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*An evangelical perspective on science and the Christian faith*



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

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JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION

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## *Views of Our British Colleagues*

# THE INTERPRETATION OF THE BIBLE IN THE LIGHT OF EXTRA-BIBLICAL KNOWLEDGE

*The problem we set out to study is the place of human knowledge in understanding the Bible. Probably nobody quite believes that the Bible is totally self-sufficient in the sense that one needs only to set a child down to read it and, without his having ever read another book, he will become a reliable interpreter of the Bible. The extreme "Bible alone" position may be a man of straw, but perhaps there are more people who would argue that we should import as little as possible of other knowledge, and there are far more who have a rather fearful and negative attitude to other fields of knowledge as they are used to help interpret the Bible. These fears are not without foundation. Clever people have often twisted the meaning of the Bible in the name of scholarship of one sort or another. We wish to try to clarify the whole question at least a little.*

**Introduction**

Let it be emphasized that the Bible is self-sufficient in the sense that a child may well arrive at its basic message better than a clever adult. (Matt. 18:3). Many unlearned people have been brought to salvation through reading the Bible without any external helps. But it is also true that such people have also often held wrong views because they did not have enough help.

It must also be stated that those who knew the Bible well and knew very little else have most frequently turned out right in the end. This however is not by virtue of their ignorance but partly by virtue of their studious attempts to compare Scripture with Scripture and their humble teachability. They also frequently went to the Scripture asking the questions that the Bible answers. The result was basically sound theology and true devotion, though as teachers they may have been shallow.

We are entirely dependent on the Holy Spirit to give us a personal understanding of the Bible. Intellectual analysis may grasp its intellectual aspects up to

*One of the sister organizations of the ASA in England is the Research Scientists' Christian Fellowship. On September 25, 1971 a Conference of the RSCF was held in London together with the Christian Education Fellowship on the subject, "Science and the Bible," with Professor Malcolm A. Jeeves, author of* The Scientific Enterprise and the Christian Faith, *as Chairman. Four papers were presented at this Conference, each prepared by unnamed groups from London, Cambridge, St. Andrew's and Bristol, respectively. This paper was presented by a group from London. These papers are prepared before the Conference, do not represent the opinion of the RSCF or any other group, and are used primarily as the basis for discussion at the Conference. The text as printed here has undergone minor editing.*

a point. Unconverted people may understand the argument of Romans for instance. But they will not grasp its personal meaning or benefit from it unless they are enlightened by the Holy Spirit. He alone can show us its true significance and He may make the essentials clear to the unlearned as He pleases.

Yet there are plenty of encouragements in both Old and New Testaments to *study* the Bible and to meditate on it and to work hard to understand it. The Holy Spirit does not see fit to encourage laziness. Our problem is what we should bring to our study in the way of extra-biblical knowledge.

### What are the Purposes of the Bible?

What does it aim to do? Perhaps the simplest answer is in terms of II Tim. 3:16,17. "All Scripture is inspired by God and profitable for teaching, for reproof, for correction, and for training in righteousness, that the man of God may be complete, equipped for every good work." This is a comprehensive aim and particular books or sections may have a more limited scope. It warns us that if we go to the Bible merely to satisfy our curiosity or to collect debating points we may find it a very unsatisfactory book. In a classroom situation this is part of the problem. Different people are looking for different things. John's Gospel was written, so the author tells us, "that you may believe that Jesus is the Christ the Son of God and that believing you may have life in His name." It is not primarily a thesis on philosophical theology and when studied for that purpose will be frustrating. Even as a textbook of morals it may be confusing if taken by itself.

This fact pinpoints the danger for the scientist, and we shall refer to it again below. If we read the Bible exclusively through scientific spectacles we shall probably miss its main points and we shall find a lot of unsatisfactory statements—unsatisfactory, that is, from the point of view of 20th century science. It was not written specially to deal with 20th century scientific questions. It may bear on some of them but it did not set out to do so particularly. If we ask a book some questions quite different from those it was written to answer, the result is rarely 100% clear, like the answers of bystanders to a detective's question. What they say may be absolutely reliable but they hadn't realized a crime was being committed. They noticed irrevelant things and failed to notice some of the points he most wanted to know.

### How are these Purposes Fulfilled?

Firstly some negatives. The Bible is not a systematic treatise on doctrine or on the Christian life, Ecclesiology or Apologetics. Also it is not all in one literary form. There are poetry, letters, history, proverbs, parables etc. etc. Neither is it all in one language or from one period of time or culture.

It has enormous variety, but we can say positively that it is "literature," that it was all *deliberately* written down for others to read and that therefore it is all given in some particular linguistic and cultural framework. It is a human product while it is also a divine product. God has apparently deliberately preserved many human elements (different writers have their own style etc.) as His way of getting the message to us. The Bible is therefore, in spite of its supernatural character, not a disembodied series of divine statements. It is embodied (as Christ was divine and yet human also), and if we want to understand it correctly we have to come to terms with its human (literary) embodiment as well as its divine character. The problem of interpretation is concerned with both, and must always pay respect to both, never to one or the other exclusively.

To get at the message, however, we have to start with the human embodiment and to take seriously the fact that this particular medium was chosen for this particular part of the message. That rules out all arbitrary interpretation such as many fanciful allegorical methods of some older interpreters. They attached meaning to words and phrases in an entirely arbitrary way. They could as easily and profitably have used any other book for their purpose. There is a limited use of allegory in the Bible but it is strictly controlled by rational canons. Arbitrary interpretation that has *no* relation to what was intended originally is ruled out if we take seriously the fact that *the Bible is human literature.* The writers were saying important things and wrote them down "for our learning". The New Testament sometimes points out a Messianic reference in an Old Testament passage which is not at all obvious to us. The passages concerned sometimes appear to have a primary reference to something else. But this tradition of an immediate and a remote historical fulfillment of a prophecy was an accepted tradition even in Old Testament times (see Melchizedek in Psalm 110:4). It seems to have been often a part of the writer's intention to speak both of a present and a far distant event at once. (e.g., the virgin—Immanuel prophecy in Isa. 7:14).

The Bible carries out its purpose by giving us human literature. It therefore requires a serious attempt to understand, amongst other things, what the original intention of the writing was, what its phrases and thought categories imply and do not imply and an acknowledgement that there is danger of grave distortion if we see it all as if it were a 20th century western book.

This however could lead to despair. Can the expert on the ancient Hebrew world alone understand it? Must we learn Hebrew and Greek befor we conduct family prayers? Obviously not. And the reason is that human literature speaks to common human experience. Otherwise how could we enjoy Shakespeare? Our understanding of the Bible depends in large measure on our human experience. If we didn't know what love and hate, sin and forgiveness, fatherhood and kingly rule were we would find it much harder. We have to watch carefully, however, just what the Bible does mean by these concepts (e.g., love or the wrath of God). It may be subtly different from our common use.

This explains why the child, although after a certain age he has certain advantages perhaps in getting the essential heart of the message, is not as reliable an interpreter as the adult. A married man is less likely to misconstrue Paul's authoritative teaching on marriage than an unmarried man who in all other respects is equally well qualified. The young and enthusiastic convert who has no experience of church life needs to listen to the experienced Christian leader and to be willing to discuss the Scriptures bearing on the New Testament order in the light of what churches in practice are. The older man may be unbiblical or in a rut of course, but the New Testament epistles were written to or about imperfect churches and not given

in a vacuum.

It is in fact impossible to keep some element of experience out, and the New Testament doesn't encourage us to try. Experience is never normative, but it is useful for avoiding silly mistakes in our understanding of the Bible. Science is, in this respect, one aspect of experience.

### What are the Consequences for Us?

Therefore we should be *positively enthusiastic* for all extra-biblical knowledge that helps us to understand the language and the culture of which that language was a part. The fact is that the interpreter's task is basically a translator's task. He wants to express the ideas and words of the Bible as accurately as possible in the ideas and language of today. Merely literal interpretations will not do. They don't do justice to the original. A good example is our Lord's reply to the question about the greatest commandment in the Law. He replied "You shall love the Lord your God with all your heart, and with all your soul, and with all your mind, and with all your strength" (Mk 12:30). The significant point is that a literal quotation would have used only three words, but it seems that the word "heart" in the Old Testament had by our Lord's time shrunk in its meaning so that it needed "heart and mind" to do justice to it. The literalist could say that Jesus misquoted the Old Testament, but this is of a pattern with much (not all) New Testament quotation of the Old Testament. A free translation is sometimes preferred to a strictly literal one because Hebrew and Greek are so different, and biblical authors are anxious to give the *meaning* (particularly the spiritual meaning) which is hard enough to convey anyway.

Any language consists of a system which people draw on and use according to their various needs. Popular language, a more careful literary language, and a variety of technical jargons can all be recognizably part of the same system, but differ widely from one another in certain respects. In spite of the abundance of new evidence that is still being assessed, we remain ignorant of many contextual factors without which we cannot fully understand every detail of the Biblical language. Nevertheless, as in everyday life, we may miss part of the significance of a statement without being misled about its main import.

Modern English has been influenced by scientific thought as well as by centuries of poetic imagery and rhetoric. A literal translation from Hebrew or Greek may suggest a precision that does not apply to the original: was the widow looking for precisely two sticks, or a couple, in its popular sense (I Kings 17:12)? Acceptable norms of exaggeration vary from language to language and context to context. The men "out of every nation under heaven" of Acts 2:5 are shown a little later to come from a relatively limited area: vv. 9-11 do not pretend to be exhaustive, but the reference to Cyrene seems to imply that not all nations then in North Africa (the modern Libya is a much smaller area) were represented. In John 11:11 the statement "Lazarus is asleep" misled the disciples, but in the context of I Cor. 15:6 a literal translation of the same verb is unlikely to mislead us even in the 20th century.

The *truths* that are conveyed to us in the Bible are, in all language, culturally and linguistically embodied truths. The Bible often speaks about real events. And

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events have a scientific and an historical aspect. It is bound to touch on things on which scientific and historical knowledge bears also. *We cannot therefore accept a dichotomy between the truths taught by the Bible and scientific facts.* Bible truths are "embodied" truths. The resurrection and virgin birth actually happened. "The fire of the Lord" fell on Mount Carmel. Moses led the children of Israel out of Egypt to Canaan. Noah entered a physical ark to escape a physical flood, etc.

But equally the language of the Bible is not 20th century language. The truths are embodied in a different culture and way of thinking and writing. 20th century scientific language may be complementary to biblical language. If we ask 20th century questions we may find we have no answers. This is inevitable. We can't even be certain of the physical diseases that afflicted Henry VIII, nor just how William II died. The records are not in our sense scientific enough. But that doesn't make them erroneous. They were not written to satisfy our 20th century scientific Christianity. How much less were far older records, set in a far different culture, framed to answer some of the questions we want to ask. Their sense of chronology *may* have been different—not inaccurate, but just different. When it says that "the whole world went to be taxed" the idea was perfectly clear to them, though not necessarily as precise as our modern censor would wish.

We can *easily lose the wood for the trees.* A purely linguistic approach often fails to clarify the ideas. Some forms of literature need several hundred words as the quantum of revelation (e.g., Job). Proverbs need only a sentence. The meaning of words and phrases may need to be seen in the context of the broad sweep of the Biblical revelation, e.g., words like *agape.*

### Some Practical Principles and Rules for Interpretation

*Principle I The Bible was originally written for ordinary human beings.* They were expected to understand and obey its message. Therefore

*Rule* (a) *We must interpret according to the proper logical understanding of the language* (This has often been called the historico-grammatical principle). This can be analysed in part into the following elements.

*Rule* (b) *Consider what the passage was intended to convey to its original hearers or readers.*

In all Scripture God had something important to say to the original hearers or readers, whatever the content or literary form of the passage. For example, the *historical passages* show God's controlling hand in the lives and history of His people and this view of history is used for the moral and theological instruction of the readers (e.g., Ps. 135). *Prophecy* likewise in-

volves an immediate challenge to writer and reader alike. The prophets were conscious of the principles of God's dealings with men, and these principles, conveyed in various prophetic utterances have the same message today as they had for the contemporary hearer or reader. In this sense there is no primary and secondary meaning to prophecy although there are often successive phases, in time, of fulfillment.

The *poetry* of the Old Testament was important for the original readers as ethical and religious teaching (e.g., Song of Solomon, David's lament over Jonathan) and in teaching the ways of God (e.g., Song of Moses, Ex. 15). Several Old Testament references to the love of God for His church (e.g., Hos. 2:14ff, Jer. 3:14) indicate that this interpretation of the Song of Solomon was probably contemporary and not solely Christian.

*Symbols and types* (e.g., Passover, brazen serpent) which illustrate to us the work of Christ were, to the original participants and readers, acts or institutions of God which taught the same Gospel truths that we may now learn from the anti-type. The sacrifices were sacraments looking forward while New Testament sacraments look back in time.

The meaning of Scripture for the original readers is thus seen to be, in principle, identical with that intended for us.

*Rule* (c) *The language of the Bible is popular and pre-scientific and employs the idioms and culture of the times without implying the 20th century scientific meaning of those terms.*

Interpretation involves some knowledge of the idioms and culture of the times. Again it should be noted that such knowledge at present derives chiefly from Old Testament writings and it is only reasonable to lay the major emphasis on these while also taking into account other sources such as the Ras Shramra tablets or Babylonian Creation Myths. While living in close contact with other, often larger, nations, the Israelites remained a separate and distinct people, largely by virtue of their beliefs and worship of their unique God. It is most improbable that Israelite culture should be connected with pagan culture on this very factor which was the cause of their separation and peculiarity. Such considerations should prevent the forcing of evolutionary or humanistic interpretations on to names, words or passages in the Old Testament which may bear superficial resemblances to pagan customs or literature.

A few of the aspects of Bible culture which need to be considered are outlined below.

*Hebrew modes of thought and expression.* The consequences of an act are immediately seen in the act itself and preludes and sequels are not necessarily severed; e.g., "iniquity" means also the consequent punishment, Gen. 20:9; "sin" is also the punishment for sin, Zech. 14:19; the birth of Esau and Jacob, Gen. 25:22-26. Thus as a consequence of Divine revelation the Hebrew writers dealt more with final than efficient causes. Similarly purpose and result are telescoped, e.g., "men make idols that they may be cut off" Hos. 8:4 (cf. Jer. 7:18, Mic. 6:16, Isa. 44:9).

*Poetry.* In addition to the more generally recognized poetry of the Bible (Psalms, Song of Solomon etc.—for similarities with contemporary pagan poetry see *New Bible Commentary* pp. 39ff.), there are other parts of the Old Testament written in poetic form. These consist of dramatic accounts enshrining historical fact in a form intended to impress itself on the memory, emotions and will of the hearers (e.g., Ps. 68, 135, Exod. 15). In this way they differ from scientific history, since words may be used in a "poetic" fashion in order to convey the main idea more strongly and, in terms of the spiritual content, more accurately. The Book of Job is an example of such a form which shows the true-to-life reactions of a man and his friends confronted with deprivation and suffering on a scale past imagining. While grounded in actual human experience, it is not necessarily a "scientific history", but is framed so as to convey most directly the natural reaction to and the Divine view of suffering. We may doubt whether it is all a "scientific" history because it is so clearly written in dramatic form. One of the primary tasks of interpretation is to determine what literary *genre* or form is being used in each passage. Words can be given only a meaning appropriate to the literary form being used, and this is often difficult to determine, as in Genesis 1:3.

*Even if we regarded the story of Job or Genesis 1-3 as something very different from 20th century history, if we do not understand them in their own terms we shall miss a large part of their significance.*

We have no reason to rule out *a priori* the possibility that Myth and Saga may have been used by the biblical writers, but the presence of Myth has to be proved and it is better to use the generic term "poetic form" than to talk of Myth on account of the derogatory popular sense of myth.

*History.* Hebrew writers were, none the less, capable of writing well documented, scientific history, (e.g., Chronicles). Events are accurately described, although the material is selected according to the purpose of the particular writer and the then current ideas of chronology. The fact that the writers (and those from whom they obtained their material) believed in acts of God in historical events inspired them to treat the historical data accurately and reverently. For this reason it is held that patriarchal history comes into this category and that Abraham is not just a "poetic" character representing a tribe. It is an arbitrary and often dishonest way of solving problems to treat all the earlier histories as myths.

*The philosophical writings.* The Hebrews were acquainted with the philosophy of neighbouring Semitic countries (e.g., I Ki. 4:30; Ob. 8; Jer. 49:7) and there are occasional similarities, e.g., between Ps. 72 and the writings of Ipuwer of Egypt who looked "beyond present evils to the advent of a righteous King who will bring rest to man as a shepherd to sheep" (E.J. Young—*My Servants the Prophets* (1952) pp 200ff). Such similarities do not necessarily point to copying or borrowing, but to an example of Rom. 2:19,20 expressed in the cultural terms of the time. Kenyon writes: "The Wisdom literature of both Egypt and Mesopotamia goes back to much earlier periods than the corresponding Hebrew books. The Hebrew writers

were engaging in a kind of literature common to Eastern countries and were no doubt influenced by the production current in the countries to east and west of them; but their writings were not direct copies. They are original compositions in the same vein." (*The Reading of the Bible*, (1944) p. 52). The study of Eastern philosophy and literature in general could thus be of help in understanding the thought processes and literary forms of the time.

*Rule* (d) *In general the Bible describes events through the eyes of the inspired writer* rather than in absolute or scientific terms. There is no 20th century science in the Bible because there were no 20th century scientists to write it. The result is often the language of a "simple observer."

This type of *descriptive language* is just as common today. The sun "rises" and "sets", the "stars come out". We have a "cloud burst" etc. In the same way biblical phrases like "He hath settled the round world so fast that it cannot be moved" or "the waters were turned to blood" need not be given a scientifically accurate meaning. The locust "goes on all fours", (Lev. 11:20); should it really have been "all sixes"! We think not. The danger of excessive literalism is as great for the liberal, who finds a "three-decker universe" etc. in the Bible, as for the conservative.

Seeing that Scripture is so deeply rooted in Hebrew and other cultures one might expect to find the scientific inaccuracies of the times. The remarkable freedom from lurid misapprehensions (as often found in medieval medical books), from the crude legendary ideas embraced by neighbouring peoples (of the Babylonian Creation Myth) and from perverted practices associated with contemporary religions (except when recognized and condemned as such) shows the purifying influences exerted by the monotheism of God's revelation both on the nation and on its literature.

*The chief value in bringing scientific study to bear on Biblical interpretation is in the prevention of fanciful interpretation.*

*Rule* (e) *Scripture needs to be understood in its own terms.* While in modern terms we may be unable to determine the actual historicity of an event, this does not mean that we should try to alter the form or the terms in which the Bible gives us its message. Even if we regarded the story of Job or Genesis 1-3 as something very different from 20th century history, if we do not understand them in their own terms we shall miss a large part of their significance. The descriptions given in the Bible are the ones chosen by God. If something is recorded in a historical framework (i.e., as apparently a series of actual *events*) we are bound to interpret it in the same way as we would interpret history (the details having the same kind of relevance as in normal history). We must speak of man keeping the garden of Eden, naming the animals, of Eve arguing with the serpent etc. even if we are not certain what kind of historiography these ways of writing represent.

There are grave difficulties about taking Job 1 literally. Does Satan really continue to appear in heaven? But this dramatic way of putting it tells us something unique about the part of Satan in disease and suffering.

Even those of us who may be uncertain about the historicity and geography of the Fall as presented in Genesis 3 cannot escape that way of thinking and talking about the entering of sin into the human race. The only safe way to think *concretely* about this spiritual truth is in terms of the Fall of the ancestors of the whole race. Any "improvement" on this is almost certain to be an impoverishment or a distortion.

There is a parallel with the sacraments. We could disembody the truths that the Lord's Supper teaches and put it in a sermon. But the Lord gave us material elements. We have to accept the form in which the Lord embodied the realities concerned. He had reasons for doing it that way which we can only partially understand.

*Principle II The Scriptural revelation is a unity.*

*Rule* (a) *Scripture cannot contradict itself* so that any paradox in Scripture cannot represent a real contradiction. Our tendency to mix descriptions in more than one language system and to extrapolate from experience in one to conclusions in the other, makes us particularly prone to encounter paradox. The classical example of this in the spiritual realm is predestination and free-will. Rightly, free-will is a concept in actor language (it is *my* experience of *my* activity), whilst predestination is a description in observer language (it is how *I* see *God's* activity on my behalf). The classical example from the physical realm is the wave/particle theory of matter. Here we may describe certain optical and electronic phenomena in a language system based on particles, or conversely in terms of such concepts as waves and frequencies. This is entirely satisfactory until we try to mix these language systems and to ask such a question as, where is the particle situated in the wave? We conclude, therefore, that paradoxes are most often encountered when independent language systems (that is basically, systems of symbols) are conjoined in a single description. Many Biblical paradoxes seem to be in this form. If we remember this there is no need to resort to highly speculative theories to explain certain events in terms of pagan religions, practices, such as why Uzzah died on touching the ark of the Lord. The apparent difficulty of reconciling some aspects of the Old Testament revelation of God's character with some aspects of the New Testament revelation in Christ should not therefore lead us to escape the plain meaning of either in an attempt to reconcile the two.

*Rule* (b) *Interpret Scripture in the light of the rest of Scripture.* Our guide here is provided by our Lord and the apostles, who used Scripture as illustration for their teaching (e.g., Mt. 12:40, Jn. 3:14, II Cor. 11:3, Gal. 4:21-31). Moreover Christ is the key to the understanding of much Scripture as well as our guide in interpreting it. This is brought out clearly in the story of Philip and the eunuch in Acts 8:26-40 and in many other passages in the New Testament, e.g., Lk. 10:23, 24, Jn. 1:14, Mt. 5:17,18. The "problem" of some Old Testament books is "solved" by our understanding of Christ. Thus Ecclesiastes may be seen as an exposition of the Fall, recording the mental struggles of

one perplexed by difficulties of which we know, in Christ, the solution. Similarly Christ is the "answer" to the Book of Job (e.g., Job 10), and the Song of Solomon (cf. Eph. 5:22-23).

If we accept apostolic Christianity we are bound by the authority of the Old Testament. Christ and the New Testament authors hold, without compromise, the divine inspiration of the Old Testament. This is brought out by the apparent confusion between "God" and "Scripture" in a number of Old Testament passages quoted in the New, e.g., Gal. 3:8, Jn. 12:1-3, Rom. 9:17, Ex. 9:16, Hebrews 3:7, Ps. 95:7. From this follows the applicability of Old Testament passages for us (Rom. 15:4, cf. Mt. 4:1-11).

Here we can be guided by those systematizations of doctrine that can demonstrate their biblical position. We must interpret what is not in itself clear by those doctrines and passages that are quite clear. John Knox expressed this position when he wrote into the Scotts Confession, "If any man will note in this our Confession any article or sentence repugning to God's Holy Word. . . . we do promise unto him satisfaction from the mouth of God; that is from His Holy Scripture, or else reformation of that which he shall prove to be amiss." The system of theology is subject to the explicit teaching of Scripture but it is also an interpretative tool. Thus we cannot interpret any verse so as to deny Jesus' deity though we may need to understand His humanity in a fresh way which our limited minds do not easily fit in. If Scripture says He was sinless, no verse can really state that He sinned. This process is paralleled by the way in which we interpret fresh scientific findings in the light of agreed principles. In the background is our conviction that the world is a unity.

There is of course a danger in both fields of failing to face facts because of a rationalistic refusal to believe that new findings *can* fit in. In any case no one man is likely to hold *all* biblical truths in a unified system.

If Rules (a) and (b) appear at times (e.g., problem passages like Hebrews 6) to contradict each other, we can only point to the analogous problems in science when confronted with unexpected facts.

*Principle III The God who speaks in Scripture is also the Creator.*

*Rule* (a) *Interpret in the light of ordinary experience, but recognize that the Bible is frequently relating extra-ordinary events.* The true significance of the story of Martha and Mary is helped by experience. No young child will *fully* understand it. The various classes of seed-bed in the parable of the Sower are clearer when we have some experience of evangelism. Church history illustrates some false interpretations of Romans 13:1-6.

*Rule* (b) *We can use extra-Biblical knowledge to help us to decide between alternative possible interpretations,* but we cannot use such knowledge to contradict the plain and inescapable meaning of Scripture (e.g., the cosmology disputes and the age of the earth). The problem is to decide when the meaning of either science or the Bible is absolutely plain and inescapable.

The Biblical miracles or "signs" may be examined scientifically but there is no *a priori* reason for their rejection on scientific grounds. It is not wrong to suggest scientific "explanations", provided the purpose of the miracle is retained and provided a dichotomy into "natural" and "supernatural" is avoided. For example, when Israel crossed the Red Sea, the natural cause (a strong east wind) and the purpose (the saving of His chosen race) are both stated, and are both taken as part of one Divine Miracle (Ex. 14:21).

In general, scientific knowledge shows that the Bible does not speak in a scientific sense about the physical structure of the universe (e.g., roundness of the earth from Isa. 40:22). It is probable that the "Hebrew idea of cosmology" referred to by some critics never occurred to the Biblical writers, so it would be unfair to criticise such an idea as erroneous. Comparison of well-authenticated scientific observations with many of the scriptural statements about the universe shows that, for example, descriptions of heaven as resting on pillars (I Sam. 2:8; Ps. 75:3), as being like a tent (Isa. 40:22) or as having windows (Gen. 7:11) are poetic or perhaps popular descriptions. It would, on the same grounds, be unwise to attach much scientific significance to Gen. 1, even where there is apparent agreement with modern science. The chief value in bringing scientific study to bear on Biblical interpretation is in the prevention of fanciful interpretation.

The question of certainty in the meaning of Scripture and in science must be approached with care, especially in the light of the history of the science-religion controversy. Since our understanding of both is, at best, incomplete, it would seem both wise and reasonable to preface statements in this context by such phrases as "I cannot escape the convictions that" or "It seems perfectly clear that".

*Rule* (c) *Recognize the possible complementarity of language system or of literary genres both in the Bible and between the Bible and science, but do not allow this to imply contradiction of matters of fact.*

For example the Bible includes fairly different descriptions of the same events in historical books and psalms. Scientific language or 20th century history could not be expected to use exactly the same terms as either. Our problem is not necessarily to provide a harmony or synthesis (a harmony of the Gospels often loses all life) though this *may* be helpful; but to assess properly what the Biblical writers meant to say. Extra-biblical knowledge here serves chiefly to warn us that certain "obvious" interpretations may be extremely unlikely and so forces us to think again. In any case the scientific status of the events was rarely the *main* interest. It may be an important aspect (the crossing of the Jordan and Red Sea) but the main message is seen in other aspects. The Egyptians saw the plagues and disbelieved.

# The Nature of Biblical Inerrancy

DANIEL P. FULLER

Fuller Theological Seminary
Pasadena, California

## The Nature of Error

In its September 18, 1970 issue *Life* magazine cited Gordon Mills as the composer of the song, *It's Not Unusual*. But actually the song was jointly composed by Gordon Mills and Leslie Reed, and Reed's agent reported the error to *Life*. *Life* replied in its October 16 issue that "it was happy to set the record straight." *Life* had been in error. The intention of *Life* magazine is to set forth life as it is, but neither *Life* nor any other newspaper or magazine can claim inerrancy, and we all do well never to believe all that we read in them.

My family doctor may illustrate a principle of healthful living by referring to something from major league baseball, but in so doing he gets the wrong players on the wrong team. Nevertheless I get the point that he is illustrating and go on having complete confidence in him as my doctor because his intention is to be an expert not on baseball (and I am not consulting him for that) but on medicine, and as long as he fulfills that intention, I regard him as inerrant and therefore trustworthy.

