

JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION



Evangelical Perspectives on Science and the Christian Faith

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"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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The Proofs, Problems, and Promises of Biblical Archaeology

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The value of archaeology in "proving" the Bible has some times been overpressed by popularizers, and on the other hand been denied by critics. A survey of recent developments demonstrates that in some cases archaeology does confirm biblical passages which were questioned, but that in other cases it presents problems which are not easily resolved at present. In any case, the main contribution of archaeology consists in providing us with the data to reconstruct the setting of the events in biblical history.

The first statement of faith we subscribe to as members of the American Scientific Affiliation declares, "The Holy Scriptures are the inspired Word of God, the only unerring

guide of faith and conduct." In a brief and selective way I would like to survey how archaeology has affected our understanding of the Bible and its backgrounds.

I would not wish to characterize archaeology as a "science," though in an increasing fashion—especially in New World archaeology—various scientific disciplines are being enlisted in excavations.¹ These would include the use of radio carbon dating,² the neutron analysis of pottery,³ osteological analysis,⁴ and dendrochronological studies⁵—to name only a few examples.

But to an even greater degree than in the hard sciences, archaeological conclusions depend upon the subjective interpretations of various factors including one's disposition toward the Scriptures as a source of historical data. For example, scholars disagree as to whether the destruction of Lachish III was caused by the Assyrian king Sennacherib in 701 or by the Babylonian king Nebuchadnezzar in 597, a difference of over a century!⁶

Moreover archaeological interpretations are constantly changing. Every season unearths new data. This is not only what is exciting but also what is frustrating about the study of archaeology.

Subjective factors which have affected archaeological interpretations include: 1) patriotism, 2) personalities, and 3) pietism. The early pioneers in Mesopotamia and Egypt strove to outdo their competitors in acquiring works of art for the British Museum or for the Louvre.⁷ Recently the Syrian authorities have been understandably upset that the media have stressed the importance of the Ebla texts for the background of Israelite rather than Syrian history.⁸

The archeology of the Holy Land has been dominated by towering figures such as Kathleen Kenyon,⁹ W. F. Albright, Nelson Glueck, G. Ernest Wright, etc.—with all of their strengths and their foibles.¹⁰ In some cases rather bitter rivalries have produced conflicting interpretations as in the notorious case of Yigael Yadin versus Yohanan Aharoni, two Israeli archaeologists.¹¹

In recent years ultra-orthodox Jews have attempted to stop Yigal Shiloh's excavations in Jerusalem because they feared that the excavators were desecrating Jewish burials.¹² Native Americans have also protested such a "violation of sepulture."¹³

In spite of these distracting factors, no one can deny the extraordinary value of archaeology in illuminating ancient texts. Among the public at large the impression has been diffused that archaeology *proves* the Bible. That statement needs to be qualified. There have indeed been striking cases in which passages, questioned by higher critics such as J. Wellhausen, have been corroborated by excavations.¹⁴ This was already stressed in the late nineteenth century by A. H. Sayce.¹⁵

But we must also recognize that there are, in addition to *proofs*, certain *problems* which have been presented by archaeology in regard to the interpretation of the biblical texts. The communication (see pp. 139–141) by Richard L. Atkins notes some of these cases.¹⁶ Atkins assumes that the type of "wishful-thinking" interpretation of the archaeological data stems from the doctrine of inerrancy, which he dep-

recates.^{16a} Though this may be the case with some popularizers and preachers, his conclusions are unwarranted in the case of the members of the Near East Archaeological Society, who sign the same statement of faith as the members of the Evangelical Theological Society.¹⁷ I would affirm that Scriptures do not err, but that our interpretations often need correction.

As examples of unwarranted attempts to "prove" the Bible Atkins cites: 1) the ark on Ararat, 2) Joshua's conquests, 3) Jesus' birth in a cave, 4) the site of Calvary—among others. William Dever of the University of Arizona has also been so embarrassed by such attempts to correlate the Bible and archaeology that he has urged the abandonment of the name "Biblical Archaeology" as unprofessional and proposes the

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more neutral term "Syro-Palestinian Archaeology."¹⁸ Dever was a student of G. Ernest Wright, whom he admires for his expertise in archaeology but whom he criticizes for his attempt to combine theology and archaeology.¹⁹ But even Dever agrees that archaeology can provide valuable background information.²⁰

The Alleged "Ark" on Ararat

Although some conservative Christians have sought to "prove" the biblical account by a search for Noah's ark on Mount Ararat in eastern Turkey, other evangelical scholars are quite aware of the pitfalls of such an enterprise.²¹ In the first place, the location of the singular Mt. Ararat appears to be a relatively late development (9th cent. B.C.); the biblical text itself (Gen. 8:4) speaks of the "mountains" of Ararat. Ararat is cognate with ancient Urartu, which was originally located farther south between Lake Van in eastern Turkey and Lake Urmia in northwest Iran.²²

In the second place the radio-carbon tests of the wood which has been recovered from the glacier on Mt. Ararat yield very late dates.^{22a} It is true that Berosos (3rd cent. B.C.) refers to a tradition that the ark was associated with Mt. Ararat,²³ but this does not carry us back far enough.

As is well known there are striking parallels to the biblical

The presidential address delivered to the American Scientific Affiliation on August 5, 1983, at George Fox College, Newberg, Oregon. The text has been amplified and annotated. I shall refer especially to articles published in 1980–83, (see Notes for previous expositions of archaeology between 1972–80).

story in the Babylonian traditions.²⁴ An evangelical scholar, Alan Millard, now at the University of Liverpool, while rummaging through some drawers at the British Museum recently discovered a major new Babylonian work, the Atrahasis Epic, which has both a creation and a flood story.¹⁵ As impressive as the similarities are, the contrasts are even starker—the Babylonian gods send the flood because mankind has become too numerous and too noisy. After the flood subsides they smell the sweet savor of the sacrifices and crowd around it like flies, as they have been deprived of sacrifices for a week.²⁶

The Problems and Promises of Ebla

One of the most publicized of recent archaeological discoveries is the recovery of a palace and archives at Tell Mardikh—ancient Ebla—in northern Syria by the Italian archaeologist P. Matthiae.²⁷ The excavations began in 1964 but the first of about 20,000 cuneiform tablets in a new Semitic language was not discovered until 1974.²⁸ The site flourished at the end of the Early Bronze period about 2350 to 2250 B.C. This is earlier than the usual date assigned to Abraham.

G. Pettinato, the original epigrapher of the expedition, aroused great excitement when he informed D. N. Freedman, then editor of the *Biblical Archaeologist*, that the Ebla texts contained the first reference to Sodom and Gomorrah and the three other cities of the Plain (Gen. 14:1–2) found outside the Bible.²⁹ If true, this would have required an earlier date for Abraham, inasmuch as Sodom and Gomorrah were never reoccupied. Indeed around the southeastern end of the Dead Sea five Early Bronze sites, which are being investigated by W. Rast and R. Schaub, have been suggested as candidates for these five cities of the Plain.³⁰

Professional and personal differences led eventually to the resignation of Pettinato, who was replaced by A. Archi. With rather bitter invective Pettinato has questioned Archi's competence in Eblaite as his earlier specialty was Hittite. Archi in turn has challenged almost every important reading of the texts by Pettinato.³¹ For example, Archi does not believe that Eblaite *Si-da-ma^{ki}* and *I-ma-ar^{ki}* can represent Palestinian Sodom and Gomorrah because they appear in lists with Syrian cities.³² Another point of contention is whether the ending *-ya* has anything to do with the divine name *Yahweh*.³³ In any

event, the thousands of texts in a Semitic language related to Hebrew promise a rich philological harvest.³⁴

The Patriarchs

The positive evaluation of the patriarchal traditions by E. A. Speiser, C. H. Gordon, and W. F. Albright³⁵ has been challenged by the recent revisionism of T. L. Thompson³⁶ and J. Van Seters.³⁷ They have in effect revived the Wellhausenian view that these narratives were not accurate representations of the second millennium B.C. but were anachronistic creations of the first millennium.

Though Thompson and Van Seters have made some valid criticisms of some of the parallels cited between the fifteenth-century B.C. Nuzi texts and the Bible, their own reconstructions are too radical to command wide assent. Other scholars have pointed out their one-sided and selected use of the evidence and the impossibility of the view that Abrahamic traditions were created only in the first millennium.³⁸

Thompson cited for support of his view Y. Aharoni's interpretation of his excavations at Beersheba.³⁹ Since he found nothing earlier than Iron Age materials associated with the site and its well, Aharoni concluded that the patriarchal narratives must date to the Iron Age (i.e. after 1200 B.C.).⁴⁰ But it is not certain that Iron Age Beersheba is necessarily the same as patriarchal Beersheba.⁴¹ There is no indication in the Old Testament that Beersheba in Abraham's time was a city.⁴²

Moses and Monotheism

In his last book Sigmund Freud speculated that Hebrew monotheism really owed its genesis to an Egyptian named "Moses," influenced by the monotheism of Akhnaton (Amenhotep IV). Though such an Egyptian influence was also suggested by Albright, this is a most unlikely scenario.⁴³ For one thing the concept of the supreme god Yahweh was already maintained by the patriarchs.⁴⁴

The Hebrews were, with the exception of the abortive monotheism of Akhnaton and the later monotheism of the Greek philosopher Xenophanes,⁴⁵ unique in stressing the worship of a single god. The Hebrew language even lacks a



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word for "goddess."

New evidence has, however, now been found near a site identified with Kadesh-barnea in northeast Sinai,⁴⁶ which has raised some questions about the purity of Hebrew monotheism. The excavator found some cartoon-like figures of Yahweh and "his Asherah." Asherah was the name of a Canaanite goddess associated with the fertility cult,⁴⁷ and also of the wooden object which represented her.⁴⁸ But as there is

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evidence that the traders at Kuntilet 'Ajrud came from Samaria about 800 B.C., their graffiti are no more than evidence of the striking syncretism which the Old Testament itself ascribes to the area of the Northern Kingdom.

The Exodus

H. Goedicke, a distinguished Egyptologist with the Johns Hopkins University, made the front page of the *New York Times* by setting forth arguments for an early date of the Exodus in the reign of Hatshepsut, and by linking the phenomena of the parting of the Red Sea and the fiery pillar with the cataclysmic eruption of the volcanic island of Thera (Santorini) in the Aegean in the 15th cent. B.C.⁴⁹ His views have been sharply contested and do seem to be highly speculative.⁵⁰

A more substantial contribution to the question of the Exodus is the important monograph by J. H. Bimson, *Redating the Exodus and Conquest*, which has called forth a flurry of reviews.⁵¹ In general, critics have responded favorably to his criticisms of the archaeological evidence used, for example, by Y. Yadin⁵² to support the late date of the Exodus and the Conquest.⁵³ But they have also reacted unfavorably to Bimson's own attempt to correlate Middle Bronze (MB) sites with an early Conquest by Joshua.⁵⁴

As I have pointed out elsewhere the view which places Joshua's conquest in the thirteenth century faces problems with the sites of Gibeon, Jericho, and Ai. As the modern village of El-Jib still rests on the tell of Gibeon and as J. Pritchard did find Late Bronze (LB) tombs there, the possibility remains that the LB settlement there is yet to be discovered. Because of massive erosion, K. Kenyon found very little LB remains at Jericho.⁵⁵ Yadin suggests that MB walls were still being used in Joshua's day.⁵⁶

As for the great mound of Et-Tell, usually identified with Ai, it is possible that some LB remains may yet lie within the

28-acre site.⁵⁷ Others have found another site with LB materials called Nisyah, two kilometers east of Bireh, which they would identify with Ai.⁵⁸ This would require the identification of Bireh as ancient Bethel rather than Beitin.

One of the complicating uncertainties is the attempt to correlate the excavated sites with those named in the Old Testament. For example, though some scholars have identified Tell Deir 'Allā in Jordan with biblical Succoth, H. Franken, the excavator, rejects this identification.⁵⁹ Albright persisted in identifying Tell Beit Mirsim, which he excavated, as the site of Debir taken by Caleb, though the tell called Khirbet Rabud, excavated by M. Kochavi now seems to be a better candidate.⁶⁰

The Judges

The Philistines were the most formidable foes of the Israelites during the days of the Judges and the early part of the United Monarchy.⁶¹ The most dramatic archaeological discovery to illuminate Philistine culture is the excavation of a unique Philistine temple at Tel Qasile just north of Tel Aviv by Ami Mazar.⁶² Though very small, the temple with its two column bases corresponds to the plan of the Philistine temple pulled down by Samson at Gaza (Judges 16:29).⁶³

An important ostrakon dated to the 12th century B.C. was found in 1976 at Izbet Sartah near Tel Aviv. Though the 83 letters in five lines are faint and defy attempts at decipherment, what is clear is that in the last line we have an Abecedary, written from left to right.⁶⁴ A. Demsky believes that the writer was an Israelite, and that this text lends strong support to the evidence for literacy attested in Judges 8:14. Some critics had contended that the Israelites did not use writing for "formal literature" as early as the Judges, in spite of strong inscriptional evidence to the contrary.⁶⁵ Commenting on the Izbet Sartah ostrakon, S. H. Horn notes: "there can be no longer any doubt that fully developed alphabetic writing systems existed in the time of Moses, making it possible for him and his successors to write books in a script easy to learn."⁶⁶

The United Monarchy

According to 1 Sam. 13:19–22 the Philistines at first retained a military advantage over the Israelites by their mastery of iron until they were defeated by Saul. New studies are shedding light on the development of iron metallurgy in biblical lands.⁶⁷

David fled from the wrath of Saul to dwell among the Philistines at Ziklag, a site which is now being investigated.⁶⁸ During her excavations in Jerusalem in 1961–68, K. Kenyon discovered a corner of the so-called "Jebusite" wall of the city which David captured.⁶⁹ She found almost nothing, however, of the structures of David and of Solomon. Current excavations in the same area under Yigal Shiloh now claim to have discovered structures dating from this early period.⁷⁰

The fabulous grandeur and wealth of Solomon seemed to be exaggerated to many critics.⁷¹ In recent studies A. Millard has pointed out that extra-biblical accounts of the wealth,

especially evidence of gold-plated buildings and statues, lend credence to the biblical descriptions.⁷²

Solomon obtained much of his wealth in trading ventures with King Hiram of Tyre. Classical scholars have questioned the traditions of the early penetration of the western Mediterranean by the Phoenicians, but Semitists have been more sanguine. On the basis of the Nora Stone (9th cent. B.C.) from Sardinia, Albright had suggested that Solomon in partnership with Hiram was sending ships to far off Spain in the 10th century.⁷³ A recent article by F. M. Cross now dates a Nora

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fragment on the basis of comparative epigraphy to the 11th century.⁷⁴

When I was in Israel in 1968 I took the tourist bus to view the so-called "Pillars of Solomon"—impressive geological structures north of Eilat. I smiled within myself at the knowledge which the other tourists did not have that we were in an area of ancient copper mining activities as slag heaps were all around. Later I learned to my chagrin that Benno Rothenberg in 1969 discovered at the base of those pillars an Egyptian temple with inscriptions of the XIXth-XXth Dynasties dating from the 14th to the 12th centuries B.C. Rothenberg therefore maintained that these were earlier Egyptian mines and not Solomon's.⁷⁵ In a recent article Bimson argues that radio-carbon dates do indicate that the Timna mines were being utilized during Solomon's reign.⁷⁶

The Divided Kingdoms

After Solomon's death ten of the northern tribes under Jeroboam I rebelled against Rehoboam, who was left with but Benjamin and Judah. According to 1 Kings 14:25-26 Shishak, the Egyptian pharaoh, took advantage of this dissension to attack Jerusalem and remove the treasures of the temple. Though this account has been questioned, a monumental stele of Shishak has been found at Megiddo. Furthermore we learn from Shishak's own reliefs and texts at Karnak in Egypt that he conquered not only Judah but areas in the Esdraelon Valley and Transjordan as well.⁷⁷

Jeroboam I set up golden calves at Dan in the north and at Bethel just above Jerusalem. Extensive excavations at Dan by Avraham Biran have uncovered a well preserved arch and gate from the Canaanite period, as well as a sacred precinct, and an Israelite horned altar.⁷⁸

The independence of the northern kingdom was gradually undermined by the expansion of the aggressive Assyrian Empire. Our earliest known synchronism falls in the reign of

Ahab, the son of Omri,⁷⁹ and of Shalmaneser III of Assyria. Ahab was part of an anti-Assyrian coalition which fought the Assyrians in the famous battle of Qarqar⁸⁰ in Syria in 853 B.C., a battle which is not mentioned in the Old Testament. The famous Black Obelisk, which depicts the Israelite king Jehu,⁸¹ comes from the end of the king's reign and is a poor historical source for the battle. Assyrian accounts of the battle progressively inflate the number of enemy casualties from 14,000 to 29,000; Assyrian casualties are hardly ever mentioned.

A text found at Tell er-Rimah in 1967 contains evidence that Adad-nirari III (810-783 B.C.) exacted tribute from Joash of Samaria (802-787 B.C.): *Ya'a-su Sa-me-ri-na-a-a*.⁸² Shortly after this the Assyrians were ruled by weak kings, a circumstance which allowed Jeroboam II (786-746 B.C.) of Israel to expand at the expense of Syria—a development which was prophesied by Jonah (2 Kings 14:25).

The book of Jonah has troubled many commentators. Even a recent evangelical commentary by Leslie C. Allen has concluded that it is best to regard Jonah as a parable rather than as a historical narrative.⁸³ On the other hand, Donald J. Wiseman, Professor of Assyriology at the University of London, has recently examined the book of Jonah in the light of cuneiform sources and concludes:

It is submitted that this survey of some of the events which might lie behind the account of Jonah's visit to Nineveh supports the tradition that many features in the narrative exhibit an intimate and accurate knowledge of Assyria which could stem from an historical event as early as the eighth century B.C.⁸⁴

Tiglath-pileser III (745-727 B.C.) was one of the greatest of all the Assyrian kings.⁸⁵ He was also known as Pul (2 Kings 15:19; 1 Chron. 5:26), the name under which he ruled as king in Babylon. It was this king who devastated not only Damascus in 732 B.C. but also parts of Gilead and Galilee as well, deporting some of his prisoners to Mesopotamia. His campaigns are fully detailed in his inscriptions and can also be correlated with evidences of devastated Israelite cities from this time. He boasted that he placed Hoshea on the throne of Israel after the assassination of Pekah. The latter's name was found on a jar from the level at Hazor destroyed by the Assyrians.

