have a choice?

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*Regular Features of the Journal: "Book Reviews,"  
"Communications", and "What Do You Think of THAT?"  
will return in the March 1970 issue.*

## YES, STEPHANIE, THERE IS A FUTURE

In June at graduation time, Stephanie Mills of Phoenix, Arizona, gave the valedictory address at Mills College in California. The title of her address was, "The Future is a Hoax." She said that she saw ahead only an overpopulated world doomed to cannibalism, a horribly disfigured planet with mankind continuing to spread "like an unfeeling, unthinking cancer across the earth." She concluded that the most humane thing she could do would be to have no children. She has no belief in a Supreme Being, but she is not a fatalist; she hopes that there will be some effective planning for population control. The following remarks are addressed to the many young people like Stephanie all around the world today. To them all, I say, "Yes, there is a future." I reinforce that by appealing to Romans 12:21, "Do not be overcome by evil, but overcome evil with good."

In the first place, this is a *strategy for personal injury*. Paul's paragraph begins, "Bless those who persecute you. Bless and do not curse them." He urges Christians to live peaceably with all men, to do everything that is within them to live in harmony and concord. Christians are to trust in God and in His moral order to work out retribution, not to seek vengeance. Paul pleads that if an enemy is hungry, he be fed; if an enemy is thirsty, he be given drink. By acting in this way, the Christian will overcome the enemy with love; he will subdue him with kindness. Hence the concluding words, "Do not be overcome by evil, but overcome evil with good."

But does this work? Is it reasonable or is it ridiculous? We need to remember that when Jesus the Christ came to this world, He came to His own and His own did not receive Him. Although He began to be rejected from the beginning of His ministry, He went about doing good. He fed the hungry, gave drink to the thirsty, healed the lame and the blind, and He raised the dead. Then He Himself went to the cross and was marvelously vindicated in His resurrection. Even members of the priestly party who had put Jesus to death, in later days became obedient to the faith (Acts 6:7). This is the very heart of God's strategy, overcoming evil with good. Dr. C. H. Dodd has said that this is the most creative element in Christian ethics. It is creative because it calls into being that which did not previously exist, relationship where there was no communication, and cooperation where there was isolation. It is creative because it cancels negative feeling and despair, and it prompts positive thought, feeling and action. It comes from the heart of the Creator who replenishes our motive because His love is shed abroad in our hearts by the Holy Spirit who is given to us.

But we do not have only a strategy for winning out over personal injury. We also have a *strategy for overcoming all kinds of evil*. There is always a future for faith, hope and love.

Faith acts according to the word of God and not the word of man. The first command of the Bible is, "Be fruitful and multiply." God wants Christian families on this earth. There ought to be a theology of eugenics from the Christian point of view. God has

always used believing families to do His great work. It's up to you, Stephanie and young people of today, whether or not *you* have children when you marry, but I submit that God wants Christian families on earth and God doesn't want Christians to think that it's impossible to rear children today to do His work in this world. Let faith act in confidence about God's Providence, His "preserving and governing all His creatures and all their actions."

Now Stephanie has a point about mankind spreading in the form of an unfeeling, unthinking cancer. We can't forever commit sins and follies and avoid the judgment of God. There is a built-in process of judgment in the world. It is time for us to be called back to our Creator, providential Supporter, and Redeemer, and I am confident that He is able to still give us His wisdom for the control of population and for the feeding of the hungry.

When Jesus taught us to pray, "Thy Kingdom come," He had particular reference to hope. God has a plan for this world: to sum up all things in Christ. Subsidiary to that plan is the conflict of the ages, the battle between truth and error, between good and evil, between Christ and antiChrist. God will keep things going to accomplish His plan. Hope is world-affirming, faith-affirming, and kingdom-affirming. When the Jews returned from exile to Jerusalem in the time of Zechariah the prophet, they looked at a ghastly ruin, at desolation, hopeless and heart-subduing. The prospect of erecting a temple again seemed utterly gloomy and without any foundation in reality. Then the prophecy came that it would be possible, "not by might nor by power, but by My Spirit," says the Lord of Hosts." The people had hope and went ahead with the building of the temple.

Love is the active energy of God going out from Christian hearts into the world. It has validity now, it has validity in the future, it has validity for this world and the world to come; it abides forever. Back in the 12th century there was a rich young man named Bernard who felt the frivolity of society and the call of Christ to serve the poor. He renounced his wealth and took vows of poverty and obedience. Bernard and his friends chose a place where human life was cheap and wretched, a place at Clairvaux, and there acting on the motto "To work is to pray," they lifted the condition of the people, established schools and hospitals, and continued in the double aim of bringing people into a healthy, happy life and leading them to God in Christ. Through Bernard of Clairvaux and his helpers a light shined in the darkness of the Middle Ages. That beautiful hymn, "O Sacred Head Now Wounded," is ascribed to him.

Dr. Sam Higginbottom was one of the distinguished missionaries of this century. He went to India with the gospel and the plow, to give them Christ and to feed their frail, emaciated bodies. Through agricultural missions he made an impact on the government of India; he gave hope to farmers around Allahabad and developed a plow which oxen pull and which could turn the earth at least six inches deep.

Yes, Stephanie, there is a future. It belongs to those who have faith and hope and love, and who believe that under God they can overcome evil with good.

**Cary N. Weisiger, III**

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Menlo Park, California

In September, 1941, five scientists of deep Christian conviction met together in Chicago. They found that they shared mutual concerns in the relationship of science and Christian faith. The **American Scientific Affiliation** is an outgrowth of that meeting.

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