A communication can be in error only if it fails to live up to the intention of its author. In considering the "nature of Biblical inerrancy," we first let the Bible writers tell us what their intention was in writing, and then if they fulfill this intention, we regard them as inerrant. The Biblical writers make it clear that their purpose was to report the happenings and meaning of the redemptive acts of God in history so that men might be made wise unto salvation. Thus Paul in writing to Timothy (II Tim. 3:15) said,

> . . . From a babe thou [Timothy] hast known the sacred writings which are able to make thee wise unto salvation through faith which is in Christ Jesus.

Paul regarded his teachings and those of the other apostles and their close associates as a continuation of the teaching of the Old Testament Scriptures which had made Timothy wise unto salvation. Thus in I Corinthians 2:6ff., he included himself, the other apostles, and their close associates in the "we" when he said, "We speak wisdom, although it is not wisdom of this age or of the rulers of this age . . . We speak a secret and hidden wisdom of God . . . [It consists in] what no eye has seen, nor ear heard, nor the heart of man conceived. It is what God has prepared for them that love him." Then in I Corinthians 2:13 Paul went on to declare that these New Testament revelatory spokesmen, like their counterparts in the Old Testament, "speak this wisdom in words not taught by human wisdom but taught by the Spirit." This means that all the revelatory spokesmen of the Bible were verbally inspired, that the words they used in teaching and writing were wholly the product of God speaking through them. Thus the Bible is inerrant, because, being verbally inspired, it fulfills its intention to recount and give the correct meaning of God's redemptive acts in history. Jesus claimed that the Bible was thus inerrant when he said, "The Scripture cannot be broken" (John 10:35). He also claimed it when he said "You do greatly err, not knowing the Scripture . . ." (Matt. 22:29), for by saying this, he was necessarily implying that what the Bible teaches is inerrant.

*In considering the nature of Biblical inerrancy, we first let the Biblical writers tell us what their intention was in writing, and then if they fulfilled this intention, we regard them as inerrant.*

## Non-revelational Inerrancy?

But there are some today who regard the Bible's plenary and verbal inspiration as insuring its inerrancy not only in its declared intention to recount and interpret God's mighty redemptive acts but also in any and all of its incidental statements or aspects of statements that have to do with such non-revelational matters as geology, meteorology, cosmology, botany, astronomy, geography, etc. Thus the late Edward J. Young argued in his book, *Thy Word is Truth*, that "the Bible in its statements is not contrary to fact."[1] He also said, "A person who continues to make so-called trifling mistakes is not one whom we can trust . . . If God has communicated wrong information even in so-called unimportant matters, he is not a trustworthy God."[2]

Now it might seem that since the Bible's importance consists precisely in the tremendous revelational teach-

A paper read at Pierce Chapel, Wheaton College, November 5, 1970, at a meeting sponsored by the Bible Department. The essentials of this paper were also read at the Southern California Section of the ASA, meeting at Fuller Seminary on November 16, 1968.

ings it conveys, that it is really unimportant for Young to take another step and insist that between what the Bible merely touches upon and the referent there exists a one-to-one correspondence. Indeed the Bible is amazingly accurate in so many of its allusions to non-revelational matters—which we define as capable of being checked out by human investigation, i.e., knowable by what eye can see and ear can hear. But the problem is that a consistent adherence to Young's position finally involves excising the Bible from the very history in which the Bible intends to say that revelation has occurred.

### Abraham's Chronology

Let me illustrate. In handling the chronology of Abraham's life Edward Young could not find a plausible way to harmonize Genesis 11:26–12:4 and Acts 7:1-4. According to Acts 7:1-4, it was only *after* Terah died in Haran that Abraham went on to Canaan. But according to the Genesis account, Abraham left his father in Haran and went to Canaan some seventy years *before* his father died.

Young cannot see his way clear to solve this problem by recourse to the several solutions that commentators have proposed. (1) He cannot replace the Masoretic text at Genesis 11:32 with the reading of the Samaritan Pentateuch, which makes Abraham's departure coincide with Terah's death, because Young was convinced of the authority of the Masoretic text. (2) Sometimes the suggestion is made that Genesis 11:26 mentions Abraham first among the three sons Terah begat from age seventy onwards, not because he was born first, but because he was the most prominent. Actually, so the suggestion goes, Abraham could have been the youngest son. If Terah was 130 when he begat Abraham, then Abraham's departure from Haran at age 75 would coincide with Terah's death at age 205. But Young rejects this as absurd because it would be impossible to understand how Abraham found it difficult to have a child at age 90 if his own father had begotten him at age 130. (3) Neither should the death of Terah, which according to Acts 7:4 occurred when Abraham left Haran, be understood as Terah's spiritual death or his death so far as Abraham was concerned, for this would be a gratuitous understanding of the verb "to die" in this context. Young cannot say that Luke simply reported Stephen's use, before the Sanhedrin, of the reading of a text now extant in the Samaritan Pentateuch, for when Stephen gave his speech he was an inspired man—"full of the Holy Spirit" (Acts 7:55),[3] and it is impossible to presume that inspiration would not expunge such an error. "It would certainly be the part of presumption," Young concluded, "to assert that at this point there was positive error in Scripture. Far wiser is the course of candid acknowledgment that, with our present limited knowledge, the answer to this particular difficulty is not known to us."[4] Thus Young is not willing to consider the explanation that Stephen's Abrahamic chronology came from a version of the Septuagint that paralleled the Samaritan Pentateuch. Incidentally, F. F. Bruce indicates that it was likely that Stephen was well-versed in this text, because there are other parts of his speech in Acts 7 which parallel the usage of the Samaritan Pentateuch.[5]

Now a historian, unfettered by the necessity to uphold Young's doctrine of inerrency, would immediately declare that it was highly probable that Stephen's peculiar chronology in Acts 7:1-4 stemmed from both his and his hearers having been nurtured in a text that is today extant in the Samaritan Pentateuch. But Edward Young, historical scholar that he was, could not follow this highly probable pathway of historical reasoning. In the face of this discrepancy all that he could say was that "the answer to this particular difficulty is not known to us."[6] But to be unwilling to let historical data supply a highly probable solution, is to reject historical data in the interest of theological dogma. By refusing the data provided by the Samaritan Pentateuch, Young would be forced to say that the parallels between Stephen and the Samaritan Pentateuch were merely coincidental, or, in other words, he would be forced to discount a cause commensurate with the effect found in Stephen's speech. To do this places all historical knowledge in jeopardy. To rule out, on theological grounds, historical data that can cast light on a source a Biblical writer was using would make it questionable whether any historical datum should ever be allowed to illuminate the meaning of a text of Scripture, and that would mean denying that the Bible is to be interpreted historically as well as grammatically. To adhere to such reasoning implies a basic distrust in the historical method, and to be consistent, one should never appeal to archaeology, etc., in support of the Bible.

*The doctrine of the inerrancy of Scripture, far from affirming that the Holy Spirit corrects non-revelational, cultural references, demands instead that they be left unchanged.*

### Christian Faith Grounded in History

Then, too, if we, as Edward Young, let a theological dogma muzzle a highly probable historical datum, then it would be difficult for us to insist that the truth of the Christian faith is grounded in history. If a historical datum cannot be used to explain Stephen's departure from the Genesis chronology, then why should we use historical reasoning to ground our faith that Jesus is risen from the dead and from there argue to the truth of Scripture?

At this point I wish I had space to spell out how I argue historically that the risen Jesus must have appeared to Paul and have commissioned him to be an apostle, with all that that word means. Then, having established Paul as an apostle of Jesus Christ, I wish I could show how to argue from this to the inspiration of the rest of the New Testament and to the inspiration and authority of the Old Testament as well. In other words, basic to my concept is that inspiration is validated by history and not vice versa.

But consistent with his view of inerrancy, Edward Young did not, as Warfield, base the authority of Scripture on the empirical data of history. In the paper he read at the Wenham conference in 1966 Young said, in distinction to Warfield, that "our conviction that the Scriptural writers are reliable teachers of doctrine rests . . . simply and solely upon the inward testimony of the Holy Spirit." Young was even quite willing to affirm that basing faith in this way involves

reasoning in a circle. He said,

> If God has actually created us, it follows that all we know we must receive from Him. He must tell us what we are to believe about anything . . . We need not be frightened by the charge that to accept the Scriptures as the infallible Word of God requires us to reason in a circle . . . If God is the Creator and man a creature, there is no way in which man can set himself up as a judge of what God has revealed.[7]

But one wonders if such unwillingness to submit the Bible to the criterion of historical reasoning does not jeopardize the strong Scriptural emphasis that God, in revealing himself to man, entered into the very stuff of history, that the "Word became flesh" (John 1:14)? If the revelation of God did thus become so completely a part of this world and its history, why then does not our access to knowledge of this revelation come always by way of historical methodology, which is our only means for knowing what happened in the past? Certainly a view of inerrancy which lifts the Bible out of history cannot be regarded as satisfactory.

### Trustworthiness of God

But is not Young right in saying that if Acts 7:1-4 contains wrong information in even so trivial a matter as a detail in Abraham's chronology, then God is not a trustworthy God? My reply would be an emphatic no. As the passages which I cited indicate, the intention and purpose of the Biblical writers is to set forth the revelational truths regarding the fact and meaning of God's acts in history. It is only because this revelation is set forth in propositions that are verbally inspired that men who take the trouble to exegete them accurately—savoring the nuances of the Hebrew and Greek words, and their syntactical relations and word order—are able to think God's thoughts after him accurately and not err in their understanding of the whole counsel of God.

*The Christian is perfectly able to credit the teaching of the Bible and be a scientist or a historian at the same time.*

But being verbally inspired, the Biblical writers were also supernaturally enabled by God to understand the best way to take certain non-revelational, cultural matters, and without changing them, use them to enhance the communication of revelational truths to the original hearers or readers. For example, if, as would appear likely, Stephen and his hearers had been raised on a text which makes Genesis 11:31 say that Abraham left Haran *after* his father died, then God helped Stephen to communicate revelation to the Sanhedrin by directing him to go right ahead and use this, very possibly, less accurate text.

Nothing revelational hinges upon the exact chronology of Abraham's early life, so it was reasonable for Stephen to use this version as a vehicle for trying to persuade the Sanhedrin of the revelational truth that throughout Israel's history God had been constantly wooing her to repent, but that Israel had always resisted the Holy Spirit (Acts 7 *passim*, esp. v. 51). The communication of this revelational truth would have been hindered had the Holy Spirit directed Stephen to use the more accurate text, for its strange sound would have diverted his hearers' attention *away* from the revelational point that God was inspiring him to make. Thus God's inspiration enabled Stephen both to utter, inerrantly, the revelational truths of his speech and also, for pedagogical purposes, to make best use of the cultural, non-revelational contents of his speech.

### The Mustard Seed

Another example of this is Jesus' allusion to the mustard seed as the smallest of the seeds (Matt. 13:31; 17:20). Botanists know of seeds even smaller than the mustard seed.[8] In the culture of the people to whom he was speaking, however, the mustard represented the smallest seed, for it was regarded as the smallest thing which the eye could see.[9] Thus the culture of the hearers provided Jesus with an illustration that aided the communication of the revelational truths that a very little faith could remove mountains, and that the kingdom of God, though very small then, would eventually become very large. Surely Jesus, in his omniscience, knew perfectly well that there were smaller seeds, but he used this facet of the culture of the people to whom he was speaking as a vehicle for conveying the cargo of revelational truth. Had Jesus spoken of the seed which was indeed the smallest, he would have been scientifically more accurate, but his hearers would have been so confused trying to understand what he was talking about that they would have concerned themselves more with the illustration than with the revelational truths it was illustrating. Therefore, the doctrine of the inerrancy of Scripture, far from affirming that the Holy Spirit corrects non-revelational, cultural references, demands instead that they be left unchanged. As Bernard Ramm has said,

> No objection can be brought against the inerrancy of the Bible because it is a culturally conditioned revelation. The Bible uses the terms and expressions of the times of its writers. Any revelation must be so accommodated to the human mind . . . When the religious liberal renounces much of the Bible because it is culturally conditioned, he fails to understand that inspiration used cultural terms and expressions to convey an infallible revelation.[10]

### Calvin

Calvin, who often spoke of the Bible as being dictated by God, also followed this approach in commenting on Hebrews 11:21, which follows the Septuagint reading of Genesis 47:31, "Jacob worshiped, leaning upon the top of his staff," when the Hebrew reads, "Jacob bowed himself upon the bed's head." Calvin realized that the translators of the Septuagint had mistaken the Hebrew word *mittah* (bed) for *matteh* (staff). But he justified the writer of Hebrews for following the Septuagint, saying,

> The Apostle [*sic*] hesitated not to apply to his purpose what was commonly received: he was indeed writing to the Jews; but they who were dispersed into various countries had changed their own language for the Greek. And we know that the Apostles were not so scrupulous in this respect, as not to accommodate themselves to the unlearned, who had as yet need of milk . . . But, in reality, the difference is but little; for the main thing was that Jacob worshiped . . .

## Bible as Revelation

Thus my point is that the Bible's intention is to set forth a revelation of the happening and meaning of God's redemptive acts in history. The whole Bible is revelation. Most of its propositions are directly revelational, while others[11] and certain aspects of some revelational propositions function to facilitate the transmission of what is directly revelational. I am persuaded that the Bible is without any kind of error in whole or in part, in that it lives up perfectly to its intention to convey a revelation from God in the most pedagogically suitable manner for the original hearers and readers.

But one misinterprets Scripture if he tries always to harmonize with science and history aspects of Biblical statements whose purpose is only to facilitate the communication of revelational truth. For example, the time span of Genesis 5 has a very essential revelational aspect in that it emphasizes that events before and after it happened *in history*. But the exact number of years is not essential to the author's intention to be a revelational spokesman. No doubt he, along with his original readers, thought that the number of years indicated in chapter 5 was the length of time that transpired between the Fall and the Flood, just as he and they probably thought that the sun and stars moved across the heaven of a stationary earth. Since such matters, however, are non-revelational, they lie outside the boundary of the Biblical writers' intention, and are therefore irrelevant to the question of Biblical inerrancy. A book is inerrant only against the criterion of its writer's intention. Interpretation is not concerned with everything that was in an author's mind, but only with the meaning which he necessarily implied by what he intended to say. Consequently the Biblical writers are to be judged only on the terms of the revelational teachings they intended to communicate, for revelation concerns what eye cannot see or ear hear by itself.

Thus since the Bible declares that its purpose is to impart revelation, we run no risk of distorting its message as we credit its revelational teachings and admit the possibility that its non-revelational statements and implications are a reflection of the culture of the writer and his original readers. Such an approach is perfectly willing to let Biblical statements in the non-revelational areas of science and history be fully tested against what men can find out about such matters for themselves and in terms of the pedagogy the Biblical writers used to impart this revelation. Because all the Biblical writers were verbally inspired of God, they accomplished perfectly all that was involved in inscripturating a propositional revelation. Knowing that verbal inspiration kept the Biblical writers free from all error in revelational matters, we are not afraid that what we can learn about history or science ourselves may jeopardize the validity of what the Bible teaches. To be sure, God revealed himself in the events of redemptive history—e.g., the Fall, the Flood, the call of Abraham, the Exodus, the inauguration of the Davidic covenant, and many others; if some aspect of these events which is an essential of revelation, did not happen, then it would destroy the truth of Scripture just as much as if historical reasoning should show that Jesus did not rise from the dead.

With Warfield we are therefore content to let the Bible always be subject to historical investigation without any theological *a prioris*. Warfield said,

> We do not adopt the doctrine of the plenary inspiration of Scripture . . . on *a priori* or general grounds of whatever kind. We adopt it specifically because it is taught as truth by Christ and His apostles, in the Scriptural record of their teaching, and the evidence for its truth is, therefore . . . precisely that evidence in weight and amount, which vindicates for us the trustworthiness of Christ and His apostles as teachers of doctrine. Of course, this evidence is not in the strict logical sense 'demonstrative'; it is probable evidence. It therefore leaves open the metaphysical possibility of its being mistaken.[12]

## Science and the Bible

Since the truth of the Bible, as well as what may be learned about science and history, comes from empirical investigation, the Christian, therefore, is perfectly able to credit the teaching of the Bible and be a scientist or a historian at the same time. It is the Bible which provides the overall matrix into which historical and scientific knowledge is fitted. The Bible has much to say about God as the creator and sustainer of this world and the one who rules in the affairs of its history. The Bible also tells about the nature, the inner motivation of us human beings who live in the world. But this world, its history, and the nature of man are areas in which science also gleans knowledge. Science, however, confesses that it cannot answer the ultimate questions about man, the world, and history. While it can analyze matter, it can only speculate about its ultimate origin. While historiography can gain knowledge of the past, it can only speculate about the ultimate meaning of any event in history. While it can describe the patterns into which human behavior tends to fall in different sets of circumstances, it can only speculate about why human beings differentiate themselves so radically from the animals that they can develop sufficient anxiety about the purpose and meaning of life to commit suicide. But the Bible, because it is a revelation from God, provides the answers to these ultimate questions and lays out, as it were, the great framework on which a world view is to be built. Science and history contribute a part of the mortar and brick that completes the remainder of the building comprising the unity of truth.

Since the Bible's non-revelational statements and implications do not have the same function as its revelational propositions, the Christian need not limit his being a scientist and historian only to those areas where the Bible is silent. He can follow the truth taught by Scripture, as well as the truth taught by science and history. It is the Christian's privilege to construct a world view from Scripture into which all other knowledge can be fitted. With theology as the queen of the sciences, the Christian has an open door to all truth and he alone is able to see it all as cohering into a unity.

## REFERENCES


[1]Edward J. Young, *Thy Word is Truth,* (Grand Rapids: Eerdmans, 1957), p. 136.
[2]*Ibid.*, p. 166.
[3]Young, *op cit.*, p. 177.
[4]*Ibid.*, p. 179.
[5]F. F. Bruce, *The Acts of the Apostles,* (London: Tyndale Press, 1951), p. 162, note.
[6]Young, *op cit.*, p. 179.
[7]*Ibid.*, p. 34.
[8]Claus-Hunno Hunzinger, *"sinapi," Theologisches Worterbuch zum Neuen Testament,* VII, 288.
[9]Strack-Billerbeck, *Kommentar zum Neuen Testament,* I, 699.

[10]Bernard Ramm, *Protestant Biblical Interpretation,* 2nd ed.; (Boston: W. A. Wilde Co., 1956), p. 192.

[11]An example of a non-revelational proposition in the Bible is Proverbs 30:25 "the ants are a people not strong, yet they provide their food in the summer." All that this verse says can be known through the human eye. Yet these two propositions serve the revelational purpose of Proverbs 30, which is to set forth the fathomless wisdom of God the creator and sustainer of the universe.

[12]Benjamin B. Warfield, "The Real Problem of Inspiration," *The Inspiration and Authority of Scripture.* S. Craig (ed.) (Philadelphia: Presbyterian and Reformed Publishing Company, 1948), p. 218. It should be noted that Edward J. Young took serious issue with Warfield on this point in his paper which he read at the conference of evangelical scholars at Wenham, Massachusetts, in June 1966. "Our conviction that the Scriptural writers are reliable teachers of doctrine," he said, "rests . . . simply and solely upon the inward testimony of the Holy Spirit."



# Notes on the Predispositions of Scientific Thought and Practice

T. H. LEITH

York University
Toronto, Ontario, Canada

*This paper first explores some early sources of the three major positions regarding the epistemological status of scientific theories. It comes down on the side of fallibilism, the thesis that the theories of science can tell us what nature* is not *like but remain quite tentative as to what it* is *like. All three theses are alike, however, in entailing a variety of prior epistemic, ontological, and practical commitments. These in turn raise a number of interesting issues, commonly given too little attention. This paper does little more than point them out with one exception, the relationship of scientific work to religious presuppositions.*

*It is argued that all scientific endeavor is carried on within either a creationistic or a naturalistic framework and that one or the other of these choices is unavoidable, though there may be differences in detail within each alternative. In this context, the role of apologetics is discussed and a number of related questions worthy of further study are mentioned. Certain challenges to those making a theistic commitment are also presented.*

*An Appendix deals with a few aspects of the Dooyeweerdian attempt at a creationistic thesis in the light of earlier comments in the paper.*

## Parmenides

The basic issues as to the relationship of scientific propositions about the world to the real character of that world were first explored in a coherent and developed fashion in ancient Greek philosophy. One point of view appears some twenty-four centuries ago in the thought of Parmenides, the Eleatic. His thought is characterized by the rationalistic presumption, destined to appear again and again in the history of Western thought, that if a thing can be thought through without contradiction then that thing must exist and that whatever cannot be thought about consistently cannot exist. On this basis Parmenides concluded that reality was eternal and unchanging, continuous and homo-

These comments grew out of thoughts presented at a seminar on the ideas of Herman Dooyeweerd held in December of 1969 at Wheaton College and at a meeting of the Western New York Chapter of the ASA at Roberts Wesleyan College early in April of 1970.

geneous; the alternative demanded, he believed, the illogical acceptance of a beginning and an end to things, of change, and of discontinuity and discreteness in nature. Only in the sensory realm can we accept both the contrary ideas that a thing *is* and that it *is not*. For reason, only the former is intelligible. Science is then reasonable, that is coherent, thought and is certainly not a body of reports about nature achieved through the senses.

### Plato

Among those who accepted aspects of this infallibilistic theory of knowledge about the world Plato at once comes to mind. For him, the true ideas or patterns or forms of things are eternal and unchanging while the physical world revealed to our senses is merely an imperfect imitation. In order to suggest how the transient things which we experience can come to copy the timeless and changeless patterns which alone are truly real, Plato introduced the Demiurge or Artificer who, contemplating the patterns as one would a set of blueprints and driven by the supreme idea of the Good, proceeds to mold Space or Chaos into the image of those ideas capable of having sensible copies. It is widely agreed that Plato, almost certainly, intended this speculative scheme to be taken in the form of a myth, a story aimed at helping us to see that the cosmos reveals rational design and action rather than appearing as the product of aimless accident. The Demiurge was very likely then only a useful device intended to aid us in grasping the necessity of some causal agency which gives the world its order and purpose. Likewise, Space or Chaos was quite probably intended to represent the continual presence of some recalcitrant factor in nature, a disorder which resists rational control.

Beginning with this mythical framework, Plato proceeded to show how the world might have been given its order. To ensure that the myth was not some wild fiction he had, of course, to develop it in consonance with whatever regularity and lawfulness nature might reveal to the senses of any reasonably careful observer of his day. However, convinced as he was that the changing world of our experience can only be crudely modelled after the eternal and unchanging ideas, Plato could not give us a coherent and exact revelation of the plan and rationale which lies behind it. Instead, he felt that he needed only to account intelligibly for the presence of regularities in the world which man experiences; his speculations were not to be derived inductively from these regularities. In addition, if the world can never reveal fully the eternal principles behind it, Plato could not consider his system to be an approximation to some final truth about nature which continued observation would reveal: what he strove for instead was a framework which presented as clearly as possible the fact that there is planning and design behind the world of experience. I am reminded here of the comment of the contemporary English philosopher Broad who somewhere stated that there is but one plausible argument for supporting traditional religion by science: the existence of scientific laws which are 'simple' compared with the vast multitude of 'facts' that can be derived from them. *A priori* he felt that it was not self-evident, or even plausible, that such laws should exist though science has found that they do.

I need not go into any of the detail of Plato's further discussions of the varied features of the universe, fascinating though they are. What is important is that we remind ourselves that Plato here provides one of the great watersheds in the history of Western thought. *On the one hand,* his view that speculation cannot provide any insight as to the true nature of the regularities of the world was to lead to the widespread assumption that the development of convenient fictions capable of predicting future events is the sole attainable ambition of the scientist. *On the other,* his sharp dichotomy between the realm of truth and the hurly-burly world of sensory experience was to call for some seemingly more appropriate synthesis by other philosophers.

*Each of these alternatives (essentialism and instrumentalism) has serious difficulties for the development of science. . . Neither fits the lessons of the history of science.*

### Aristotle

First, let us turn to the latter of these diverse tendencies. It may be useful if we look here at Aristotle. Perhaps we recall that, in his view, the Platonic scheme was a failure because it attempted to explain the world in terms of speculative ideas which are only suggested and scarcely understood, namely the Demiurge and Space. He was convinced that it was preferable to place emphasis upon what is easiest to analyze, the careful description and classification of things. Thus Aristotle recommended that, in studying the world, we should determine first the various substances which comprise it and that we ought then to attempt to comprehend their nature. From here, we might move to an intelligent understanding of the processes of change in the world, seeing it as the consequence of the character of substance and not, *pace* Plato, as something unintelligible which must remain at the level of opinion.

Aristotle's ambition was nothing less than a systematic and coherent presentation of the entire spectrum of scientific knowledge, the whole to be as faithful an account of the nature of the cosmos as was possible. To this end he mustered his unique view of the foundations of true understanding, the mind capable of intuitive insight into the distinctions obtaining in the world and the mind capable of grasping what such essential differences entail through logical demonstration. We simply must understand the world just as it is ordered, he claims, if we grasp what sense perception and a systematized analysis of these perceptions teach us. Intuition enables us to apprehend the categories of nature as present in the individual things which we perceive. The world is potentially intelligible and our minds are inherently capable of actualizing that intelligibility. Demonstrative knowledge in science now rests merely in correct logical deduction from these first principles, in an exact and detailed unfolding of what they entail.

We might characterize Aristotle's scientific method as a recipe for the writing of encyclopedia articles, outlines of what is entailed in the acceptance of certain premises respecting nature. Indeed, it implies the writ-

ing of articles containing final truth on many subjects to whatever extent our minds have grasped fully the essential attributes of some aspects of the world. Thus Aristotle's scheme is presumed to be an account which mirrors precisely the way that things really are at least insofar as one has the necessary information available from experience. It embraces final truths about the world capable only of supplementation, and not of revision, as our observations are carried out more widely. The technique clearly does not include the invention of artificial circumstances, simplifications, and abstractions which focus on a few factors within the complexity of nature so that we may examine how these factors are related experimentally and quantitatively. It is not, then, a presentation of either scientific method or scientific knowledge as these are widely understood in our day.

The scientist commonly no longer believes that nature is readily intelligible and that its intelligibility lies in the things of the world having essential attributes recognized by our mind. Rather, we consider understanding to be far more difficult and we believe that science progresses by inductive generalizations of varied sorts, or hypotheses, which see the world in relationships and from perspectives which are quite unlike the Aristotelian direct apprehension of where a thing fits, of necessity, into the order of nature. We believe that Aristotle simply distorts and over-simplifies the process of scientific discovery and that to follow him is to leave science much as he left it, an encyclopedia of information with occasional supplements but without any revisions.

If Aristotle's thesis as to the nature of science is what Karl Popper in varied writings has called *essentialistic,* that is if it claims to have grasped the essential character of certain of nature's regularities and patterns, the opposite tendency springing from Plato's dichotomy may be called *instrumentalism.* Here the Platonic model of the world, which we say was probably no more than an attempt to draw our attention to just how rationally this realm of nature can be analyzed, results in the view that science may be satisfied with any device which 'saves the appearances', that is with any mathematical scheme which results in events occurring as they are observed to occur, and with descriptions of such matters as the sizes and shapes of objects. In astronomy, this emphasis upon the kinematics of objects and upon measurement is nicely examplified by the work of Eudoxus and Callipus, by Heraclides and Hipparchus, and eventually by Ptolemy. The astronomer becomes a mathematician and observer, uninformed by theory and interested only in estimating sizes and distances or in inventing geometrical devices which move the heavenly bodies in a manner consonant with past observation and adequate for making reasonably precise predictions as to their locations and motion at some given and future time.