In 722 the great city of Samaria fell to the Assyrians (2 Kings 17:6, 18:10). Samaria had been the splendid capital of Ahab which had been adorned by Phoenician craftsmen brought south by his wife Jezebel. In the debris, excavators found richly decorated ivory fragments, which illustrate the ostentatious luxury denounced by the prophets.⁸⁶

The Bible is correct in crediting the siege to Shalmaneser V, though his successor Sargon II claimed credit for the capture of the city.⁸⁷ Sargon boasted that he carried off 27,290 (or 27,280) persons from Israel, replacing them with various other peoples from Mesopotamia and Syria, who eventually intermarried with the natives to form the hybrid Samaritan population.

Sargon's armies conducted four campaigns in 720, 716,

713, and 712 to secure the Philistine coast. The invasion of 712 led by Sargon's general, mentioned in Isaiah 20:1, is confirmed by a fragment of an Assyrian stele discovered in 1963 at Ashdod.⁸⁸

In 701 Sennacherib attacked Judah, capturing the southern city of Lachish though failing to take Jerusalem. This can be coordinated with the biblical account of the miraculous deliverance of Jerusalem under the courageous defiance of Hezekiah (2 Kings 18–19; Isaiah 36–37). As I mentioned

Numerous tombs in Jerusalem and elsewhere can illustrate for us the kind of tomb in which Jesus was buried. But only faith can convince us of the reality of the resurrection!

earlier one of the most controversial issues dividing archaeologists is the dating of the destruction of Lachish III. Was it the work of Sennacherib in 701 or of Nebuchadnezzar a century later? Recent excavations at Lachish under D. Ussishkin seem to have shifted the balance in favor of the Assyrian date.⁸⁹

In spite of some doubts which have been raised as to the identification of Tell ed-Duweir with Lachish,⁹⁰ the Assyrian texts and reliefs can aid us in a clear understanding of this siege.⁹¹ A new inscription of a letter of Sennacherib to his god Anshar was published in 1974 by N. Na'aman. This reveals that Sennacherib captured Azekah and Gath and then took Lachish (cf. Micah 1:10–17), before advancing upon Jerusalem.⁹²

The Assyrians were to be overthrown at the end of the 7th century by a coalition of Medes⁹³ and Chaldeans.⁹⁴ The latter were led by Nabopolassar,⁹⁵ the father of the great king Nebuchadnezzar, who is mentioned almost a hundred times in the Old Testament.⁹⁶ *The Chaldean Chronicles* published by D. J. Wiseman in 1956 have shed welcome light on the early years of Nebuchadnezzar. It was in his first year that Nebuchadnezzar's forces took away such captives as Daniel.⁹⁷

As to the Greek words in the book of Daniel, which have been used to date Daniel in the Maccabean era c. 165 B.C., it is essential to note that the Greeks penetrated the Near East long before Alexander.⁹⁸ Greek mercenaries fought both for and against Nebuchadnezzar. The argument from the close correspondence of Daniel 11 with events of the Maccabean era to sustain a late date is a highly subjective one.⁹⁹ Those who do not believe in predictive prophecy of such precision will regard Daniel as a *vaticinium ex eventu*, "a prophecy after the event."

Space does not permit me in this article to discuss the numerous archaeological finds which have illuminated for us the books of Esther,¹⁰⁰ of Ezra,¹⁰¹ and of Nehemiah¹⁰² from the Post-Exilic era.

Qumran

Let me discuss some recent developments with respect to the Dead Sea Scrolls found at Qumran since 1947.¹⁰³ With the Israeli seizure of the West Bank in 1967, Yigael Yadin was able to acquire the "Temple Scroll," which had been kept under abominable conditions. Its length of some eight meters surpasses even the great Isaiah scroll.

In 1977 Yadin published a three-volume work on the scroll.¹⁰⁴ Though as yet no English edition or translation of the entire work is available, a German translation has appeared,¹⁰⁵ and numerous articles on the text have appeared in English.¹⁰⁶ The text is presented as the words of Yahweh. The Temple Scroll sets forth numerous and detailed injunctions. It ordains strict monogamy for the king (col. 56:12f.). It sets forth plans for the placement of the toilets outside the city and lays down a blueprint for the erection of a new temple. It forbids the entrance of any diseased or blind person into the Temple City.¹⁰⁷ What a striking contrast to the attitude of Jesus!¹⁰⁸

In 1972 a famed papyrologist, José O'Callaghan, identified certain Greek fragments from Cave 7 at Qumran as the earliest manuscripts of the New Testament. O'Callaghan is the founder of *Studia Papyrologica*, head of the department of papyrology at the theological seminary in Barcelona, and also professor of Greek papyrology at the Pontifical Biblical Institute in Rome. In the case of 7Q5, O'Callaghan identified this piece with Mark 6:52–53 and dated it to A.D. 50. This sounded almost too good to be true.¹⁰⁹ Since his initial studies made from photographs, O'Callaghan has studied the papyri themselves firsthand and also infra-red photos of the papyri, and has continued to maintain his identifications.

Unfortunately with few exceptions, almost all scholars who have examined his arguments, including some who have been able to study the fragments themselves, believe that O'Callaghan's arguments cannot be sustained. More plausible is their identification as parts of the Septuagint, the Greek translation of the Old Testament. In most cases the fragments are too tiny to warrant any degree of confident identification.¹¹⁰

Recently some Greek biblical manuscripts, which appear to be a part of the great Sinaiticus manuscript which Tischendorf discovered, have been found in a back room at the Monastery of St. Catherine's in the Sinai. Full details have as yet not been revealed, but the notices are tantalizing.¹¹¹

Jesus Christ

The tradition that Jesus was born in a cave is a relatively old one, going back to Justin Martyr of Samaria in the second century.¹¹² Helena, the mother of Constantine, built a basilica there. Investigations in the present Church of the Holy Nativity have revealed mosaics which may go back to this structure. Jerome, the translator of the Vulgate, was inspired to make his home next to the alleged Cave of the Nativity in 385.

At the time when a popular movie about the search for the lost ark (of the temple) was being shown, Eric and Carol

Meyers received great media attention for their discovery of an "ark" from a synagogue in Galilee.¹¹³ Their "ark" is quite different, however. It is an architectural decoration from a late synagogue. Unfortunately, with the exception of the synagogue at Masada¹¹⁴ and a few others, almost all of the remains of synagogues in Israel come from the Byzantine period and not from the New Testament era.¹¹⁵

This seems to be the case with the celebrated synagogue at Capernaum. The possibility remains that the synagogue of Jesus' day may lie covered under the present remains which have been left in situ. Under the octagonal structure between the synagogue and the Sea of Galilee exciting discoveries have been made by V. Corbo since 1968. He discovered that the octagon was a basilica of the fifth century. Beneath that he found evidence of a house church with graffiti which mention Peter. The first-century level was a fisherman's house, which was transformed into a church. Not only is this the earliest structure which can be identified as a church, but it is plausible to believe that this was Peter's own house!¹¹⁶

Recent excavations have clarified the numerous constructions of Herod the Great, including his work in Jerusalem.¹¹⁷ We now have a better idea of the walls and of the streets of Jerusalem in Jesus' day.¹¹⁸ Investigations by B. Mazar have succeeded in giving us a clear understanding of the temple platform and of some of the decorations which came crashing down when Titus destroyed the temple in 70.¹¹⁹ Debate over the exact location of the temple on the platform continues, however.¹²⁰

The harsh reality of crucifixion's brutality¹²¹ has been brought home to us by the discovery in 1968 of ossuaries at Giv'at ha-Mivtar just north of Jerusalem.¹²² Among the bones of thirty-five individuals, there is evidence that nine died from violent causes, including a child who was shot with an arrow, a young man who was burned upon a rack, and an old woman whose skull was bashed in. Of the greatest interest is one ossuary which provides us for the first time with physical evidence of crucifixion. It is the ossuary of a Yehohanan, who was a young man between the ages of twenty-four and twenty-eight. He was crucified at some time early in the first century A.D.

Yehohanan's *calcanei* (heel bones) were still transfixed by a four and a half inch iron nail, which had been bent as it was pounded into a cross of olive wood. The right *tibia* (shin bone) had been fractured into slivers by a blow, the "coup de grace" which was administered to hasten death (cf. John 19:32). The crease in the right radial bone indicates that the victim had been pinioned in the forearms rather than in the hands as in the traditional depictions of Christ's crucifixion. The Greek word *cheiras* in Luke 24:39-40 and John 20:20, 25, 27, usually translated "hands," can and should be translated "arms" in these passages.

Conclusions¹²³

Numerous tombs in Jerusalem and elsewhere can illustrate for us the kind of tomb in which Jesus was buried.¹²⁴ But only faith can convince us of the reality of the resurrection!¹²⁵

Archaeology in some striking cases does present us with *proofs* of the validity of passages which have been questioned. In other cases it is not to be denied that there are still *problems* which cannot be currently resolved in reconciling the archaeological data with the biblical text. But here we need to be aware of the fallacy of arguing from silence.¹²⁶ There is no question but that we have but scratched the surface. There are almost limitless *promises* of new data and texts available to future generations.

When I think of the function of archaeology, I am reminded of the three elements which make opera so enjoyable for me: 1) the lyrics, 2) the music, and 3) the sets and costumes. Scriptures correspond to the lyrics, faith creates the music, and archaeology provides the setting. We can understand the text by itself, or the music by itself, but how much richer is our enjoyment with the provision of the sets and costumes. Just so archaeology can provide us with the *realia* which help us recreate in our minds' eye the original settings of the Scriptures.

NOTES

- AJA *American Journal of Archaeology*
- Arch *Archaeology*
- BA *Biblical Archaeologist*
- BAR *Biblical Archaeology Review*
- BASOR *Bulletin of the American Schools of Oriental Research*
- BS *Bibliotheca Sacra*
- CT *Christianity Today*
- GB *Greece and Babylon* (1967)
- HTR *Harvard Theological Review*
- IDBA *International Dictionary of Biblical Archaeology*
- IEJ *Israel Exploration Journal*
- ISBE *International Standard Bible Encyclopedia* (rev. ed.)
- JAOS *Journal of the American Oriental Society*
- JASA *Journal of the American Scientific Affiliation*
- JBL *Journal of Biblical Literature*
- NEASB *Near East Archaeological Society Bulletin*
- PEQ *Palestine Exploration Quarterly*
- SA *The Scriptures and Archaeology* (1980)
- SS *The Stones and the Scriptures* (1972, 1981 repr.)
- TB *Tyndale Bulletin*
- WTJ *Westminster Theological Journal*

This article refers especially to articles published in 1980-83, as I have earlier published the following expositions of archaeology between 1972-80: *The Stones and the Scriptures* (Philadelphia: Lippincott, 1972; Grand Rapids: Baker, 1981), hereafter SS; "A Decade and a Half of Archaeology in Israel and in Jordan," *Journal of the American Academy of Religion*, 42.4 (1974), 710-26; "Documents from Old Testament Times: A Survey of Recent Discoveries," *WTJ*, 41.1 (1978), 1-32; "Archaeology and the New Testament," *The Expositor's Bible Commentary*, ed. F. E. Gaebelin (Grand Rapids: Zondervan, 1979), I, pp. 645-69; with D. J. Wiseman, *Archaeology and the Bible* (Grand Rapids: Zondervan, 1979); "Archaeology and the Scriptures," *The Seminary Review*, 25.4 (1979), 163-241; *The Scriptures and Archaeology* (Portland: Western Conservative Baptist Seminary, 1980), hereafter SA. Where no author is listed the reference is to one of my own writings.

¹D. P. Williams, "As a Discipline Comes of Age: Reflections on Archaeology and the Scientific Method," *Arch*, 29.4 (1976), 229-31; J. Pouilloux, "Archaeology Today," *AJA*, 84.3 (1980), 311-12; C. Renfrew, "The Great Tradition versus the Great Divide: Archaeology as Anthropology?" *AJA*, 84.3 (1980), 287-98; J. A. Sabloff, "When the Rhetoric Fades: A Brief Appraisal of Intellectual Trends in American Archaeology During the Past Two Decades," *BASOR*, 242 (1981), 1-6.

²"Problems of Radiocarbon Dating and of Cultural Diffusion in Pre-History," *JASA*, 27.1 (1975), 25-31. Cf. M. G. L. Baillie, *Tree-Ring Dating and Archaeology* (Chicago: University of Chicago, 1982).

³One of my former students, Professor Michal Artzy of the University of Haifa, has become one of the leading scholars in this field. See for example: M.

- Artzy, I. Perlman, and F. Asaro, "Cypriote Pottery Imports at Ras Shamra," *IEJ*, 31.1-2 (1981), 37-47.
- ⁷J.K. Eakins, "Human Osteology and Archaeology," *BA*, 43.2 (1980), 89-96; K.A.R. Kennedy, "Skeletal Biology: When Bones Tell Tales," *Arch*, 34.1 (1981), 17-24.
- ⁸N. Liphshitz and Y. Waisel, "Dendroarchaeological Investigations in Israel (Taanach)," *IEJ*, 30.1-2 (1980), 132-36; N. Liphshitz, S. Lev-Yadun, and Y. Waisel, "Dendroarchaeological Investigations in Israel (Masada)," *IEJ*, 31.3-4 (1981), 230-34. Cf. G. Edelstein and M. Kislev, "Mevasseret Yerushalayim: Ancient Terrace Farming," *BA*, 44.1 (1981), 53-56.
- ⁹This problem will be addressed later in the article.
- ¹⁰J.E. Barrett, "Piety and Patriotism—Secularism and Skepticism," *BAR*, 7.1 (1981), 54-55; N.A. Silberman, *Digging for God and Country* (New York: Alfred A. Knopf, 1982).
- ¹¹A. Mikaya, "The Politics of Ebla," *BAR*, 4.3 (1978), 2-7; H. Shanks, "Syria Tries to Influence Ebla Scholarship," *BAR*, 5.2 (1979), 36-37; C. Bermant and M. Weitzman, *Ebla: An Archaeological Enigma* (London: Weidenfeld & Nicolson, 1979).
- ¹²Cf. P. R. S. Moorey, "Prominent British Scholar Assesses Kathleen Kenyon," *BAR*, 7.1 (1981), 46-48.
- ¹³In the decade from 1970-80 many leading archaeologists passed away: in 1970: Paul Lapp; in 1971: W.F. Albright, N. Glueck, R. de Vaux; in 1974: G. Ernest Wright; in 1976: Y. Aharoni; in 1978: J.L. Kelso and M. Mallowan; in 1979: G.L. Harding; and in 1980: M. Burrows. See SA, pp. 1, 9.
- ¹⁴This rivalry has been brought out into the open in a series of articles in *BAR*. Even after Aharoni's death, the feud is continued by his wife and by his friend A.F. Rainey. See *BASOR*, 225 (1977), 67-68; *BAR* 3 (1977), 3-4; *BAR*, 6 (1980), 1.
- ¹⁵H. Shanks, "Politics in the City of David," *BAR*, 7.6 (1981), 40-44.
- ¹⁶V.A. Talmage, "The Violation of Sepulture: Is It Legal to Excavate Human Burials?" *Arch* 35.6 (1982), 44-49.
- ¹⁷Likewise, the tendency of archaeology to confirm classical traditions against the criticisms of sceptical scholars may be seen in: *Composition and Corroboration in Classical and Biblical Studies* (Philadelphia: Presbyterian & Reformed Pub., 1966); "Homer, History, and Archaeology," *NEASB*, 3 (1973), 21-42; "The Archaeological Confirmation of Suspect Elements in the Classical and the Biblical Traditions," *The Law and the Prophets* (O.T. Allis Festschrift), ed. J. Skilton et al. (Nutley, NJ: Presbyterian & Reformed Pub., 1974), pp. 54-70.
- ¹⁸A.H. Sayce, *Fresh Light from the Ancient Monuments* (1883); idem, *The Higher Criticism and the Verdict of the Monuments* (1893); idem, *Monument Facts and Higher Critical Fancies* (1904). Sayce began as a higher critic and was rejected for Pusey's chair at Oxford as deemed too liberal by Gladstone. It is an irony that, after the discovery of the Tell Amarna tablets in Egypt, Sayce became an opponent of higher criticism, whereas Pusey's successor, S.B. Driver, became a proponent of such criticism. See B.Z. MacHaffie, "Monument Facts and Higher Critical Fancies," *Church History*, 50.3 (1981), 316-28.
- ¹⁹R.L. Atkins, "Extravagant Claims in Bible Archaeology," (in this issue). For a book which stresses the disharmonies, see my review of M. Magnusson's *Archaeology of the Bible in Fides et Historia*, 12.2 (1980), 150-52.
- ²⁰For a work which advocates a doctrine of "infallibility" rather than "inerrancy," see J. Rogers and D. McKim, *The Authority and Interpretation of the Bible* (Philadelphia: Westminster, 1979). For a response from an inerrantist position, see J.D. Woodbridge, *Biblical Authority* (Grand Rapids: Zondervan, 1982).
- ²¹The NEAS includes such careful and competent scholars as Harold Mare of Covenant Theological Seminary, Bastiaan Van Elderen of Calvin Theological Seminary, Keith Schoville of the University of Wisconsin, Robert Cooley of Gordon-Conwell Theological Seminary, etc. John D. Davis of Grace Theological Seminary in his article, "Archaeology and Apologetics," *Spire*, 11.4 (1983), 7-9, as an inerrantist deplores the abuse of archaeology in popular apologetics.
- ²²W.G. Dever, "Archaeological Method in Israel: A Continuing Revolution," *BA*, 43.1 (1980), 40-48; idem, "Should the Term 'Biblical Archaeology' Be Abandoned?" *BAR*, 7.3 (1981), 54-57.
- ²³W.G. Dever, "Biblical Theory and Biblical Archaeology: An Appreciation of G. Ernest Wright," *HTR*, 73.1-2 (1980), 1-15.
- ²⁴W.G. Dever, "What Archaeology Can Contribute to an Understanding of the Bible," *BAR*, 7.5 (1981), 40-41. Cf. J.M. Miller, "Approaches to the Bible through History and Archaeology," *BA*, 45.4 (1982), 211-16.
- ²⁵"Critical Comments on the Search for Noah's Ark," *NEASB*, 10 (1977), 5-27; "Is That an Ark on Ararat?" *Eternity*, 28 (Feb., 1978), 27-32.
- ²⁶See "Urartu," in *The New International Dictionary of Biblical Archaeology* (hereafter *IDBA*), ed. E.M. Blaiklock and R.K. Harrison (Grand Rapids: Zondervan, 1983) pp. 463-65. *Foes from the Northern Frontier* (Grand Rapids: Baker, 1982), ch. 2.
- ²⁷L.R. Bailey, "Wood from 'Mount Ararat': Noah's Ark?" *BA*, 40.4 (1977), 137-46; idem, *Where Is Noah's Ark?* (Nashville: Abingdon, 1978).
- ²⁸G. Komoroczy, "Berosos and the Mesopotamian Literature," *Acta Antiqua*, 21 (1973), 125-52.
- ²⁹See A. Heidel, *The Gilgamesh Epic and Old Testament Parallels* (Chicago: University of Chicago, 1949).
- ³⁰W.G. Lambert and A.R. Millard, *Atrahasis: The Babylonian Story of the Flood* (Oxford: Clarendon, 1969).
- ³¹Anthropomorphism in Ancient Religions," *BS*, 125 (1968), 29-44.
- ³²See "Unearthing Ebla's Ancient Secrets," *CT*, 25 (May 8, 1981), 18-21; P. Matthiae, *An Empire Rediscovered* (Garden City: Doubleday, 1980). See also P.C. Maloney, "Assessing Ebla," *BAR*, 4.1 (1978), 4-11; idem, "The Raw Material," *BAR*, 6.3 (1980), 57-59; R. Biggs, "The Ebla Tablets: An Interim Perspective," *BA*, 43.2 (1980), 76-88.
- ³³G. Pettinato, *The Archives of Ebla* (Garden City: Doubleday, 1981), emphasizes Eblaite's western affinities. I. Gelb, *Thoughts about Ibla* (Malibu: Undena, 1977), stresses Eblaite's eastern affinities. Cf. C. H. Gordon, "Eblaite and Its Affinities," *Festschrift für Oswald Zemerényi on the Occasion of His 65th Birthday* (Amsterdam: John Benjamins, 1975), pp. 297-301.
- ³⁴D.N. Freedman, "The Real Story of the Ebla Tablets, Ebla and the Cities of the Plain," *BA*, 41.4 (1978), 143-64; H. Shanks, "Interview with D.N. Freedman," *BAR*, 6.3 (1980), 51-54.
- ³⁵W.E. Rast and R.T. Schaub, "Preliminary Report of the 1979 Expedition to the Dead Sea Plain, Jordan," *BASOR*, 240 (1980), 21-62; H. Shanks, "Have Sodom and Gomorrah Been Found?" *BAR*, 6.5 (1980), 16-37; W.C. Hattem, "Once Again: Sodom and Gomorrah," *BA*, 44.2 (1981), 87-92. But note the scepticism of J.A. Sauer, "Syro-Palestinian Archaeology, History, and Biblical Studies," *BA*, 45.4 (1982), 201-209, especially 207.
- ³⁶G. Pettinato, "'Declaration' on Ebla," *BAR*, 5.2 (1979), 39-47; idem, "Ebla and the Bible," *BA*, 43.4 (1980), 203-16; idem, "Ebla and the Bible—Observations on the New Epigrapher's Analysis," *BAR*, 6.6 (1980), 38-41; H. Shanks, "BAR Interviews Giovanni Pettinato," *BAR*, 6.5 (1980), 46-53. For A. Archi's responses to Pettinato, see: A. Archi, "The Epigraphic Evidence from Ebla and the Old Testament," *Biblica*, 60 (1979), 556-66; idem, "New Ebla Epigrapher Attacks Conclusions of Ousted Scholar," *BAR*, 6.3 (1980), 55-56; idem, "Archi Responds to Pettinato," *BAR*, 6.6 (1980), 42-43; idem, "Further Concerning Ebla and the Bible," *BA*, 44.3 (1981), 145-54.
- ³⁷H. Shanks, "Ebla Evidence Evaporates," *BAR*, 5.6 (1979), 52-53; A. Archi, "Are the 'Cities of the Plain' Mentioned in the Ebla Tablets?" *BAR*, 7.6 (1981), 54-55; idem, "Notes on Eblaite Geography II," *Studi Eblaïti*, 4 (1981), 1-18.
- ³⁸M. Dahood, "The God Yā at Ebla?" *JBL*, 100.4 (1981), 607-608; H.-P. Müller, "Gab es in Ebla einen Gottesnamen Ja?" *Zeitschrift für die alttestamentliche Wissenschaft*, 70.1 (1981), 70-92.
- ³⁹See M. Dahood's Appendix in Pettinato's book (n. 28); also M. Dahood, "Ebla, Ugarit and the Old Testament," *Bible and Spade*, 8.1 (1979), 1-15; idem, "Are the Ebla Tablets Relevant to Biblical Research?" *BAR*, 6.5 (1980), 54-55, 60; D.N. Freedman, "The Tell Mardikh Excavation, the Ebla Tablets, and Their Significance for Biblical Studies," *NEASB*, 13 (1979), 5-35.
- ⁴⁰See SS, pp. 36-46; "Patriarchal Age," *Wycliffe Bible Encyclopedia*, ed. C.F. Pfeiffer, H.F. Vos, and J. Rea (Chicago: Moody Press, 1975), pp. 1287-91; SA, pp. 1-3.
- ⁴¹*The Historicity of the Patriarchal Narratives* (Berlin: W. de Gruyter, 1974).
- ⁴²*Abraham in History and Tradition* (New Haven: Yale University, 1975).
- ⁴³See SA, pp. 3-6, 10. For a positive presentation of Abraham in a second millennium setting, see D.J. Wiseman, "Abraham in History and Tradition," *BS*, 134 (1977), 123-30, 228-37.
- ⁴⁴Y. Aharoni, "Nothing Early and Nothing Late," *BA*, 39 (1976), 55-76.
- ⁴⁵Z. Herzog, "Beer-sheba of the Patriarchs," *BAR*, 6.6 (1980), 12-28.
- ⁴⁶M.D. Fowler, "The Excavation of Tell Beer-sheba and the Biblical Record," *PEQ*, 113 (1981), 7-11.
- ⁴⁷N. Sarna, "Abraham in History," *BAR*, 3 (1977), 9.
- ⁴⁸SS, p. 165; SA, p. 13; S. Herrmann, *Israel in Egypt* (London: SCM Press, 1973), p. 22.
- ⁴⁹W.F. Albright, *Yahweh and the Gods of Canaan* (Garden City: Doubleday, 1968); F.M. Cross, *Canaanite Myth and Hebrew Epic* (Cambridge: Harvard University, 1973).
- ⁵⁰Whether or not Zoroaster preached the monotheistic worship of Ahura-Mazda is complicated by our late Zoroastrian sources. See the ch. on Iranian Evidences in *Pre-Christian Gnosticism* (Grand Rapids: Eerdmans, 1973; Grand Rapids: Baker, rev. ed., 1983).
- ⁵¹R. Cohen, "The Excavations at Kadesh-barnea (1976-78)," *BA*, 44.2 (1981), 93-107; idem, "Did I Excavate Kadesh-Barnea?" *BAR*, 7.3 (1981), 20-33; Z. Meshel, "An Explanation of the Journeys of the Israelites in the Wilderness," *BA*, 45.1 (1982), 19-20.