*All methodological questions and all interpretations of our experience and its ground are assessed within but one of two perspectives, a theistic creationism or a humanistic naturalism.*

### Two Views of Science

Here, then, we find introduced in Aristotle and in the Hellenistic-Roman astronomers, two theses which were to divide scientists through history. On the one hand, there is the scientist who is convinced of the finality of his knowledge claims, who believes that some theory about what is going on in the world is not only the latest but the last word. Here one thinks not only of the rationalist philosophers of nature like Descartes, Leibniz, or Spinoza, but of Kepler, of facets of Newton, and even Einstein or Niels Bohr. On the other side, there is the scientist who in the face of this, what he takes to be, presumptuous arrogance refuses to do more than measure and predict and who must therefore see his theories only as useful colligative structures for description rather than as possible explanations of what is going on. Pearson and Mach, or Percy Bridgman in our time, are but a few who have presented science in this light. I expect that none of us is unaware that each of these alternatives has serious difficulties for the development of science. Surely the former tends to authoritarian stagnation while the latter denies the common scientific desire for understanding; neither fosters criticizability nor serious testing. Neither fits the lessons of the history of science.

### A Fallibilistic View

As a consequence, many scientists have accepted a *fallibilistic* stance (but not one which is instrumentalistic) on the nature of theory, i.e., they have concluded that our hypotheses regarding nature are tentative suggestions as to what might be going on in the world. To the degree that they survive severe challenge in the crucible of experience they will be taken as corroborated and therefore as unfolding part of the mystery of nature, like chipping off a fragment of one layer of an onion of indefinite size. If, instead, they should be falsified by observation or experiment they may be taken as sloughing off one more erroneous speculation, as indicating against the vastness of nature's complexity at least one manner in which it does not behave. It is not my purpose to develop these points further although I accept this view of the role of scientific theories and though I am quite aware of many detailed problems (not, I think, serious) when it is analyzed carefully.[1] Instead, I wish to point out that this and the first two theories about theories are broadly illustrative of the fact that no scientist is without presuppositions. Surely it is apparent that each of these creeds manifests a different epistemology, that each is a representation of a different ambition for scientific work, and that each is capable of strongly biasing the development of science in distinctive directions. But the important point is what they have in common: each has an epistemology, each has a set of purposes for scientific work, none is without prejudice. All scientists work within one of these three frameworks: all scientists thus exhibit such presuppositions as inform their specific creed.

### Common Presuppositions

Let us look for a moment at these commitments. For one thing, all three philosophies of science make certain assumptions in their methodology. Each accepts the public character of observation and experimentation in studying the world, i.e., each calls for a

belief in the existence of other persons like ourselves capable of experiencing what we do in much the same way under the same circumstances and capable of reasoning according to the same rules. Again, each accepts the reliability of the scientist's memory, for, without this assumption corroboration or falsification of theories by experimental test would be impossible. Or again, each of the three assumes that events in the world are causally related for in the absence of this assumption prediction or postdiction become untrustworthy. (I should remark, however, that this belief is grounded in the problem of probabilistic inference rather than in the scientist's past experience of events which are regularly conjoined, a foundation which met Hume's wrath.)

I think it can be argued that each of these three stances regarding the nature of theory also make certain presuppositions regarding what theories imply. Even instrumentalism, which sees theories as human constructs descriptive of events but as non-empirical (in that knowledge, in the sense of understanding, of reality cannot arise from experience) rests on such a pre-theoretic base. Its theory of knowledge and its accompanying ontology provide this foundation and result in this agnosticism. When we turn to essentialism and fallibilism we recognize here too a particular epistemology in each, though the one is radically different from the other. However, we also notice a similarity in ontology, a belief that reality involves a series of aspects not reducible into one another and that each exhibits regularities, or what one might call lawful relationships.[2]

## Interesting Problems

At this point a host of interesting problems arise. For one thing, there is the problem of discerning how far epistemology and metaphysical speculation arise from experience, to what extent they are *a priori*, and to what extent they may be adjusted by further experience. For another, there is the matter of defining an epistemology and a metaphysic coherent with both our theories and our theories about these theories.[3] For the supernaturalist there is also the challenge of relating the above difficult considerations to general and special revelation. For the non-supernaturalist there is the opposite problem: how to explain the origin of the world, its processes, its lawful character, and the foundations of value judgment of various kinds.

I must also speak about theories themselves in the natural sciences. It is my belief that they do not stand autonomous and value-free either. As remarked above, they are conditioned by our attitudes regarding the methodology of science and its intentions and by connected decisions which we make as to what indeed theories in science *are*. They are also limited by the character of reality itself and by the relationship of knower to known, even if we claim to understand such matters only imperfectly, just as they are also affected by how we do in fact understand these things. In addition, theories are at times controlled by esthetic judgment (such as simplicity, symmetry, and elegance), by economic and political judgments, and certainly by religious predilections.[4]

Thus far I have reported, in a fragmentary way, some foundational attitudes found in scientific work and in the statements about this work made by its practitioners. This sort of diagnosis should be suggestive of interesting lines of analysis which I hope will receive rather more attention on the part of our more philosophical readers than has been the case in the past. One might hope too that such attention will lead to vigorous debate by those who choose differing options among the attitudes which we have mentioned.[5]

*One consequence of our commitment is the task of interpreting special revelation and even general revelation adequately from within the inhibiting context of the scientific world view of our time.*

## Theistic Creationism vs. Humanistic Naturalism

For the remainder of these notes, however, I am going to deal in a little more detail, but still in outline, with only one subject calling for analysis among these many, but I take it to be critical and more fundamental than the others which have been hinted at above. Let me state it fairly clearly: it is my conviction that all methodological questions and all interpretations of our experience and its ground are assessed within but one of two perspectives, a theistic creationism or a humanistic naturalism. By this I mean that either the existence, purpose, and plan of our universe require explanation having a large component beyond itself or they do not. Either the parts of the universe are creatures of some creative activity not wholly explainable from the natural events in their past and their context within space and time or naturalistic understanding is (potentially at least) exhaustive. Either nature calls for transcendent analysis or understanding need not seek beyond the immanent.

I am, of course, aware that there are varieties of theism (even deism, for our purposes, is one) and thus nuances in creationism. I am equally sensitive to the spectrum of naturalistic opinion called to mind by Epicurus or Whitehead or Spinoza, by Bergson and Einstein, by Hoyle or a Hindu or Dewey or an Augustinian, or by Teilhard de Chardin and Altizer. Yet with the expenditure of sufficient energy I think the case could be made that the diverse creationistic schemes differ only in the sense in which the universe is seen as dependent in whole and in part on something other than itself, while naturalistic schemes must all rest on the autonomy of the world and leave the question of existence shrouded in mystery. I also realize that what counts heavily in practice is a man's belief about a state of affairs rather than what is actually true of it; certainly the world may be considered to be the domain of some transcendent creative activity when in fact it might be proper to rest our explanation on an imminent level. But this does not alter either the fact that men do believe one thing as against the other or the fact that the existence of the world is or is not contingent regardless of what they believe.

Again, I am aware that to assess problems of scientific method and ideas of science within one of the two perspectives mentioned above does not mean that in practice the conclusions are always the same. There are more premises involved in drawing deductions on

these matters than the acceptance of one world view or the other. Certainly there are both theists and naturalists who are essentialists, for example, just as Gordon Clark is a theistic instrumentalist and certain other theists are fallibilists in science. Each camp has wide variations in epistemic and ontological belief, broad internal differences on methodological details in a given area of study or on the credibility of theories within that area, and considerable variety in matters axiological. These are distinctives worthy, in my estimation, of much more scrutiny than they have been given but once more I will move on for only the creationistic-naturalistic dichotomy interests me here.

**Choice of a Starting Point**

Perhaps the first issue to which I should turn briefly centers around the choice of a creationistic or a naturalistic starting point. There is a real problem here because a fundamental level of understanding is just that; being fundamental it conditions, and is not conditioned by, other judgments. Does one then accept it on raw faith? In one sense the reply is 'yes'; if I can make all assessments of the evidences properly only from a stance which is neither a part of the evidence nor a position resting on that evidence then I have already committed myself. If I am logical, my conclusion as to the thrust of the evidences must rest already implicit in my premises. I take it that this takes care of the widespread, presumably objective, agnostic attitudes on this matter. There is certainly lots of room for tentativeness in life and I have indicated earlier my sympathy with scientific fallibilism. What I cannot see is that there is room for either here; the agnostic must commit himself even though he may be in error in his judgment. There is leeway for error but there is no space for tentativeness. A theist may be wrong in his theism not only in details, which is almost a truism if we are human, but in his choice of perspective. The naturalist, the humanist, may also err. But at any given time both must, as I think even the professed agnostic has, come down for one stance or the other. There is no middle way.

Yet one reads and hears extensive and detailed arguments on each side, theist trying to convert naturalist and vice versa, and one also reads and hears of agnostic suspensions of judgment. Why do people try to argue someone out of one ultimate commitment and into another? Why do philosophy textbooks claim that the sign of intellectual maturity is agnosticism on the basic issues of life? Commonly it is because they forget that the truly empirical approach to life, asking for evidence before they make decisions, cannot apply to ultimate matters where the evidence is *given* an interpretation and does not *lead* to it.[6] There is a place, however, for apologetic argument from both the theist and the naturalist as long as the character of the argument does not involve one in a devious circularity. For example, a theist may argue for the historical, and other sorts of credibility, of some purported special revelation of the supernatural. What he is doing is assessing the possibility that its message as revelation may be taken seriously though it is not being tested directly; only its context is being evaluated.[7] Personal experience, internal witness if you will, may also be used but the argument is really only that if it carries conviction and satisfaction for him perhaps others might care to make the same commitment of faith themselves. On any other level, one must recognize that another's experiences, as one's own, are evaluated as they are because each already believes something about them and one is limited to trying to assess the other's convictions differently in one's own context of commitment.

*Does general revelation entail some hierarchical structure, such as the living being irreducible to the non-living, the psychic being more than the organic, and even energy being indefinable in terms of more primitive physical aspects?*

There is, however, another important type of argument used in the creationist-naturalist dialogue. It is basically negative. Here the creationist asks the naturalist, and vice versa, whether he finds it easy to rest his beliefs on the ground which he does. For example, the creationist may argue that the purported autonomy of the claims of science is not subject to corroboration from within science itself. He may point out that all facts are theory-laden, being selected and interpreted. In both cases he asks the naturalist, if he is a scientist, to think about his suppositions.[8] Does he find his non-scientific reasons for doing science satisfying and are his assumptions about nature able to gratify? Is he not concerned that the presumed finality and autonomy of the scientific outlook may lead to scientism with its technocratic control of society by the expert and its totalitarian possibilities for suppressing other ideas on the grounds that they are unscientific and therefore valueless?

In reply, the naturalist may ask whether resting one's values and one's understanding ultimately upon the decisions and under the control of some supernatural entity is not risky and perhaps unnecessary. He may also point to the historic presumptions of religion to finality and autonomy and its all-too-common autocratic and inquisitorial proclivities. At the very least one may hope that the debate may remain open in spite of the tendencies in every human institution to close it on one side or the other or at least to gain the propaganda advantage. The inquisitorial idea that one has truth and that this means that all else is error, any resting in which is evil and must be prevented for the safety of others and for the good of the sinner, will always be with us in formal religious, or in scientific, garb. It needs restraint by a large measure of humility, a freedom to wager with or against Pascal, the understanding that only decisions freely made are decisions at all, that the history of totalitarian systems has certain lessons to teach, and that if there are errors on matters supernatural they must be left to the supernatural (if there is such a thing) for judgment. Need I point out what this means for jurisprudence or the hiring and firing of faculty in the open university? Ideological dangers and biases beset free debate on such issues, and even the behaviour resulting from choices made on one side or the other, all around us today.

## Other Problems

Let us turn now to some matters which remain after one has chosen one of the two ultimate alternatives as to world view. I choose the theistic and creationistic one for scrutiny because it is my own. How does one control, for example, the tendency for theistic creationism to appear as a speculative metaphysic with all the evils which contemporary philosophy sees in such system-building? On the one hand I would suggest that systematic theology affords us with certain suggestive controls beyond which we go at our peril. Too much metaphysics is an attempt to find answers to questions which are essentially religious.[9] Even here there are internal problems but I will ignore these at present.[10] On the other hand, I am not opposed to dangerous journeys if they prove useful, so that I am willing to use analogies to help me think that I understand ideas like 'creation' for example and I am willing to use other speculations if, as metaphysical ideas often have in the past, they help the scientist with his work, e.g., in his choice of new directions for scientific theorizing.

Another problem has to do with the outworking of our theistic choice in our scientific work. Does the decision carry with it some distinction in our behavior as scientists from that of our colleagues? Surely it calls for certain ethical commitments in what we do with our work and determining within what limits we will carry it on. Surely it calls for us to think more about science as we see it practiced. Surely it calls us to emphasize the strong subjective elements which occur all through the processes of theory-formation and decisions about the credibility of these theories. And surely it calls us all to think more, as some of our restless students plead, about the application of science for the betterment of the human condition.

Lastly, we must work out certain consequences of our commitment. One which must exercise us is the convoluted task of interpreting special revelation and even general revelation adequately from within the inhibiting context of the scientific world view of our time. Then there is the task of developing a theistic philosophy of science based, in fundamentals at least, upon these hermeneutical and exegetical endeavors. Clearly at these points our philosopher of science seems to be an essentialist; he believes that he has certain truths about reality. Where then does he become a fallibilist, for as I have mentioned I think he should when dealing with contemporary theories in science? (I cannot see instrumentalism as a viable option, for what does scientific knowledge point toward if it does not point toward nature as we experience it?)

Probably, for the Christian theist, this is at the point where the meaning of a Biblical text involves decisions, on incomplete evidence, as to its intention in Hebrew or Greek and certainly by the time one is building theories (i.e. interpreting, selecting, and organizing) in the construction of a systematic theology. In nature, seen as a general revelation of the supernatural, it comes when we seek to say what precisely the revelation entails. We have seen that nature appears to be lawful else science and much, if not all, of life would be irrational and incoherent. Perhaps that is a major part of its revelatory character. Does it also show up in some hierarchical structure, such as the living being irreducible to the non-living, the psychic being more than the organic, and even energy being indefinable in terms of more primitive physical aspects? These are, I believe, open scientific questions and I would venture to say that they are most exciting. I would certainly hope that theistic philosophers and theistic scientists will work on these various issues for all represent borderlines in our present knowledge. At the very least the effort should help foster scientific study, help clarify the problems which are entailed in and the dangers of a precipitous reductionism, and help show how the investigation of a given aspect of nature calls for a consideration of its coherence with all other aspects and even with other disciplines. It is my firm belief that such study will go a long way toward restoring the lost community of learning, so prevalent in our universities, but found also among Christian scholars where the lack is both absurd and tragic.

*The real issue is whether any modal structure of reality will carry convincing weight in converting the naturalist to a theist.*

## Appendix: Dooyeweerd on Creationism

I have spoken above both of the necessity to be self-conscious of our own beliefs and to call others to awareness of theirs as well. I have also mentioned general revelation and have suggested that even the theist, who believes that the created world must somehow speak of a Creator, should be tentative in giving definition to the signs of nature's createdness. In combination, these two points immediately raise the question of how then nature may act as a revelatory medium to the nontheist and whether his own commitments regarding the world could ever be found wanting in his own eyes when held against nature's own witness to its proper character. There can be little doubt that the thinker who has been most sensitive to these matters in our time is Herman Dooyeweerd, a Dutch philosopher best known on our continent through his magnificent work, *A New Critique of Theoretical Thought* and his more recent and more popular book *In the Twilight of Western Thought.*

On the hortatory side of his writing, i.e., the portion intended to make us aware of our ultimate commitments, Dooyeweerd's position is akin to that of these notes. He argues that the vaunted claim, by those of scientistic persuasion, of the autonomy of science is merely a statement of an ambition to brook no bounds to scientific study; an ambition, however, which may not be sustained by the nature of a particular problem. Again, the claim that all truth is founded upon objective facts, he sees as incapable of sustaining ethical conduct or judgments of purpose both in nature and in human life. Nor is there any purely scientific experience; what we have is experience controlled by some scientific interest which may give us scientific knowledge. Such knowledge is partial, however, because the investigation of any aspect of the world requires that we consider its coherence with other aspects. Surely it calls for our taking a position (self-conscious or not) on such matters as the origin of things, the place of man in the world, and the foundation and character of the order of the cosmos for these control in part the way we theorize. But it also calls for relating physics,

for example, to questions of biology, to social or economic or esthetic concerns, and to ethical matters.

When he turns diagnostic in describing the fundamental character of nature, Dooyeweerd claims that this coherence demanded in practice is rooted in a fundamental integration within reality. All things in the cosmos point to all others thereby indicating, at least in part, the plan and purpose of the whole. While he sees the world as exhibiting various modes of being (his translator's term is "modalities") which are irreducible to one another (number, space, motion, energy, the biotic, the psychic, the historical, the lingual, the social, the economic, the esthetic, the juridic, the ethical, and the mode of faith), he interprets these aspects as bound in a coherent and lawful structure. Thus the individual sciences can deal only with particular modalities, abstracted from the whole though each thing in the world exists in all modes. Because each mode is sovereign in its proper place, each science (e.g., physics, biology, economics, law) has a unique, though restricted, role to play in helping us to understand nature. On the other hand, just because the modes direct our attention elsewhere as well as inwards, the particular sciences treated individually impoverish our insight into the whole. Certainly, if any science is treated as being one to which others can be reduced, the process is a confusion of the meaning proper to one modal sphere with that of another and the product is the sort of antinomy so well-known in Kant.

I have mentioned earlier that the question of irreducible levels of discourse is a fascinating one worthy of careful scrutiny. It is one for which there is considerable affirmative evidence, though whether there are as many meaning-levels as Dooyeweerd suggests is quite another matter and may be left open here. There is some indication, however, that because the reductionism problem is far from settled in at least certain areas of knowledge, the evidential character which Dooyeweerd sees it affording for creationism is diminished, perhaps unjustly but considerably, in the opinion of many naturalists. The real issue, however, is whether *any* modal structure of reality will carry convincing weight in converting the naturalist to a theist. This has little to do with the modalities themselves; it is the old problem of clear evidence for something being interpreted erroneously in another manner. Cannot a naturalist interpret a modal world in his own fashion? Cannot he do the same for an even simpler world, one which exhibits merely a lawful character?

The answer to both questions is, I think, affirmative. He can even be consistent but (I think) wrong. Dooyeweerd is really saying that if the world is a created world it must speak of its createdness and any other interpretation given to it must be false. It has, if you like, a general revelatory character. The lawfulness of nature (this has little to do with whether we have got the laws correctly or fully) and at least convincing evidence for a modal structure of some sort (which has little to do with whether Dooyeweerd has it all correct) are for many, and should be for all, a revelation of the Creator. But the man who chooses not to see, whose premises give him what Van Til used to call his "colored spectacles", will not see. There are issues he just won't raise with his own position. He is a true humanist; a Creator which cannot be fitted to his egocentrism and a world which is not in accord with his anthropomorphic blueprints will be rejected out of hand.

As I said earlier, and as Dooyeweerd also recognizes, the task of the theist is both to keep the shoe pinching and to develop further his own insights. The latter makes general revelation meaningful to him and the former asks the naturalist to keep thinking. Eventually, if the naturalist embraces enough of nature in his considerations, the coherence of the world and the consistency of his own system must come into conflict. That, in turn, raises the great crisis, a crisis in ultimate presupposition.

## REFERENCES


[1]See Karl Popper, *The Logic of Scientific Discovery* and *Conjectures and Refutations*. See also my paper, "Modern Scientific Cosmogonies", *Journal ASA*, September, 1964.

[2]Compare my "Some Presuppositions in the Philosophy of Science". *Journal ASA*, March, 1965.

[3]It is striking how little self-consciousness most writers exhibit in these matters. The origins of epistemological theories and of metaphysical ideas have received comparatively little study considering the vast literature presenting the theories and ideas themselves. The writer has, however, collated some materials and he will be happy to pass his references on to any interested reader. Among philosophers of science there has been rather more attention to epistemic issues related to matters of theory and metatheory but metaphysical suppositions have received very inadequate analysis. This failure to deal properly with ontological issues dates from Comte and Mach (if not from Kant) but, in our century it has arisen largely from antagonism to metaphysical system building, as in Bradley, on the part of those influenced by both logical empiricism and linguistic analysis.

[4]See my papers under References [1] and [2] above.

[5]See my "What is the Philosophy of Science?", *Gordon Review*, Summer, 1967 for some further comments on these matters.

[6]For example, there are places where Bertrand Russell came on strong for agnosticism as an option, but I think most of his writings illustrate that his judgment was not really suspended on the matter. He was a naturalist in practice. An examination of textbooks calling for a similar tentativeness likewise reveal, on careful reading, that they are hardly neutral either. On occasion one meets agnostic claims which are really theistic but this is much less common.

[7]The same applies to miracle. An unusual, and at the time inexplicable, event calls for its own assessment. Its interpretation as carrying revelational import in a unique way is logically different.

[8]Compare Richard Rudner in Philipp Frank, *Validation of Scientific Theories*, pp. 24-28. "Because of a strong reaction to the restrictions of historical religions, many scientists consciously or (worse) unconsciously claim an objectivity in their analyses which places value judgments, not clearly where they can be analyzed, but into the realm of the intuitive, unrecognized, or hap-hazard."

[9]Too much systematic theology has also been speculative metaphysics; at least it has not been self-conscious in moving from the one to the other. What is important is that we become aware of our speculations and careful to explain how we propose that they be tested. I have discussed some matters here in my papers under references [2] and [5] above.

[10]Very little has been done, to my knowledge, by conservative writers on metatheological problems. Montgomery and Knudsen have done something within the ASA, however, to initiate discussion.

# The Tasaday and the Problem of Social Evolution

GEORGE J. JENNINGS

Geneva College
Beaver Falls, Pennsylvania

*The discovery of different cultures characterizing various societies has led anthropologists to theorize as to the origin and development of the different ways of life. The finding of the "stone age" Tasaday in the Philippines further stimulates scholars to explore the problem as to why mankind has progressed through history at unequal rates with some groups showing minimal "advance" while others are quite dynamic, and have incorporated into their patterns of life more complex technological, economic, social, religious and other cultural forms. To the Christian scientist, the problem also involves a reconciliation of ethnological data with the Biblical account of the Fall of man and his subsequent experiences, many of which are not made explicit in Biblical statements.*

## The Discovery of the Tasaday People

The discovery of another "stone age" people in the Philippines has stimulated renewed interest among scholars and scientists in a study of man and his cultures. On June 7, 1971, Manuel Elizalde, head of the Philippine government's Presidential Arm on National Minorities (Panamin), and Dr. Robert B. Fox, head of Panamin's research division and chief anthropologist for the Philippine Natural Museum, visited the Tasaday tribe in the tropical forests of Mindanao. Their visit was to investigate reports of this small group living in a Paleolithic culture. Their visits since the first one have confirmed reports by loggers and neighboring tribesmen that the Tasaday are a people who have lived a primitive life in isolation on this southern Philippine island.

After initial visits, Elizalde and Fox indicate that the Tasaday are a gentle, shy people who base their subsistence on hunting small game and gathering wild fruits and roots. Shallow, clear-flowing streams provide tadpoles and small fish which the people trap with their hands without the use of hooks or nets. No food is cultivated and the staple of their diet is the pith of the wild palm. Monkey meat is considered a delicacy. The monkey's hair is singed off in a fire (the Tasaday apparently either know how to kindle a fire or how to preserve it) and the meat cut away with bamboo blades sharpened by a small stone. The meat is then roasted over the open fire before it is consumed. Wild pigs and deer are also trapped for their meat but information has not been given as to the nature of the trapping techniques. Another important dietary item is wild yams which they dig up with digging sticks (a dibble); they prefer the deeper yams which are considered most delicious.

The Tasaday group visited thus far represent only six families with a total of thirteen children, nine of which are male. They report that their name, Tasaday, is derived from a mountain but the meaning of the word is yet unknown. Preliminary linguistic analysis by Fox reveals that their language is a variety of the neighboring Manubo tribe, which like all native Filipino languages, is in the Malayo-Polynesian family. Their language emphasizes strong vowel phonemes and incorporates staccato phonemes in a rhythmic linguistic pattern. Initially, conversation was made possible through a native of the Manubo tribe. After preliminary difficulty, the Manubo tribesman rapidly learned the Tasaday language and could serve as an interpreter.

## Ethnographic Data

Among ethnographic data procured thus far, the following information is known. The people are gentle and shy. They seem never to have heard of fighting and have had no contact with warlike tribes. In fact they apparently had known only one other group which disappeared some years ago, possibly from some epidemic disease. The Tasaday are thus in character strikingly different from other primitive tribes reported in recent years by explorers, missionaries, and anthropologists in inaccessible areas of New Guinea, the Amazon Basin, and South-West Africa. For example, the hostility of the Auca people in the upper reaches of the Amazon Basin has been widely publicized following their slaying of missionaries in 1957. Attacks, slayings and cannibalism have also been experienced among certain hostile primitives in New Guinea in recent years.

The Tasaday are further characterized by a religion which includes the belief that someday the supernatural being, or god, called Diwata, would personally visit them and bring them help in their struggle for survival

as well as comfort to them in the trials of life. As a matter of fact, they ascribe to Elizalde the title of Diwata, believing that his coming is the fulfillment of the promise made to their ancestors. The people view monogamy as the normal form of marriage between a man and a woman, and this monogamous state is to continue until death. A young man (who does not know his age but apparently is about twenty years old) served as an informant and expressed concern that he had not yet acquired a wife and seemed to feel that he had limited opportunities to do so since there are more single males than females.

This tiny tribe seems to have no political organization and no one dominates as a formal leader. To settle such issues as moving in their nomadic life, they hold general meetings where discussion is followed by mutual agreement as to the course of action to be followed. It is premature to speculate on how the people handle whatever personal aggression may result from group living and the lack of formal leadership.

The anthropologist, Fox, and other Panamin officials have expressed concern about the Tasaday who are now experiencing contacts with other cultures, especially modern culture so different from their simple form of life. The officials are requesting that the Philippine government make the Tasaday forest a reserve to prevent loggers, hunters, miners, and farmers from exploiting the group. It is common knowledge among anthropologists that much damage can be done to so primitive a people and their culture by recklessly exposing them to advanced technology, society, and culture in general. Of course, evangelical Christians will consider missionary efforts among the Tasaday. It may be well for those who will consider evangelizing the people that they do not allow their zeal to obscure the need for tactfulness and sound perspective in approaching a people who undoubtedly should hear the Gospel, but who must not be subjected to the ravages of thoughtless culture change which on occasion has marked Christian missions among peoples having a different culture.

The Tasaday may be more nearly at a purely primitive stage than other groups reported in recent years, but they are certainly not the only example of extreme cultural retardation. For example, Paul Hoffman, in a report published in the New York *Times* (June 15, 1971) describes a "South-West Africa Tribe Still in the Stone Age." His reference is to the Tjimba and Himba, two black tribes, which he claims are the shyest and most backward of any contemporary African people. Much more populous than the Tasaday, these people number about 20,000. They, too, are hunters and gatherers for their subsistence. Their principal weapon is a spear made doubly lethal by their knowledge and application of poison. Dr. Johann Guildenhuis, chief physician of the South-West African state, has visited the two tribes to administer antibiotics and other modern drugs. According to him, the people are remarkably healthy. He reports also that they have no money economy. Their spear heads are made from sharpened flints in a bone fide Paleolithic tradition. Their diet includes plants and small animals although the main source of food is the wild zebra. Little other information is available from the Tjimba and Himba at present, but they undoubtedly offer rich sources of ethnographic data for anthropologists in quest of characteristics of primeval cultures.