- ⁴⁶"Cultic Prostitution—A Case Study in Cultural Diffusion," *Orient and Occident*, ed. H.A. Hoffner (Kewlaer: Butzon and Bercker, 1973), pp. 213–22.
- ⁴⁷Z. Meshel, "Did Yahweh Have a Consort?" *BAR*, 5.2 (1979), 24–36; J.A. Emerton, "New Light on Israelite Religion: The Implications of the Inscriptions from Kuntilet 'Ajrud," *Zeitschrift für die alttestamentliche Wissenschaft*, 94 (1982), 2–20. Such syncretism was also found among the Jews at Elephantine in the fifth cent. B.C. See B. Porten, *Archives from Elephantine* (Berkeley: University of California, 1968).
- ⁴⁸H. Shanks, "The Exodus and the Crossing of the Red Sea according to Hans Goedicke," *BAR*, 7.5 (1981), 42–50; C.R. Krahmalkov, "A Critique of Professor Goedicke's Exodus Theories," *BAR*, 7.5 (1981), 51–54; H. Shanks, "In Defense of Hans Goedicke," *BAR*, 8.3 (1982), 48–53; Y.T. Radday, "A Bible Scholar Looks at *BAR*'s Coverage of the Exodus," *BAR*, 8.6 (1982), 68–71.
- ⁴⁹For one thing Goedicke's reconstruction requires a northern route. Though some Israeli scholars, e.g. B. Rothenberg, "An Archaeological Survey of South Sinai," *PEQ*, 101 (1970), 4–29, have come to favor a central route, most scholars still favor a southern route: see D.M. Beegle, *Moses, The Servant of Yahweh* (Grand Rapids: Eerdmans, 1972; Ann Arbor: Pryor Pettengill, 1979 repr.), pp. 170–173; S.H. Horn, "What We Don't Know about Moses and the Exodus," *BAR*, 3 (1977), 29; G.I. Davies, "The Significance of Deuteronomy 1.2 for the Location of Mount Horeb," *PEQ*, 111 (1979), 87–101.
- ⁵⁰Bimson's monograph, which was part of his dissertation, was published by the *Journal for the Study of the Old Testament* at Sheffield in 1978. Cf. E.H. Merrill, "Palestinian Archaeology and the Date of the Conquest," *Grace Theological J.*, 3.1 (1982), 107–21.
- ⁵¹Y. Yadin, *Hazor* (New York: Random House, 1975); idem, "The Transition from a Semi-Nomadic to a Sedentary Society," *Symposia* . . . , ed. F.M. Cross (Cambridge: American Schools of Oriental Research, 1979), pp. 57–68; idem, "Is the Biblical Account of the Israelite Conquest of Canaan Historically Reliable?" *BAR*, 8.2 (1982), 16–23.
- ⁵²SS, pp. 46–64; SA, pp. 15–17, 22.
- ⁵³See for example reviews by H. Engel in *Biblica*, 61.3 (1980), 437–40; by A.F. Rainey in *IEJ*, 30.3–4 (1980), 249–51; by J.A. Soggin in *Vetus Testamentum*, 31 (1981), 98–99.
- ⁵⁴SS, pp. 57–58; SA, pp. 16, 22.
- ⁵⁵H. Shanks, "BAR Interviews Yigael Yadin," *BAR*, 9.1 (1983), 16–23.
- ⁵⁶SS, pp. 57, 60. Cf. L. Allen, "Archaeology of Ai and the Accuracy of Joshua 7:1–8:29," *Restoration Quarterly*, 20 (1977), 41–52.
- ⁵⁷W. Fields, "Have We Found Ai?" offprint published by the author, Joplin, MO: Ozark Bible College, 1981.
- ⁵⁸H. Franken, "The Identity of Tell Deir 'Allā, Jordan," *Akkadica*, 14 (1979), 11–15.
- ⁵⁹M. Kochavi's excavations of the site in 1968–69 are reported in *Tel Aviv*, 1 (1974), 2–33.
- ⁶⁰See *Greece and Babylon*, hereafter *GB* (Grand Rapids: Baker, 1967); "Archaeological Evidence for the Philistines," *WTJ*, 35.3 (1973), 315–23.
- ⁶¹A. Mazar, "A Philistine Temple at Tell Qasile," *BA*, 36 (1973), 42–48.
- ⁶²Timnah, where Samson obtained his first Philistine wife (Judges 14:1), has been identified with Tel Batash, which is being excavated under the direction of George Kelm and A. Mazar. A clay bulla is the first evidence that the Philistines wrote on papyrus. R.D. Kaplan, "Looking at Some Recent Excavations," *Christian News from Israel*, 27 (1979), 19–20.
- ⁶³M. Kochavi, "An Ostrakon of the Period of the Judges from 'Izbit Sartah," *Tel Aviv*, 4 (1977), 1–14; M. Kochavi and A. Demsky, "An Israelite Village from Days of the Judges," *BAR*, 4 (1978), 19–31.
- ⁶⁴"Documents from Old Testament Times," *WTJ*, 41.1 (1978), 1–32; A.R. Millard, "The Practice of Writing in Ancient Israel," *BA*, 35 (1972), 98–111; cf. idem, "In Praise of Ancient Scribes," *BA*, 45.3 (1982), 143–53; F.M. Cross, "Newly Found Inscriptions in Old Canaanite and Early Phoenician Scripts," *BASOR*, 238 (1980), 1–20. The Phoenician alphabet may have been transmitted to the Greeks at a much earlier date than the 8th cent. B.C. See J. Naveh, "The Greek Alphabet: New Evidence," *BA*, 43.1 (1980), 22–25; see SA, p. 32, n. 26.
- ⁶⁵S.H. Horn, *Biblical Archaeology after 30 Years (1948–1978)* (Berrien Springs, MI: Andrews University, 1978), p. 10.
- ⁶⁶T. Stech-Wheeler, J.D. Muhly, K.R. Maxwell-Hyslop, & R. Maddin, "Iron at Taanach and Early Iron Metallurgy in the Eastern Mediterranean," *AJA*, 85.3 (1981), 245–68; cf. J.D. Muhly, "Bronze Figurines and Near Eastern Metalwork," *IEJ*, 30.3–4 (1980), 148–61.
- ⁶⁷E.D. Oren, "Ziklag: A Biblical City on the Edge of the Negev," *BA*, 45.3 (1982), 155–67.
- ⁶⁸"Jebusites," *IDBA* pp. 256–57; K. Kenyon, *Jerusalem, Excavating 3,000 Years of History* (London: Thames and Hudson, 1967).
- ⁶⁹Y. Shiloh, "Excavating Jerusalem: The City of David," *Arch.*, 33.6 (1980), 8–17; idem, "The City of David Archaeological Project: The Third Season, 1980," *BA*, 44.3 (1981), 161–70.
- ⁷⁰"Solomon," *IDBA* pp. 419–22; SS, pp. 67–71.
- ⁷¹A.R. Millard, "Archaeology and Ancient Israel," *Faith and Thought*, 108.1–2 (1981), 58–59; idem, "Solomon in All His Glory," *Vox Evangelica*, 12 (1981), 5–18.
- ⁷²W.F. Albright, "The Role of the Canaanites in the History of Civilization," *The Bible and the Ancient Near East*, ed. G.E. Wright (Garden City: Doubleday, 1961), pp. 343–51.
- ⁷³F.M. Cross, "Early Alphabetic Scripts," in Cross, *Symposia* (n. 52), pp. 103–19.
- ⁷⁴B. Rothenberg, *Timna* (London: Thames and Hudson, 1972).
- ⁷⁵J.J. Bimson, "King Solomon's Mines? A Re-assessment of Finds in the Arabah," *TB*, 32 (1981), 145–46.
- ⁷⁶"Shishak," *IDBA* pp. 412–13; SS, p. 71; K.A. Kitchen, *The Third Intermediate Period* (Westminster: Aris & Phillips, 1973).
- ⁷⁷A. Biran, "An Israelite Horned Altar at Dan," *BA*, 37.4 (1974), 106–107; idem, "Tell Dan—Five Years Later," *BA*, 43.3 (1980), 168–82; idem, "Two Discoveries at Tel Dan," *IEJ*, 30.1–2 (1980), 89–98; J.C.H. Laughlin, "The Remarkable Discoveries at Tel Dan," *BAR*, 7.5 (1981), 20–37; L.E. Stager and S.R. Wolff, "Production and Commerce in Temple Courtyards: An Olive Press in the Sacred Precinct at Tel Dan," *BASOR*, 243 (1981), 95–102.
- ⁷⁸It was Omri who moved his capital to Samaria from Tirzah. For a re-examination of R. de Vaux's interpretations of his excavations at Tirzah, see M.D. Fowler, "Cultic Continuity at Tirzah? A Re-examination of the Archaeological Evidence," *PEQ*, 113 (1981), 27–32.
- ⁷⁹Qarqar, *IDBA* pp. 375–77; SS, p. 72; SA, pp. 36–37.
- ⁸⁰See SS, fig. 6 on p. 53.
- ⁸¹SA, p. 37; W.H. Shea, "Adad-Nirari III and Jehoash of Israel," *Journal of Cuneiform Studies*, 30.2 (1978), 101–13.
- ⁸²L.C. Allen, *The Books of Joel, Obadiah, Jonah and Micah* (Grand Rapids: Eerdmans, 1976), pp. 77–81.
- ⁸³D.J. Wiseman, "Jonah's Nineveh," *TB*, 30 (1979), 38–39.
- ⁸⁴"Tiglath-pileser III," *IDBA* pp. 451–53; SA, pp. 37–38.
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- ⁹⁰D. Ussishkin, "The 'Lachish Reliefs' and the City of Lachish," *IEJ*, 30.3–4 (1980), 174–95; cf. P. Albenda, "Syrian-Palestinian Cities on Stone," *BA*, 43.4 (1980), 222–29.
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- ⁹³Chaldea, Chaldeans," *IDBA* pp. 123–25.
- ⁹⁴Nabopolassar," *IDBA* pp. 326–27.
- ⁹⁵Nebuchadnezzar," *IDBA* pp. 332–34.
- ⁹⁶D.J. Wiseman, et al., *Notes on Some Problems in the Book of Daniel* (London: Tyndale Press, 1965). On various problems related to Daniel see: *GB*; "The Archaeological Background of Daniel," *BS*, 137.1 (1980), 3–16; "Hermeneutical Issues in the Book of Daniel," *Journal of the Evangelical Theological Society*, 23 (1980), 13–21; "Nabonidus," *ISBE* (forthcoming).
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- ⁹⁸D.W. Gooding, "The Literary Structure of the Book of Daniel and Its Implications," *TB*, 32 (1981), 43–80.
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FROM FAITH TO FAITH

The Roman Empire had raised science, prosperity and power to their ancient peaks. The decay of the Empire in the West, the growth of poverty and the spread of violence, necessitated some new ideal and hope to give men consolation in their suffering and courage in their toil; an age of power gave way to an age of faith. Not till wealth and pride should return in the Renaissance would reason reject faith, and abandon heaven for utopia. But if, thereafter, reason should fail, and science should find no answers, but should multiply knowledge and power without improving conscience or purpose; if all utopias should brutally collapse in the changeless abuse of the weak by the strong; then men would understand why once their ancestors, in the barbarism of those early centuries, turned from science, knowledge, power, and pride, and took refuge for a thousand years in humble faith, hope, and charity.

Will Durant, *The Story of Civilization*, Vol. IV "The Age of Faith" p. 79

Extravagant Claims in Bible Archaeology

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Authentication of the Bible record by means of pick and shovel has achieved a great degree of success in recent times. Ancient sites have been located, dates firmly established, and even individual people identified as real historical personages. Today, one may gaze on the mummified face of Rameses II, observe the charred evidence of Joshua's overthrow of Hazor, view the ancient walls of Babylon restored, and read parallel historical references to kings Ahab and Jehu from the records of neighboring monarchs.

This outstanding achievement in biblical corroboration has lent great encouragement to those who acknowledge the essential historical validity of the Scriptures. However, for some well-meaning individuals even this is not enough. For those who take the position of total inerrancy of the Bible, it is a case of all or nothing: unless there is *exact* correlation with Scripture, an archaeologist's conclusions are written off as invalid. As a consequence, there have been instances where extreme claims have been made without regard to proper evidence, where disproven arguments have not been retracted, and where shallow scholarship has precipitated subjective debates and emotional declarations.