*The Tasaday are strikingly different from other primitive tribes reported in recent years.*

### The Challenge of Social Evolution to Biblical Interpretations

Undoubtedly anthropological theory when applied to Tasaday data, as well as to other primitives already studied or under the process of examination, will present a challenge to orthodox Christian views which postulate a process of degradation by mankind on the basis of Biblical interpretations. A classic Biblical statement frequently cited by orthodox Christians is Romans 1:18-32. This statement and other similar ones are used to support the contention that man, at least religiously, has been marked by deterioration rather than progressive improvement from a pristine state of animism through polytheism to monotheism. The social philosopher, Auguste Comte, reflects evolutionary influences when he proposed a three-stage progression in human history from the religious through the metaphysical to the scientific stage.

An analysis of the differing views of orthodox Christian thinkers and social evolutionists brings to the fore certain basic questions: If we assume a literal Adam and Eve, what was the cultural status of these progenitors of mankind and their immediate descendents? Are we justified in assuming that, following the Fall, Adam and Eve were essentially primitive in their manner of life in certain respects like the Tasaday and other primitive groups which are becoming rarities in this twentieth century? Does not the Biblical record suggest cultural evolution centered in religious thought and practice from the events of Genesis to the New Testament culture characterizing Jesus and His followers? A couple of examples may illustrate this. One may cite the case of marriage in the Old Testament and then in the New. Polygyny was common and accepted in ancient Israel, as well as among their contemporaries, but monogamy seems to have prevailed in the New Testament period when it was considered the ideal form. Or again the notion of *lex talionis* (an eye for an eye, etc.) in Old Testament justice among the Hebrews (and other people of antiquity), is replaced by forgiveness and "turning the other cheek" in New Testament teaching and example.

Leaving this line of thought for the moment, we may note that the basic assumption held by most archaeologists is that there has been progression by mankind from the Paleolithic through the Mesolithic and Neo-lithic into the Chalcolithic, Bronze, and Iron Ages prevailing at the rise of the first civilizations. Thus we may note that the archaeologist, V. Gordon Childe, assumed an evolutionary sequence when he proposed such concepts to divide history as "The Neolithic Revolution," "The Urban Revolution," and "The Industrial Revolution." These "revolutions" represented dramatic transitions in man's progression from early, simpler cultures to complex, modern types.

Recently Peacock and Kirsch treat social evolution in such terminology as the "dimensions of modernization" (1970). In their scheme, the more modern a society, the more specialized are the social, political, and economic units in the cultural organization. In the

transition from primitive to modern life, "social relations become to an ever higher degree functionally specific, and to an ever lesser degree functionally diffuse." Also, as societies modernize, "markets and media of exchange become increasingly generalized." Centralization is another dimension of modernization; that is, the more modern a society, the more centralized it is under some central control. Furthermore as a society modernizes it becomes increasingly bureaucratized.

Peacock and Kirsch also assert that social evolution affects the kinship and family structure. In most modern societies, kinship is reckoned bilineally, whereas in many nonmodern societies, especially primitive societies, kinship is reckoned unilineally. In addition, the nuclear-family household, composed of parents and unmarried children, is dominant after social evolution in contrast to the extended family that prevails in earlier and simpler social organizations. To put it in other words, wherever modernization occurs, extended-family households may be seen giving way to nuclear-family households, and with this change the emphasis on kinship bonds diminishes, while the emphasis on conjugal bonds increase.

The process of modernization within the scope of social evolution includes the three factors of social differentiation, social mobility, and social change. Social differentiation (the separation of social units from one another) issues in part from the growing specialization of units which accompanies modernization. Social mobility is the movement of individuals between the strata of society. It seems quite certain that with social evolution both the idealized rate of mobility and the actual rate tend to rise; not only do people think they can rise (or fall) faster in the social milieu but they actually can. In terms of social change, the more modern a society is, the more rapid is its overall rate of change—in short, it is dominated by social dynamism.

Social evolution also has its impact on religion and ideology. With the changes taking place through time, the trend among dynamic societies is toward a universalistic ethic which decrees that men must be judged on the basis of merit and skill, rather than on the basis of some immutable status assigned to them at birth. Not kinship, race, sex, or caste, but deeds are what count in a universalistic ethic. Where such statuses count more than deeds, the reference is to a particularistic ethic. Today, in many of the developing nations, the act of becoming modern is strongly bound up with the notion of universalism. Undoubtedly the Tasaday people are essentially particularistic while in contemporary Western culture, the ideals are generally universalistic. There is a second broad ideological trend that accompanies social evolution. The more modern a society, the less will its members believe that their society exercises control over their cosmos, or ideal system. The less modern the society, the more they will perceive or believe such control exists. Thus the Tasaday will perceive undoubtedly little separation between the cosmic world, which they most likely express by myth and some ritual, and the actual world, in which they live.

Finally, social evolution has an important relation to technology. A society is technologically advanced to the extent that it employs tools and inanimate power sources. It is unlikely that the primitive technology of the Tasaday includes power resources derived from gravity, wind, and water (to say nothing of electricity, steam, and nuclear energy). Their source of power is human strength and energy. Again their tools, as yet not inventoried, are extremely simple with perhaps the dibble (digging stick) the major tool. This is a far cry from the jet airplane or the electric computer. Technological modernization accompanies the social evolutionary process.

*Does not the Biblical record suggest cultural evolution centered in religious thought and practice from the events of Genesis to the New Testament culture?*

### Social Evolution and the Direction of World History

A comparison of the Tasaday and similar primitive societies provides a scientific basis upon which to relate social evolution and the direction of world history. The more modern the society, the greater is its capacity to change rapidly in order to exploit a rapidly changing environment. This fact is in the thinking of the anthropologist Fox, who views with concern an unlimited introduction of innovations among the Tasaday who presumably with tradition-bound patterns could not change rapidly without possible cultural chaos and social disorganization. Modern sociocultural patterns—partly because they encourage high technological development, which in turn makes possible a quick, effective response to such upheavals as floods, war, and population explosion, and partly because they encourage a general flexibility and capacity for rapid change—maximize a society's ability to adapt.

Assuming the above argument is true, consider the principle of natural selection that has emerged from studies of biological evolution. This principle maintains that over time a population tends to display more and more the traits of its most adaptive members, since it is these which are most likely to survive and reproduce their traits. Since the less adaptive members tend not to survive and reproduce, their traits disappear over time. An analogous principle may operate for societies. The most hightly adaptive societies at any period of history will be the ones that survive and reproduce by disseminating their patterns. Therefore, these patterns become more and more widespread, while the patterns of the less adaptive societies become less common. In our own time, the modern patterns are increasingly prominent, while during the past six or seven thousand years the trend has been away from the primitive pattern. As in the case of the Tasaday, a primitive pattern persists only when protected by isolation. According to one estimate, only six percent of the world's people still live in primitive societies. The finding of the most primitive of societies like the Tasaday is decreasing (hence the greater interest in them and others of like cultural level).

Having made the analogy between natural selection in the theory of biological evolution and in sociocultural evolution, we must emphasize that this is only an analogy. Aanalogies are meant to suggest hypotheses, not to prove them (Nagel, 1961:107-117). The applicability of these statements to theoretical biological evolution is no proof that they are equally applicable to

sociocultural evolution. Sociocultural statements must be judged on their own terms.

Sociocultural evolution appears to be moving in a different direction from that theorized in biological evolution. Biological evolution is often likened to a branching tree, with more and more branches appearing as evolution proceeds. Thus, insects have branched out (undergone adaptive radiation), it is held, to such a degree that today some 600,000 insect species exist. By contrast, sociocultural evolution appears to be converging into a single "species." The trend seems to be one in which all societies will eventually assume the modern pattern. In the case of primitives like the Tasaday, the objective is to prevent chaos and decimation under modern impact that would destroy them.

A second difference between biological and sociological evolution is that men's motives and plans play a more important role in the sociocultural process than in the biological scheme of things. Since the principle of natural selection is advanced to explain the evolution of all animals, it does not consider motive and plan as possible causes. The principle of natural selection recognizes only that if by accident, mutation, or other process a more adaptive trait or pattern appears, that trait or pattern will tend to be perpetuated. No assumption is made about how the trait or pattern originated, and the biologist is particularly wary of talking as if the organism in which a given trait or pattern originated had planned it that way. Of course, the teleological problem is unanswered by those who reject divine superintendency of the theoretical process. We cannot engage our attention to this problem in this paper, but rather we must take into account the observation of Redfield and others that the more modern the society, the greater the capacity of its members to control their destinies, to move in the direction of consciously established goals (1953). Hence when an overwhelming number of today's developing societies (and we may predict that the Tasaday will become such) say they yearn to modernize, we cannot ignore this yearning in predicting the direction in which the world's societies are likely to move. Of course, modernizing societies mourn the loss of their traditions, but at the same time many recognize that in the face of population pressures and other environmental threats, modernization is the only way to survive. Not only the objective observer but also the natives of societies involved recognize the adaptive advantage of modern patterns.

*Sociocultural evolution appears to be moving in a different direction from that theorized in biological evolution.*

Arguments such as this have inspired Marion J. Levy, Jr., in his *Modernization and the Structure of Societies,* to brand the modern pattern a "universal solvent." Levy claims that when a nonmodern society comes in contact with a modern society, the non-modern society inevitably modernizes, whereas the modern society never "demodernizes." Levy believes that this occurs because every society, no matter how spiritual its values, contains some individuals who want the material advantages which modern patterns produce. The process of modernization need not occur all at once. Perhaps only part of a society is affected at first. But modernization is like a dye which, upon touching one thread, is slowly absorbed until it changes the color of the whole cloth. Adopting modern technology to gain material advantage soon results in changes in family structure, government, and other institutions. According to Levy, only romanticists (and naive missionaries) could believe that part of a society can modernize while the rest remains entirely intact. Although societies such as Japan apparently do segregate modernizing sectors and traditional sectors for a time, it is doubtless true that such segregation cannot endure forever. The American Indians have been remarkably adamant in resisting certain ideologies of the whites after centuries of contact, but it is doubtful that they will be able to maintain an ethos that fails to mesh with that of the dominating society. It seems quite probable that eventually all societies will thoroughly modernize. There is thus a great challenge to evangelical Christians to maintain their attempts to evangelize and retain an effect in the modernized culture of which they are a part, the effect called "salt" and "light" by Jesus to His disciples.

Although this view of world history, according to which all societies will eventually conform to the modern pattern (with its materialistic and secularistic ethos), may be too simplistic, it seems better founded on ethnological data than the idea that there is no discernible direction to the transformations of today's societies. Modernization theory calls into question the belief that every society is developing along its own unique path according to its own unique genius.

Today's stagnating societies such as the Tasaday might be happily stagnating in 3000 A.D. But with the onrush of modernization fewer and fewer backwaters, or cul de sac locations, in which to hide will remain. Modernization tends to integrate all regions of the world into one system. Older readers may easily recall the "One World" of the late Wendell Wilkie. The few primitive societies found today remain primitive partly because they have been able to retreat into the jungles, deserts, or mountains and avoid the advance of modernity; but as modernity pushes further these havens too will be lost. The Tasaday have in essence lost their haven even if the Philippine government establishes their forest as a reserve. This will merely postpone modernization. Indeed, just as the pace of technological innovation has accelerated steadily since human history began (Blum, 1967: 211, 219), so the process of sociocultural change itself has accelerated. As the world becomes more nearly a single system, changes in one sector instantly excite changes in the other sectors. Exotic societies such as the Tasaday, therefore, seem to be doomed.

## Social Evolution and the Idea of Progress

In general, Americans have concluded that modernization, which is dominated by the multiplication of technological devices, means the better life. This opinion prevailed until recently when the view that change can be equated with progress is increasingly challenged. Some scholars have become disillusioned by sociocultural conditions attending modern civilization. The enormity of contemporary urbanization, the ruthless exploitation of natural resources, the impersonal character of social relationships, the threatening power and control of gigantic corporations and labor unions, the bureaucratization of complex governmental organiza-

*We are tempted to say that there is an inverse ratio between technological progress and the spiritual state of man as conceived in Biblical statements.*

tion, the crescendo of crime, the decline in the spiritual ethos, and many other adverse features characterizing modern life cause fear and anxiety to the point of neuroses and even psychoses to growing numbers of people. Much of modern life is marked by sociocultural upheaval that prevents equanimity and inner contentment.

The discovery of a primitive people such as the Tasaday creates a yearning by restless modern man for a less complex and threatening context of circumstances. Such yearning stems from the assumption that the Tasaday life is free from problems and stresses, at least relatively so. That the Tasaday escape certain problems such as environmental pollution, impersonal relationships, rampant crime, insecurity of employment, aimlessness in life stemming from secularism and materialism, along with other factors which plague civilized man, is quite probable. But the preliminary information gained from the Tasaday suggests that their life is not one marked by complete euphoria. For example, it is reported that they anticipated the visit of the god, Diwata, who was to bring aid to relieve them of life's problems which probably loom as large in their thinking as do problems to modern man. It is quite likely that further study of the Tasaday will reveal tensions and stresses not immediately observable. The Pueblo Indians who live in the American Southwest were initially viewed as a people marked by peace, cooperation, and equanimity. Subsequent studies corrected the earlier and idealized characterization by pointing out that aggression, hostility, fear and conflict are present among these desert dwellers. The anthropologist needs to be wary of allowing initial impressions to obscure reality to be obtained by intensive ethnological study.

As a Christian anthropologist, the writer is concerned with the problems attending social evolution and modernization; for, in assuming the responsibility as a student of society and culture, he cannot ignore the spiritual dimension in determining what is to be considered progress. A critical question is this: Has the process of social evolution and modernization contributed to greater satisfaction, or contentment, than earlier and simpler patterns of life? Euphoria is a difficult state to measure since it is highly subjective in nature and it is very elusive when we consider the remarkable adaptability of man who has demonstrated that he can operate in a broad range of sociocultural circumstances. We must also ask this question: Can we compare the state of contentment experienced by an affluent suburbanite in the American culture with that of the primitive Tasaday? What criteria are valid and reliable in measuring the differences in culture?

Within the context of Christian convictions and Biblical statements (which are fundamental to the writer's opinion), the answers must revolve about the spiritual dimension. It is, therefore, not a question of whether the Tasadayan dibble can be compared with the suburbanite's computer, but rather whether the two individuals in contrasting sociocultural stations have an appreciation of spiritual truth which the writer claims to be dependent upon Biblical information. The American suburbanite may conclude that he enjoys the fruit of progress in his technological conveniences while his covert personality may be marked with insecurity and anxiety unknown to the simple Tasadayan who lacks the conveniences. The only resolution of the problem of progress in social evolution seems to be in terms of a man's ultimate satisfaction or peaceful state of mind. This peace of mind rests upon the Biblical adage that man does not live by bread alone.

Has modernization through social evolution delivered man from his fundamental problem? Has the history of mankind been marked with increasing euphoria? According to the Apostle Paul, the evolution of society and culture has not been marked by progress if we see progress as synonymous with spiritual improvement and equanimity. The fact of the matter is that there seems to be retrogression rather than progress. We are tempted to say that there is an inverse ratio between technological progress and the spiritual state of man as conceived in Biblical statements. Thus we read what the Apostle prognosticates in relation to social evolution and modernization in II Tim. 3:1-9.

Social evolution leading to modernization has not introduced this repertoire of ungodliness listed by Paul. These sins were known and practiced in antiquity as attested to by the Old Testament account. The fact of the matter is that we may infer comparable commissions prevailing in the days of Noah, conditions which climaxed in the judgment upon that civilization by the Flood. Every perceptive student of history knows about the almost endless occurrence of sins depicting the viciousness of man, or as the aphorism has it, man's inhumanity to man. What, then, are we to understand about social evolution, modernization, and the moral state of man in contemporary civilization? We must not conclude naively that the Tasaday and similar groups are completely virtuous and free from sin. Ethnological data sustains the contention of the Apostle Paul in Romans 3:12, "All have turned aside, together they have gone wrong; no one does good, not even one."

The most reasonable conclusion before us is that social evolution has been accompanied by modernization with an intensification and multiplication of what has been characteristic of man since the Fall. The Tasaday, by isolation and retardation, have escaped the ravages of rampant sin characterizing man in contemporary civilization, but they are not to be considered innocent children of nature. The perspectives open to man may either be to attempt to retreat to the sociocultural level of primitive life as exemplified by the Tasaday (actually this is impossible to achieve), or to anticipate a "new heavens and a new earth in which righteousness dwells" (II Peter 3:13).

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# BOOK  REVIEWS

**THE POPULATION BOMB,** by Paul R. Ehrlich, New York: Ballantine Books, Inc., 1971. Revised and Expanded Edition, Paperback, $0.95.

"*The Population Bomb.* While you are reading these words five people, mostly children, have died of starvation—and forty more babies have been born." In this fashion the cover of this paperback volume heralds Paul Ehrlich's purpose to arouse the public to what he and many others consider an impending catastrophic international situation. This situation is, in short: too many people lead to too little food (primarily, in the developing nations) and to dangerous pollution of the environment (primarily, in the industrial nations). And indeed, the situation is already upon us. Ehrlich predicts that it will rapidly develop into a global calamity.

The author details demographic features and causes for the burgeoning population and points to the inevitability of the greatest baby boom of all time during the next decade, because 40% of the population of the underdeveloped world consists of people under 15 years old. He estimates that two billion people out of a total world population of over three and one-half billion will not be properly fed in 1971 and that we are already beyond the point of preventing large scale famines in the next decade or so. In a chapter entitled "A Dying Planet," Ehrlich tells how the environment is deteriorating: land erosion and gullying, salinization of irrigated land, salt seepage into aquifers due to a falling fresh water table, dam fill-up, pesticide effects, air contamination, industrial chemical poisoning, sewage pollution, and excessive noise level.

In three scenarios, the author speculates what the outcome of overpopulation might be within the next fifteen years in terms of war, pestilence, famine, and alternately an outcome based on international cooperation, control, and sharing of resources.

Under the topic "What is Being Done," the inadequacies of present population control measures in various world areas are cited. Ehrlich points out that "family planning" most often means planned overpopulation. Various proposed measures for increasing the world food supply are evaluated, but he stresses that population control is the only real solution to the food problem. The author assigns the "green revolution" to a less-than-panacea status, because of the input of fertilizer and water required, and because of the consequent potential for environmental deterioration. A review is given of some measures which have been taken to stop environmental contamination. He concludes that "the palliatives are still too few and too weak" and especially singles out certain government agencies such as the United States Department of Agriculture and the Food and Drug Administration as lacking sensitivity on ecological issues.

Ehrlich suggests four broad measures by which overpopulation—food shortage—environmental deterioration can be handled: (1) decreasing the population growth rate to zero and then to a negative value; (2) concurrent increase of food production; (3) careful monitoring of agricultural programs with regard to minimizing adverse environmental effects and restoration of ecosystems; and (4) assessment and beneficient management of the world's nonrenewable resources. Specific suggestions are made for government actions to implement these proposals. Individuals are urged and told how to create pressure on politicians to achieve these desired goals. Examples of letters sent to influential officials by private citizens are included.

Certain matters brought forth by the author directly touch upon Christian principles and can become the foci for discussion leading to individual and collective Christian action. Three such matters are presented as follows.

1. The United States with less than one-fifteenth of the world's population is said to use about one-third of its raw materials (page 129). It is asserted that the affluence of our country greatly depends on many of our imports such as minerals and energy sources. In addition to non-agricultural imports, the overdeveloped countries are taking more protein from protein-deficient countries than is returned

***Other Books Received and Available for Review***
*(Please contact the Book Review Editor if you would like to review one of these books.)*

John Cobb, *God and the World,* Westminster, 1969.

Ignace Lepp, *The Psychology of Loving,* Mentor-Omega 1963.

R. R. Limner, *Sex and the Unborn Child,* Julian Press, 1969.

M. O. Vincent, *God, Sex and You,* Lippincott, 1971.

to these countries. Much of this imported protein is said to be fed to pets and farm animals (page 23). Should and do Christians in industrial nations feel convicted about contributing to this imbalance?

2. The overdeveloped countries such as the United States are also said to be the world's major polluters (page 7). Ehrlich maintains that "the attitudes of Western culture toward nature are deeply rooted in Judeo-Christian tradition" (page 155). He says that most (in our culture) hold the "Christian view" that "God designed and started the whole business for our benefit. He made the world for us to dominate and exploit" (page 156). How do most Christians really interpret God's command to man in Genesis 1:26-28?
3. Ehrlich advocates "a federal law requiring sex education in schools—sex education that includes discussion of the need for regulating the birth rate and of the techniques of birth control" (page 133). Such education, the author feels, should be given before junior high school at the latest. He advocates a "greater availability of contraceptives and abortion" (page 136) to solve the problem of "the unplanned results of premarital sexual activity". A suggested means the author gives to exert social pressure for population control is: "Give your child an IUD to take to 'show and tell' " (page 166). Ehrlich insists: "Above all, *raise a stink*. Let other people know how serious your group thinks the problem is and how determined you are to do something about it" (page 166). How active are Christians in providing adequate sex and birth control education within the context of biblical principles and the values of family life?

Most evangelical Christians would find points of disagreement with Paul Ehrlich's philosophy, methods, and language. Undoubtedly many, if not most, need to be awakened to the biological realities and effects of overpopulation. All of us need to know and carry out our Christian responsibility in the face of these realities and in the light of a proper interpretation of the Word of God.

*Reviewed by Robert E. Hayes, Associate Professor of Food Science and Nutrition, Olivet Nazarene College, Kankakee, Illinois* 60901.

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**DIALOGUE IN MEDICINE AND THEOLOGY,** Dale White, (ed.) Abingdon Press, 1968, Paperback. $1.95.

Though now four years old, this collection of papers and discussions from a 1967 Convocation on Medicine and Theology held at the Mayo Clinic and Rochester Methodist Hospital (and initiated by the United Methodist Church) still preserves the thrust and original purpose of the Convocation: "more and better communication between physicians and clergymen." The contributors apparently were selected both for their qualifications and their representativeness, and include professionals in internal medicine, pastoral counseling, psychiatry, pastoral theology, Christian ethics, systematic theology, the general practice of medicine, and the pastoral ministry. Each contributor is actively involved in the identification and investigation of the moral and ethical issues which bring the two professions together.

With the exception of Seward Hiltner's discussion on the biblical understanding of health (which is the outstanding chapter of the book), the topics are largely ones which have become popularized in recent years through the exposure in mass media. The topics include: organ transplants, effects of specialization, abortion, contraception, euthanasia, prolongation of life, and health care. Perhaps it is the deluge of articles and reports covering these same topics in almost every current periodical that makes the reader frequently expect more in the discussion of any particular topic than the book often provides.

The case history involving an ethical dilemma is a frequent vehicle used to illustrate the various meeting points of medicine and theology. The dilemmas are the ones we have become accustomed to hearing. There is the young girl who has been abducted, raped and then finds herself pregnant. Should she have a therapeutic abortion? At what point does our specialization begin to reduce our effectiveness in treating (or ministering to) the whole person? What new ethical issues are raised by the proliferation of medical advances? What about mind-controlling drugs? When is the beginning of life and what does this have to say about conception control? Can genetic manipulation be justified? When does life end? What characteristics must be present for us to say that a being is a person?

Unfortunately, the scope of this book allows for little more than the raising of these questions. Only rarely can any one question be dealt with in any way resembling thoroughness. This opinion is not meant to fault the book, but merely to express a sense of incompleteness felt by the reader at the end of almost every chapter. In one sense it is the nature of ethics to be incomplete rather than complete, and conditional rather than final. Also, the attempt to cover several areas of the interdisciplinary dialogue necessitates a brief discussion on any one topic.

The resulting presentation in this book, from just these kinds of self-limitations, can be considered a major strength: an intensely readable general consideration of interprofessional dialogue with suggestions for further development of the dialogue. In this way, the book becomes useful not only for the professional person but also for the interested lay reader who has puzzled for a long time over the incongruous division in our society of the care of the "physical" aspects of man and the care of the "non-physical" aspects, whether they be sociological, psychological, or religious.

Though one contributor sees the areas of psychiatry and psychosomatic medicine as the most likely loci for collaboration, it is not necessary for us to restrict ourselves in this way. Whether it was psychiatry, psychology, medicine, religion, or common sense that brought us to the renewed understanding that "one cannot be ill physically without having some emotional accompaniments to the illness and vice versa," is a moot question. That we have come to re-understand this, and that this understanding is central to an understanding of the Christian and Biblical concepts of health and disease, is the real point of significance.

Here the reader is led to reconsider the concise yet remarkably thorough presentation of "The Bible Speaks to the Health of Man." Hiltner's chapter makes sense of both the book and the dialogue itself. His discussion is thoroughly Biblical, and he is successful in stripping away our prejudgments on the views of Scripture on health and disease. He condemns the modern striving after health as the highest value, in

which view men make of health another "work" to be done for its own sake. Hiltner helps us see that in the Biblical view the highest value is "wholeness." Health, as a component of that wholeness, is properly seen as that which flows from God's love and grace as a part of His reconciling and redeeming work among men. Health is something that is a corollary of redemption in Jesus Christ. In that sense, it is social (even cosmic), as much as individual. It is a part of the holistic view of man that Christianity derived from its Jewish ancestry, and as such is central to our understanding of the meaning of the Christian life and the way of Salvation.

It is this understanding for the basis of dialogue between medicine and theology and an appreciation for some of its possibilities in actual practice that helps us come to grips with a statement in the preface of the book.

> Human illness traced back to its source in the individual patient almost inevitably provides a meeting place for the physician and the clergyman and a bright and challenging opportunity for the best efforts of both, one in support of the other. Communion between the ministry of healing and the ministry of faith is as old as man's search for God in the turmoil of lives beset by the malignancies of passions and plagues, of demons and death.

With such awareness this book has meaning and value for each of us.

*Reviewed by Chester J. Minarcik, Jr., Medical Student, Medical School, University of Virginia.*

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**SCIENCE AND HUMAN VALUES IN THE 21ST CENTURY,** R. W. Burhoe, Ed., Westminister Press, (1971). Paperback $3.45.

The power of technological achievements resulting from the discoveries of science, and those discoveries themselves, have placed a tremendous strain on present value systems and world views, particularly upon the religions of the advanced cultures. *Science and Human Values in the 21st Century,* edited by Ralph Wendell Burhoe, is an attempt to prophesy the changes necessitated by the new aspects of the cosmos revealed by science. This book sprang from a symposium at the University of Pittsburgh, and contains chapters by physicist Harold K. Schilling, theologian Langdon Gilkey, psychologist O. H. Mowrer, and biophysicist Robert L. Sinsheimer, in addition to four chapters by the editor.

Ralph Burhoe authors the first two and last two chapters (plus the epilogue) in which he attempts to establish a basis for prophecies and then proceeds to prophesy, respectively. He is qualified for his writing and editorial tasks on the basis of his editorship of *Zygon, Journal of Religion and Science,* and his Professor- and Directorships at the Center for Advanced Study in Theology and the Sciences at Meadville/Lombard Theological School.