Quite often, it is true, the initial fault has lain with the excavator himself, since he naturally tends to magnify the importance of his discoveries by tying them to important historical happenings or to supposed Bible references.¹ And then to further cloud the issue, the biblicist has usually become involved whenever he has sensed the slightest threat to his doctrine of inerrancy. The result has often been an unscientific bias that has colored the interpretation of an artifact's real identity and significance for many years after its discovery.

Of course, the principle involved is that emotional bias (toward either supporting or contesting the Bible) has no place in a scientific investigation. The only acceptable approach requires forthright analysis of a site or an artifact and then publication of the results and conclusions *whatever they might be*. When this is done, the Bible will undoubtedly be shown to be extremely accurate—considering the fact that it is a composition by multiple authors having widely variant abilities, proclivities, and motivations. Nevertheless,

the Bible's absolute inerrancy can hardly be expected to be exonerated in all cases. In support of this supposition, consider the following cases.

Kathleen Kenyon's excavations at Jericho between 1952 and 1958 proved that the city actually did not exist during the Exodus period when it was supposedly conquered by Joshua. By the time of the conquest, Jericho had been a ruin for a hundred years or more. As stated in the November–December 1978 issue of *Biblical Archaeology Review*:

Her Jericho excavations have raised problems for Biblical historians: she found no city there during the Late Bronze Age, the period when Joshua is thought to have lived. Had the Late Bronze Age city eroded away, as some scholars think, or was Joshua's conquest of Jericho, for some reason or other and in some detail or other, inaccurately related in the Bible? Dame Kathleen rejected the view that the Late Bronze Age city had eroded away.²

A similar problem occurred with regard to Joshua's supposed conquest of the city of Ai. Actually the Hebrew word *Ai* means "Ruin," and that is exactly what it was at the time of the Hebrew invasion. Excavations of the site have shown that it was totally destroyed in 2400 B.C. (evidently by Egyptians), and it remained a ruin until about 1220 B.C. At that latter date, according to Joseph Callaway of the Southern Baptist Theological Seminary, a new settlement was made on three acres of the 27-acre hilltop. There were no defenders of the site to resist this peaceful occupation.

At Beersheba, the occasional dwelling place of the nomadic Patriarchs, excavations have been under way for eight seasons (1969–1976). Fortifications dating to the time of David and later Judean kings have been accurately identified. But when investigations were made into earlier periods by digging all the way to bedrock, there was no evidence of habitation at Beersheba in historical times before about 1200 B.C. (Traditionally, the dates for Abraham, Isaac, and Jacob have been set between 2000 and 1800 B.C.) Dr. Ze'ev Herzog of Tel Aviv University, has concluded that "if the Patriarchal Age is represented at all at Beersheba, it must be the very modest villages of Strata IX and VIII from the 13th to 11th centuries B.C." What this new evidence does

to the dating of the Patriarchal age is still a matter of debate.

Still another Patriarchal anachronism that has come to light is the questionable association of the Philistine people (of the Iron Age) with Abraham, Isaac, and Moses (of the Bronze Age). The Bible indicates that the land of Canaan was inhabited by Philistines from the days of the Patriarchs in Gen. 21:34, 26:15, and Ex. 15:14. But historical accounts taken from the archives of neighboring kings indicate that these people were not on the scene until the 12th century B.C. Having been defeated by the Egyptians in a great sea battle about 1191 B.C., the "sea peoples," as they were called, were thrown back upon Canaan—which they readily occupied by means of their new iron weapons. It was their initial presence, in fact, that precipitated the formation of the Hebrew monarchy under the first warrior-king, Saul.

Bible literalists have frequently cited the finding of alluvial deposits at Ur by Sir Leonard Woolley as a conclusive proof of Noah's Flood. Now while it is true that in his first excitement Woolley cabled London in 1929, "We have found the Flood!" he was later to back down and publish more sober evidence of a quite localized inundation.³ And since his time, other excavations have indicated multiple flood silt layers at various uncoordinated periods of time in all of the ancient Sumerian cities—as would be expected from normal riparian fluctuations. It is significant to note that at the city of Kish evidence concerning belief in a Flood story was actually found *beneath* the flood layer in that location.

At Ur, Woolley found a deposit of silt eleven feet thick which he explained "would probably mean a flood not less than twenty-five feet deep." He felt that "in the flat low-lying land of Mesopotamia a flood of that depth would cover an area about 300 miles long and 100 miles across . . ." Going to the Bible record, Woolley equated his finding with the Genesis account which said "that the waters rose to a height of 26 feet." (Actually, the passage reads "15 cubits above the mountains" in Gen. 7:20, and 15 cubits is about 26 feet, to be sure, but *above the mountains*, and Mount Ararat, where Noah landed, is 17000 feet high!) Woolley concluded:

It is not a universal deluge; it was a vast flood of the valley of the Tigris and Euphrates which drowned the whole habitable world between the mountains and the desert; for the people who lived there, that was all the world. The great bulk of these people must have perished, and it was a scanty and dispirited remnant that from the city walls watched the flood recede at last. No wonder that they saw in this disaster the gods' punishment of a sinful generation, and if some household had managed to escape by boat from the drowned lowlands, the head of it would naturally be chosen as the hero of the saga.

Bible literalists are firmly committed to a universal Flood, however, and so the slopes of Mt. Ararat continue to entice explorers in search of the remains of Noah's Ark. As an added incentive, an aerial photograph taken in the 1940's purportedly showed evidence of a boat-like formation on the side of the mountain. But despite the fact that climbers have reached the top several times, no convincing proof of the ancient vessel's existence has been produced. During a recent expedition in 1955, Fernand Navarra found planks of hand-

tooled wood at the 13000 foot level, but laboratory tests showed the fragments he brought back to be less than 2000 years old. Dr. Lawrence Stager, in referring to various wooden specimens that have been retrieved from Ararat, says, "the chunks always date medieval—probably remains of old monasteries." And Dr. James Pritchard, esteemed archaeologist of the University of Pennsylvania, states flatly, "It's as sensible to look for Noah's Ark as it is for Jack's Beanstalk!"

Several of the holy sites now visited by pilgrims to Palestine were "discovered" by Helena, the mother of the Emperor Constantine. Her location of the Sepulchre and Mount Calvary (including remnants of the Cross itself) were influenced by a local bishop's directions and backed by a vision she was said to have received. The authenticity of these finds, however, is now commonly called in question. Certainly, enough wood from the "true Cross" has been found over the years to construct several crosses.

Helena's "Cross" was reportedly found in a cistern, and this bespeaks the regard accorded to rock-hewn caverns and wells in the Holy Land. Every ancient garbage pit or latrine is a potential candidate for hallowing and christening as a sacred site. The visitor to the Near East comes away amazed at how much holy activity was carried on in caves. At Bethlehem one is shown a cave where Jesus was born and at Nazareth the cave of the Annunciation to Mary. On the isle of Patmos one can explore the very cave in which John received his visions of the Apocalypse. Also, one may readily observe Elijah's cave on Mount Carmel and the witch of Endor's cavern in the hillside of Moreh (this despite the fact that 1 Sam. 28:24 makes reference to a "house" in which the woman lived). To credit all of the pious accounts of modern residents of these areas, all of the holy people of Bible times must have been cave dwellers! Of course, the most obvious reason for this popular aggrandizement of caves is that they are very durable objects of scenery, while man-made sites are generally reduced to rubble in a few years' time. Certainly it would be futile to search for the remains of the famous inn of Bethlehem, and so the Nativity has been shifted to what *does* remain from ancient times—a cave.⁴

The same kind of veneration given to caves has also sometimes been accorded to old trees that are supposed to date to Bible times. The gnarled olive trees of Gethsemane are assumed to be of great antiquity, despite the fact that by all of the historical accounts of the final siege of Jerusalem by the Romans, the soldiers cut down every tree in the area for use in making ramps, catapults, and crosses. They also cut trees for use as fuel and just out of plain spite. Certainly the "oaks of Abraham" esteemed by superstitious Arabs are not authentic. When the Emperor Constantine found idols and altars beneath the supposed terebinths of Abraham at Mamre, he ordered them destroyed and replaced them with a basilica. And yet, still the credulous seek to shore up their faith by imbuing every hilltop, stone, or tree with an assumed sanctity that cannot be even partially substantiated.

Even respected scholars are not completely immune to this type of dubious activity. Witness the current Ebla controversy, which has proven to be a classical case of nonscientific subjectivity's being allowed to bias the interpretation of

findings. Of course, the primary blame for this situation must be laid to the political turmoil and chauvinism now rampant in the Near East. Whereas one scholar has, in this situation, made early claims to identification of biblical places and people in the Eblaite tablets, another expert has refuted these conclusions—supposedly under anti-Israeli pressure by the local Arab state. Whether or not the tablets' contents are really relevant to the Bible must be established by cooler heads than are now participating in the heated debate.

And so, since to the present time there has been an obvious tendency among biblical archaeologists to jump to conclusions, there is now afoot a movement to abandon the term "Biblical archaeology" altogether. Professor William G. Dever, of the University of Arizona, prefers to avoid the temptation to bias by simply using the less polarized and more general term "Palestinian archaeology." Scanning the record, he summarizes the situation as follows:

We ought to recall with embarrassment the attempt to prove the Biblical account of the Flood from the sedimentary layers of mounds in lower Mesopotamia; the location of Noah's Ark on the ice-capped summits of Mt. Ararat in Soviet Armenia; the discovery at Jericho of the walls of Joshua which with more competent investigation turned out to be at least a thousand years before Joshua's time.⁵

Now, in the light of all of this questionable spadework and speculation, one is compelled to take a stand on the need for integrity in the science of sacred antiquities. With this in mind, it may be noted that since the time of Henry VIII every English monarch has carried the honorific title "Defender of the Faith." And what has become just another appellation of nobility in this case might well be the aspiration of every sincere adherent to the Christian faith. For, every true believer should also be a "defender of the faith" in the highest sense and deepest motivation. But, as it often happens, some proponents of a worthy cause come to believe so deeply in their own particular viewpoint that they get carried away and then feel justified in employing any tactic, fair or foul, in its defense. Certainly this would be the perfectly normal and acceptable approach of any Machiavellian prota-

gonist, since according to this philosophy as stated by Lenin, the end justifies the means to that end. Sad to say, the altercations of religious factions down through the years have not been totally immune to tactics of this baser sort.

In this vein, the esteemed evangelist Billy Graham has greatly over-stated his case by dogmatically pronouncing that: "Archaeology has never uncovered anything that disproved the Scriptures."⁶ Now, Dr. Graham is no illiterate, uninformed individual. Perhaps his reading and research has been somewhat limited in this particular field, but if he has *any* acquaintance at all with Near Eastern archaeology, he has surely come across the numerous unsolved mysteries and digressive discoveries that must preclude any such absolutist claim to 100% accuracy of the Bible's historical record in minutest detail.

NOTES

¹When Heinrich Schliemann excavated the city of Troy in 1873, he found golden jewelry which he proudly proclaimed to be "the treasure of Helen of Troy." Actually, these artifacts were from a period 1000 years before the time of the Trojan War. And then three years later when he was at Mycenae, he found a golden burial mask which he claimed depicted "the face of Agamemnon." This time his chronological error was only 400 years.

²Physical evidence shows that Jericho was destroyed in 1560 B.C. The site was later occupied by a small town without walls between 1400 and 1325 and then abandoned. The conquest under Joshua likely took place about 1225 B.C.

³Dr. Lawrence Stager, University of Chicago archaeologist, says, "Woolley probably hit a pothole." Woolley also erred with respect to another famous artifact, the golden figurine of a "goat with its horns caught in a thicket" (Gen. 22:13). This false identification to a Bible event has obscured the real meaning of the artifact for decades. (Its real purpose was to depict a common Near Eastern motif of a goat leaping up to browse upon the leaves of the Tree of Life.) Besides, this goat in question has wings!

⁴During his travels in the Holy Land, Harry Emerson Fosdick came across a Neanderthal skull called "Galilee man" in a museum and was led to exclaim, "Who . . . could have dreamed that humanity would climb from the Galilee man to the Man of Galilee?" And yet, how ironic it is that we would make a cave dweller of this very Man of Galilee by supposing that He was first born in a cave and then later raised in the so-called "Grotto of the Holy Family" in Nazareth!

⁵*Biblical Archaeology Review*, May-June 1981.

⁶Quoted from page 59 of *How To Be Born Again*, by Billy Graham, Word Books, Waco, Texas, 1977.

"... we must bear in mind that the cause of learning has often been promoted by scholars who are prepared to take a risk and expose their brain-waves to the pitiless criticism of others."

F. F. Bruce, "Modern Scribes on the Judean Scrolls" *Christianity Today* 1 (11): 5

Dinosaur Religion: On Interpreting and Misinterpreting the Creation Texts

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Resolution of science/religion conflicts is often thwarted by polarization into extreme viewpoints, such as "scientific creationism" and "scientific naturalism." Not only do the extremes attempt to dismiss each other; ironically, they often have much in common. They both place religious and scientific statements on the same level; they both try to draw religious and anti-religious conclusions from scientific data and theory; they both interpret religious texts, such as the creation accounts, in terms of scientific fact and model—either to defend the scientific truth of the Bible or to reject the Bible as primitive science. If one carefully distinguishes between the special literature and language of the Bible and that of modern science, resolution of apparent conflicts is possible.

One can hear all sorts of marvelous things over that relic of a pretelevision era, the wireless. The following is an excerpt from a radio sermon by a Tennessee country preacher, exhorting on the theme of evolution:

Friends, the work of the Devil is being carried on under many guises, right under our very noses. I was walking down the streets of one of our great cities, and I came upon this establishment, "The Museum of Natural History." There was a sign out in front of this edifice that said, "Come, see and hear about dinosaurs." I was curious about what went on in such places, so I walked in there, and there was this man, a tool of the Devil, preaching about monstrous creatures to all these little unsuspecting children from a school. He was holding in his hand, and reading from, a book called *Prehistoric Animals*.

Now, nothing prehistoric could possibly be Christian. So, I snatched the book from his hand. I was totally upset, in these perilous times, when the Anti-Christ in our government says, "No, you children can't have prayers in school, but you can have dinosaur religion taught every day." And here in this unholy temple of dinosaurs children are being preached to from false bibles and taught to worship idols that never existed. And in their minds belief in these creatures is taking the place of the knowledge of God and God's Word.

So, I cast the book down the steps, and stomped on it. And I tried then and there to plan how I might mount a crusade against this new Devil religion of dinosaur belief. Dinosaurs are the work of the Devil. They are the Devil's plaything. Such godless, communist dinosaur information must be destroyed before it carries us all to perdition.

Though this is naively phrased, there are some genuine problems being alluded to, however crudely and ignorantly put. Some scientists do have a kind of "dinosaur religion," first in the sense in which an evolutionary way of structuring history is seen as a substitute for biblical and theological ways of interpreting existence. Scientific explanations of phenomena are understood as supplanting religious interpretations by being superior and truer accounts of the same things. Some scientists also have a kind of dinosaur religion in the sense in which various alternative metaphysical conclusions—atheism, materialism, secular humanism—are drawn from evolutionary readings of data, even though they do not strictly follow from the data. Naturalistic explanations are seen as

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INTERPRETING THE CREATION TEXTS

providing sufficient knowledge, without significant remainder, of the knowable—despite the fact that one would have to be able to stand outside and apart from the context of naturalistic explanation in order to make that judgement. Religious issues, which have been ushered out the front door as no longer acceptable or relevant, are then admitted through the back door on the assumption that they are the inevitable extensions of the scientific world-view.

When evolution is taught in the public school or college classroom as implying either of these propositions, it is “dinosaur religion.” When certain scientists suggest that the religious accounts of creation are now outmoded and superseded by modern scientific accounts of things, this is “dinosaur religion.” Or when scientists presume that evolutionary scenarios necessarily and logically lead to a rejection of religious belief as a superfluity, this is dinosaur religion. These additional steps are not directly within the province of science, should not be construed as science, or taught as science. They are, themselves, *scientific* superfluities. They involve a leap in the argument, a jump to metaphysical conclusions about immediate and ultimate causation, chance and design, determinism and divine freedom, the natural and the supernatural.

Scientific Imperialism

There seems to be a tendency in all fields of study, including the sciences, to be imperialistic. Whatever academic enterprise we represent, we tend to view all issues from that point of view, as if it were the true center of the universe and the one assured vantagepoint from which to survey all else. Our particular form of knowing and body of knowledge is seen as having the first and last word on the subject, with all other fields forced to bow the knee and pay tribute. It is our tower whose top reaches heaven, and our leading lights who have made a name for themselves. Instead of humbly acknowledging that all forms of human knowing are finite and limited, representing but one or another angle of vision, we make excessive claims for our particular angle and the knowledge it affords.

Psychologists are inclined to view everything psychologically; sociologists sociologically; economists economically; while biologists want to get to the biological basis of the matter. Linguists argue that it is fundamentally important to see any issue from the standpoint of different language

systems. Historians want to discuss everything in the framework of its historical development; anthropologists in the framework of cultural forms. Physicists tend to view the universe in terms of physical relations; chemists in terms of chemical relations; mathematicians in terms of mathematical relations. Philosophers consider themselves capable of philosophizing about anything, and have proceeded accordingly to multiply the subdivisions of their discipline into the philosophy of mind, art, literature, history, law, economics, language, science and religion. And there are religionists, as well, who have tried to argue, not only that theology is king or queen of the sciences, but that the Bible itself offers definitive statements in all these areas, and that all other fields must check the pages of Holy Writ for permissible paradigms, methodologies and conclusions.

One of the results of this kind of imperialism is a failure to appreciate the many different languages and concerns which the different disciplines represent. Language is an amazingly malleable instrument. It has been developed into a great number of different forms, none of which is reducible to any other: biography, homily, poetry, novel, allegory, legend, parable, fable, fairytale, saga, epic, satire, tragedy, comedy, proverb, riddle, joke—right down to instruction manuals, grocery lists, television commercials and subway graffiti. Anyone without training in law has only to try reading a legal document to be impressed with the remarkable plasticity of language in playing so many different language games, each with its own rules, goals and field of play. If one were to judge the merits of a legal contract by the canons of poetry, one could not help but conclude that it was abominable poetry, and unfit to convey poetic truth. If one were nevertheless to insist on defending the poetic character and value of this legal document, despite the overwhelming opinion of the literary community that the material was either unpoetic, or, if poetic, very bad poetry, one would do a great disservice to the document and the legal truths it intends to convey.

It is always of critical importance to know exactly with what type of linguistic usage one is dealing, and to apply the appropriate canons of interpretation. Philosophical language is not the same as biological language; a novelist's use of language is not the same as computer language; theological language is not the same as political language; etc. Each type of language has its own specialized vocabulary or jargon, its own mode of presentation, and its own objectives. Even when the same words are used, they are used in different ways, with



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different nuances and implications.

Some language uses, to be sure, are closer than others. A parable, for example, is closer to biographical writing than to a legal document. It is so close, in fact, that without being told in advance that one is dealing with a parable, or being given clear indications within the parable itself, one might think that one was reading a statement of biographical and historical fact. Jesus' parable of the Good Samaritan begins: "A man was going down from Jerusalem to Jericho. . . ." (Luke 10:30). The parable of the Husbandman begins: "A man had two sons; and he went to the first and said. . . ." (Matthew 21:28). All of Jesus' parables were, no doubt, "true" to the life of Palestinians in that time period. This "true to life" character allowed people to identify readily with the situations and characters depicted. The parables were not fables, fairytales or fantasies. But they *were* parables, which means that whether the story actually happened, or happened with precisely those details, is immaterial.

The purpose of Jesus' parables was not to convey historical or biographical information, or to discuss the social and political issues of the first century. Its purpose was to be a *parable* of the religious situation. In a parable, religious truth is not being made to conform to historical and biographical reporting. Rather, the reverse is the case: characters and situations are being used as vehicles of religious truth. Insisting that the parables are only "believable" if one can also believe, and perhaps even demonstrate, that they actually happened, and that every detail is historically and biographically true, is to be confused over what the parables are asking one to believe, and what they are aiming to communicate. Their truth is a *parabolic* truth. What they "literally" are is parables. And the only legitimate way of interpreting parables is *parabolically*.

A similar situation exists with respect to the biblical creation texts. They may have the appearance of narrative accounts, whose purpose is to convey information concerning natural history and the life and times of the first humans. Yet the narrative form can be used for a variety of types of literature, from strictly historical narrative to the "once upon a time there lived . . ." of the fable and fairytale. The narrative form itself does not indicate historicity or facticity. That can only be determined by a careful examination of the narrative and its context. It is easy to see, however, how a confusion over the exact linguistic usage could occur. Two types of language which are very close to one another in form are more easily mistaken for each other than those which are quite different. It is doubtful, for example, that it would ever occur to anyone to conclude that Genesis 1 is an *instruction manual* on how to create a universe. It does not have the look of "how to" literature; yet it does have the look of narrative literature. But of what sort?

When one surveys the history of science/religion controversies, one finds linguistic confusion to be a major source of misunderstanding and conflict. The problem is created, on the one side, by those of scientific orientation who, naturally, tend to look at biblical materials in terms of the narrative accounts of modern science and natural history. Having

placed the creation texts in that particular type of linguistic box, the next step is easily taken: to conclude that they represent pre-modern, pre-scientific explanations of things for which we now have better explanations. The creation texts are then seen as examples of ancient attempts at comprehending the world by means of the limited information and tools at their disposal. Since we are in possession of superior knowledge and instrumentation, we have gone beyond these earlier views, more or less as brick buildings have gone beyond straw huts or sheepskin tents. We not only have better explanations; we even have scientific explanations for why ancient peoples

Quite ironically, those who would dismiss the Bible as pre-scientific, and those who would defend it as the true science, find themselves in agreement that these biblical texts are to be interpreted "literally"—that is, as intending to offer literal statements of scientific and historical fact.

thought and believed in this curious manner. Thus, we venture to offer psychoanalytic, or sociological, or even sociobiological explanations for religious beliefs. The innermost secrets of these matters, presumably, are now to be found at long last in Freudian psychology, or structural anthropology, or perhaps French existentialism!

Of course, if by pre-scientific we mean only to suggest that the biblical accounts pre-date what we call modern science, then they may be said to be pre-scientific. But the tendency is to translate pre-scientific as un-scientific, or at best as preliminary to science, and therefore as rendered obsolete by more advanced understandings. Yet this would only be possible if one could first assume that biblical uses of language, and scientific uses of language, in dealing with a common theme such as origins, functioned on the same level and in the same way. The very phrasing of the issue in terms of "information" and "explanation" presupposes that the two languages share the same narrative form, ask the same kinds of questions, and deal with the same type of truth. If this is not so, then the whole line of argument is erroneous and irrelevant. It would be like trying to argue that a photograph is a truer and more advanced representation of a subject than a painting, or that Sophocles' *Oedipus Rex* is superseded by Freud's analysis of the Oedipus complex, or that Michaelangelo's *Pieta* has been surpassed by NASA's moonlander.

Skeptics are not the only ones confused about this. There are also those who try to interpret the creation texts in relation to scientific statements, not in order to dismiss them as pre-scientific, but in order to defend them as scientifically true. Collisions between science and religion are, in large

part, the result of religious people insisting that the biblical texts function as scientific and historical reports, and that to interpret them otherwise would be unfaithful to them. To compound the confusion, this supposed scientific and historical meaning is said to be the *literal* meaning of the texts.

Given these assumptions, if there appears to be a conflict between biblical statements and scientific or historical statements, the latter must give in as misguided or misinformed. Biblical statements, it is argued, can only be said to be true, reliable, trustworthy and believable if they conform to these, largely modern and essentially secular, uses of language. Thus, quite ironically, those who would *dismiss* the Bible as pre-scientific, and those who would *defend* it as the true science, find themselves in agreement that these biblical texts are to be interpreted "literally"—that is, as intending to offer literal statements of scientific and historical fact.

"Creation Science"

The nomenclature currently used by various fundamentalist groups is itself revealing as to the extent of the linguistic confusion: Scientific Creationism, Creation Science, Creation Research, Bible Science. The resulting mix is neither good Bible nor good science. And the effect is to distort rather than uphold the fundamentals. To suggest that the first chapters of Genesis ought to be read in textbooks and classrooms as an alternative to evolutionary theories presupposes that these chapters are yielding something *comparable* to scientific theories and historical reconstructions of empirical data. But that is precisely what is in question. If they are not comparable, then such a position in seeking to be loyal to the Bible would be unfaithful to it, and while endeavoring to exalt the Bible would only bring dishonor upon it.

The central thesis of "creation science," in the words of a leading exponent, Henry Morris, is essentially this: "The biblical record, accepted in its natural and literal sense, gives the only scientific and satisfying account of the origins of all things. The creation account is clear, definite, sequential and matter-of-fact, giving every appearance of straightforward historical narrative."¹

These assumptions concerning the biblical texts cannot be asserted out of hand and are not given *a priori*. It is by no means self-evident that this material is a "record," or that it gives "every appearance of straightforward historical narrative," or that its "natural" sense is the "literal sense," or that by "literal" is meant "scientific," "sequential," or "matter-of-fact." This may indeed be the way things *appear* to certain modern interpreters, living in an age so dominated by scientific and historical modes of thought, and for whom modern science and historiography offer the criteria by which religious statements are to be judged true or false. But it is by no means obvious that this represents the literary form or religious concern of the Genesis writers. This is the interpretive issue, and it cannot be settled by dogmatic assertions, threats about creeping secularism, or attempts at associating alternative views with skepticism and infidelity. Nor can the issue be settled by marshaling scientific evidence for or against either evolution or creation, since it would first need to be demonstrated that the Genesis accounts are intending to offer scientific and historical statements.

Morris elsewhere states: "It is only in the Bible that we can possibly obtain any information about the methods of creation, the order of creation, the duration of creation, or any of the other details of creation."² Again this assumes, even presumes, that the intent of the biblical materials is to give "information," and that such "information" is concerned with the "method," "order," "duration," and "other details" of creation. Why such technological and chronological and factual information would be of pressing *religious* importance and *spiritual* significance is not at all apparent. And one can well imagine all sorts of "information" in a variety of areas that might have been vouchsafed to the human race had the Bible been in the business of dispensing this kind of knowledge.

When one carefully examines the argument, one discovers that the biblical view of creation is not being pitted against evolutionary theories, as is supposed. Rather, evolutionary theories are being juxtaposed with literalist theories of biblical interpretation. Even if evolution is only a scientific theory of interpretation posing as scientific fact, as the creationists argue, creationism is only a religious theory of biblical interpretation posing as biblical fact. And to add to the problem, it is a religious theory of biblical interpretation which is heavily influenced by modern scientific, historical and technological concerns. It is, therefore, essentially *modernistic*, even though attempting, and claiming, to be truly conservative. A genuine conservatism would, above all, seek to *conserve* the original conception and concern of the biblical materials—not measure and test it by contemporary canons.

One may observe this problem developing in the statement of belief which members of the Creation Research Society are required to sign. It begins:

The Bible is the written Word of God, and because we believe it to be inspired thruout, all of its assertions are historically and scientifically true in all of the original autographs. To the student of nature, this means that the account of origins in Genesis is a factual presentation of simple historical truths.³

There is a curious leap in the statement from the affirmation of the Bible as the inspired Word of God to the conclusion that, therefore, "all of its assertions are scientifically true in all of the original autographs," and furthermore that "this means that the account of origins in Genesis is a factual presentation of simple historical truths." There is a double *non-sequitur* in the statement, even though the conclusions drawn are offered as if logically and necessarily derived from the proposition: "because we believe it to be inspired thruout."

These leaps in the argument indicate the degree to which scientific and historical concerns have come to dominate the interpretation of biblical texts. The result is that the issue of inspiration is completely tied to the assumption of a particular type of statement which the modern world might understand, and be willing to accept, as scientific and historical "fact," "record," or "truth." But to affirm divine inspiration does not dictate only one possible type of literary form, or require God to play according to the rules of any particular linguistic usage. And certainly such demands must not be brought to the text as a prerequisite for "believing" them.

It may surely be said that the Genesis accounts of creation are not in conflict with scientific and historical knowledge. Yet this is not because they can be shown to be in conformity with this knowledge, but precisely because they have little to do with it. They belong to a different literary genre, type of knowledge, and kind of concern. To take an example from poetry, which is considerably closer to the character of the creation materials than scientific or historical prose: a poetic treatment of an autumn sunset is neither scientifically true nor untrue. It needs no harmonization with scientific theories, and requires no scientific confirmation. It is unrelated to that sort of truth; and it uses language in ways that are peculiar to itself.

For someone to endeavor to defend the integrity and worth of a particular poem by attempting to argue that its "assertions" were "scientifically true," and that it was reducible to a "factual presentation of simple historical truths"—in the original autograph copy—would be no defense at all. It would be a confusion of categories, like trying to defend a client being sued for divorce by introducing the evidence in a traffic court! Any defense of a poem based on such confusions, and any attack on other forms of literature which do not "agree" with the poem, no matter how well-meaning and heroic, would be the greatest possible disservice to the poem, the spirit of the words, the intentions of the poet, and poetry in general. In its anxiety to protect the poem from unappreciative critics, it would succeed in opening up the poem to even greater criticism and misunderstanding.

Similarly, a "literal" interpretation of the Genesis accounts is inappropriate, misleading and unworkable. It presupposes and insists upon a kind of literature and intention that is not there. In so doing it misses the symbolic richness and spiritual power of what is there. And it subjects the biblical materials, and the theology of creation, to a completely pointless and futile controversy. The first questions in interpreting any part of Scripture are always, what kind of literature is one dealing with, and what issues are being addressed? One cannot merely assume from the superficial look of the material, as it appears to modern eyes, that the material is of the same order as what we might call history or science. One must first provide strong evidence from within the passage itself, and from a careful study of the theological and cultural context of the passage, as to the specific literary form and religious concern involved. When one does this, the literalist assumptions turn out to be far afield, and to have been brought to the passage as a precondition for its acceptance.

The Context of Genesis 1

Since it is the 6-day creation account of Genesis 1 that is central to the "creation model," and most commonly compared with modern scientific accounts, we will focus on the issue of its interpretation. And we will concentrate on the historical context and literary form of the passage, since it is here that we find important clues as to the nature of the account. We cannot simply abstract scripture from its original context of meaning, as if the people to whom it was most immediately addressed were of no consequence. And, having created a vacuum of meaning, we cannot then arbitrarily substitute our own issues and literary assumptions. Certainly

the Bible is not restricted to the ancient world, and has relevance for the modern world. But too much haste in applying the Bible to our own situation, lifting its words out of context, may seriously misinterpret and misapply its message. No matter how well-intentioned, this would be like grabbing medicine bottles off the shelf and administering them to the sick without carefully reading the ingredients and directions provided on the labels.

These rules are especially critical in understanding Genesis. Even a cursory reading of the context in which, and to which, Genesis 1 was written would indicate that the alternative to its "creation model" was obviously not some burgeoning theory of evolution. All cultures surrounding Israel had their origin myths, some impressively developed in epic proportions and

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covering almost every aspect of the cosmos in great detail. Yet they were, from the standpoint of Jewish monotheism, hopelessly polytheistic.

In fact, if one looks at the cosmological alternatives that were prominent in the ancient world, one senses immediately that the current debate over creation and evolution would have seemed very strange, if not unintelligible, to the writers and readers of Genesis. Scientific and historical issues in their modern secular form were not issues in debate at all. Science and natural history as we know them simply did not exist, even though they owe a debt to the positive value given to the natural order by the biblical affirmation of creation, and to its monotheistic emptying nature of its many resident divinities. What did exist—what very much existed—and what pressed on Jewish faith from all sides, and even from within, were the religious problems of idolatry and syncretism.

The critical question in the creation account of Genesis 1 was polytheism versus monotheism. That was the burning issue of the day, not some issue which certain Americans 2,500 years later in the midst of a scientific age might imagine that it was. And one of the reasons for its being such a burning issue was that Jewish monotheism was such a unique and hard-won faith. The temptations of idolatry and syncretism were everywhere. Every nation surrounding Israel, both great and small, was polytheistic. And many Jews themselves held—as they always had held—similar inclinations. Hence the frequent prophetic diatribes against altars in high places, the Canaanite cult of Baal, and "whoring after other gods."

Read through the eyes of the people who heard it or recited it, Genesis 1 would seem very different from the way most people today would tend to read it—including both evolutionists who may dismiss it as a prescientific account of origins, and creationists who may try to defend it as the true science and literal history of origins. For most peoples in the ancient world all the various regions of nature were divine. Sun, moon and stars were *gods*. There were sky gods and earth gods and water gods. There were gods of light and darkness, rivers and vegetation, animals and fertility. Everywhere the ancients turned there were divinities to be taken into account, petitioned, appeased, pacified, solicited, avoided. Though for us nature has been “demythologized” and “naturalized”—in large part because of this very passage of Scripture—for ancient Jewish faith a divinized nature posed a fundamental religious problem.

In addition, pharaohs, kings and heroes were often seen as sons of gods, or at least as special mediators between the divine and human spheres. The greatness and vaunted power and glory of the successive waves of empires that impinged on or conquered Israel (Egypt, Assyria, Babylon, Persia) posed an analogous problem of idolatry in the human sphere.

In the light of this historical context it becomes clearer what Genesis 1 is undertaking and accomplishing: a radical and sweeping affirmation of monotheism vis-a-vis polytheism, syncretism and idolatry. Each day of creation takes on two principal categories of divinity in the pantheons of the day, and declares that these are not gods at all, but creatures—creations of the one true God who is the only one, without a second or third. Each day dismisses an additional cluster of deities, arranged in a cosmological and symmetrical order.

On the first day the gods of light and darkness are dismissed. On the second day, the gods of sky and sea. On the third day, earth gods and gods of vegetation. On the fourth day, sun, moon and star gods. The fifth and sixth days take away any associations with divinity from the animal kingdom. And finally human existence, too, is emptied of any intrinsic divinity—while at the same time *all* human beings, from the greatest to the least, and not just pharaohs, kings and heroes, are granted a divine likeness. And in that divine likeness, all human beings are given the royal prerogatives of dominion over the earth, and of mediation between heaven and earth.

On each day of creation another set of idols is smashed. These, O Israel, are no gods at all—even the great gods and rulers of conquering superpowers. They are the creations of that transcendent One who is not to be confused with any piece of the furniture of the universe of creaturely habitation. The creation is good, it is very good, but it is not divine.

We are then given a further clue concerning the polemical character of the passage when the final verse (2:4a) concludes: “These are the generations of the heavens and the earth when they were created.” Why the word “generations,” especially if what is being offered is a chronology of days of creation? Now to polytheist and monotheist alike the word “generations” at this point would immediately call one thing to mind.

If we should ask how these various divinities were related to one another in the pantheons of the day, the most common answer would be that they were related as members of a family tree. We would be given a genealogy, as in Hesiod’s *Theogony*, where the great tangle of Greek gods and goddesses were sorted out by generations. Ouranos begat Kronos; Kronos begat Zeus.

The Egyptians, Canaanites, Assyrians and Babylonians all had their “generations of the gods.” Thus the priestly account, which had begun with the majestic words, “In the

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beginning God created the heavens and the earth,” now concludes—over against all the impressive and colorful pantheons with their divine pedigrees—“*These* are the generations of the heavens and the earth when they were *created*.” It was a final pun on the concept of the divine family tree.

Creation versus Procreation

Other cosmologies operated, essentially, on an analogy with *procreation*. A cosmic egg is produced and hatches. A cosmic womb gives birth. Or a god and goddess mate and beget further gods and goddesses. In Genesis a radical shift has taken place from the imagery of *procreation* to that of *creation*, from a *genealogy* of the gods to a *genesis* of nature. When Hesiod entitled his monumental effort at systematizing the complicated web of relationships between the many Greek gods and goddesses a *theogony*, he was reflecting the fundamental character of such cosmologies. They were theogonies (birth of the gods) and theo-biographies as well. They depicted the origin, life and times of the various divinities. And they interpreted “nature” in terms of these divine relationships. Procreative, family, social and political relationships were used to describe the natural order, understood as divine beings and powers in their interaction.

Thus, the alternative to the “creation model” is the “procreation model.” If there is any sense in which the “creation model” of Genesis stands over against evolutionary models of natural history, it is only in the sense that it *self-consciously and decisively rejects any evolution of cosmic forces presented in terms of an evolution of the gods*. For that, by and large, was what polytheistic cosmologies were: the evolution of natural phenomena read as the emergence of new species

of divinity. And the interactions within nature—its ecology—were read as the interactions within and between various families, clans and armies of gods.

The fundamental question at stake, then, could not have been the scientific question of how things achieved their present form and by what processes, nor the historical question about time periods and chronological order. The issue was idolatry, not science; syncretism, not natural history; theology, not chronology; affirmation of faith in one transcendent God, not empirical or speculative theories of origin. Attempting to be loyal to the Bible by turning the creation accounts into a kind of science or history is like trying to be loyal to the teachings of Jesus by arguing that his parables are actual historical events, and only reliable and trustworthy when taken literally as such.