In Chapter 1, Burhoe defines life as a homeostatic physical mechanism in which the brain is the cybernetic device which centrally organizes not only individual but also social life. The brain receives information bits about the environment and then alters behavior to maintain life. Extrapolating this biological phenomenon, he suggests that man necessarily predicts his future from what he knows of his world. God in this physical system is the order-producing, life-building selection principle which transcends the evolving train of living organisms.

While there have been many dire predictions made concerning present world religions and Christian beliefs in particular, Burhoe concludes in Chapter 2 that the human spirit always seeks to transcend itself and therefore religious quests will continue. He further predicts that the third millenium will see the development of a universal world reigion which transcends all of the current world religions, even though the time for such development is limited.

Chapter 7 presents "A Scientific View of the Role of Religion". Burhoe suggests that life is the natural consequence of stratified thermodynamic stabilities, i.e., higher living systems are the necessary result of the interaction of entropic tendencies of thermodynamics with potential structures which, in the nature of the cosmos, are preferred due to hidden stabilities. Life is thus an "entropy-consuming" process which creates greater order. This principle may be extended beyond molecules to societies in which religions have been the major order-building phenomena. Futhermore, religion is a technology which is necessary to maintain societal order, so that the human species may continue development. A religious reformation, however, is needed—a reformation which is based on the transcending principles of science and which speaks the scientific language of our age.

In "Prophecies of a Scientific Theology", Chapter 8, Burhoe continues his theme that man must draw his "do's and don'ts" from the transcending principles of the cosmos which science has illuminated. He suggests that a "natural piety" is developing among the impious scientists of the world. Unfortunately, he does not consider the fact that any new theology based upon scientific principles depends upon man's interpretation of data about the cosmos and/or man's extrapolation of the transcending principles of value systems applicable to human beings.

In the epilogue, Burhoe discusses the current trend toward a universal scientific-technological world view and postulates that religions which fail to communicate their message will be weeded out by the process of natural selection. He calls for a scientifically based symbol system where the Lord, the God concept, is the man-transcending power or reality (a term which Burhoe seems to like best to denote God) that creates and determines man's destiny. He demonstrates the rather naive belief that a reformed symbol system will transform man from his "present patterns of self-centered indulgence, apathy, isolation, confusion, and frustration". If few religions have been able to save man from himself, even with symbol systems applicable to their age, there seems little basis for believing that another system will deliver man in this age.

In Chapters 3 through 6, the four other scientists present views which vary moderately to greatly from the editor's. In Chapter 3 physicist Schilling argues that man is now at the stage where he can create his future. His thesis is that in the finite future man will become "more fully human"; he will develop into an interdependent and community oriented species. This will not be achieved easily, but *with God,* he emphasizes, it may. Schilling seems to rely on his Christian faith for a redeeming ethic which is in harmony with the basic character of the universe. His optimism rests on his belief that science will be able to define reality and persons in an understandable fashion, and technol-

ogy will be able to propagate these ideas to the entire world. He seems to have ignored the fact that man seldom (if ever) turns from independence and selfishness to interdependence and mutuality of his own free will.

In Chapter 5, psychologist Mowrer, after defining good and evil in a manner free of any god concept, presents deliverance from evil to good through small group participation and encounter. He places his hope in nontheistic religious groups in which estrangement is overcome and temptation resisted through interaction with and commitment to one's peers. Mutual understanding, interdependence, and good will inevitably result.

In "Science and the Quest for Human Values", Chapter 6, biophysicist Sinsheimer suggests that hope for man lies in programming values into his genetic heritage. He states that man might be less human but more humane if he "never knew hate or rage or envy or terror". Sinsheimer assumes a great deal of genetic technology which is yet to be developed. Even more naive is his assumption that this power will be used wisely and not for corrupt purposes. Who will decide that "good" men are not merciless, artless, unimaginative slaves?

Perhaps Langdon Gilkey's Chapter 4, "Biblical Symbols in a Scientific Culture", should have been placed at the end, for in it he successfully cuts the groundwork from underneath the postulations of the other authors. He states simply that history is irrational because man is a selfish, ambitious, power-corrupted being and prophecy concerning such a species is foolish. As for world views, he suggests that man return to the Biblical symbols because they are correct. The modern religious myths of Evolution and Marxism have been shown to be false. The present scientific Gnosticism prevalent among many scientists—the belief that man will shortly know enough to save himself—is self contradictory and less believable than the traditional symbols of the Bible.

While this book is basically an interesting, albeit dubious, look at the future based on a misunderstanding of man's nature, Gilkey's chapter is an excellent critique on modern scientism and a successful philosophical attack upon modern scientific Gnosticism.

*Reviewed by Carl Lynch III, Medical Student, University of Rochester Medical School.*

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**CONTEMPORARY THEOLOGY AND PSYCHOTHERAPY** by Thomas C. Oden, The Westminister Press, Philadelphia. 1967. 158 pp.

Ever since science began, men have been interested in the relationship that exists between the doctrines of religion and the findings of scientific research. The conclusions of Columbus, Copernicus, Newton, Darwin and Freud, to name a few, have put churchmen on the defensive and led to heated debates about the real nature of man and his world. In the past, many of these debates have focused on the subject-matter of the natural sciences, but within our generation the emphasis seems to have shifted more to the social sciences. Undoubtedly there are many reasons for this shift, but certainly one factor must be that social scientists (and especially psychologists) so often study the very subjects which are discussed in the Bible; subjects like child rearing, interpersonal relations, suffering, healing, discouragement, aggression, and hope.

Twenty years ago the dialogue between psychology and theology was of interest only to a few theologians and a handful of social scientists. But this has changed! The existential despair of the 50's and 60's has led increasing numbers of people to look to theology and to psychology for the answers to man's problems. (There is, perhaps, an even greater interest in sociology, but I have chosen to limit my remarks to theology and psychology since these are the areas that are discussed in Dr. Oden's book.) And the disciplines of psychology and theology, perhaps embarrassed by the attention and caught with little that they can offer, have been turning to each other. In increasing numbers, theological seminaries are requiring that students take courses in psychology and pastoral counseling and, amazing as it may seem, psychologists are even getting interested in religion. O. Hobart Mowrer, Abraham Maslow, Erik Erickson, Carl Rogers, and a host of lesser known psychologists have been looking to theology to see if religion can help in understanding man's behavior and solving his problems.

Books and articles on the relationship between psychology and theology continue to roll off the presses. In a footnote, Dr. Oden notes, no doubt with tongue in cheek, that "the sheer quantity of this literature would lead one to suspect that something exciting must be happening in this area" (p. 143), but elsewhere the author reaches a conclusion with which I am inclined to agree. Discussions "on the potential rapprochment of psychology and theology . . . have borne meager fruit in this present decade with recent literature tending increasingly toward trivia and repetition. . . . the issues between current theology and psychotherapy remain mostly muddled and unresolved" (p. 9,16). In writing his book, Dr. Oden no doubt sought to avoid the trivia and to clarify the issues, but in my opinion he hasn't succeeded very well.

The book is divided into three parts. Part one pinpoints some of the issues of debate and then presents the thesis that Bonhoeffer's "worldly theology" and Teilhard de Chardin's "Christian humanism" are the best theological positions on which to build a dialogue with psychology and psychotherapy. In the second part of the book (which in my opinion is the best) Oden critically examines the work of three men—Paul Tillich, Edward Thurneysen and Seward Hiltner—who "stand out above all others" as representatives of the theology-psychotherapy debate. In part three the author, basing his conclusions on the systems of Bonhoeffer, Teilhard and Bultmann, suggests some future directions for the "emerging dialogue" of theology and psychotherapy.

Scattered throughout the book are a number of good insights and thoughtful conclusions. In his evaluation, for example, the author criticizes Tillich's tendency to assume that science, including therapy, should ask all of the questions while theology sits around waiting to supply answers. Surely science can give some answers just as theology can help in formulating the questions that should be asked. Borrowing from Bonhoeffer, the author also criticizes the "subtle assumption in Tillich "that God seems to be working on the edge of life, just at the abyss of human meaninglessness and doubt where man is at the end of his rope, but not at the center of ordinary existence, not in the middle of town" where man lives and interacts with people (p. 70). Thurneysen's belief that healing can be divided into two distinct spheres, one secular and one theo-

logical, is also critized. This is a point which should be heeded by many of the Christian psychologists that I know, therapists who keep their theology and their psychology so separated that the twain never meet, especially in a counseling session. Then Oden looks at the pastoral psychology movement in the United States and dares to criticize what a host of theologians, seminarians, and psychologists hold in great reverence. "The American pastoral care movement," Oden suggests, "has drifted along with liberal theology in general toward anti-systematization and even anti-intellectualism in the sense of resisting deliberately systematic or theological substructures as a basis for its actual functioning" (p. 84). The movement has selected "an 'operation-centered' approach, which argues that theological conclusions are drawn from interpersonal relationships and pastoral experience. . . . The overwhelming weight of authority for theological knowledge is given to *experience,* and in this sense the American pastoral care movement belongs essentially to the tradition of a liberalizing, pragmatizing pietism." (p. 89). Prayer, scripture reading, and doctrine are nothing more than gimmicks—techniques that can be used on occasion because of their psychological effect on the counselee. Rarely have I seen such a clear-cut, and in my opinion accurate, appraisal of the pastoral care movement.

But Oden, regretfully, does not offer anything better. Having rejected the inspiration and authority of the Bible as the Word of God, the author joins with other contemporary theologians who are floundering in their search for a theological base. He gives an exposition of Colossians 1 and Matthew 25, but he rejects other parts of the Scriptures and claims, for example, that all men are automatically saved (p. 126-7, 134), that God is known by works (p. 116) and that the church needs to embrace a modern form of gnosticism (p. 109)—the very doctrine against which the Scriptures speak so strongly (especially in 1 John). In addition, Oden falls into a language which may mean something to theologians but certainly does nothing to clarify the dialogue with science. For example, in summarizing his "Bonhoefferian-Teilhardian-Christology," the author states "The central inadequacy of a theology of culture has been a *dehistoricized* Christology which misplaces the historicity of the accepting reality, the eventfulness of the power of acceptance" (p. 56). Equally confusing is the statement that "psychotherapy is not primarily concerned with conceptualizing authenticity as an ontological possibility, but with mediating a relationship of accepting love that will *in fact* free one for authenticity" (p. 114), or that "the saints are the celebrating community of those who know themselves to have been grasped by the unconditional positive regard of God amid their estrangement" (p. 97).

Oden's book is a serious and scholarly attempt to relate contemporary theology and psychotherapy, but the attempt gets bogged down in theological doubletalk and vagueness. Because he has no clearcut Biblically based theology, Oden finds himself led to the very trivia and repetition which he condemns in the first chapter of his book.

Discussions of this sort will continue, no doubt, but they will do little to bring secular science and Christianity together. Modern theologians have, for the most part, rejected the revealed Word of God and substituted a series of man-made speculative systems. Armed with these confusing human creations they can hardly hope to relate to modern science—which has lately been doing some soul searching of its own.

It is time that more evangelicals got into the task of integrating modern science and a Biblically based theology. The task is not easy but it needs to be done and in spite of all our talk about its importance, it does not appear to me that many of us are really in the battle. Until more of us are willing to show in clearly written treatises that the findings of science and the revealed Word of God can and do relate to each other, then we will have to be satisfied with confused books such as the one that Dr. Oden has written.

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**THE THIRD FORCE: THE PSYCHOLOGY OF ABRAHAM MASLOW.** by Frank Goble, Grossman Publishers, New York. 1970. 201 pp.

For many years the science of psychology has been dominated by two theoretical forces. The first of these, psychoanalysis, was originally formulated by Freud and has had a great influence on the development of both clinical psychology and psychiatry. The second force, behaviorism, grew out of the work of John B. Watson and has pretty much shaped the direction of academic psychology in America during the past 50 years.

More recently, however, a third force has been making itself felt in psychology. Disillusioned with the impotence of psychoanalysis and the sterility of behaviorism, increasing numbers of psychologists are looking to a new theoretical position—a position which writers such as the author of this book enthusiastically proclaim as "a major breakthrough that is capable of changing the course of world history" (p. xii). Goble's book is written as a summary of the major tenets and principles of this new third force movement.

The term "third force" was first suggested by a psychologist named Abraham Maslow and it is in this man's research and writings that the new movement has found much of its theoretical basis. Maslow was a man of exceptional ability and diversified interests. A former president of the American Psychological Association, he authored numerous publications and for many years held a position on the faculty of Brandeis University. When Frank Goble decided to write a summary of Maslow's ideas and to describe the current state of Third Force Psychology, Maslow agreed to cooperate. He read the manuscript of this book, offered suggestions for revision, and wrote an introduction. Then, suddenly in June of 1970, Abraham Maslow died of a heart attack. Goble's book appeared shortly thereafter and now stands as a comprehensive introduction both to the life work of Maslow and to the third force movement which is gaining increasing influence in American psychology.

Maslow and his followers do not reject Freud and Watson totally. Psychoanalysis and behaviorism, it is asserted, have given us some helpful information and many useful techniques, but both of these forces fail to view man as a creature who is uniquely different from all other animals. According to third force psychology,

> The study of the mentally ill (which is the chief method of psychoanalysis) is valuable, but not enough. The study of animals (which is the behaviorists' main technique) is valuable, but not enough. The study of average individuals will not, in itself, solve the problem. In order to understand mental illness we need a thorough understanding of mental *health*.
>
> Maslow proposed . . . . the idea that one could learn a great deal about man and his potential from the study of emotionally healthy, mature people. . . . (p. 18).

From this beginning there developed a new way of looking at human behavior. Maslow tried to find and study people who were "outstanding examples of mental health." He developed a creative list of human needs and described how people could, by developing their own "unrealized potential" move toward a state of psychological maturity which he called "self actualization." As he developed his ideas, Maslow grappled with the problems of improving mental health, making education more effective, helping neurotics to function more effectively, and enabling society to improve. He endowed the whole third force movement with a great optimism and a belief in the innate potential and goodness of man.

Goble's volume is divided into two parts. The first of these (which comprises about two-thirds of the book) summarizes Maslow's theories of human motivation and behavior, while the second part describes how others have applied third force ideas to such practical issues as mental health, crime prevention, education and industrial efficiency. In a style that is lucid, non-technical, and very readable, Goble gives us an excellent overview of the third force philosophy. The author has an intense respect for Maslow and believes that in this new system "a breakthrough of world-wide significance has occurred in our understanding of man and his behavior" (p. 118). In spite of this enthusiasm, however, the author presents a balanced introduction to his topic and the book is an excellent summary of a way of thinking that may well influence not only psychology, but other areas of science as well (see the article by Harman, *Journal ASA*, June, 1971). *The Third Force* will be an important book for psychologists, but it can also be read with real profit by laymen and by scientists in fields other than psychology.

Having enthusiastically endorsed Goble's book, however, I should like to comment briefly on the third force philosophy itself. (I am currently preparing a more detailed evaluation of third force psychology during a year of sabbatical leave in Europe.) There is a great deal in this formulation that can be enthusiastically accepted by Christians: the importance of both love and discipline in child rearing; the value of self understanding; the need for respect and trust in interpersonal relations; the realization that "man does not live by bread alone but by his higher needs"; the belief that responsibility is healthy while irresponsibility is costly; the approach which considers man's feelings, desires and emotions instead of examining him as one would look at a pigeon in a Skinner box; the recognition that there is such a thing as right and wrong and that values have a place in all of science including psychology. But in spite of these views we must recognize that third force psychology rests on a basic assumption which is both non-Christian and anti-Biblical. This is the view that man is alone in the universe and that he is sufficient in himself.

Consider, for example, the third force views of human values as described in Goble's book.

> The ultimate disease of our times is valuelessness . . . this state is more crucially dangerous than ever before in history; and . . . something can be done about it by man's own effort.
>
> Perhaps the most unique aspect of Maslow's Third Force theory is the belief that there are values or moral principles common to the entire human species, which can be scientifically confirmed. Maslow strongly feels the need for a usable system of values that does not rest upon blind faith alone. 'It is certainly true that mankind, throughout history, has looked for guiding values, for principles of right and wrong. But he has tended to look outside of himself, outside of mankind to a god, to some sort of sacred book perhaps, or to a ruling class. What I am doing is to explore the theory that you can always find values by which mankind must live, and for which man has always sought, by digging into the best people in depth. I believe, in other words, that I can find ultimate values which are right for mankind by observing the best of mankind. If under the best conditions and in the best specimens I simply stand aside and describe in a scientific way what these human values are, I find values that are the old values of truth, goodness, and beauty. and some additional ones as well—for instance gaiety, justice, and joy.' They are intrinsic in human nature, a part of man's biological nature, instinctual rather than acquired. (pp. 87-8).

In spite of its great potential for creating a new psychology, this third force movement falls short of the Biblical conception of man. Man was created in God's image, we read in the Scriptures, but he fell. Now in his fallen state, natural man may employ all of his best efforts and creative talents, but without help he cannot reform himself or cure all the ills of society. There is still a need for man to "look outside of himself to a God, to a sacred book." By himself man can only make limited progress. He needs the love of God, the power of Jesus Christ, and the direction of the Holy Spirit if he is to see humanity pulled out of a miry clay and set firmly on a rock (Psalm 40:2).

Third force psychology has the potential of pointing the science of human behavior in a new direction. But the system that Goble describes so well in his book also presents Christians with an exciting challenge: a challenge to show conclusively that man by his own efforts can only go so far. To really change ourselves and our society we need more than psychoanalysis, behaviorism, and third-force humanism. We need a psychology with a new dimension—a psychology which is developed and tested against the truths that are proclaimed in the divine Word of God.

*Reviewed by Gary R. Collins, Division of Pastoral Psychology, Trinity Evangelical Divinity School, Deerfield, Illinois* 60015

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**EVOLUTION ON TRIAL** by Cora Reno, Moody Press, Chicago 1970. 192 pp. $3.95

Cora Reno has written this book specifically for high school students and people who work with them. She has included 12 widely used high school biology textbooks including the three B.S.C. versions. And she clearly points out that the "evolution" she is discussing is the "amoeba to man" type and not the genetic variation type which is included by many biologists under the term "evolution". She quotes freely from the various arguments given for organic evolution in these texts and for each gives an anti-evolutionist's answer. In discussing the argument that similarity indicates rela-

tionships, the author replies, "another thought that comes to the mind of a Christian to explain likenesses between living things is that they could be the result of a common plan in the mind of God, the Creator."

In another instance the author quotes from the B.S.C.S. Green version, "Evolution is neither a great many changes taking place all at once nor a random change. Rather it is a guided selective change with environmental factors . . . usually playing a part in selection. Thus there is also a *guiding factor* in evolution." In reply she writes, "A consistent completely evolutionary position does not allow for the existence of a *guiding factor*. We feel that this is another weakness in the theory of evolution. The Christian sees creation and a guiding and sustaining force coming from the hand of God. . . ."

There is an affirmation of a strong faith in God, the Creator.

> We acknowledge that we do believe in the supernatural, but we also try to be accurate in our science. There are certain things that must be taken by faith by either the evolutionist or the creationist. . . . There is a way in which our faith is not blind because we have seen the truth of God's Word in other areas. We have seen lives changed by belief in the Bible's promises concerning the new birth and we have seen and are seeing fulfilled prophecy.

The final chapter, "What's In It for You" is a challenge to accept the Bible as the supernatural "Word of God" and to seek eternal life through the Lord Jesus Christ.

In the reviewer's opinion, *Evolution on Trial* is a well-written book that will be of great value to high school students and people who work with them.

*Reviewed by Philip Harden, Department of Biology, Roberts Wesleyan College, Rochester, N.Y.*

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**THE WISDOM OF EVOLUTION,** by R. J. Nogar (New York: Reprinted by the New American Library, a Mentor-Omega Book) 1966.

Father Raymond J. Nogar is a Dominican priest, theologian and biologist. He has written a very significant book which gives a cogent presentation of the classic Roman Catholic position regarding creation and evolution. Here is how Nogar describes the purpose of this book:

> *First,* it examines the proofs for the fact of evolution, and it evaluates the power of the scientific fact in the light of biology and anthropology. *Second,* this book marks off the limits of evolution by logical analysis, manifesting what generalizations flow from the scientific facts and what generalizations do not. *Third,* the book attempts to give a synthesis of scientific evolution and a philosophy of life which is both consonant with the known facts and agreeable to a sound Judeo-Christian philosophy (*Preface.*)

Nogar's first chapter is crucial. The problem of the fact of evolution is a problem in "prehistory." Nogar says that prehistory is the science of reconstructing the past which has not been witnessed by human eyes. The prehistorian must depend upon arguments from analogy, that is to say, by reconstructing one series of events. Another important instrument in reconstructing prehistory is the device of reasoning called "extrapolation." This is the reasonable projection of an established conclusion into areas in which the argument probably remains valid, areas which cannot as yet, be explored. The opposite of this device is called "interpolation" or the insertion of factors (conjectured) between two known entities.

Nogar suggests that the prehistorian is not looking for "absolute certitude, nor does he ever assert that he has it . . . he quite obviously is looking for a degree of probability." (p. 39) Probable, more probable and most probable are degrees of conviction based upon the successive piling up of evidence and the successive removal of reasonable doubts. Nogar sums up in this way the procedure that will follow in his book:

> Is evolution a fact? From the above discussion it is clear that our answer depends upon the ability to recognize a very special kind of fact, circumstantial fact . . . In the following pages, the case for evolution will be reviewed much after the pattern of a legal case. In this way the nonspecialist can watch the building up of the fact of evolution gradually as one by one, paleontology, genetics. embryology, comparative anatomy, biogeography and all the other main contributors to the fact of evolution give their evidence. The reader, in watching the case for evolution unfold before his eyes, can judge as to whether the verdict is just. (p. 41)

Nogar argues that we must take the findings of science seriously; not because man is autonomous, but because God has revealed Himself in nature also. He is convinced that the evidence for the theory of evolution is sufficient to make it a reputable scientific doctrine. He also limits evolution so that it does not become a world view, i.e., evolutionism. In principle the acceptance of evolutionary development implies that man also has undergone evolution. Nogar accepts the evolution of man's body as postulated by anthropologists. However, he is very careful to draw a line between man's biological nature and his spiritual nature. Nogar insists that man's spiritual nature, that which makes man a personal human being made in the image of God, was a special creative act of God.

In Nogar's perspective, any tension between evidence for evolution and the Genesis creation account is alleviated by viewing Genesis as a literary framework. The creation account has an historical character in the sense that it describes in a generally factual way real events (God created the cosmos; intervened to make man; there was a state of moral rectitude; our first parents did sin etc.). However, the Bible in no way speaks about the manner of creation. Nogar states that modern biblical scholarship has changed our view of the creation account (as well as that of the whole Bible) in terms of its purpose. The purpose of Scripture is to teach basic religious truths rooted in history, but not to give a precise, chronological, detailed account of history and origins.

Nogar feels that evolutionary science adds another dimension to the argument from the natural order of the universe. Not only is there a magnificent order, but there is also an unimaginable dynamic and developmental order in their history. He then asks: if the existence of God was necessary to the old conception of the rather static order of nature, how much more is the existence of God necessary to the evolutionary order of natural development? The working of the laws of nature is the working of the design and will of God. To the scientist, however, the working and the problems of research, the facts and laws and theories with which he is concerned presupposes the universe endowed with this orderly activity. To consider the providential action of God as a constant series of miracles would be a faulty view of nature and de-

structive of science and of theology as well.

Nogar's book is significant and worth reading because he makes a forthright and thorough presentation of the evidence for evolution; the author also proceeds from a clear hermeneutical and theological position. Nogar is obviously an equally competent theologian and scientist. However, in my judgment, the basic importance of this book resides in the clear and unequivocal explanation of the meaning of the "fact" of evolution and the nature of scientific evidence. This dimension has been lacking in past attempts at harmonizing creation and evolution. Thus theologians and nonscientists do not clearly understand the scientific arguments. I feel Nogar has bridged this communication gap very well.

This third part of the book will raise the most questions, especially for those who do not accept the author's starting point. Here Nogar attempts to provide a synthesis of scientific evolution and a philosophy of life which is consistent with the known facts and is agreeable to a "sound Judeo-Christian philosophy." In the author's case, this is a Thomistic synthesis. However, the book is very well written, thought provoking and provides *one* theological solution to the creation-evolution dilemma. If you are interested in the evolution-creation question, be sure to read this book.

*Reviewed by Maynard C. Niebcer, Pastor, The Mount Pleasant Christian Reformed Church, Mt. Pleasant, Michigan.*

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**MATHEMATICAL CHALLENGES TO THE NEO-DARWINIAN INTERPRETATION OF EVOLUTION** Edited by Paul S. Moorhead and Martin M. Kaplan. The Wistar Institute Press, Philadelphia, Pennsylvania, (1967) 140 pp., Paperback $5.00

> In physical science a first essential step in the direction of learning any subject is to find principles of numerical reckoning and methods for practically measuring some quantity connected with it. I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be. (*Lord Kelvin*)[1]

> Scientists are always concerned with the elaboration and testing of hypotheses which may conceivably be refuted by further experience, and their attitude is scientific only in so far as they are prepared to admit this. If at any time they put forward theories for which they refuse to admit the conceivability of falsification, they have abandoned scientific method, even though they may produce masses of evidence which is supposed to be confirmatory. (*Encyclopaedia Britannica*)[2]

> The current neo-Darwinian Theory has the methodological defect of explaining too much. It is too difficult to imagine or envisage an evolutionary episode which could *not* be explained by the formulae of neo-Darwinianism. (*Karl Popper*)[3]

> Concepts such as natural selection by the survival of the fittest are tautologous; that is, they simply restate the fact that only the properties of organisms which survive to produce offspring, or to produce more offspring than their cohorts, will appear in succeeding generations. (*Murray Eden*)[4]

The above quotations represent some of the questions that can be raised about the modern theory of evolution. They are the kind of questions that occur particularly to the physical scientist and, indeed, it was at an informal gathering of physical and biological scientists that the genesis occurred for the book being reviewed. As noted in the Preface: "Actually, the seed was sown in Geneva in the summer of 1956 during the course of two picnics held at Vicki Weisskopf's house and at my house, on two consecutive Sunday afternoons. Koprowski and I, the only biologists present, were confronted by a rather weird discussion between four mathematicians—Eden, Schützenberger, Weisskopf and Ulam— on mathematical doubts concerning the Darwinian theory of evolution. At the end of several hours of heated debate, the biological contingent proposed that a symposium be arranged to consider the points of dispute more systematically, and with a more powerful array of biologists who could function adequately in the universe of discourse inhabited by mathematicians.

The book contains the proceedings of the conference. There were four papers presented by the physical scientists: "Inadequacies of Neo-Darwinian Evolution as a Scientific Theory" by Dr. Murray Eden, Professor of Electrical Engineering, Massachusetts Institute of Technology, "How to Formulate Mathematically Problems of Rate of Evolution?" by Dr. Stanley Ulam, Research Advisor, Los Alamos Scientific Laboratories, "Mathematical Optimization: Are There Abstract Limits on Natural Selection?" by Dr. William Bossert, Harvard University, and "Algorithms and the Neo-Darwinian Theory of Evolution" by Dr. Marcel P. Schützenberger, University of Paris. The biological scientists also presented four papers: "Evolutionary Challenges to the Mathematical Interpretation of Evolution" by Dr. Ernst Mayr, Director, Museum of Comparative Zoology, Harvard University, "The Problems of Vicarious Selection", by Dr. George Wald, Professor of Biology, Harvard University, "The Principle of Historicity in Evolution", by Dr. Richard C. Lewontin, Professor of Zoology, University of Chicago, and "Summary Dis-

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*For to my mind, this is a certain principle, that nothing is here treated of but the visible form of the world. He who would learn astronomy and the other recondite arts, let him go elsewhere . . . It must be remembered, that Moses does not speak with philosophical acuteness on occult mysteries, but states those things which are everywhere observed, even by the uncultivated, and which are in common use.*

John Calvin
*Commentary* on Genesis 1:15

cussion" by Dr. C. H. Waddington, Institute of Animal Genetics, Edinburgh. In addition there are two Post-Conference Comments and seven Preliminary Working Papers.

To summarize briefly, the physical scientists attempted to formulate mathematically the various processes in the stages of evolution. Such a formulation can now be considered seriously because of the availability of high speed computers. While the one billion years assumed to be available for evolution may appear to be a long time, the number of generations is finite and the changes occurring between all generations in evolutionary history can be simulated on a computer in a few days (10 days using one of the mathematical formulations presented at the conference (page 73)). The results of such analyses of the theory of evolution were, without exception, spectacularly unsuccessful.

In response to these presentations, the biological scientists reminded the physical scientists of the complexity of the evolutionary process: the historical variations in the environment, the dependence of an organism's characteristics that interact with the environment on many genetic factors, so that the effect of a genetic change is difficult to specify, and the possibility of unknown factors limiting the available routes for change (it was noted that the DNA helix is the most energetically stable form for a collection of amino acids). In a stimulating discussion of several evolutionary phenomena, Dr. Mayr demonstrated the power of the qualitative concepts developed by biologists in explaining the biological world. It also became clear that the mathematical formulation of these concepts will not be easy. Perhaps the consensus of the conference was best expressed by Dr. Waddington in his closing statement when he said:

> . . . I think we have approached each other to some extent. I hope the biologists have shown the physicists that evolutionary theories are not totally vacuous. I think the physicists have shown us that they are certainly as yet very incomplete, and I think we are ready to realize they are very incomplete. Possibly we now know slightly better in which directions they are incomplete.

Rather than review in detail the contents of the papers I will attempt to give some of the flavor of the conference by selecting excerpts from the often entertaining discussions following the papers that might be of particular interest to the readers of the *Journal ASA*. In view of the fact that the American Scientific Affiliation has published a monograph on the human eye it is enlightening to hear the present opinion of the "experts" on the evolution of the eye (page 97).

Dr. Waddington: "I think it is relatively simple to make an eye."

Dr. Mayr: "I don't know who should answer that but I agree there, too. Somebody quoted Darwin yesterday and, as with the Bible, you can quote him for one thing or another. In one place he said that it completely horrified him to think of the eye and how to explain it; and at another place he said once you assume that any kind of protein has the ability to react to light, once you admit that, then it is no problem whatsoever to construct an eye. If you have a light-sensitive protein, then by natural selection you obtain pigments, anything that changes the diffraction of light, and any kind of a lens-like substance. As a result—and I think there are conflicting statements in the literature—somewhere between twelve and seventeen times in the history of evolution, eyes have evolved independently, separately, in different lines of organisms.

So the eye simply means a light-sensitive structure with auxiliary organs like pigments, lenses and focusing devices of various sorts. I don't think this is as difficult to evolve as is sometimes claimed."

An entertaining anecdote was told by Dr. Fentress of the Brain Research Center, University of Rochester during one of the many discussions about the tautological nature of evolution.

> I would simply like to give one example which I think illustrates how important it is to ask a precise question. When I was in Cambridge, we were working with two species of British vole.
>
> We had a little test in which an object moved overhead; one species would run away and the other species would freeze. Also, one species happened to live in the woods and the other happened to live in the field. This was rather fun, and, not really being a zoologist, I went up to see some of my zoologist friends and I reversed the data. I asked them, simply, why a species which lived in the field should freeze and why one that lived in the woods should run away (when the converse was the case). I wish I had recorded their explanations, because they were very impressive indeed.

An illuminating comment was also made in the course of Dr. Mayr's lecture concerning the content of the theory of evolution.

> These considerations of time, of space, of population size, result in an emerging picture of evolution which is in some respects, and particularly in emphasis, somewhat different from the classical neo-Darwinian picture that we find in the literature. I want to say that when the mathematicians this morning talked about the neo-Darwinian model, they talked about Fisher of 1930 and Sewall Wright of 1931. The people who are most active in the evolutionary field have by no means abandoned what Fisher, Haldane and Sewall Wright said, but they have built on it a lot of additional superstructure. Therefore, the neo-Darwinian story, what is it, really? Is it what Fisher and Wright said 35 years ago or what we believe in 1966?

It is important to remember that the theory of evolution, like any other scientific theory is modified and developed with time.

In conclusion, this reviewer is struck by the similarity between the confidence of the evolutionist and the confidence of the Christian in their beliefs. Both have a "gut" feeling that their beliefs are founded on a reality. Both can produce evidence in support of their beliefs. Yet both have had the unpleasant experience of seeing their beliefs modified as new evidence has appeared. Neither can at present, or possibly ever, give a logically convincing proof for his beliefs. Yet, neither has had his beliefs disproved. To the outsider, confidence in such beliefs is puzzling, leading Professor Weisskopf, Professor of Physics, Massachusetts Institute of Technology, to remark at one point (p. 100):

> "If I wanted to be nasty toward the evolutionists, I would say that they are surer of themselves than the nuclear physicists—and that's quite a lot."

Perhaps the sensitivity of the evolutionist as well as the Christian to criticism is rooted in this very fact that, in the end, he must resort to arguments of plausibility rather than proof to defend his beliefs.

[1]Lord Kelvin, "Electrical Units of Measurement" (1883) in *Popular Lectures and Addresses* (London, 1981-94), I pp. 72-73.

[2]*Encyclopaedia Britannica* (1968) Vol. 20, p. 20.

[3]Karl Popper as paraphrased by P. Medawar in *Mathematical Challenges to the Neo-Darwinian Interpretations of Evolution*, P. S. Moorhead and M. M. Kaplan, eds. (Philadelphia, Wistar, 1967), p. xi.

[4]M. Eden in Ref. 3, p. 5.

*Reviewed by John A. McIntyre, Department of Physics, Texas A&M University, College Station, Texas* 77843.

# *ASA ANNUAL MEETING, 1971*

## *Whitworth College, Spokane, Washington*

(All listings below go from left to right as one looks at the photo.)

*Children in Front*: Ruth Ann Heddendorf, Jill Albert, Peter Simpson, Sharon Simpson, Sherrell Barnhart, Brenda Simpson, Melanie Groner

*Front Row*: Ed Payne, Judy Albert, Jerry Albert, Dave Winter, Don Boardman, David L. Willis, Gilbert J. Hunter, John F. Stewart, Harold Hartzler, Joe Dikes, Wayne Linn, Ed Olson, David Heddendorf

*Second Row*: Paul Simpson, George Bate, Marolyn Bate, Betty Boardman, Judy Barnhart, Ludlow Corbin, Russell Johnson, Marjorie Johnson, Ken Lincoln, Shirley Lincoln, J. N. Howitt, Gordon Brown, Peg Harrison, A. Harrison, J. T. Chappell

*Third Row*: Hartzler, V. Smith, M. Dilling, Cordelia Barber, Roger Voskuyl, M. Cuppett, Steve Barnhart, Philip Moberg, Helen Moberg, Jean Dunn, Earline Willis, Doris Kennedy, E. James Kennedy

*Fourth Row*: R. McAllister, David O. Moberg, Ellie Heddendorf, Don Stoner, Jack McIntyre, Joanne Elsheimer, Neil Elsheimer, C. Richard Terman, Millie Johnston, Larry Johnston

*Fifth Row*: Richard Bube, Russell Heddendorf, Harold Harder, Marvin Giddings, Robert Shacklett, Grayson Capp

**THE BRAIN:** ***Towards an Understanding*** by C. U. M. Smith, G. P. Putnam's Sons, New York, 1970. 392 pp. $10.00

**THE STORY OF QUANTUM MECHANICS** by Victor Guillemin, Scribners, New York, 1968. Paperback. 332 pp. $3.95

These two books fall into the category of science books written in a popular vein for readers "without formal training in science or mathematics," which can really be appreciated only if the reader has had some such formal training. Under the latter condition, they are both excellent and easy reading, strongly to be recommended for cross-field communication and insight. What makes these two book particularly outstanding is their recognition of philosophical and theological questions, as well as purely scientific ones.

Dr. Smith, author of *The Brain,* is a lecturer in the Department of Biological Sciences at the University of Aston in Birmingham, England. He is also the author of *Molecular Biology: A Structural Approach.* In *The Brain* he is concerned to show how much is known about the physical and chemical basis for brain activity. To prepare for this discussion, he treats the properties and behavior of the nervous systems, and to follow up this discussion, he treats motivation, perception, memory, consciousness and the brain-mind dilemma. Although modest about the accomplishments to date of brain science,

> What is consciousness and how far does it extend through the animal kingdom? has hardly yet been dragged from the realm of philosophy to that of physiology. The honest brain scientist, like St. Augustine of Hippo when faced with the analoguous problem of the origin of human souls, must confes ignorance.

Dr. Smith nevertheless takes the strong stand that

> There are no ghosts in the brain's machinery, no unmoved movers. It is all a matter of physics and chemistry.
>
> There is no gulf fixed between animate and inanimate creation. The great discoveries of modern biology leave no doubt that the 'living' has evolved from the 'nonliving.'
>
> 'Mind,' 'consciousness,' has no subsistence without matter.

In view of this position, it is striking to see Dr. Smith avoid materialistic reductionism in the later more philosophical chapters, and to opt instead for the emergence of psychological and spiritual qualities as a result of interactions within a system, viewing "mental" and "physical" not as contradictory but as complementary. When finally he is brave enough to enter the free will vs. determinism arena, he cites the argument for freedom and responsibility in a deterministically describable system advanced by the Christian scientist Donald M. MacKay. He concludes that "freedom of action and in consequence the possibility of a moral universe has entered the world with the evolution of self-awareness. . . . The physical brain theory adumbrated in this book does not eliminate the very possibility of human freedom." The book contains 18 glossy photographs and 168 figures.

*The Story of Quantum Mechanics* is divided about equally into three parts: (1) quantum mechanical ideas in the atomic realm, (2) quantum mechanical ideas in the nuclear realm, and (3) deliberations on philosophical implications, causality, free will and determinism. The author, Victor Guillemin, has been involved in teaching and research for over thirty years in physics and biophysics at the University of Illinois College of Medicine and the Harvard University Physics Department. It is the kind of book that every student should read just about the time he is exposed to his first rigorous course in quantum mechanics. There are 36 figures and nine blank pages at the end for notes. I found the book full of fascinating insights and statements, e.g.,

> A natural law is thus an assertion about what nature has been *observed* to do, not what it is *compelled* to do.
>
> Light waves may be looked upon as a purely mathematical concept, a pattern in space given by the laws of wave optics, which determines the path of photons but has no real physical existence.
>
> A (atomic) particle of itself has neither a position nor a momentum and . . . the act of observation *creates* its mechanical state.
>
> Each of the many elementary particles is somehow constituted of all the others.
>
> It has been conjectured that nearly all of the neutrinos born since the dawn of creation are still coursing through space bearing most of the entire mass of the universe in the form of their energy.
>
> Recent cosmological studies have led to the conjecture that the universe consists of matter and antimatter in equal amounts, these two kinds occurring as groups of galaxies and antigalaxies widely separated in space.
>
> Material particles do not simply exist statically; they are centers of immense activity, of continual creation and annihilation.
>
> A vacuum is not an empty space . . . Rather, it is a seat of continuous activity with virtual particles of many kinds winking in and out of existence.
>
> *Interacting* and *existing* are but two manifestations of the same dynamic principles.

I could go on—but that should be enough to entice you to get hold of this book. Dr. Guillemin even indulges in a bit of teleology when he points out that the amount of energy which would be made available within a stable nucleus by the transformation of a neutron into a proton, is less, *but only by a small fraction,* than the energy required to cause it. A slight shift in the energy balance and there would be no stable nuclei except hydrogen, no world, no life. "Such is the slender margin which has favored the creation of our richly varied environment and of ourselves to enjoy it." Dr. Guillemin considers the long debates about free will and determinism as based on a misunderstanding—and hence their proposed resolutions as unnecessary, the misunderstanding that endows the scientific conception of causality with connotations of coercion or compulsion.

> Far from being incompatible with free will, determinism in the scientific sense is actually a prerequisite for it.

The book ends with an 11-page glossary of scientific terms, and a 5-page reading list.

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**THE GOD OF SCIENCE** by Frederick E. Trinklein, Wm. B. Eerdmans, Grand Rapids, Michigan (1971). Paperback. 192 pp. $3.45.

Imagine the following book, *Football Views of Musicians.* In preparing this book the author carefully interviews 38 musicians from all over the world on their views about football. He is objectively scientific about the procedure, and is careful to include European as well as American musicians, to include both rock and symphony musicians, to choose only those musicians

with a good reputation for their ability in music, and to choose randomly within these constraints. By this procedure he avoids books by musicians trying to push a particular viewpoint on football. He summarizes his interviews, which typically come out looking like this:

> Q. *Can a musician play football?*
>
> A.1 Certainly. I love football and play at every opportunity.
>
> A.2 Absolutely not. Love of music automatically rules out football.
>
> A.3 I have no interest in football, one way or the other.
>
> A.4 I suppose sandlot football is all right, but I have no use for professional football.
>
> A.5 I don't know much about football. But take soccer—there's a game!

A hundred or so other similar questions follow with similar answers. What would the good of such a book be, in spite of the objective truth of its method and responses? Perhaps, if someone felt that no musician would have anything to do with football, or if someone else felt that every musician would be a devoted football fan, such individuals would be enlightened by seeing specific cases of musicians who either did or did not consider football worthwhile. But except for this extreme and somewhat trivial use, there is not much else positive that can be said. Who really cares what randomly chosen distinguished musicians have to say about football? Other musicians don't care; football fans don't care. The very effort to secure random choices has ensured the unsuitability of those interviewed for the task: some are ardent football afficianados, some have never seen a football game, some come from countries where football isn't even played etc. The quest for scientific objectivity has resulted in truth, but irrevelant and not very pertinent truth at that.

The above parable constitutes my book review of *The God of Science*. Replace in the parable "football" by "God," "musicians" by "scientists," make the needed changes in the details of the parable, and you have a description of this book.

There are of course some good replies by scientists quoted in the book. There is also, however, almost every naive statement ever made by a college freshman:

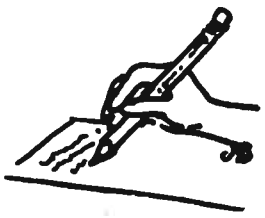
> I'm not interested in religion. I have my beliefs. I just simply will not join or get involved seriously in any organized church.
>
> A man can keep his religious beliefs separate from his science. Human beings can separate contradictory states in the mind, which may be a good thing.
>
> There must be some kind of split personality if you are at the same time active in science and believe.
>
> To be a good Christian and a good scientist is an almost insoluble conflict.
>
> God is an idea, an abstract construction.
>
> The definition of God must be different for each individual.
>
> We have no proof that the concept of God is more than an idea.
>
> The concept of God is completely meaningless and useless in connection with the origin of the universe.
>
> In none of the fields of nuclear chemistry have I found any reason to say that this is done by God.
>
> If religion says that God created the world, intelligent children will ask, "Who created God?"
>
> The more you find out how things work, the less the need for the magical resources of the deity.
>
> The principle of uncertainty proves that God can exist.
>
> To me faith seems to be the blind acceptance of some thing without proof.
>
> I do not believe in God, I do not need a God.
>
> If there is a God, then I am very sorry to say that he has never revealed himself to me. He could have done this, in fact he should have. But he didn't.
>
> I never use the word "God." . . . Although I cannot prove that such a thing does not exist, I'm quite sure that it doesn't.
>
> I don't believe that it ("God") is concerned with the fate of the individual and with every sparrow that falls from the sky.
>
> Scientists generally don't believe in miracles.
>
> I know of no evidence for any miracles.
>
> Miracles can be explained by probability.
>
> The creation story in the Bible is not scientifically possible.
>
> I look at miracles as folklore.
>
> Miracles . . . are very bad signs of religious fanaticism.
>
> I wouldn't bother about such questions.
>
> The afterlife does not have very much importance to me. I'm not interested in it.
>
> I do not believe in the resurrection of the body.
>
> I cannot believe in the Resurrection of Christ.
>
> Students today (are) . . . interested in religion only in terms of ethical values.
>
> Many young people are unhappy. Perhaps they don't want to believe in God, and one shouldn't force them to.
>
> The church should either change or ease out of existence.
>
> The future of religion among people who think like the scientist is the Unitarian view.
>
> I do not believe in the improvements among uncivilized people that are ascribed to missions.
>
> Scientists don't have the time for theological training . . . We've had theological exposure in Sunday School.
>
> The Bible is a wonderful book . . . I regard Christ in the same sense, but I hate Paul. He was a very disagreeable person.
>
> There is no place today for religion in its classical form.

This is the wisdom of the great minds of science on God? No, these are musicians talking about football.

There may have been more, but I was able to locate only two places in the entire book where even passing mention was made to Christ as Savior. Dr. Hubert Alyea, Professor of Chemistry at Princeton, says, "I believe, as a Christian, that he (God) did send his son, that he did come to save us." Dr. John Friedrich, chemist at USDA Northern Regional Research Laboratory in Peoria, Illinois, confesses, "Because of Christ, we can love God. . . . The only answer is Christ. He did it for us. . . . If the Christian church would teach this, forget about details, and talk about the love of Christ and salvation through him . . . then there would be some real life put back in the church." I'm looking for books by Alyea and Friedrich.

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

# Communications



## Tone Down the Rhetoric

Let me first say how much I have enjoyed the *Journal ASA* (reading it here in our library). It has provoked me and helped me. I particularly appreciate your willingness to let Christians with different views express themselves. This is a refreshing change in a day of strict party lines.

I graduated from Harvard ('68) and am now a student here at Westminster. I've had an interest in "science" (whatever that is distinct from "truth") for several years. I spent a year systems programming for I.B.M. in Poughkeepsie before coming to Westminster.

My concern in writing this letter is that of fearing that the ASA *may be* lapsing into a party line—theistic evolution. I realize that since the break-off of the Creation Research People, you are more or less inclined to debunk flood geology, etc. but I do hope that as *Christians* you will not close your minds to truth. I perceive that in the *tone* of many of your contributing writers is a superiority ("these idiot Morris-Whitcombites") which is far from a Christian attitude. Several essays indicated this to me. I believe you printed van de Fliert's article, "Fundamentalism and Fundamentals of Geology," (*Journal* ASA 21, 69 (1969)) from the original in the *International Reformed Bulletin*. Van de Fliert's attitude toward the flood theory and its proponents is, to say the least, haughty in its assumed omniscience. Van de Fliert *pre-supposes* the absolute truth of his position in order to discredit the other! Thus his "disproof" consists in spewing back contemporary uniformitarian assumptions and "facts"—it is *unthinkable* ostensibly for him to even consider any other hypothesis. This is not Christian thinking. Is tradition a sacred cow? (I realize he says science changes, but how much of a change is the question.)

In *Journal* ASA 23 No. 1 (1971) I find this same closed-mindedness in Seeley's articles. He speaks of "flood geology" (p. 26) as a "widespread delusion," "mythology", "pseudo-science," "giant cancer," "obscurantism," etc. Where is Christian courtesy in this barrage of hostility? let alone "scientific objectivity"?

Name-calling, on either side of this issue, is uncalled for. I must say that I, having studied this issue with some diligence, (for example I took a course at Harvard in the History of Biology, criticized Darwin and Huxley in detail, got an A in the course), see tremendous possibilities in this Flood theory. Am I an obscurantist, cancer-ridden idiot?

Please tone down the rhetoric and turn up the real interchange of opinion.

Scripture must be inerrant in "science." It is God's Word, *His* interpretation of creation, and thus needs no interpretation. However in *correlating* the Divine Word to the creation, *pseudo-problems* may arise (only in the creation) because (a) man can never be omniscient and (b) the task of science is subordinate to worship, and when this is reversed (Humanism) *everything* becomes meaningless, including the "I" of the scientific "investigator."

John M. (Kim) Batteau
*Westminster Theological Seminary, Philadelphia, Pennsylvania*

## 315 Years Later

Perhaps you would like to use the enclosed excerpt in the *Journal ASA* sometime. The material is from a letter by Pascal, dated March 24, 1657. Would that all Christians might take the same position as Pascal, St. Thomas, and St. Augustine.

In what way, then, are we to learn the truth of facts? It must be by the eyes, father, which are the legitimate judges of such matters, as reason is the proper judge of things natural and intelligible, and faith of things supernatural and revealed. For, since you will force me into this discussion, you must allow me to tell you, that, according to the sentiments of the two greatest doctors of the Church, St. Augustine and St. Thomas, these three principles of our knowledge, the senses, reason, and faith, have each their separate objects, and their own degrees of certainty. And as God has been pleased to employ the intervention of the senses to give entrance to faith( for "faith cometh by hearing"), it follows, that so far from faith destroying the certainty of the senses, to call in question the faithful report of the senses would lead to the destruction of faith. It is on this principle that St. Thomas explicitly states that God has been pleased that the sensible accidents should subsist in the eucharist, in order that the senses, which judge only of these accidents, might not be deceived.

We conclude, therefore, from this, that whatever the proposition may be that is submitted to our examination, we must first determine its nature, to ascertain to which of those three principles it ought to be referred. If it relate to a supernatural truth, we must judge of it neither by the senses nor by reason, but by Scripture and the decisions of the Church. Should it concern an unrevealed truth, and something within the reach of natural reason, reason must be its proper judge. And if it embrace a point of fact, we must yield to the testimony of the senses, to which it naturally belongs to take congnizance of such matters.

So general is this rule, that, according to St. Augustine and St. Thomas, when we meet with a passage even in the Scripture, the literal meaning of which, at first sight, appears contrary to what the senses or reason are certainly persuaded of, we must not attempt to reject their testimony in this case, and yield them up to the authority of that apparent sense of the Scripture, but we must interpret the Scripture, and seek out therein another sense agreeable to that sensible truth; beause, the Word of God being infallible in the facts which it records, and the information of the senses and of reason, acting in their sphere, being certain also, it follows that there must be an agreement between these two sources of knowledge. And as Scripture may be interpreted in different ways, whereas the testimony of the senses is uniform, we must in these matters adopt as the true interpretation of Scripture that view which corresponds with the faithful report of the senses. "Two things," says St. Thomas, "must be observed, according to the doctrine of St. Augustine: first, That Scripture has always one true sense; and secondly, That as it may receive various senses, when we have discovered one which reason plainly teaches to be false, we must not persist in maintaining that this is the natural sense, but search out another with which reason will agree."

St. Thomas explains his meaning by the example of a pas-

sage in Genesis, where it is written that "God created two great lights, the sun and the moon, and also the stars," in which the Scriptures appear to say that the moon is greater than all the stars; but as it is evident, from unquestionable demonstration, that this is false, it is not our duty, says that saint, obstinately to defend the literal sense of that passage; another meaning must be sought, consistent with the truth of the fact, such as the following, "That the phrase *great light*, as applied to the moon, denotes the greatness of that luminary merely as it appears in our eyes, and not the magnitude of its body considered in itself."

An opposite mode of treatment, so far from procuring respect to the Scripture, would only expose it to the contempt of infidels; because, as St. Augustine says, "when they found that we believed, on the authority of Scripture, in things which they assuredly knew to be false, they would laugh at our credulity with regard to its more recondite truths, such as the resurrection of the dead and eternal life." "And by this means," adds St. Thomas, "we should render our religion contemptible in their eyes, and shut up its entrance into their minds."

And let me add, father, that it would in the same manner be the likeliest means to shut up the entrance of Scripture into the minds of heretics, and to render the pope's authority contemptible in their eyes, to refuse all those the name of Catholics who would not believe that certain words were in a certain book, where they are not to be found, merely because a pope by mistake has declared that they are. It is only by examining a book that we can ascertain what words it contains. Matters of fact can only be proved by the senses. If the position which you maintain be true, show it, or else ask no man to believe it—that would be to no purpose. Not all the powers on earth can, by the force of authority, persuade us of a point of fact, any more than they can alter it; for nothing can make that to be not which really is.

It was to no purpose, for example, that the monks of Ratisbon procured from Pope St. Leo IX. a solemn decree, by which he declared that the body of St. Denis, the first bishop of Paris who is generally held to have been the Areopagite, had been transported out of France, and conveyed into the chapel of their monastery. It is not the less true, for all this, that the body of that saint always lay, and lies to this hour, in the celebrated abbey which bears his name, and within the walls of which you would find it no easy matter to obtain a cordial reception to this bull, although the pope has therein assured us that he has examined the affair "with all possible diligence (*diligentissime*), and with the advice of many bishops and prelates; so that he strictly enjoins all the French (*districte praecipientes*) to own and confess that these holy relics are no longer in their country." The French, however, who knew that fact to be untrue, by the evidence of their own eyes, and who, upon opening the shrine, found all those relics entire, as the historians of that period inform us, believed then, as they have always believed since, the reverse of what the holy pope had enjoined them to believe, well knowing that even saints and prophets are liable to be imposed upon.

It was to equally little purpose that you obtained against Galileo a decree from Rome, condemning his opinion respecting the motion of the earth. It will never be proved by such an argument as this that the earth remains stationary; and if it can be demonstrated by sure observation that it is the earth and not the sun that revolves, the efforts and arguments of all mankind put together will not hinder our planet from revolving, nor hinder themselves from revolving along with her.

Again, you must not imagine that the letters of Pope Zachary, excommunicating St. Virgilius for maintaining the existence of the antipodes, have annihilated the New World; nor must you suppose that, although he declared that opinion to be a most dangerous heresy, the king of Spain was wrong in giving more credence to Christopher Columbus, who came from the place, than to the judgment of the pope, who had never been there, or that the Church has not derived a vast benefit from the discovery, inasmuch as it has brought the knowledge of the Gospel to a great multitude of souls, who might otherwise have perished in their infidelity.

John McIntyre
*Texas A & M University,*
*College Station, Texas*

## Translational Errors

In the communication of O.L. Brauer (*Journal ASA* 23, 78, (1971)) comments were made concerning translational errors in the Bible. Most people (theologians and otherwise) agree that there are some translational errors in the King James Version (and other versions) of the Bible. However, one must consider the difference between occasional errors in translation and gross errors that change a complete Biblical doctrine. Mr. Brauer does not seem to have made this distinction. I am not and do not pretend to be a Greek or Hebrew scholar as would be necessary to research his claim. However, I do believe that the Scriptures substantiate an immortal eternal soul (Matthew 10:28, Matthew 16:26 and Acts 2:31) which will spend eternity in a literal Hell (Acts 2:31, Luke 16:23, II Peter 2:4) or a literal Heaven (II Thess. 4:18, Phil. 3:20,21; II Corinthians 5:1). The Bible also teaches that it is not God who sends us to Hell but it is our own choosing—it depends solely upon our acceptance or rejection of the finished work of Jesus Christ, God's only Son.

By assuming a translational error in one or two words, Mr. Brauer is willing to discard the complete Biblical doctrine of salvation and thus the total purpose of God's inspiring the writing of the Bible. It is inconsistent to believe that God could inspire the Bible and then not be able to preserve it through the centuries.