Even among interpreters who do not identify with the scientific literalism of the creationists, one often finds a sense of relief expressed in noting that the sequence of days in Genesis 1 is relatively “modern,” and offers a rough approximation to contemporary reconstructions of the evolution of matter and life. At best the days, read as epochs, provide a *very* rough approximation to recent scientific scenarios. The entire progression actually begins, not with a burst of light, but with watery chaos—as in both Egyptian and Babylonian mythologies—which hardly corresponds to any modern understanding of origins. The “formless earth” is also depicted as existing before the light of day one and the sun, moon and stars of day four. Vegetation, too, is created before the sun, moon and stars, on the third day, and surely would have wilted awaiting the next epoch. And no ingenious arguments about heavy cloud covers until the fourth epoch will work, since the text refers to the sun, moon and stars being “made” and “set in the firmament of the heavens to give light upon the earth” on the fourth day.

Still, no matter how close the approximations to modern natural histories might be, the entire line of argument is a lapse into a form of literalism, with its assumption that this account is in some way comparable to a scientific, historical one. If there is a “modern” appearance to the account, it is not because it anticipates modern scientific constructions by presenting a similar sketch of a scientific order. It is rather because it anticipates them by preparing the way *for* them, in purging the cosmic order of all gods and goddesses. In Genesis the natural order, for the first time, becomes natural rather than supernatural. Nature has been radically demythologized and de-divinized.

What was formerly divine, or a divine region, is now

declared to be “creature.” Nature, in fact, could not become nature in the sense in which we have come to use the term until it was emptied of divinity by monotheistic faith. Nor could science and natural history become possibilities until nature was thoroughly demythologized. One may have half-way houses, such as astrology and alchemy, but only when nature is no longer divine can it be probed and studied and organized without fear of trespass and reprisal.

This does not mean that nature is secularized or desacralized; for it is still sacred by virtue of having been created by God, declared to be good, and placed under ultimate divine sovereignty. What it *does* mean is that to treat Genesis 1 as of the same order as later science is to confuse result and cause. Genesis 1 clears the cosmic stage of its mythical scenes and polytheistic dramas, making way for different scenes and dramas, both monotheistic and naturalistic. Thus, if there is a scientific look to the text, it is not because it is an early form of natural history, but because the cosmic order, in its totality, is now defined as nature.

Fortunately, the literalism of the skeptics who would dismiss Genesis as pre-scientific conjectures about origins, and the literalism of the scientific creationists who would insist that Genesis offers the only correct paradigm of origins, are not the only options. In fact, they are not legitimate options at all. What Genesis 1 is, literally, is a cosmogony. But it is a very unique cosmogony. It uses the cosmogonic form to reject in a decisive manner its familiar content, whether as *birth* of the cosmos or birth of the *gods*. And it fills this form with radically new content: the natural objects of divine creation and sovereignty.

For this one Creator-God no birthdate can be given, no cosmic region assigned, no biographical details offered. In contrast to the often lurid accounts of the lives of the gods and goddesses, their family quarrels, their jealousies and power struggles, their sexual exploits and insane rage, their cosmic battles, rape and plunder, there is no divine story to be told. The story of this God is not a personal biography, but the story of interaction with the world of his creation, and with human history. These are the issues being addressed. And these are the fundamentals of the doctrine of creation.

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Is Creation-Science Science or Religion?

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This essay examines the grounds for rejecting creation-science given by the Arkansas Federal Court (Jan. 5, 1982). It looks at the charges that the idea of creation comes from the Bible, and that creation-science is religion because it implies a supernatural cause or Creator. It also examines the allegation that creation-science is not science because it is not a testable or falsifiable theory.

The first charge is found wanting because the source of a scientific theory is irrelevant to its scientific adequacy, and disallowing theories with implications of a Creator unconstitutionally favors naturalistic religions.

The charge that creation is not science is based on a prevailing confusion between operation-science (empirical science) and origin-science (forensic science). Neither creation nor macroevolution is an operation science, but both are an origin science.

Is creation-science science or religion? In Arkansas (Jan. 5, 1982) a federal judge ruled that creation-science is religion.¹ We propose to examine the grounds of this decision with a view to answering this question: should creation-science be taught in public school science classes?

What is Religion?

A. The Grounds of the Arkansas Decision

Nowhere does the Arkansas judge provide a definition of religion. However, he did rule creation-science is religious because it has certain characteristics which the judge considered essentially religious. According to Judge Overton these religious characteristics include the following:

1. A supernatural cause;
2. Creation from nothing;
3. A religious source (the Bible);
4. The implication of a Creator.²

B. An Analysis of the Arkansas Decision

1. *A Supernatural Cause.* The validity of these conclusions bears scrutiny. First of all, the claim that whatever involves a

supernatural cause is religious appears to beg the question in favor of naturalistic religions. Why eliminate only beliefs, such as creation, which are consistent with supernatural religions? To do so is to show a preference for naturalistic religious beliefs. For naturalism is also an essential of many religions. In fact, the Supreme Court has declared that "among religions in this country which do not teach what would generally be considered a belief in God are Buddhism, Taoism, Ethical Culture, Secular Humanism and others."³ So to rule out views of origin which involve a supernatural cause has the effect of favoring these naturalistic religions.

Furthermore, limiting science to purely naturalistic causes seems to be misdirected for historical, philosophical, scientific, and educational reasons. Historically, it is widely acknowledged that the belief in a supernatural creation is the very origin of modern science. In a landmark article on the source of modern science, M. B. Foster wrote: "What is the source of the un-Greek elements which were imported into philosophy by the post-Reformation philosophers, and which constitute the modernity of modern philosophy? The answer

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is . . . *the Christian doctrine of creation.*"⁴ Indeed, for the first two and a half centuries of modern science (1620–1860) most of the leading lights in science believed the universe and life gave evidence of a Creator. It is sufficient to recall names like Bacon, Kepler, Pascal, Boyle, Newton, Agassiz, Maxwell, Mendel and Kelvin—all of whom believed in a supernatural cause of the universe and life.

Philosophically, it is difficult to justify an approach to origins in science which gives a hearing to only one of the available alternative explanations. Indeed, it is of the essence of philosophy to be open to opposing views. Furthermore, not allowing a creationist explanation of origins is contrary to

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present practice in high school humanities and philosophy classes. Here arguments both for and against a Creator are presented. I fail to see why the same procedure should not also be utilized in a science class.

Scientifically, there are some serious objections to disallowing minority views. Remember Galileo. Remember also Velikovsky.⁵ Furthermore, without new (which means, *minority*) views there would be no possibility of scientific progress. There is a good current example of this. The prevailing views of coal formation call for millions of years of build up of decaying vegetation. However, a scientist working from a nonevolutionary model, theorized that coal can be formed in short times by chemical action. The result was the revolutionary but highly underpublicized invention of a fossil fuel for a fraction of the price of gasoline.⁶ By disallowing creationists' theories an opportunity to be presented, scientists in the name of science may be unwittingly hindering the progress of science.

Educationally, serious oversights are involved in forbidding creation-science an entrance to the science class room. With the exception of a few vocal zealots for evolution,⁷ most serious scientists recognize that macro-evolution is not a proven fact; it is at best only a theory. Some evolutionists have even admitted it is a "myth"⁸ or a matter of "faith." Speaking to a group of American scientists (Nov. 5, 1981) the famous British paleontologist, Colin Patterson said, "the explanatory value of the hypothesis of common ancestry is nil." He went on to say, "I think that many people in this room would acknowledge that during the last few years, if you had thought about it at all, you have experienced a shift from evolution as knowledge to evolution as faith."⁹

In any event, it is *possible* that evolution may be wrong, and creation may be right. If this is so, then court decisions which forbid teaching creation could have the consequence of legislating the impossibility of presenting the truth in the science class room. I find it difficult to believe that fair-minded scientists are willing to say in effect: "creation-science may be true, but we will not allow it to be taught anyway!" Have we reached the point in American scientific education that we have so narrowed our definition of "science" that we have eliminated the possibility of it discovering truth?

2. *Creation from Nothing.* The Arkansas judge affirmed that "creation of the world 'out of nothing' is the ultimate religious statement because God is the only actor."¹⁰ But this pronouncement appears to be a case of special pleading. For there are only two basic views on the origin of the universe: 1) either it is eternal or else 2) it came into being out of nothing. But why should we legislate that the belief in an uncaused, eternal universe is not religious, but the belief that it had a cause of its beginning is essentially religious? There are religions which believe the universe was not created from nothing (e.g., pantheism, atheism), just as there are those which believe it was made from nothing (e.g., theism). Why should one belief about the origin of the universe be considered religious and not the other?

Further, if we insist that a belief is religious because it is part of or consistent with some religion, then we will have to exclude from the public school most beliefs about origin and ethics ever held by mankind. For there is scarcely a significant cosmological or ethical view ever held that has not been at some time part of the religious beliefs of some group somewhere. Surely this is too high a price to pay in order to rid our schools of what some believe are undesirable minority views among scientists.

Of course some may claim that it is scientific to believe the universe came into existence from nothing without a cause. But they may insist that to believe something (or someone) caused the universe to exist is religion. However, why should the denial of causality be scientific and its affirmation unscientific? Even the skeptic, David Hume, rejected as absurd the suggestion that things might arise without a cause.¹¹ The principle of causality—that every event has an adequate cause—is fundamental to science. Hence, if there is scientific evidence that the universe had a beginning, then it is reasonable to postulate a cause for the universe coming into existence. In fact, it is both arbitrary and unscientific to limit the quest for causes to only natural ones. The prominent astrophysicist, Dr. Robert Jastrow, recently went so far as to say that "science has proven that the universe exploded into being at a certain moment." Thus, "the scientists' pursuit of the past ends in the moment of creation."¹² Jastrow concludes, "that there are what I or anyone else would call supernatural forces at work is now, I think a scientifically proven fact."¹³

3. *The Implication of a Creator.* Of course it must be admitted that there is a difference between postulating a Creator as a cause and positing a natural force. A Creator is an object of religious devotion or commitment. So it can be argued that a Creator is an inherently religious concept and, thus, should be ruled out of the proper domain of science. On

the other hand, it is argued that natural objects and causes are not inherently religious. Hence, they can be legitimately posited as causes of events in the world.

However, this argument falters for several reasons. First of all, many natural forces (rain, wind, sun) are also objects of religious worship and devotion for many. In view of this any appeal to the causal powers of wind, rain or sun should also be considered religious. Further, if we must exclude from a science class anything which has been worshipped, then we would have to eliminate rocks from geology class because some people have worshipped rocks! We would surely have to exclude religious icons from archaeological and historical studies. With this same kind of reasoning we should also forbid the presentation of any historical evidence for Christ or Buddha in history classes. For both men are the object of religious worship or devotion by millions. After all, any historical evidence presented for the existence and teaching of these religious figures may have the effect of encouraging religious devotion to them.

Reasonable minds can see that such inferences are faulty. For it is clear that one can present historical evidence for the existence of Christ or Buddha without calling on students to worship them or make an ultimate commitment to either them or to their teachings. The same thing holds true in high school philosophy classes. Evidence and arguments can be presented for the existence (or non-existence) of a Creator without thereby calling on anyone to worship or make an ultimate commitment either for or against this Creator as such.

Indeed, one may speak of a Creator without presenting Him as an object of worship. In fact, it is not uncommon in Western thought for the Creator of the world not to function as the ultimate object of devotion or commitment. Both Aristotle and Plato are examples of this, as were the Gnostics. All of these views posited a Creator which they did not worship as the ultimate good but was simply viewed as the cause of the universe.

Dr. Paul Tillich was consulted by the Supreme Court when they concluded (in the *Torcaso* case, 1961) that belief in a God is not essential to religion. Tillich gives the key as to how the Ultimate (be it a Creator or whatever) may be approached in two different ways. If we study the Ultimate

from a *detached objective point of view* this is not religion; it is philosophy. However, when we approach the same Ultimate from an *involved, committed perspective* this is religious.¹⁴ Building on Tillich's distinction, Dr. Langdon Gilkey notes that it is like two different climbers scaling a mountain from different sides. They are not approaching two different peaks. There is only one Ultimate. But there is more than one way this Ultimate can be approached.¹⁵

In view of this reasonable distinction we would conclude that if one approaches a Creator from the objective, detached vantage point of scientific inference he has not thereby engaged in a religious exercise. And this is precisely what creation-science does with regard to positing a Creator as a possible scientific explanation of origins.

The idea of a creative Cause of the universe is religiously innocuous when presented simply as a *scientific theory*. It is even less problematic when it must be presented as only *one* of the alternate ways to explain the data. It should be pointed out that these features of presenting creation only from an objective scientific approach and as only one of opposing views are part of the creation-evolution laws which were passed in both Arkansas and Louisiana.¹⁶

4. The Creation View Comes from a Religious Source. One of the more curious implications of the Arkansas ruling is its claim that creation-science was considered religious because it came from a religious source, the Bible. This reasoning has the characteristics of the genetic fallacy. First of all, let us grant that the *source* of this idea of creation is the Bible. If this makes it religious, then modern science itself is also religious. For it is well established that the doctrine of creation revealed in the Bible was the source of modern science. As M. B. Foster put it in response to the general query as to the source of modern science, "The answer to the . . . question is: *The Christian revelation*. . ."¹⁷ If this is so then modern science itself is religious since it came from a religious source!

Second, if we must reject a scientific theory because it comes from a religious source, then we must also reject many archaeological discoveries. For the source and inspiration of many near-eastern archaeological finds came from the Bible. Further, we would have to reject Kekule's model of the benzene molecule, since he got it from a *vision* of a snake



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biting its tail!¹⁸ And we must also consider the alternating current motor unscientific because Tesla received the idea for it in a vision while reading a *pantheistic* poet.¹⁹ But has anyone ever rejected Socrates' philosophy simply because his inspiration for it came from a Greek prophetess? Or has anyone ever rejected Descartes' rationalism simply because his inspiration came from three dreams on November 10,

Why then should one arbitrarily rule out of science classes the inference that highly complex information in the first living thing was the result of an intelligent agent?

1619? On the contrary, it is wrong to reject a scientific model because of its source—even if the source is religious in nature. Scientists are not concerned about the *source* of a model but rather about its *adequacy* in explaining the data. One evolutionist recently stated the issue well when he wrote:

I would like to stress that I have no quarrel with the creationists' use of Genesis and other parts of the Bible as sources of ideas, scientific and otherwise. The ultimate test of a scientific theory or model is the degree to which it efficiently and logically correlates our perceptions of our surroundings (both spatial and temporal). Depending on the idiosyncrasies of individual scientists, any source of ideas, inspiration, or insight may be useful for model building—experimental observation, the Koran, the Bible, a revelation, numerology, a dream or hallucination, etc. The history of science reveals many examples of valuable scientific contributions which had their roots in such inspirations.²⁰

What is Science?

Granted that creation-science is not essentially religious, there remains the question as to whether it is really scientific. Here both the Arkansas decision and much of anti-creation literature are based on an equivocal use of the term "science."²¹

A. Two Kinds of Science: "Operation-science" and "Origin-science"

Non-creationists rightly point out that: 1) the universe operates by natural laws; 2) these laws represent repeatable patterns of events which may be tested by observation in the natural world; 3) the singular acts of creation are not testable by any of these operational laws of nature because the acts of creation were not *observed* nor have they been *repeated*. On this basis some have concluded that creation-science is not really science. They maintain, however, that naturalistic explanations of origins, such as evolution, are scientific.

I believe this conclusion confuses two kinds of science: science about the *operation* and science about the *origin* of things.²² First, if *observation* of some recurring pattern of

events in nature is essential to all science, then naturalistic explanations of origins are not scientific either. After all, there were no observers of the Big Bang or of the spontaneous generation of life—both of which are widely held naturalistic explanations of origins. Indeed, there were no scientific observers of any alleged evolutionary process leading up to man. So if scientific observation of some recurring pattern of nature is essential to a scientific understanding, then naturalistic or total evolutionary explanations are not scientific either. The fact is, however, that *observation* of a recurring pattern of events is a key element only of scientific views about the *operation* of the universe but not about its *origination*. For only the operation of the universe involves regularities; the events of origin were unrepeatable singularities.

For example, there has been no *repetition* of the Big Bang, spontaneous generation, or of any alleged evolutionary tree of life. These are held to be singular and unrepeatable past events which are nonetheless accepted as scientific explanations in the scientific community. The simple fact of the matter is that no view of origins (natural or supernatural) is based on the observation of any recurring pattern of events. For the events of origin were neither observed nor have their like been repeated since. Hence, repetition is a crucial element of the *operation* of the universe but not about its *origination*. For there is no scientific evidence that the universe and life originated over and over. But if macroevolution is not rejected because there is no recurring pattern of events in nature against which it can be tested, then neither should creation be rejected for this reason.

The fact of the matter is that those opposed to creation-science use a double-standard. By defining science in terms of regular, repeatable patterns (operation-science), they correctly conclude that creation-science is not science in this sense. Then when asked to justify how the unrepeatable singularities of macroevolution can be science, they appeal to a different sense of the term science (origin-science) in which observed analogies from the present can be used to understand these unobserved singularities of the past.

Some object to this conclusion by insisting that there is a significant difference in the kinds of singularity involved. For example, the singularity of the spontaneous generation of first life is very different from the singularity of creation of that life. The first one implies a natural cause, but the other entails a supernatural cause. But they insist that a supernatural cause places it outside the domain of science. They contend that science deals only with *secondary* causes (observable in the natural world) but not with *primary* or ultimate causes (which are not observable). The latter, they say, is philosophy (or religion) but not science. Evolution deals only with secondary causes, but creation refers to a primary cause (a Creator). Hence, they conclude that evolution is science and creation is philosophy (or religion).²³

In response to this several things should be noted. First of all, science deals with all of nature, the whole physical space-time universe. That is, science deals with all events (and their causes) in the spatio-temporal universe. Just because some of these events do not have a *material* cause does not mean they are not subject to scientific analysis. Otherwise,

science by definition must be materialistic. But if science were limited only to material causes then neither psychology, psychiatry, nor sociology would be science because they involve mental causes. Neither historically nor logically can science be limited to only material causes. It is simply arbitrary to do so. But if science can include mental (intelligent) causes of events which occur in the space-time world, then there is no reason to eliminate intelligent creation of the world or life forms from the realm of science.

Second, taking recent discoveries in astronomy as a model it is no longer possible to exclude a supernatural primary cause as a possible explanation of the origin of the universe.

Based on these scientific principles, creation is a viable explanation of origins. For there is no observational evidence in the present that can adequately account for the cause of origin of the universe by operational laws alone.

For the only kind of cause that could have brought the whole of nature into existence is one from beyond nature, namely, a supernatural Cause. Indeed, the word *supernatural* is even being used by astronomers, such as Robert Jastrow, to refer to the cause of this unique origin event.

Third, if *only* secondary causes can be considered scientific explanations, then *the very distinction between primary and secondary causality begs the question in favor of naturalism.*²⁴ For all secondary causes by definition are *natural* causes. Hence, by definition *only* natural causes would be allowed as scientific explanations. This would make science incurably naturalistic by definition! This is not only unnecessary but it is arbitrary. It is a form of methodological naturalism.

Fourth, since it is logically possible that not all events of origin can be explained by only secondary (natural) causes, then by limiting science to only natural causes one is faced with the absurdity that science would have to insist on a natural cause *even if it is false!* Not only is this unreasonable but it would also lead to a lot of fruitless activity in science, by insisting that one seek purely natural causes where the evidence indicates the contrary. It would be like demanding that geology students continue to study the faces formed on Mount Rushmore until they can explain them by some natural process of erosion!

Fifth, there are only two possible explanations for the origin of first life. Either it resulted from purely non-intelligent natural forces, such as erosion forming the Grand Canyon. Or else life originated by intelligent intervention,

such as the creation of the faces on Mount Rushmore. And it matters not whether the non-intelligent natural force was created or uncreated. The observed fact is that natural force cannot produce the likes of Mount Rushmore or a hydroelectric plant without direct intervention by some intelligence.

So in the final analysis there are only two possible *efficient* causes of first life (whatever instrumental causes may have been utilized). Thus our point is that if one allows *only* a natural (non-intelligent) cause of first life as a scientific explanation, then he has arbitrarily ruled out of science the very kind of intelligent cause the evidence may call for. Indeed, in a land-mark work it has recently been shown by some of our own ASA members that the most plausible scientific explanation of the origin of first life is an intelligent cause.²⁵

Finally, inferring intelligent causes for certain kinds of events has long been an accepted practice even in the area of physical sciences. Archeologists have always inferred intelligent causes for pottery, arrowheads, or hieroglyphics because of the distinctive marks of intelligent contrivance or the complex information conveyed by them. Why then should one arbitrarily rule out of science classes the inference that the highly complex information in the first living thing was the result of an intelligent agent? It is also an accepted practice in contemporary astronomy to engage in the search for extraterrestrial intelligence (SETI). And certain criteria have been established by which one can distinguish a purely natural signal (such as stars emit) from the signal of an intelligent being.²⁶ If this is legitimate science to lay down criteria by which one can determine an intelligent cause for the sequence of symbols, then there is no good reason to insist that creationists cannot do the same for the sequence of elements in the first living cell.

B. The Nature of a Scientific Understanding of Origins

The operational laws of the universe are based on *observation and repetition*. Any theory about the operation of the universe can be tested by measuring the theory against a recurring pattern of events in the natural world. But with the past events of origin (of the universe and life) it is a different matter. These unique events of origins are past singularities. No theory about these events can be tested by measuring the theory against these events for the simple reason that *the original events are not available for our observation.*²⁷ For this reason a science of origins is more like a forensic science. We have no instant replay of an unobserved murder. The forensic scientist must make an inferential reconstruction of the past on the basis of what he knows in the present.

There are two essential principles in origin science: the principle of *causality* and the principle of *uniformity*. The principle of causality holds that every event has an adequate cause. And the principle of uniformity says the present is the key to the past. Hence, the kind of cause known repeatedly in the present to produce a certain kind of event is assumed to be the kind of cause that produced like events in the past.

Let's apply these principles to a specific situation. Some

contemporary proponents of the Big Bang theory believe that the scientific evidence, such as observing an expanding universe with dwindling usable energy (à la Second Law), leads to a supernatural cause of the universe. Astrophysicist, Dr. Robert Jastrow, said emphatically that there were "supernatural forces at work"²⁸ in producing the universe. He adds,

Now we see how the astronomical evidence leads to a biblical view of the origin of the world. The details differ, but the essential elements in the astronomical and biblical accounts of Genesis are the same: the chain of events leading to man commenced suddenly and sharply at a definite moment in time, in a flash of light and energy.²⁹

Now should Dr. Jastrow be disbarred from science because he believes the scientific evidence leads to the supernatural, even to Genesis chapter one? Should his book be banned from public school libraries?

Recently another renowned scientist, Sir Fred Hoyle, concluded that there is a Creator of first life in the universe. Surprised by his own mathematical calculations that the chances for life appearing spontaneously were 1 in $10^{10,000}$, this former atheist concluded there must have been an intelligent Creator of first life.³⁰ Now it seems eminently unfair to argue that Fred Hoyle was doing science as long as he did *not* conclude the evidence pointed to a Creator of life but was no longer doing science once he believed the scientific evidence favors a Creator.

In point of fact, to argue that only non-intelligent causes are scientific is contrary to the scientific principles of causality and uniformity. Based on these scientific principles, creation is a viable explanation of origins. For there is no observational evidence in the present that can adequately account for the cause of origin of the universe by operational laws alone. And as to the scientific data relating to the alleged spontaneous generation of life, one scientist recently wrote, "One must conclude that, contrary to the established and current wisdom a scenario describing the genesis of life on earth by chance and natural causes which can be accepted on the basis of fact and not faith has not yet been written."³¹

Neither can the beginning of the universe be adequately explained by operational natural laws. By the very nature of the case there were no natural processes before nature came into existence. Likewise, natural forces can account for the Grand Canyon, but *these operational laws do not explain the faces formed on Mount Rushmore!* The only kind of cause we ever *observe* forming things like Mount Rushmore is intelligence. This is our *uniform* experience.³² Hence, the scientific principle of uniformity points to an intelligent source for Mount Rushmore. But since even the simplest form of life conveys vastly more information than does Mount Rushmore, it is not unscientific to postulate an intelligent cause of life.

To use another example, the redundant patterns of radio signals from stars do not indicate an intelligent cause. But were astronomers to receive a single sentence of intelligible information on their radio telescopes, some would not hesitate to postulate extra terrestrial intelligence as its cause.³³ Now if such an inference is scientific and is allowed in our public

schools, then why should creationists be forbidden to make scientific inferences to an intelligent cause of life? For example, the genetic information in the human brain is equal to the information contained in all the world's great libraries.³⁴ Why then should it be unscientific to infer this vast information has an intelligent source?³⁵ In fact, would we not consider it to be unscientific to assume that all the books in all the great libraries have no intelligent cause? After all, has anyone ever *observed* even one volume of a library result from an explosion in a printing shop? Or has anyone ever observed spontaneous information transformation from one source to another by random changes? Rather, is it not our uniform observations that new information always has an intelligent cause? If this is so, then it is simply arbitrary to rule out legitimate inferences to an intelligent, supernatural cause of the universe and life forms from scientific reasoning. For origin-science is different from operation-science. Unlike operation-science, origin-science has no recurring pattern of events in nature against which to test its theories. Instead, origin-science is dependent on the scientific principles of *causality* and *uniformity* which lead naturally to a creationist's view.

In conclusion, it is more than arbitrary to eliminate the teaching of scientific views about origins. Clarence Darrow, the ACLU lawyer in the famous Scopes trial, said it well: it is "bigotry for public schools to teach only one theory of origin."³⁶ And if it was bigotry in 1925 when only creationists' views were taught, then it is still bigotry in 1984 when only evolutionary views are being taught. Bigotry has not changed in the past half century; only the bigots have.

NOTES

¹For a published account of the Arkansas ruling *McLean v. Arkansas* (January 5, 1982) see Norman L. Geisler, *The Creator in the Courtroom*, Milford, Michigan: Mott Media, 1982, chapter 8.

²*Ibid.*, pp. 174, 176, 177.

³*Torcaso vs. Watkins* (1961) reported in *United States Reports: Cases Adjudged in the Supreme Court at October Term, 1960*, reporter of decisions, Walter Wyatt, Washington, D.C., United States Government Printing Office, 1961, p. 495, n. 11.

⁴M.B. Foster, "The Christian Doctrine of Creation and the Rise of Modern Natural Science," *Mind* (1934), 43:448 (emphasis added).

⁵Carl Sagan has an honest account of the injustices done to Velikovsky's minority scientific views. See Sagan, *Cosmos*, New York: Random House, 1980, pp. 90, 91.

⁶This was reported by an expert science witness at the Arkansas trial, Dr. Donald Chittick. See Geisler, *ibid.*, pp. 142, 143.

⁷Isaac Asimov, for example, makes the unfounded claim that "scientists have no choice but to consider evolution a fact." See "The Genesis War," *Science Digest* (Oct., 1981), p. 85.

⁸One writer put it this way:

With the failure of these many efforts science was left in the somewhat embarrassing position of having to postulate theories of living origins which it could not demonstrate. After having chided the theologian for his reliance on myth and miracle, science found itself in the unenviable position of having to create a mythology of its own: namely, the assumption that what, after long effort, could not be proved to take place today had, in truth, taken place in the primeval past.

Loren Eiseley, *The Immense Journey*, New York: Random House, 1957, p. 199.

⁹This is taken from "Appendix A" of *Plaintiffs' Pre-Trial Brief* for the Louisiana creation-evolution trial, filed June 3, 1982 by Patricia Nalley Bowers, Assistant Attorney General, Louisiana Department of Justice.

¹⁰Geisler, *ibid.*, p. 174.

¹¹Hume wrote, "I never asserted so absurd a proposition as *that any thing*

- might arise without a cause: I only maintained that our certainty of the falsehood of that proposition proceeded neither from intuition nor demonstration; but from another source." *The Letters of David Hume*, ed. by J.Y.T. Grieg, Oxford: The Clarendon Press, 1932, I:187.
- ¹²Robert Jastrow, *God and the Astronomers*, New York: W.W. Norton & Co. Inc., 1978, pp. 114, 115.
- ¹³Robert Jastrow, "A Scientist Caught Between Two Faiths," *Christianity Today* (Aug. 6, 1982), p. 18.
- ¹⁴See Paul Tillich, *Systematic Theology*, Chicago: University of Chicago Press, 1951, Vol. I, pp. 18-28.
- ¹⁵See Langdon Gilkey, *Maker of Heaven and Earth*, New York: Doubleday & Co., 1959, p. 35.
- ¹⁶For the exact wording of the Arkansas Bill see a published copy in Geisler, *ibid.*, pp. 3-9.
- ¹⁷M.B. Foster, *Ibid.* (emphasis added).
- ¹⁸See Ian G. Barbour, *Issues in Science and Religion*, Englewood Cliffs, New Jersey: Prentice-Hall, Inc., p. 158, or "Kekule von Stradonitz" in *The New Encyclopedia Britannica*, Chicago: Encyclopedia Britannica, Inc., 1980, p. 749.
- ¹⁹See John J. O'Neill, *Prodigal Genius: Life of Nicola Tesla*, Washburn Press, 1980.
- ²⁰Arnold Tulus, "How Old is the Earth?" in *Sequel*, Purdue University (Winter 1981-82).
- ²¹The Arkansas judge insisted that "The essential characteristics of science are: (1) It is guided by natural law; (2) It has to be explanatory by reference to natural law. . . ." Geisler, *ibid.*, p. 176.
- ²²The distinction between these two kinds of science is as old as that between cosmogony and cosmology. Wilder-Smith made this distinction. Dr. Charles Thaxton (*Ibid.*) calls these "operation-science" and "origin-science." My own contribution is to set forth two crucial principles of a science of origins: *causality* and *uniformity* (see my *Is Man the Measure*, Grand Rapids: Baker Book House, 1983, chapter 11). For example, "the laws of nature do in fact provide the basis for the *functioning* of a machine, without at the same time being responsible for its *genesis*." See A.E. Wilder-Smith in *The Natural Sciences Know Nothing of Evolution*, San Diego: Master Books, 1981, pp. XII, XIII.
- ²³Following Hutton, Lyell and others, Langdon Gilkey made this distinction at the Arkansas trial, and the judge apparently accepted it. See Geisler, *Ibid.*, pp. 65, 174, 175, and Gilkey's pre-trial Deposition, pp. 4-10.
- ²⁴It is purely arbitrary for naturalists like Niles Eldredge to claim that a scientist "by the rules of his profession must consider the origin of all things natural solely in naturalistic terms." *The Monkey Business*, New York: Washington Square Press, 1982, p. 10.
- ²⁵See Charles B. Thaxton, Walter Bradley and Roger L. Olsen, *The Mystery of Life's Origin*, New York: Philosophical Library, 1984.
- ²⁶See Olin Teague (chairman), *Possibility of Intelligent Life Elsewhere in the Universe* [revised October, 1977]. *Report Prepared for the Committee on Science and Technology*, U. S. House of Representatives, Washington, D.C.: U. S. Government Printing Office, 1977, pp. 50-65.
- ²⁷For this point and the use of the term "forensic science" in this connection I am indebted to Dr. Charles Thaxton. See *Crossroads: Science Meets Society*, Vol. 2, No. 1, Feb. 1982, p. 11.
- ²⁸This is recorded in an interview with Robert Jastrow, "A Scientist Caught Between Two Faiths," *Ibid.*
- ²⁹See Robert Jastrow, *God and the Astronomers*, New York: W.W. Norton & Company, Inc., 1978, p. 14.
- ³⁰See Fred Hoyle, *Evolution from Space*, London: J.M. Dent & Sons Ltd., 1981, pp. 24, 142, 148.
- ³¹H.P. Yockey, "A Calculation of the Probability of Spontaneous Biogenesis by Information Theory," *Journal of Theoretical Biology* (1977) 67, 396.
- ³²Even the empirical skeptic, David Hume said, "uniform experience amounts to a proof, [so that] there is here a direct and full *proof* from the nature of the fact. . . ." See Hume, *Enquiry Concerning Human Understanding*, New York: The Bobbs-Merrill Co., 1955 (first published 1748), p. 123 (no emphasis added).
- ³³See Carl Sagan, *Broca's Brain*, New York: Random House, 1979, p. 275.
- ³⁴This library analogy is used by Carl Sagan, *Cosmos*, p. 278. Yet in spite of it Sagan refuses to acknowledge the need for a creator.
- ³⁵Recently a scientist has shown that, "The statistical structure of any printed language ranges through letter frequencies, diagrams, trigrams, word frequencies, etc., spelling rules, grammar and so forth and therefore can be represented by a Markov process given the states of the system. . . ." In addition, this same "sequence hypothesis applies directly to the protein and genetic text as well as to written language and therefore the treatment is mathematically identical." See Hubert P. Yockey, "Self Organization Origin of Life Scenarios and Information Theory" in *Journal of Theoretical Biology*, 1981, 91, p. 16.
- ³⁶See R. O'Bannon, *Creation, Evolution and Public Education* 5, Dayton Symposium on Tennessee's Evolution Laws (May 18, 1974).

ASA'S 1985 ANNUAL MEETING TO BE HELD AT OXFORD, ENGLAND

Plans for next year's joint Annual Meeting with Britain's Research Scientists' Christian Fellowship at St. Catherines College at Oxford University are moving along well. Two speakers, Donald MacKay and Walter Thorson, have already accepted our invitation, and several others are being approached. The theme will be "Christian Faith and Science in Society—God's Providence and Man's Control" with two sub-themes, "Biblical and Scientific Truth" and "Science as a Servant—Use and Abuse." There will be several sessions for contributed papers. The Conference will run from noon Friday, July 26, to noon Monday, July 29, 1985.

Following the Conference, there will be a 16-day tour available to points of scientific interest in the Netherlands, France, Switzerland and Germany, including a trip on the Rhine and a visit to Berlin and East Germany. Total cost, including air fare from New York, is an amazing \$1,600.

Some travel support will be available for those contributing papers, based upon the number submitting and individual need. Younger members will be favored. If you wish travel support, a letter of intent and a reasonably detailed abstract of your paper should be sent to the Executive Director in Ipswich by January 1.

Is "Creation-Science" Science or Religion?—A Response

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Judge Overton defined "creation-science" as religion and not science. Dr. Geisler does not like the implications of that definition for public school science education. He believes that creation is as scientific as evolution. Therefore "creation-science" ought to be included in public school curricula.

The Definition of Science

The scientific community rigorously excludes from the definition of natural science all reference to supernatural causes. As Judge Overton indicated in his opinion, science is guided by natural law and is explanatory by reference to natural law. Natural science restricts itself to material causes. Geisler believes that this restriction to natural, material causes in science is arbitrary and biases the situation in favor of naturalism and against supernatural religions like Christianity. He says that if science were limited to material causes then such disciplines as archaeology, psychology, and sociology could not be sciences because they plainly allow for mental (intelligent) causes as well as material causes. But what the judge was talking about, what is at the center of the creation debate, and what goes on in the public school classroom is *natural science*, i.e., physics, biology, chemistry, earth science, and astronomy. But these sciences are not like archaeology or psychology. They are not concerned with the activity of the human mind nor with human culture. *Natural science* is restricted to material causes. The term "science" in the rest of this response will generally refer to "natural science."

The Limitations of Natural Science

The natural sciences are restricted to material causes because it has been recognized that these sciences with their methods of measurement, observation, testing, and prediction are incapable of dealing with supernatural causes such as divine intelligence. Psychology can deal with human or animal intelligence because such intelligence can be observed, tested and measured in various ways. But how can we do any such thing with God? How do we measure divine providence? How can we predict when God will perform a miracle or create a universe? Natural science has no way of dealing with "miracle."

Now without question many individual natural scientists have adopted a "naturalistic" philosophy and are unashamedly anti-supernatural. They are convinced that the scientific enterprise is possible only in terms of a world that exists apart from God. Some non-Christian scientists have even mistakenly thought that because natural science does restrict itself to natural law and the natural world that there *is* nothing but natural law and the natural world. They have fallen into a scientism which assumes that science can explain everything and that science is the only road to truth. Non-Christian scientists have also commonly made anti-Christian pronouncements in the name of science. They have made such pronouncements as if *scientific* investigation had led to their conclusions. Because we often encounter individual scientists who display a "naturalistic" bias we might mistakenly assume that naturalism or anti-supernaturalism is built into science itself. Such is not the case.

Natural science is defined by a scientific community that is composed of both Christians and non-Christians. Natural science is said to be explanatory of the empirical world in terms of natural law only because the methods of natural science have limits. Natural science cannot make theological, economic, moral, or aesthetic judgments, for example. Individual scientists certainly are capable of answering questions of a theological, moral, or aesthetic nature. They can do so because they are human beings capable of operating in more than the scientific mode of thought. When, however, an individual natural scientist makes a theological or an aesthetic judgment he does not do so on the grounds of natural science. Although the individual scientist can come to religious and aesthetic conclusions as a human being, the methods of natural science are incapable of leading to religious, moral, economic, or aesthetic judgments. Conclusions about good, evil, sin, grace, providence, beauty, value, miracles, God, and love are outside the competence of science.