Dr. Floyd Wilcox
*Associate Professor of Science*
*Central Wesleyan College*
*Central, South Carolina* 29630

*If a new religion were to arise today with a theology which includes pronouncements about the nature of the physical universe, framed as thoughtfully as those of the Old Testament, it would contain references to RNA molecules, de Broglie matter waves and to many other findings of contemporary science. But if the founders of this new religion were to assert that these statements are eternal verities, they would be at loggerheads a hundred years later with the scientists who would have advanced to newer knowledge and more broadly valid interpretation.*

Victor Guillemin
*The Story of Quantum Mechanics,* Scribners, New York (1968), p. 226.

## Genetics and Eve

George Jennings (*Journal ASA* 23, 139 (1971)) asks for the reaction of Christian geneticists to the Incarnation and the creation of Eve. I believe I qualify on both counts. Reaction: the creation of Eve was a miraculous event, and so was the Incarnation.

Parthenogenesis may have happened in man (see Chapter 14 of *Pregnancy: Conception and Heredity,* Blaisdell, 1965 by Eric Weiser for an interesting discussion of a possible female human produced by parthenogenesis and of related matters); Weiser cites S. Balfour-Lynn in the June 30, 1966 *Lancet,* but since females have an XX chromosome constitution and males an XY, there seems no way of producing a male human without the assistance of a Y-bearing cell. Male turkeys have been parthenogenetically produced, but here the female has an XY chromosome constitution, and the male is XX. (Olsen, M.W. and S. J. Marsden—"Natural Parthenogenesis in Turkey Eggs" *Science* 120: 545-546, 1954; Olsen, M.W. "Segregation and Replication of Chromosomes in Turkey Parthenogenesis", *Nature* 212: 435-436, 1966; Poole, H.K. and M.W. Olsen, "The Sex of Parthenogenetic Turkey Embryos" *J. Heredity* 48: 217-218, 1957.)

It might be possible, chromosomally speaking, for a male to produce a single XX cell or a group of XX cells if certain processes known to occur in other organisms (such as the turkey) do occur in man, but this would be just a first step, itself unlikely, in producing a viable female from a male. In other words, genetically speaking, Eve is possible, but the Genesis account leaves the much more important question of how she developed from a group of cells to a (presumed) adult to God's direct work, in my opinion.

Martin LaBar
*Division of Science*
*Central Wesleyan College*
*Central, South Carolina* 29630



## An Open Letter of Protest

Statements made in recent issues of the *Journal ASA* must not be allowed to pass without challenge. If these statements represent the views of the majority of the membership of the Affiliation, then it has lost its *raison d'etre* and certainly can no longer claim a Biblical foundation.

In *Journal ASA* 23, 118 (1971) you review *The Returns of Love: Letters of a Christian Homosexual.* After quoting the author's statement that "homosexual acts are *wrong,* with an intrinsic, unqualified wrongness," you state later in your review that "There is perhaps a thesis which can be advanced contrary to the approach of the author, which, it seems, cannot be refuted except on rather specific empirical grounds." You then proceed to develop your thesis, which you claim is based on Romans 13:8-10 (verse 10 of which reads: "Love cannot wrong a neighbor: therefore the whole law is summed up in love"(New English Bible)).

Your thesis can be summarized in the following statements taken from your discussion:

> we may then define a Biblically approved sexual relationship between two persons as a relationship based on a loving lifelong commitment of one to the other.
>
> Inasmuch as the Biblical condemnation of fornication does not imply a condemnation of sex within a loving lifelong commitment, the question remains as to whether the Biblical condemnation of homosexual abuses implies a condemnation of homosexual practies within a loving lifelong commitment.
>
> It is difficult, however, to find Biblical support for the condemnation *per se* of a loving lifelong homosexual relationship involving sex—if indeed it is possible for such a relationship to exist. And this is an empirical question.

This is clearly an application of situation ethics to the question of whether an act, in this case a homosexual act, can be judged to be sin. As noted above, however, there was no question in the mind of the author that a homosexual act under any circumstances was sin. The Bible is absolutely clear on that point, and there can be no application of empiricism in an attempt to justify any other conclusion. Leviticus 18:22 states, "Thou shalt not lie with mankind, as with womankind: it is abomination" (KJV). In I Corinthians 6:9,10, we read, "Do you not know that the unrighteous will not inherit the kingdom of God? Do not be deceived; neither the immoral, nor idolaters, nor adulterers, nor homosexuals, nor thieves, nor greedy,

*After you've read the Dialogue on pp.* 80-88 . . .

*Simply fill out this form indicating your own position, and give your suggestions for future Dialogues.*

*Please mail to*: The Editor, *Journal ASA,* 753 Mayfield Avenue, Stanford, California 94305.

_____ I agree wholly with Maatman.
_____ I agree mostly with Maatman, but some with Bube.
_____ I agree mostly with Bube, but some with Maatman.
_____ I agree wholly with Bube.
_____ My position is substantially different from either Maatman's or Bube's. I enclose a brief summary of it.

nor drunkards, nor revilers, nor robbers will inherit the kingdom of God" (RSV).

How could Scripture be any clearer on a point than that? The homosexual relationship is condemned by God under any circumstances, and such a "loving lifelong relationship" would only assure that such defiance of God was a lifelong defiance. Your suggestion was a license to sin. You strip God of every attribute except love. A proper response to this homosexual would be to assure him that not only was he clear concerning what the Scripture taught regarding homosexual acts, but that through complete surrender of himself to Christ he could be cleansed even of the tendency.

In *Journal ASA* 23, 156 (1971) you review two books: *Biblical Cosmology and Modern Science* by Henry M. Morris, and *Modern Science and Christian Life*, by Stanley D. Beck. Your review of Dr. Morris' book is an example of what has become so typical in the *Journal* of reviews of publications by creationists—a polemic with little discussion of factual material found in the book. You accuse him of "pouring old wine into old wineskins," of offering "an almost unbelievable manual of pseudo-science esoterica," and of "Flatly rejecting the modern stance of several of the major sciences"—all before the reader is apprised concerning any of the book's contents. You quote Dr. Morris' statement that "Thus the Biblical cosmologist finally must recognize that the geological ages can have had no true objective existence at all, if the Bible is true," without supplying the reader any idea at all concerning why Dr. Morris had reached this conclusion.

While attempting to make Dr. Morris appear blatantly anti-scientific, you correctly accuse him of rejecting the modern stance of several of the modern sciences. Dr. Morris does not reject modern science, but the *modern stance* of many scientists. The modern stance of scientists not only require rejection of the Biblical record of creation, the fall of man, and the Flood, but also rejection of the virgin birth of Christ, His blood atonement, and His resurrection, in fact, of the very existence of God Himself. Dr. Morris refuses to emasculate the Scriptures, as Beck does, in order to accept what is fashionable in science.

Concerning the views of Beck revealed in his book, you state that

> Beck seems to drift at times into statements not obviously reconcilable with evangelical or Biblical Christian faith. . . He tends at times to speak as though man's sin were only 'the pull of his biological heritage.' And he indicates he would probably hold a mythological view of such concepts of resurrection, ascension, and the second coming as well as feel that atonement and redemption are 'abstract theological concepts'.



These views not only are "not obviously reconcilable with evangelical or Biblical Christian faith," but they clearly *reject all of the cardinal Christian truths. They are anti-Christian.* Yet in spite of this you state, "his book is still to be recommended over that of Morris' for the average reader as far as the stated subject is concerned." And that stated subject is the relationship of modern science to Christian faith.

If I have any command at all of the English language, it seems clear to me that you are implying that you would rather see men go to hell with what you consider good science than go to heaven with what Morris considers good science. You accuse Morris of running the risk of leading astray those who look to him as the voice of modern science, but you dare not accuse him of pseudo-Christianity, so clearly embraced by Beck. Setting aside the question of what constitutes good science, let us recall the words of Christ when He said, "And if thine eye offend thee, pluck it out, and cast it from thee: it is better for thee to enter into life with one eye, rather than having two eyes to be cast into hell fire" (Matt. 18:9).

In an earlier part of your review you quote Dr. Morris as stating that "If these first eleven chapters are not historical, then our entire Biblical foundation has been removed." The views you have expressed concerning homosexualism, the views expressed by Beck, and your preference for those views over the position of Morris, eloquently testify to the truth of that statement. Both Dr. Beck and yourself reject the historical content of Genesis 1-11, and one must strip away the entire Biblical foundation to accept either your point of view or those of Beck. If these represent the "modern stance of several of the modern sciences," then let the membership of the American Scientific Affiliation reject this stance and stand on the Biblical foundation

I would like to make the following suggestions for Dialogues to be considered for future publication in the *Journal ASA*.

*Subjects:* _____

_____

*Participants:* _____

_____

of the Christian faith. That the Affiliation should take any other position seems unthinkable as long as it pretends to be Christian.

Duane T. Gish
*Assistant Director, Research*
*Creation-Science Research Center*
*San Diego, California* 92116

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(*Editor's Reply*: In his fervor to correct publicly what he considers to be heresy in the *Journal ASA,* Dr. Gish falls into a number of serious errors. It is important both that these errors be pointed out, and that the readers of the *Journal ASA* be assured that the *Journal ASA* and its editors stand squarely on the authority and reliability of the Scriptures as the Word of God, and on the redeeming work of Jesus Christ, our Lord and Savior. We do not claim, however, to be either faultless or infallible. We expect those who differ with us to make use of the open Communications section of this *Journal,* but we are saddened when such complaints and criticisms take the form of personal attacks.

The first error made by Dr. Gish is to identify the opinions of a *Journal* writer, whether editor or any other, with the position of the majority of the membership of the ASA. We have frequently pointed out that the ASA does not take positions on controversial issues, and the inside cover of the *Journal* always carries the statement that articles published in the *Journal* should not and cannot be taken to represent the position of the ASA. The reason for this policy is that the ASA exists as an open forum to discuss the interface of science and Christian faith within the context of a commitment to Biblical Christianity and to authentic science. In other organizations it may well be that the word of the publication must conform in every respect to the official pronouncements of the hierarchy, and that therefore the word of the publication can be taken to represent the official position of the organization. This is not true of the *Journal ASA,* never has been true, and as far as I am able to affect it, will not be true in the future. It is therefore always inappropriate to cast any aspersions on the Christian orthodoxy of members of the ASA because of a particular publication in the *Journal.* Disagreements are always welcome and appropriate, but such disagreements should be on matters of fact, not on matters of motive.

The second error made by Dr. Gish is to assume that any suggestion that a perspective contrary to traditional Christian opinion be considered must be apostate and intended to deceive. With reference to the book review of *The Returns of Love: Letters of a Christian Homosexual,* Dr. Gish correctly quotes my words, "There is *perhaps* a thesis which *can be* advanced contrary to the approach of the author, which, it *seems,* cannot be refuted except on rather specific empirical grounds." (Italics here are added by me now.) Any reader of that review will agree, I believe, that the advancing of this thesis is couched in as many "hedge" words as it is possible to use, and that having advanced the thesis I return to the theme of deliverance from homosexuality as the highest good. Dr. Gish assumes that I am advocating homosexual acts; such a conclusion cannot be reached from the review, which simply proposes an alternate perspective known to be held by a variety of Christian homosexuals and missionaries to Christian homosexuals. I am certainly not dealing in situation ethics. The ethic is clear: any relationship not founded upon a lifelong commitment of love cannot be accepted under any circumstances. There are no situations where a relationship falling short of a lifelong commitment of love can be condoned. The question remains: are there situations in which a lifelong commitment of love can exist, which are different from traditional views? I suggest that this is a fitting subject for Christians to consider from the perspective of Biblical and scientific insight.

The third error made by Dr. Gish is the argument that bad science by an orthodox Christian presents a more accurate picture of the relationship between science and Christian faith than questionable theology by a Christian scientist. Dr. Gish's interpretation of the implication of my position is completely his own; it is certainly not mine. I would be the first to agree that it is infinitely more important for a man to accept the Lord Jesus Christ as his personal Savior and Lord, than it is for that man to have an accurate knowledge of science. But this was not the subject under discussion. The fact remains that a better guide to the interaction between science and Christian faith may well be given by a man who understands the structure of science and Christian faith, although his own formulation of the Christian faith may be defective in part (as gleaned from a few statements out of an entire book), than is given by a man who is himself a thoroughly orthodox and committed Christian (albeit with a commitment to a particular eschatological perspective), whose views on both science and the relationship between science and Christian faith are distorted.

The *Journal ASA* and its editor seek the comments and criticisms of its readers. We shall continue, however, to maintain that which is also clearly stated on the inside front cover of the *Journal ASA,*

> Open discussion of all issues is encouraged in the expectation that the pursuit of truth can only be enhanced by exposure to conscientious and honest inquiry.)

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*To thoughtful scientists it has been a constant source of wonder that nature shows such a large measure of correlation with their simple mathematical formulas. "The eternal mystery of the world," said Einstein, "is its comprehensibility."*

Victor Guillemin
*The Story of Quantum Mechanics,* Scribners, New York (1968), p. 262.

# INERRANCY, REVELATION AND EVOLUTION

***The meaning of Biblical inerrancy and the relationship between the natural revelation and the Scriptural revelation, with special application to the scientific theory of evolution in the light of Genesis 1-3.***

RUSSELL W. MAATMAN

RICHARD H. BUBE

*This is the first of what is hoped will be a series of Dialogues to be presented in the pages of the* Journal ASA. *We have described these Dialogues as "unique journalistic presentations," and this is what we believe them to be. Each published Dialogue is the result of many months of correspondence and feedback between the participants, during which time every effort is made to eliminate extraneous claims and criticisms. The chronological schedule for each of the participants in the Dialogue follows a pattern something like the following: (1) prepare a position statement, (2) prepare a critique of the other position, (3) revise one's own position statement in response to its critique, and revise one's own critique in response to revisions of the other's position statement, (4) repetition of step (3) until both participants agree that the positions and critiques are fair, equitable and devoid of misunderstanding, and finally (5) prepare a rebuttal to cover those matters in the critique that could not be met by revisions in the position statement. When all of these steps have been completed, the final copy of the Dialogue is submitted for the approval of both participants. A period of nine months was necessary to complete this first Dialogue between Professor Russell W. Maatman and Professor Richard H. Bube. We hope that readers of the* Journal ASA *will participate in these Dialogues in two ways: (a) by indicating their own personal position as indicated in the special form on page 77, and (b) by suggesting topics and participants for Dialogues to be presented in the future.*

## THE POSITION OF RUSSELL W. MAATMAN

(*Professor Russell W. Maatman is in the Department of Chemistry at Dordt College, Sioux Center, Iowa. He is the author of* The Bible, Natural Science and Evolution, *Reformed Fellowship, Grand Rapids, Michigan* 1970.)

The Bible is the Word of God written, prepared under the infallible guidance of the Holy Spirit, and is therefore inerrant in the autographs. Scholarly research indicates that the best texts available today agree on all points of substance, and therefore may be concluded to be close to that of the autographs.

Such a teaching about the nature of the Bible is derived from the Bible's teaching about itself. In fact, some part of this teaching can be learned solely from the Bible. Only the Bible could reveal to us that it is indeed the Word of God written, prepared under the infallible guidance of the Holy Spirit. Only the Bible could reveal to us that it teaches only that which is consistent with absolute truth. This uniform agreement with absolute truth is Biblical inerrancy.

We know that the Bible is inerrant because it teaches that whenever God speaks, He speaks absolute truth. Since the Bible consists of the words of God (II Peter 1:21, Hebrews 3:7, and Hebrews 4:7 teach that God is the Author), we therefore know that the Bible is consistent with absolute truth, or inerrant. Neither the kind of error being discussed here, i.e., inconsistency with absolute truth, nor any other kind of error devised by man, could possibly apply to the words of God. An historian could be guilty of historical inaccuracy, or error, because he has faulty knowledge. God's knowledge, His words, and His Word cannot be faulty. If someone says that he has detected error in the Bible, he implies that his knowledge is superior to the knowledge of God the Author. (For a more complete discussion of what error means in this context, see Reference 1.)

Jesus teaches us how far we can push this matter of inerrancy or consistency with absolute truth. In Matthew 5:17,18 He guarantees us that the smallest details of the Bible, all the jots and tittles, will stand until all is finished. (His statement also assures us that the best texts we now have are reliable.) In some passages Jesus emphasizes this teaching by resting an argument from the Bible on a detail as small as the difference between the singular and the plural of a noun (John 10:34-36) or the tense of a verb (Matthew 22:31,32).

(*continued on p.* 82)

# THE POSITION OF RICHARD H. BUBE

(*Professor Richard H. Bube is in the Departments of Materials Science and Electrical Engineering at Stanford University, Stanford, California. He is the author of* The Human Quest: A New Look at Science and Christian Faith, *Word Books, Waco, Texas 1971.*)

The Bible is the Word of God, written in the words of men who were guided by the Holy Spirit so that they faithfully conveyed the purpose of God's revelation to man. Thus, when we inquire as to the content of the Biblical revelation in terms of the purpose for which it was written, we are assured of a completely authoritative and trustworthy Word.

Such a teaching of the nature of the Bible is consistent with the Bible's own testimony concerning the purposes for which it was written. These purposes can be conveniently summarized under three major categories: (1) to reveal Jesus Christ as Lord and Savior and through Him, God as Redeemer, as shown, for example, in passages such as John 20:31; (2) to confirm and strengthen the faith of believers, as shown, for example, in passages such as Luke 1:3,4; and (3) to provide a guide for Christian living, as shown, for example, in such passages as II Timothy 3:16. A reading of Paul's prayers also helps us understand the kinds of purpose for which the Biblical writings were made, in agreement with the above texts, as in Ephesians 1:6, 18-20; 3:16-19; 4:12-14. We have also the abundant testimony of Jesus and of His disciples concerning the authoritative reliability of this revelation.

It is possible to affirm that on the basis of God's faithfulness in the Scriptures, there is no error in the Bible when it is properly interpreted. This statement, however, has no definite meaning unless we are able to establish a criterion by which the definition of "error" is established. The only criterion which is consistent with the Bible's own testimony is that which establishes that an error exists in the Scripture only if it can be shown that the revelation of Scripture fails to achieve the purpose for which it is given. Statements of contemporary culture and worldview, which would have to be judged as "error" on any kind of arbitrary criterion for "error," are seen not to constitute a revelational error because of the proper and effective role they play in conveying that revelation to us.

It is clear that our ability to evaluate correctly the nature of Biblical purpose is of fundamental significance for our interpretation of the Biblical record. It is important that we turn to the Bible's own testimony concerning the purposes for which it was written. Here we follow a time-tested and evangelically honored set of principles in Biblical hermeneutics:[1] that the New Testament should be used to interpret the Old Testament, that the Epistles interpret the Gospels, that systematic passages interpret incidental passages, that universal passages interpret local passages, and that didactic passages interpret symbolic passages. Passages which state the purpose for the Biblical writings must be used to interpret those which do not. To claim that every passage declares its own purpose is to do violence to Biblical hermeneutics.

When the Biblical writers use contemporary cultural terms or worldview perspective, we do not automatically know whether that expression or perspective is indeed an accurate representation of the absolute reality of God's creation, or whether that expression or perspective is totally effective in conveying God's revelational content to us and men of all ages in spite of the fact that it does not present an accurate representation of that absolute reality. The Bible is after all communication: communication between God and man, in which the language of the hearer must play as large a role as the content the Speaker wishes to convey. This relationship is emphasized to us by the Incarnation, in which God made the supreme accommodation to man's limitations by becoming a man for all of us to see and learn from. Some sects maintain that to say truly that Jesus the man was also God, requires that God be a man; historic Christianity rejects this position and recognizes the limitations of human understanding and the accommodating response of a loving God.

The recognition of the Bible as communication emphasizes to us the necessary role of interpretation in applying the revelational content of the Bible to ourselves. This application can be done successfully only if we take account of the purpose of the Biblical writings, as well as the historical and cultural context in which the various books were composed. We cannot be content with the illusion that it is possible to believe "what the Bible says," as though that act could be separated from our own interpretation. Rather we must be diligent in determining what is the proper interpretation from a careful examination of other aspects of the Scriptural revelation on the same or similar material, and from a careful examination of other aspects of reality to which we may have access. We do not introduce this other extra-Biblical material to see whether or not there is an "error" in the Bible; we introduce it in order to make sure that we ourselves do not interpret falsely and so generate our own "error."

As creatures living in a created universe, we have in addition to the special revelation of God through the writers of the Bible, i.e., a spoken revelation, also a revelation in the created word itself, i.e., something that God has made. We accept the Bible as the authoritative and trustworthy Word of God. Our interpretation of the Word must be carefully made; our interpretation of the Work must be carefully made. We may be wrong in both our theology and our science; we cannot in either case impugn the reliability of the Word or the Work of God.

The partial and incomplete knowledge which we can obtain from our interpretation of the natural world must be ultimately consistent with the partial and in-

(*continued on p. 83*)

## MAATMAN'S POSITION

(*continued from p. 80*)

Since the Bible is the inerrant Word of God and not to be criticized, it is its own authority. The Bible speaks on whatever it speaks, and whatever it says is true. If the Bible speaks on geology, it speaks true geology. Similarly, the Bible speaks truly of all other sciences if it discusses them: of cosmology, biology, geography, history, etc. The reliability of the Bible on any scientific matter it speaks about is demonstrated by imagining an attempt to draw the line between the reliable and the unreliable in the Bible. Any method of line-drawing chosen would then be given authority equal to that of the Bible; but the Bible grants no such authority. What seems to be lacking on the part of those who maintain that the Bible contains error is a careful delineation of what method of line-drawing is used, and what the authority is for the use of such a method.

Is it possible, however, to draw the line by considering the Biblical purpose? A Biblical passage is without error, the argument is sometimes proposed, when that passage is interpreted in the light of its purpose. The line can then be drawn. If use of a passage is outside the Biblical purpose, the passage cannot be considered without error. But this procedure begs the question. It is certainly true that the Bible is without error with respect to its purpose. But what is its purpose? Is it enough to cite some passages, and maintain that *here* is a complete statement of Biblical purpose? The passages usually cited do not say the same things; they are complementary. An exhaustive statement of the Biblical purpose using a limited number of passages cannot be formulated. The best position is to allow the entire Bible to give us the entire Biblical purpose. Thus, for a given passage, we must simultaneously interpret it and determine its role in giving us the entire Biblical purpose. We should neither presuppose the Biblical purpose as it applies to the passage in question, thus forcing the interpretation of the passage, nor should we interpret the passage by abstracting it from the remainder of the Bible and therefore from the Biblical purpose. By this means, we will not force a preconceived idea about purpose on the passage. It can speak for itself.

What has been said so far does not answer the question as to whether the Bible actually contains geology, cosmology, etc. It is far too easy to remove a few sentences of the Bible from their context—and the true context is nothing less than the entire Bible—and make unwarranted conclusions about geology, cosmology, etc. Correct interpretation is necessary. The Bible teaches us much concerning how we are to interpret it. Because of the nature of the Bible, the principles of interpretation (hermeneutics) can be derived only from the Bible. Some of these principles are as follows: (1) the Old Testament is to be understood in terms of what is taught in the New Testament; (2) whenever possible, Scripture is to be compared with Scripture; (3) all power is in God's hands and therefore He is not limited; (4) Christ's work is the central message of the Scriptures; and (5) the Scriptures cannot teach error. We may use extra-Biblical information in our attempt to understand the Bible, but no such information can possibly contradict the principles of interpretation derived from the Bible. No archaeological findings, for example, could show that the New Testament is not to be the guide for understanding the Old Testament, or that Christ's work is not the central message of the Scriptures. No archaeological findings could prove that the Bible contains error.

Even with these principles of interpretation, there are two problems in applying them to actual Biblical passages, (1) We seem to discover evidence that the Bible after all *does* contain error. Passages may seem to conflict. Or, extra-Biblical information and the Bible might seem to conflict. With additional work, we can resolve some of these conflicts, but some of them may remain unresolved.

Attempts to resolve these conflicts can be rewarding and give us new insight. Concerning the question of supposedly conflicting passages, we can gain an insight into the method God used in communicating with us. For example, it has been claimed that the chronology at the beginning of Matthew is in error because it does not agree with the Old Testament. It is significant that those who claim a conflict here universally assume that Matthew is wrong and the Old Testament is right. In other words, it is unintentionally admitted that there is something in the Matthew passage and its context which reveals Matthew's "error." In fact, this "something" is so evident that we may conclude that Matthew himself knew of his "error." At this point his "error" ceases to be error. By studying this passage and its relation to other parts of the Bible, we come to realize that God uses various means of communication. We ourselves use language in various ways; but we do not claim such a practice is erroneous. Understanding that God communicates by these various means, we are helped in the analysis of other supposed conflicts, instances in which it is not so readily evident which of a pair of passages gives us history, science, etc.

Concerning the question of a supposed conflict between extra-Biblical information and the Bible, it is instructive to examine the phrase "the sun rises." The idea expressed here is found in the Bible and sometimes it is claimed that the idea is in conflict with the scientific discovery that the earth rotates on its axis. Yet it is no more fair to claim that the Bible errs in this matter, than to claim we err when we say, "the sun rises." Similarly, does the Bible err when it seems to say that the seat of the emotions is in the reins, or kidneys? It errs in such an instance no more than we err when we say, "I feel it in my bones." Also, we fail to comprehend the universe of discourse being used when we claim a Bible writer thought God lived so many miles above the earth, just because he said God is on high. We say the same thing, and we maintain we do not err in this matter.

(2) Another problem that arises in applying our hermeneutical principles is the apparent existence in the Bible of various forms of literature, such as poetry, fables, letters, sermons, allegories, and history. This diversity presents questions of interpretation. The best way to answer such questions is to study the text in its context as exhaustively as possible, never forsaking our Biblically-derived principles of interpretation. When we use this approach, we will arrive at some conclusions not so easily seen on a first reading. Thus, even though talking trees and donkeys are both outside our experi-

(*continued on p. 84*)

## BUBE'S POSITION

(*continued from p.* 81)

complete knowledge which we can obtain from our interpretation of God's Word. In developing this knowledge we must be completely open to the guidance of God's Word in our interpretation of the natural world, and to the guidance of God's Work in our interpretation of the Bible. Interpretations of the Bible cannot ultimately contradict interpretations of the natural world. Specific scientific theories can, of course, contradict specific theological interpretations. Sometimes it may be that the scientific theory is wrong; sometimes it may be that the theological interpretation is wrong; sometimes it may be that they are both wrong. When such apparent contradictions occur and cannot be resolved, dogmatism is ruled out and each individual before God must proceed in love in accordance with his best understanding.

In most cases the Biblical revelation must have priority over the natural revelation. This is because no interpretation of ultimate significance can be made without the Biblical revelation, because the Biblical revelation alone has the ability to let man see himself as he is, because the Biblical revelation alone has the ability to guide and judge the directions and motives of scientific research, and because the Bibical revelation informs us of God's activity in history that we cannot deduce from scientific procedures alone.

There are portions of the Biblical revelation, however, which deal with subjects for which the authors could not be eye-witnesses and which so deeply probe the significance of the future and of the past that their expression must be given in a universally comprehensible form. Two portions which particularly stand out are the final book of Revelation and the early portions of the first book of Genesis. These portions of Genesis take on the qualities of the last pages of Revelation and appear as a kind of "prophecy of the past," as Revelation stands as a prophecy of the future. It is not clear how such passages should be interpreted; extensive Christian scholarship through the years has shown that hermeneutics alone does not yield an unambiguous guide. Any insights we can obtain to guide this interpretation are welcome. It may well be that these passages are to be interpreted as a literal historical description (even after the pattern of a 20th century newspaper reporter viewing the scene) of actual events in space and time. It may also well be that these passages are to be interpreted in a more symbolic and universal way. In those instances that deal with the vast patterns of the past or of the future, we may well expect to find true insight into reality set forth with a minimum of specific scientific mechanisms so as to maintain the purpose for which it was written and its universal application. To insist that every passage of the Biblical revelation that seems to present a scientific mechanism *must* do so with absolute authority and finality, that the Bible *must* be literally and completely true whenever a scientific matter is apparently mentioned in the text, may well be to miss the kind of book the Bible is. In a misguided effort to preserve and defend a "high view of inspiration," the very spirit of the book and its purpose may be misrepresented.

Genesis 1-3 provide profound insights into the basic structure of the world, the nature of God and man, and the relationships between God, man and this created universe. These profound insights transcend *in importance* any possible theories of the age of the earth, cosmology or biology, by as much as the insight that love is foundational to a happy marriage transcends instruction in sexual mechanics. And, as instruction in sexual mechanics may be inappropriate in communication with a 5-year-old, so instruction in the details of "modern science" may be inappropriate in communication with men with varying degrees of personal, cultural and technological sophistication. For the individual man it is vastly more important to know *that* God created the world than to know when God created it, vastly more important to know *that* God created man than to know how God created him. For the scientist, it is sufficient to know that if the world appears to be a certain age by scientific methods, then scientifically it is that age; that if man appears to be the product of evolutionary processes according to scientific analysis, then scientifically evolutionary theory is a profitable guide to research. It is tragic when efforts to make the "when" and "how" of creation into items of Christian doctrine (on grounds that must be intrinsically uncertain) lead others to reject the very fact of Creation itself. We do not know how much of Genesis 1-3 should be taken as literal historical fact; we must be open, however, at least to the possibility that the principal purpose of these chapters lies elsewhere.

On this basis, a comparison of the Biblical record and of the General Theory of evolution forces one to the conclusion that dogmatism is ruled out. With all of its admitted difficulties, some form—possibly not understood completely at present--of the General Theory appears to be the best scientific interpretation of the data available from the natural world. As long as this is true, it is not possible to force a dogmatic interpretation of the "how" of creation out of Genesis 1-3. Advocates of a dogmatic acceptance of the General Theory are embarrassed by scientific problems with the theory and gaps in its data. Advocates of a dogmatic rejection of the General Theory in favor of Divine *fiat* creationism are embarrassed by the negative stance vis-a-vis the General Theory into which all of their scientific efforts must be directed, since *fiat* creationism itself would by definition be beyond the reach of scientific verification.

Finally, since the possibility of the "how" of God's creation being related to an evolutionary process need have no direct conflict with the revelational content of Genesis 1-3, it is perhaps more productive to consider whether some kind of scheme of General Evolution might be interpreted in a Biblical and Christian framework,[2] than it is to insist that the General Theory must be rejected because of the ways in which non-Christian men have used it to advance their own non-Christian philosophies and goals. There are all too many historical examples of Christians refusing to accept some particular scientific interpretation until considerable damage had been done to their witness.

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[1]E. J. Carnell, *The Case for Orthodox Theology*, The Westminster Press, Philadelphia, Pa. 1959. Chapter IV.

[2]R. H. Bube, "Biblical Evolutionism?" *Journal ASA* 23, 140, December 1971.

## MAATMAN'S POSITION

(*continued from p. 82*)

ence, it is possible for us to conclude (by arguments not given here) that the Biblical passage (Numbers 22:30) describing the talking donkey is historical, but that the Biblical passage (Judges 9:8-15) describing the talking tree is a fable.

In solving the problems arising from this diversity of communication which God uses, we need to know to what extent we can use extra-Biblical information. For example, is a given portion of the Bible historical or non-historical? A fundamental principle can be derived from our Biblically-derived hermeneutics given above: no part of secular history—political, economic, social, geological, biological, or any other kind—can be used to prove that certain events referred to in the Bible cannot have occurred, and that the account containing them is therefore non-historical. An apparent conflict between a Biblical passage and secular history occurs for one of two reasons: either the Biblical passage is non-historical, or the secular account is in error. Even though our interpretation of the Biblical passage in question can be wrong, the passage itself is absolutely true. We cannot say the same for the secular account, even though it, like the Biblical passage, is based upon raw data (i.e., general revelation for the secular account) with which we may not differ. The secular account is itself, unlike the Bible, an interpretation, and as such it can be in error. Therefore, the secular account, which is not necessarily absolutely true, cannot be reliably used to determine the content of the Biblical passage, which is necessarily absolutely true. We are left where we started: the apparent conflict arises either because the Biblical passage is non-historical, or the secular account is in error. We cannot use the secular account to decide whether or not a Biblical passage is historical.

Using the conclusions developed above, we conclude that Genesis 1-3 is historical. With respect only to the creation of man, for example, we have the following evidence: (1) secular history cannot be used to answer the question of the historicity of the Genesis account of the origin of man; (2) comparing Scripture with Scripture, we note that "generations," used in the introduction to the account of the creation of man in Genesis 2:7 refers to "history" in various other parts of the Bible; and (3) again comparing Scripture with Scripture, we note that the historicity of Adam is considered on the same level as the historicity of Christ Himself in Romans 5 by Paul, who discusses even some of the *details* of the creation of man in I Timothy 2:13,14. Other passages which assume the historicity of Adam are I Chronicles 1:1, Luke 3:38, I Corinthians 15:22,45 and Jude 14.[2]

### *Maatman's Critique of Bube's Position*

Even though Bube and I obviously agree on some matters, for the sake of brevity this critique is limited to areas of disagreement. Much of what might be said here has already been incorporated into my position statement; I shall not repeat those matters here.

I hope that the reader will re-examine my remarks concerning Biblical purpose. Bube assumes without proof that it is *not* the *whole Bible* which gives the entire Biblical purpose. The core of his approach to the question assumes the correctness of this assumption. His procedure is approximately equivalent to the fallacy in formal logic of "reasoning from the general to the specific." Thus, in his first step he deduces the general nature of the whole Bible from an examination of certain passages. In his next step, he applies these results to specific passages not used in the first step. Such a procedure is unjustified, and therefore his argument is basically weak. There should be a simultaneous determination of the dependence of the interpretation of a given passage upon the entire Biblical purpose, and the contribution of that passage to that purpose.

Bube suggests that the early portions of Genesis "take on the qualities of the last pages of Revelation and appear as a kind of 'prophecy of the past' as Revelation stands as a prophecy of the future." This concept appears *at first* to be very attractive. It remains attractive only if it stands up under close examination of the Genesis text. The text is interpreted correctly only if correct hermeneutical principles are used. These principles show, for example, that secular history cannot be used to answer the question of the historicity of Genesis 1-3. It is precisely with the application of these principles (see my position statement) that Genesis 1-3 is shown to be historical, not a "prophecy of the past" in the sense that Bube uses this phrase. Bube does not deny the validity of hermeneutical principles, but in his treatment his unproven assumption concerning Biblical purposes overrides all other considerations.

Bube says, "To insist that every passage of the Biblical revelation that seems to present a scientific mechanism *must* do so with absolute authority and finality, that the Bible *must* be literally and completely true whenever a scientific matter is apparently mentioned in the text, may well be to miss the kind of book the Bible is." I want to maintain that the Bible is always true to its purpose. Bube maintains that the Bible is always true to its purpose—as he defines the purpose. No doubt some of our difference is semantic. Even so, the question of whether or not an apparent scientific mechanism is an actual scientific mechanism should be answered with the use of Biblically-derived hermeneutical principles. These principles will not help us answer a question we ask about a passage if the wrong question is asked. But if for a certain passage it is deduced with the use of these principles that a scientific mechanism is presented, then the Bible is the kind of book which presents a scientific mechanism in the passage in question. It cannot be decided finally what kind of book the Bible is until "all the returns are in," including an understanding of the passage in question. It should then be no surprise if some of the passages which seem to present a scientific mechanism do not do so; but it should also be no surprise if part of God's Biblical purpose is to present scientific mechanisms in certain other passages.

(*continued on p. 86*)

In all of these considerations an emphasis has been put on interpreting a passage only after the context of the passage has been determined. In the context of the account of the creation of man there are elements—such as the tree of life and the talking serpent—not ordinarily found in an historical account. Why do we nevertheless conclude that the account of the creation of man is historical? We can reason in this way concerning the tree of life and the talking serpent because there are many clearly historical passages in the Bible which contain elements just as strange as those just mentioned in the early chapters of Genesis. The talking donkey has been mentioned. There is bread which seems to fall from the sky, a fire which consumes water on command, a rod which becomes a serpent, a disciple who walks on water, a man who lives inside a fish, a great light from heaven accompanied by a voice, a transfigured face on a mountain top, persons arising from their graves, a voice from heaven saying, "Thou art My beloved Son," fiery tongues appearing on many persons at the same time, a man who walked with God and disappeared, a fiery chariot which descended from heaven and took away a man, and much more. Were we to reject as historical such passages because of the presence of strange elements, the Christian faith would evaporate. It is true that there *are* passages containing strange elements that are not historical; but a decision concerning historicity must be made on grounds other than the strangeness of such elements.

Concluding that the account giving the creation of man is historical means that man was formed by a specific and unique instantaneous creative act of God; that woman was formed from the body of man by a second specific and unique creative act of God; that these first two human beings, created in a perfect and sinless state, disobeyed God, fell into sin, made it necessary for God to send His Son to die for the redemption of their sins and the sins of all their descendents, who were tainted by the first sin of their ancestors.

With these considerations as a basis, the validity of the General Theory of evolution can be simply challenged. It is evident that the hypotheses of the General Theory with respect to the origin of man are completely inconsistent with the Biblical revelation and hence must be false. The existence of many scientific problems with a full exposition of the General Theory, as well as the historical evidence that acceptance of the General Theory has led to a wide variety of dehumanizing philosophical systems, confirm the correctness of this conclusion.

## REFERENCES

[1]R. W. Maatman, *The Bible, Natural Science and Evolution*, Reformed Fellowship, Grand Rapids, Michigan (1970)

[2]For a more complete discussion of the question of the creation of man, see (a) Reference 1, (b) Critique of "Biblical Evolutionism?" in *Journal ASA* 23, December 1971, and (c) Response to R. H. Bube's review of Reference 1, *Journal ASA* 23, December 1971.

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### *Bube's Critique of Maatman's Position*

The key to the difference between Maatman's position and mine lies in our interpretation of the meaning of "inerrancy." We both agree that one of the principles of Biblical hermeneutics is that the Bible can show no error when properly interpreted. Theoretically, Maatman takes this affirmation as an absolute dictum defining an absolute inerrancy; I take the statement as a guide to what it means "to interpret properly" and define thereby a revelational inerrancy.

Two major criticisms can be directed against Maatman's position. First it can be argued that his *theoretical* position on inerrancy is philosophically and not Biblically grounded. Second, it can be argued that not only is his *operational* procedure contradictory to his own theoretical position, but also that it is in substantial agreement with my own consistent position on revelational inerrancy. I have previously attempted to give a critique of the kind of position espoused by Maatman; the reader may wish to refer to these treatments for more detail.[1-3]

Before entering into this discussion, it is necessary to clarify one central point. When two persons engaged in dialogue use the same word with two different meanings, only confusion results. When Maatman speaks of error, one would expect that it would always be in terms of his opening statements, i.e., failure to be consistent with absolute truth. In actual fact, as we show below, he does not always use the word in this way, since he is able on various occasions to affirm that relative truth is equivalent to absolute truth. On the other hand, when I speak of error in the Bible, I mean only what must be considered error if Maatman's position of absolute inerrancy were consistently applied; to refer, then, to my position as one that claims there is error in the Bible is a misrepresentation. I claim that there is no error in the Bible properly interpreted, but that if Maatman's position of absolute inerrancy were to be consistently applied, we would have no alternative but to conclude that error was present.

To clarify this distinction let us call a statement a Type 1 Error if it is in error with respect to the criterion of absolute truth, and a statement a Type 2 Error if it is in error with respect to the criterion of the author's revelational purpose. For example, the statement that "the sun rises" in the Bible is clearly a Type 1 Error, but it is not a Type 2 Error. Using this terminology, I then claim that Maatman argues theoretically for the absence of both Type 1 and Type 2 Errors in the Bible, but is able in any critical specific case to defend the Bible against only Type 2 Errors. My position is that neither theoretically nor operationally are there Type 2 Errors in the Bible, but that if one insists on using the criterion appropriate for Type 1 Errors, he may well find Type 1 Errors.

The first major criticism of Maatman's position is that his use of the concept of "absolute truth" is derived from philosophical or theological presuppositions not derivable from the Bible. He argues, to be sure, that the Bible reveals "that it teaches only that which is consistent with absolute truth," and that the Bible reveals "that whenever God speaks, He speaks absolute truth." These assertions, however, do not prove the case. In fact, the case rests not on the Biblical passages cited, which hardly are sufficient to establish a correspondence with "absolute truth," but rather on an implied syllogism which runs something like this:

(*continued on p.* 86)

## MAATMAN'S CRITIQUE

(*continued from p. 84*)

Bube suggests that those who accept "Divine *fiat* creationism" are embarrassed because they must be negative with respect to scientific tests of the General Theory of evolution, "since *fiat* creationism itself would by definition be beyond the reach of scientific verification," and that it is productive to consider "whether some kind of scheme of General Evolution might be interpreted in a Biblical and Christian framework." But suppose for the sake of argument that special creation *did* occur? Could not God have revealed this fact in the Bible? And would it then not be better to accept the scientifically-incomprehensible concept of special creation, than any scientifically-comprehensible (but wrong) concept of origins? Finally, could not part of God's purpose in giving us the Bible be that we learn that special creation did occur?

### *Bube's Rebuttal*

Maatman feels it is unjustified for me to deduce "the general nature of the whole Bible from an examination of certain passages," when I apply this procedure to determining Biblical purpose. But certainly this is exactly what Maatman does—what we all must do—when we treat the question of the inspiration and inerrancy of the Bible. For Maatman to claim that every passage must declare its own purpose is as pointless as to argue that every passage must declare its own inspiration.

Maatman argues that "the question of whether or not an apparent scientific mechanism is an actual scientific mechanism should be answered with the use of Biblically-derived hermeneutical principles." With this principle I would certainly agree in whatever cases there may be where it is possible to accomplish such a goal. But what of those many cases where we *cannot* answer such a question by Biblical exegesis alone? At the very least, is not the claim for dogmatism unsuitable in such cases? Given such a case, is there no place for extra-Biblical evidence to help in guiding to a probable interpretation, if not a certain one?

God's purpose in giving us the Bible *could be* to convey all kinds of particular information; our concern must be, however, with what God tells us that purpose is.

## BUBE'S CRITIQUE

(*continued from p. 85*)

a. God is Absolute Truth.
b. All of God's spoken words are absolute truth.
c. The Bible is one of God's spoken words.
d. The Bible is absolute truth.

Now the full analysis of such a syllogism requires a good deal of logical sophistication. In particular one needs to look for presuppositions that are implied but are not explicitly stated. One needs to consider exactly the effects of communication between God and man that make the Bible truly both the Word of God *and* the word of man. Maatman recognizes this fully in his operational treatment of critical issues; he fails to admit it only in advancing a theoretical position. Maatman's implied syllogism does not take into account that the Bible is truly God's Word and truly man's word, in such a way that partial truth, (faithful, authoritative, human truth) is revealed without error (absence of Type 2 Error), but not necessarily in such a way that "absolute truth" is conveyed (absence of Type 1 Error). Maatman may presuppose that "absolute truth" is conveyed because of his personal philosophical presuppositions, but I do not think he can argue that "Bible-believing" Christians must accept it.

If Maatman does make such a presupposition, it then leads him to the basic contradiction of his own position, which is the ground for the second major criticism. Apparent conflicts or errors in the Bible are of at least three types: (a) those that are clearly only apparent and must be contrived, to argue even for Type 2 Errors; both Maatman and I dispense with these quickly; (b) those that appear to be real enough, but can be shown not to be Type 2 Errors; while maintaining his theoretical position of no-Type-1-Errors, in this situation Maatman joins me in arguing that these are indeed not cases of Type 2 Errors; (c) those that may indeed be real, but on which sufficient data are not available to make an unambiguous decision; in this situation Maatman insists that his theoretical position must become operational, whereas I maintain the same operational no-Type-2-Error position I have consistently advanced. In order to be somewhat less abstract, let us consider an example of each of these types of situations.

A situation of type (a) is the description of the death of Judas in Matthew 27:5 and Acts 1:18. This case has often been cited as an example of a Biblical contradiction, but both Maatman and I would agree that no necessary contradiction is involved and that no error of either Type 1 or Type 2 is necessarily implied, e.g., the two accounts can be put together for a single consistent narrative.

Situations of type (b) are like those cited by Maatman. When Matthew's chronology in Chapter 1, especially the statement of Matthew 1:17, or Jesus' statement (Matthew 13:32) about the mustard seed being the smallest of all seeds, or even such statements as "the sun rises," are considered, not all the argument in the world can prevent these statements from being Type 1 Errors. They simply do not convey "absolute truth." Maatman, under these conditions, joins me in arguing at great length that, nevertheless, these should not be considered Biblical errors—Type 2 Errors. This reaction is in fact what occurs whenever an advocate of absolute inerrancy must face a Biblical statement which is clearly and demonstrably not in correspondence with "absolute truth;" in order to defend *any* inerrancy, it is inerrancy with respect to Type 2 Errors that must be defended. We believe this to be necessary because no other criterion for error can be Biblically defended.

An example of a situation of type (c) is given by the possible contradiction between an evolutionary development and origin for man and an interpretation of Genesis to propose a *fiat* creation origin. In this case all the evidence is not in, and the question cannot be settled dogmatically. Christian scholars disagree about the conclusions of Biblical hermeneutics applied to exegesis; scientists disagree about the conclusions of the

scientific method applied to the natural world. My position is that there can be no Type 2 Errors in the Bible, and that therefore, in the absence of unambiguous data to guide either scientific or Biblical interpretation, we need to explore what it may mean to affirm that there are no Type 2 Errors. Maatman, in spite of his failure to defend the absence of Type 1 Errors in any other critical situation, now in this situation is dogmatic that the absence of Type 1 Errors must be taken as the guide to interpretation.

In order to understand Maatman's position statement properly, it is necessary for the reader to go through the statement carefully and decide in every instance whether a Type 1 Error and/or a Type 2 Error is in mind whenever the word "error" appears. As pointed out above, this is particularly important when he speaks of others who assert that there is error in the Bible; in the present context, Maatman uses the word as if it were a Type 2 Error, but those of whom he speaks use the word only in terms of Type 1 Error, i.e., an error arrived at by false criteria not intrinsic to the Bible itself.

As another example, consider Maatman's statement, "No archaeological findings could prove that the Bible contains error." We could agree with this statement in terms of Type 2 Error. But to claim categorically that this is impossible with respect to Type 1 Errors seems to solve no problems. If the Bible were to state that such-and-such happened at X in the year Y, and reliable archaeological finds were to show that the same such-and-such happened at Z in the year W, and not at X in the year Y, this would constitute the discovery of a Type 1 Error in the Bible. Now we may still wish to assert that such a finding *would* not be found; but to assert that it *could* not be found seems both unwise and unjustified. A scientific theory which is impossible to falsify is held in little regard; so also is a theory of Biblical inerrancy which is impossible to falsify.

Maatman claims that no part of secular history can be used to show that an event referred to in the Bible is non-historical. His argument rests on the fact that the secular account can never be proved beyond the shadow of a doubt. But surely such an approach mistakes the requirement of logical proof for the less restrictive (and far more common) requirement of reasonable evidence. It may be admitted freely that any historical evidence is capable of producing only a probable description of what actually happened in the past. The question is not whether such evidence can on any point indicate beyond a shadow of a doubt that the Biblical account is non-historical, but rather whether such evidence can indicate a high probability for a non-historical Biblical presentation. The question deals with when dogmatism is justified, and when dogmatism must give way to an open consideration of alternate possibilites.

Maatman says that "the Bible speaks on whatever it speaks, and whatever it says is true." The difficulty enters in determining *when* and *to what extent* the Bible does speak *on* any subject. The principles of revelational inerrancy also affirm that when the Bible does speak on a subject, it speaks without error to achieve its purpose. It may not always be possible, however, to settle these "when" and "on" questions without help from some extra-Biblical source. Ramm[4] has treated these questions at some length, and concludes for example that

> 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 revealed truth.

It would seem that according to Maatman's view of absolute inerrancy, any astronomical system referred to by the Bible must be invested with absolute truth.

In the course of his presentation, Maatman implicitly offers another syllogism, which has striking similarities to Anselm's ontological proof for the existence of God. Maatman's syllogism can be cast into the following form:

a. The Bible is the greatest book that can be conceived.
b. Suppose that error exists in the Bible.
c. A book without error is greater than a book with error.
d. A book without error is greater than that book than which a greater cannot be conceived.
e. This is impossible. Therefore the Bible is without error.

The difficulty comes, as usual, with the definition of "error" in the second statement, and with the truth of the third statement. It makes a great difference whether Type 1 or Type 2 Errors are in mind in the second statement, and whether the "greatness" of a book or of any other source depends on the absence of Type 1 and/or Type 2 Errors. Again while claiming to speak of Type 1 Errors, Maatman argues *against* extra-Biblical evidence on the grounds that it cannot detect what would really be a Type 2 Error in the Bible; I argue *for* extra-Biblical evidence on the grounds that it can prevent Type 1 Errors from being *read into* the Bible by faulty interpretation.

Finally Maatman advances several technical reasons for arguing that the account given in Genesis 1-3 must be historical. While such arguments should certainly be taken into account insofar as they are relevant to the question, I believe they are hardly conclusive. Space does not permit a detailed consideration of the alternative interpretation of these chapters, but this has been attempted by several authors.[5-7] Although "strangeness" by itself cannot be taken as final evidence for non-historicity, as Maatman argues, the direct application of non-physical properties to physical objects (e.g., tree of life, tree of the knowledge of good and evil) allows for little else but a symbolic interpretation. The argument that the theological use of the Adam-account by New Testament authors does not constitute an irrefutable proof of the historicity of these accounts—in an absolute literal sense as required by Maatman—has also been advanced earlier.[8]

It is appropriate for those who reject the interpretation of the data given by the General Theory of evolution to provide an interpretation of their own which is consistent with the data. This has not been successfully done.

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2. R. H. Bube, *The Encounter Between Christianity and Science,* Eerdmans, Grand Rapids, Michigan (1968). Chapter 3, "Biblical Revelation."
3. R. H. Bube, Book Review of *The Bible, Natural Science and Evolution* by R. W. Maatman, Reformed Journal 21, No. 4, 22 (1971); *Journal ASA* 23, December 1971.
4. B. Ramm, "The Relationship of Science, Factual Statements and the Doctrine of Biblical Inerrancy," *Journal ASA* 21, 98 (1969)
5. A. van der Ziel, *Genesis and Scientific Inquiry,* Denison, Minneapolis (1965)
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[7]R. H. Bube *The Human Quest: A New Look at Science and Christian Faith*, Word, Waco, Texas (1971)
[8]R. H. Bube, See Reference 2, pp. 93-98.

### *Maatman's Rebuttal*

Underlying Bube's critique is the idea that possible errors in the Bible can be divided into two types. Elsewhere in this Dialogue I attempt to prove that any such attempts to divide the Bible are arbitrary. I shall here try to show specifically why Bube's division into types is not helpful.

Phrases like "the sun rises" are not erroneous *when the writer's universe of discourse is taken into account.* We should attempt to ascertain Matthew's meaning in the Matthew 1 chronology, assuming *a priori* that he did not err given his universe of discourse. When we turn to the first chapters of Genesis, we assume again that Moses did not err given his universe of discourse. We could make a similar statement about any part of the Bible which is claimed by some to contain error, and it makes no difference if the supposed error is a Type 1 or Type 2 error.

For example, Bube encounters difficulty concerning the division of error into types when he says that an archaeological discovery could reveal a Type 1 error (contradicting absolute truth) but not a Type 2 error (contradicting revelational purpose) in the Bible. I assume that Bube is willing to give assent to a rather detailed list of non-negotiable Christian beliefs. Is he willing to state—given the usual possibility of scientific error—that no archaeological "finding" could contradict *any* of these non-negotiable beliefs? I think he would admit that there could be such a "finding," but that he would not then jettison his non-negotiable belief. (For example, archaeologists could claim to find either the dead body of Christ or an ancient account of finding his dead body.) Bube would reject the archaeological finding if it purported to discover a Type 2 error in the Bible. How, then, can he say that an archaeological finding could detect a Type 1 error in the Bible? The archaeological finding could be just as wrong in the latter case as in the former. Using an extra-Biblical method does not enable us to find error in the Bible, regardless of whether or not these possible errors are classified into types.

Relating cosmology to the Bible—a matter Bube refers to—raises similar questions. I have shown elsewhere (pp. 25-28 of Reference 1 of my position statement) that the concept of a three-story universe which some persons claim to find in the Bible, cannot actually be present in the Bible because the concept conflicts with certain non-negotiable Christian beliefs. (One such Christian belief is the belief that answers to moral questions can be found only in the Bible. For, if the Bible told early believers that the universe consists of three stories, it also told them—for example—that it would be morally wrong to dig deep into the earth, the supposed place of hell. But hell is not deep in the earth, and therefore it is not morally wrong to dig deep into the earth.) In Bube's terminology, finding the concept of a three-story universe in the Bible can be shown to be the same as detecting a Type 2 error in the Bible. Bube's position is questionable to the extent that he holds the teaching of the Bible to be independent of the cosmological system found in it.

It is significant that Bube is willing to make a judgment concerning "the sun rises," Matthew 1, and other passages, but concerning the first chapters of Genesis he says, "In this case all the evidence is not in, and the question cannot be settled dogmatically." It is always safe to say concerning a scientific matter that all the evidence is not in. But is the Biblical evidence in? Is it actually not possible to make *some* conclusions concerning whether or not the first chapters of Genesis provide *some* information concerning origins which is of interest to the scientist? Bube gives rather scant treatment to my rather specific reasons for accepting the historicity of these chapters.

With regard to the syllogism Bube finds in the third paragraph of my position statement, I fail to see why "logical sophistication" is necessary for arriving at (d) when (a) through (c) are without doubt taught by the Bible. Bube suggests, but does not offer proof, that the introduction of the human factor in the authorship of the Bible necessarily casts a shadow over (d).

Bube is mistaken in stating that opponents of the General Theory of evolution have not provided an interpretation which is consistent with the data. The principal data used to support the General Theory of evolution are data showing that older organisms are simpler and that there is a similarity of structure among living things. I shall deal only with these aspects of the question here. The position of the anti-evolutionists with respect to these data has generally been as follows. In the first place, ecological studies have shown that in general, simpler organisms can exist without the more complex, but the reverse is not true. In the second place, at the molecular level, there is only one element, carbon, which comprises the skeleton of the long-chain molecules found in all living things. Living things are similar to each other in this respect because no other element is capable of forming long chains; and this relation between the elements can in turn be shown (using quantum mechanics) to exist because of the very nature of the universe. Likewise, at the macroscopic level, God made similar structures in living creatures because only these structures can carry out the functions intended for them. Again, the basic reason a certain function can be carried out by only one structure lies in the very nature of the universe. Such an explanation of why the older is simpler and why there is similarity in structure accounts for the data, but does not—unlike the General Theory of evolution—demand the existence of a continuum in the spectrum of living things. Significantly, the continuum has not been found.

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