A geologist can stand on Glacier Point overlooking Yosemite Valley and be emotionally overwhelmed by the magnificence of the panorama. The geologist may also firmly believe that God in His providence brought Yosemite Valley into being. He or she did not, however, arrive at the conclusion that Yosemite Valley is an awe-inspiring sight through a

scientific geological investigation. Nor did our geologist arrive at the conclusion that Yosemite Valley is the work of divine providence through a scientific geological investigation. These conclusions were of an aesthetic and religious, not a scientific, nature. The science of geology cannot help us to tell whether a rock is beautiful although a geologist as human being can make such a determination. The science of geology cannot help us to discover God's providence even though the geologist as human being can make the discovery. All the science of geology can do is enable us to explain the origin and history of a rock in terms of the laws of nature operating under certain natural conditions.

Natural Science is Only One Way to Truth

The fact that the capabilities of natural science are limited in this way does not mean that there are no other legitimate ways to view the world. Natural science does not deny the legitimate existence of aesthetics, economics, and theology. Natural science simply does not view the world in the same way as these other disciplines. Natural science neither affirms nor denies that God could have miraculously created a rock or the Earth instantaneously. Natural science simply does not make that judgment because such a judgment is out of its realm of competence. Aesthetics can tell us that Yosemite Valley is beautiful, but is not competent to tell us whether Yosemite Valley was miraculously created by God or formed by glaciers. Such a limitation on the competence of aesthetics does not mean that aesthetics has an anti-God bias. Similarly science's limitations do not imply that science is defined in a "naturalistic" way.

Creation is Known by Faith not Science

The truths of creation and providence are revealed in Scripture. At least the initial creation (Genesis 1:1) was a sheer divine miracle by which God brought the world into existence. This creation is, to me, as certain, indeed more so, than any scientific conclusion. Nevertheless, the power of God displayed in the created order (Romans 1:20) is clearly seen through the eyes of faith of the regenerated Christian and is not discoverable by scientific investigation. Moreover, it is by faith and not scientific investigation that we understand that the universe was formed at God's command (Hebrews 1:3). My belief regarding the creation of the universe by God would be excluded from public school science classrooms by Judge Overton simply because it isn't a "scientific" belief as Geisler suggests. My beliefs about creation and providence are pre-scientific. So were those of Kepler, Boyle, Newton, and Maxwell. The Christian belief in creation forms the presupposition of natural science. Creation is not the conclusion of scientific inquiry. It is the basis of scientific inquiry. Belief in creation lies at the heart of the thoroughly religious, biblically-directed world-and-life view that I bring to bear on the world around me. I believe that the entire scientific enterprise would be totally impossible apart from the truth of the doctrines of creation and providence. Indeed, some religious world-view lies behind each person's conception of the very possibility of natural science. The proper, correct religious foundation of natural science cannot, however, be discovered through application of the methods of natural science. Natural science cannot explore its

own foundations scientifically. The foundations of natural science are of a religious-philosophical nature and cannot be taught as science although we may dearly wish that they would be taught and discussed in public schools.

Creation and Evolution as Origin-Science

Geisler believes that creation is no less scientific than evolution. To establish this conclusion he introduces a distinction between origin-science and operation-science. Operation-science, he says, is based on observation of recurring patterns of events in nature. Such science deals with the world as it is today. Creation is not scientific in this sense because it hasn't been observed or repeated. But, says Geisler, neither has evolution been observed or repeated and therefore it is no more operation-scientific than creation. Thus creation and evolution fall into another category of science which he calls origin-science. This kind of science deals with singularities and is like forensics in that it builds up its conclusions by inferential reconstruction from evidence. In my judgment, there can be no hard-and-fast distinction between two such kinds of science.

The recurring patterns of events that natural science seeks to observe are condition-dependent. Natural events are repeated only if the material conditions of the event are the same. Science is not content simply with observed repetitions of events. It seeks to observe repetitions of events that are connected to (caused by) repeated material conditions. Scientists are interested in the conditions as much as in the observed recurring event.

Some events can be repeated indefinitely because the original conditions can be fairly well reproduced indefinitely. Consider the reaction of specified concentrations of ammonia and hydrochloric acid at specified temperature and pressure. Such carefully controlled repetitions lead to firm conclusions, often expressible in mathematically rigorous terms.

Not all events are controllable in the same way as a chemical reaction and may be repeated only in a very loose sense. Many modern-day observable events (supposedly operation-science) like volcanic eruptions and floods recur only in a loose sense because the original material conditions vary widely. These conditions can never be reduplicated. Each eruption or flood is really a singular event relative to a chemical reaction. Geological generalities about floods and volcanic eruptions are formulated from the results of similar singularities and thus must be expressed with somewhat less mathematical rigor than laws of chemical equilibrium.

Many modern geologic events are not even observed directly. The events must be reconstructed "forensically" from the results of the events by analogy with similar effects from known, observed events.

The origin of life and evolution are somewhat like modern geologic processes. These biological events may not have been repeated because the original conditions were not exactly reproduced. Although there was no direct observation of the inferred events, the effects of those events can be observed and the events "reconstructed" by analogy with

similar effects of known, observed processes like genetic variation, mutation, and speciation. Clearly the "certainty" about evolution is less than for that of a chemical reaction. Nonetheless it is possible to reason from effect to cause by analogy with known processes and it is possible to seek to experiment with and try to reproduce original conditions.

The story with a Big-Bang creation, however, is different. Let us grant that science may well have run up against its limits in the Big Bang and can find no way to penetrate further into the past. This doesn't mean that creation becomes a *scientific* hypothesis. *Science* simply has nothing to say at this point. Creation, like the origin of life, has not been directly observed or repeated. But the difference lies in that creation, unlike evolution, was a condition-less event. Only God existed. There were no material conditions that could potentially be reconstructed to give another repetition of creation. Creation occurred not by necessity but by God's free choice. It was unconditioned. There is then no way to test the creation hypothesis, no way to try by theory or experience to duplicate the original conditions. But where there is no effort to reproduce conditions, to predict events from those conditions, and to test whether the event occurs when the conditions are met, then science is no longer being done.

Discredited Scientific Hypotheses

Let us suppose that creation really should be regarded as a valid scientific hypothesis. Does this mean that "creation-science" is science and should be given exposure in school? Geisler suggests that the Big Bang had a supernatural origin. He appeals to Jastrow in support of the contention that such a conclusion is valid scientifically. Creation-science, however, is not asking for the supernatural origin of the Big Bang. The Big Bang idea entails a universe that has been expanding for the past several billions of years. Such a thought is anathema to creation-science. Creation-science has nothing to do with Jastrow. Creation-science wants a miraculous creation, only a few thousands of years ago, in which the world was created with the appearance of age.

Dare we appeal to scientific evidence to validate the idea of supernatural creation a few thousands of years ago? The overwhelming weight of evidence argues compellingly in favor of an old Earth with a long dynamic history and not in favor of creation a few thousand years ago. The geological

community is virtually unanimous on that point. So if we did accept creation as a valid scientific idea then it would clearly fall into the category of the discredited hypothesis. The scientific evidence simply does not point to anything unusual having happened a few thousand years ago. It does not point, as does the expanding universe, to an event like a Big Bang in which the outer limits of science may be approached.

Geisler could have made a case that some aspects of "creation-science" other than creation do fall within the limits of competence of natural science. For example, the flood geology component of creation-science is scientific in the sense of being testable against the empirical world and explanatory by reference to the natural world. Flood geology, however, also has no significant observational support. It has been falsified repeatedly and is thus another discredited scientific hypothesis that has gone the way of phlogiston and sunken land bridges. On the basis of observational data the scientific community has discredited very recent creation and flood geology but has not discredited biological evolution. The question that must be answered is whether or not we should teach in public school science classes that thoroughly discredited scientific hypotheses have as much present validity as those scientific hypotheses which are still useful to the scientific community. One would hope Christians would not favor the perpetuation of disproved hypotheses.

Conclusion—Christian Education

In conclusion we can all deplore the fact that public school education presents a fragmented view of life that is afraid to explore the philosophical-religious foundations of disciplines. It is a shame that science classes would not have freedom to go outside the bounds of science by discussing aesthetic or economic questions or by exploring the foundations of science. In my judgment, the present situation cries out for a vigorous Christian education where teachers and students together can boldly and freely explore the religious foundations of natural science, where they can dare to become philosophers in the science class, and where they can give praise to God that He has endowed the universe with value, beauty, and usefulness as well as law. The beauty of the Christian school is that we need not be trapped in a sterile fragmented education which prevents the integration of knowledge and divorces natural science from its religious roots.



How Long Were The Days of Genesis?

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Since the Darwin Centennial of 1959, there has been a growing enthusiasm among Bible believers for Young Earth interpretations of creation. Prior to 1959, fundamental and conservative Bible scholars, ministers, and others commonly accepted Old Earth interpretations such as:

1. *The Castastrophism group of Theories*: Proponents of these theories have in common the belief that there were millions or billions of years between Genesis 1:1 and 1:2, that the original creation of Earth was destroyed in one or more catastrophes, and that Genesis 1:2ff describes its re-creation in six literal days.

2. *The Day-Age Theorists* assert that the "days" of the creation account were ages. "Evening and Morning" means "Beginning and End."

3. *The Alternate Day-Age Theorists* say that the "days" were twenty four hours long each, but that they were separated by vast expanses of time to allow the newly created plants and animals to multiply.

4. *The Revelation Day Theorists* interpret the "days" of creation, not as days in which God created the various things, but as days in which God spoke to Moses.

5. *The Eden Only Theorists* hold that the Earth is billions of years old, but that Genesis 1:2ff is recent and pertains to Eden only.

6. *The Relativity Theory* is difficult to explain. Essentially, its adherents teach that time and space are not absolute as we earthlings generally suppose, but are relative. "A day with the Lord is as a thousand (or more) years." At the speed of light time stands still. God is light. The days of Genesis cannot be dogmatically stated as being any particular length. From certain viewpoints the days might be said to be a few seconds in length, while from other viewpoints they might be said to be twenty four hours or many centuries or more in length.

7. *The Allegory Theorists* hold that the Genesis account is written in a style of Hebrew that is not employed in literal historical selections, such as in the bulk of the Pentateuch or

in Samuel, Kings and Chronicles. The language is a lofty, majestic form of Hebrew that strongly suggests other than a strictly literal interpretation. Allegory Theorists hold that the Creation account emphasizes that the universe and life on earth were created by God. Some proponents suggest that there is a striking parallel between the Creation account and the new birth and spiritual growth in Jesus Christ.

Since 1959, we have seen the pendulum swing rapidly and decisively towards Young Earth theories. These include:

1. *The Literal Theorists* assert that the earth and the universe were created in 4,004 B.C. in six literal days.

2. *The Extended Literal Theorists* recognize that Ussher miscalculated the date 4,004 B.C., and that the earth and the universe were evidently created at least a few thousands of years earlier.

3. *The Flood Geology Theorists* assert that the earth and the universe were created only a few thousands of years ago, but that the Genesis Flood caused practically all of the fossils and strata.

4. *The Apparent Ages Theorists* say that the Earth was created only a few thousands of years ago. Some say that the Flood gave it a false appearance of vast age. Others say that God created it with an appearance of great age to fool skeptics and to test believers. Still others say that Satan counterfeited the apparent vast age to fool believers and to keep skeptics trapped.

The new Young Earth Creationists are using aggressive techniques that are totally inappropriate in either scientific or Christian circles. These techniques include name calling, e.g., referring to Bible-believing Christians who adhere to Old Earth theories of creation as "evolutionists." Other techniques of aggression can be observed in their various meetings and elsewhere, e.g., their typical absolute refusal to discuss strengths and weaknesses of various points of view.

One serious weakness of Young Earth theories is their insistence that the Creative Days were necessarily twenty

four hours long. Their arguments include:

1. That anytime in Scripture a number precedes the word "Day" a literal day is meant. (This of course, is their own rule and is not a rule of Hebrew grammar.)

2. That the expression, evening and morning, limits the days to twenty four hours. (A review of the Scripture—e.g., Psalm 90:4–6 and elsewhere—shows that this is not necessarily true.)

3. That the relationship between the Seventh Day and honoring the Sabbath Day proves that the Creative Days were twenty four hours long. (But the emphasis in Exodus 20 is on the number seven, and not on the duration of the days. (Cf. "Sabbatical Year").

However, there are some serious problems that conservative and fundamental Christians must consider before they become rigidly committed to twenty four hour days. For example, Noah was instructed by God to put two of each of the unclean animals on the Ark. And God started the human species with two individuals. Since our God is a consistent God, such consistency would lead us to expect that God would have created two individuals of each dioecious species (that is, species with two separate sexes), and one individual of each of the asexual species. Now if the creative period were a literal calendar week, the animals would have died quickly of starvation after they eliminated the pairs of plants that God created on Day Three. Therefore, either Day Three was a long period or it was followed by a long period to allow plants to obey God's command to multiply.

Careful reading of Genesis chapters 1 and 2, would suggest that the Sixth Day was rather crowded for a mere twenty four hours. Genesis 1:24 and 25 are typically interpreted as meaning that all land animals were created on the Sixth Day. Genesis 1:26 and 27 tells us that God created the first male and female humans. Genesis 1:28 allows them to get acquainted with God in a time of fellowship, and God blessed them and instructed them to multiply and fill the Earth, to subdue the Earth, and to have dominion over the fish and birds and all animals.

In Genesis 1:29 God told the couple that He had given them the herbs and the trees for food. They evidently took time out to get familiar with the herbs and the trees as well as with the birds, fish, and land animals. And, certainly Adam and Eve took time out to get acquainted with each other that Sixth Day.

It is very hard to believe that all of these events took place within the day-light hours of a literal twenty four hour day. But, consider also that Genesis 2:4ff goes into much more detail about other events during the Sixth Day. Genesis 2:15 says that God put the man in "the Garden of Eden to dress it and keep it." So, God on this eventful Sixth Day taught Adam how to cultivate the Garden.

Genesis 2:16 tells us that God told Adam that "Of every tree in the Garden thou mayest freely eat." Adam apparently was shown many or all of the trees at that time. Otherwise, God's instructions would not have been meaningful. Genesis

2:17 tells us that God then pointed out the Tree of the Knowledge of Good and Evil, and forbade the eating of it on pain of death.

Now as hard as it is to believe that all of these preceding events could have occurred in the daylight hours on the Sixth Day, let us look at Genesis 2:19. It informs us that God formed "every beast of the field, and every fowl of the air, and brought them unto Adam to see what he would call them, and whatsoever Adam called every living creature, that was the name thereof."

Genesis 2:20 says, "And Adam gave names to all cattle, and to the fowl of the air, and to every beast of the field; but for Adam there was not found any help meet for him." So, Adam completed the naming of all birds and land animals before he met Eve. Adam obviously would not do a sloppy job in naming all the animals that God had made. How long did it take Adam to name each one—twenty minutes? Ten minutes? Let us assume that it took Adam a mere five minutes to observe and study each animal pair carefully, noting its colors, feeding behavior, territorial behavior, courtship behavior, play behavior, nesting behavior, parental behavior, and its interactions with other animals. That is a very large order, but Adam was perfect. After careful observation of each pair of birds and land animals, Adam finally succeeded in giving appropriate names to each. Naming one every five minutes, he would name twelve per hour. Assuming that he worked eight hours after all the preceding activities on that Sixth Day with no coffee breaks, no rest room breaks, and no lunchroom breaks, Adam would name ninety six in one day. Let us round it out to one hundred on that Sixth Day. There are twelve thousand species of modern mammals, to say nothing of several times that many extinct mammals. Adam would need one hundred twenty days to name all of the modern mammals and several times that to name the now extinct ones. Flood Geology enthusiasts cannot try to "sneak out the back door" and assert that Adam named only the animals of Eden. Literalists must face verses 19 and 20 that say that Adam named all the animals that God created. Of course, devout people who are accustomed to studying the Bible, "comparing Scripture with Scripture," should readily see that the literalists ignore for their own convenience such superlatives as Genesis 41:47 and Luke 2:1.

In addition to the mammals Adam also named during the same Sixth Day all the birds that God made (8,600 species), all the reptiles (5,300 species), and all the amphibians (2,500 species)—a process that would add another 164 days under the same unreal procedure suggested for mammals. If we include the extinct species, the time required would be a few times larger. Literalists usually claim that insects and other invertebrates were also created on the Sixth Day. By the same process it would require another 23 or so years to name the current species! If he named all of the now extinct species, several times that would be required.

Now, while naming all the animals that God had made, Genesis 2:20 implies that Adam spent some time during that busy Sixth Day to notice that all the animals had mates, "but for Adam there was no help meet for him." And Genesis 2:21

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describes how God caused Adam to go to sleep, and how God created Eve from his rib or side. Obviously, the pair would have wanted much time to get acquainted on that Sixth Day before retiring for the evening. And Adam would have been excited about showing Eve around the Garden, and telling her how he had succeeded in naming all of the animals that God had made.

Examination of the Fourth Day presents us with another set of problems. Genesis 1:16 indicates that God created the sun, moon, and stars. The closest star to us other than our sun is Alpha Centauri, which is four and a half light years away. Adam and Eve could have seen no stars in the heavens other than our sun for four and a half years if these are literal solar days. With each succeeding decade the light from a few more stars would finally reach Earth. After about half a century, Polaris, the North Star, would appear. But Genesis 1:18 is very clear that the stars were to "rule over the night," while Genesis 1:14 says that they were to "be for signs and for seasons, and for days, and for years." God's purpose for stars simply does not fit easily with the notion that the creative days were only twenty four hours long.

In addition, remember that many stars are millions of light years away from Earth while many others are billions of light years away. Unless we recognize that their light has been traveling for millions or billions of years to Earth, we are forced into a serious problem. Some revert to the Apparent Age interpretation, and actually claim that God created the light already on the way, thus giving the false appearance of vast age! In the first place this is not necessary for an Eternal God. In the second place this Apparent Age theory forces God to lie.

Apparent Age theorists often counter with questioning us about "how old did Adam and Eve appear to be when they were created?" But that is an altogether different matter. If

they had been created as helpless zygotes, fetuses, babies, or children, they would have died. It was essential for our first parents to have been created in the young adult stage. It would be folly as well as totally unnecessary and a lie for stars to have been created with light already on the way. The God of the Bible is a Holy and non-deceptive God. He does not lie in word or in action.

Another point must be considered—Genesis 2:10–14 describes four large rivers in existence in Eden prior to all of those events of the Sixth Day. These large rivers could not come from a mere mist that occurred once (Genesis 2:6). Rivers come from melted snows and rains. They also come from underground springs. However, underground springs come from melted snows and rains. Four large rivers in Eden that went over "the whole land of Ethiopia" (Genesis 2:13), to Assyria (Genesis 2:14) and including the Euphrates (Genesis 2:14) would have required rains, rains, and more rains over an extended period of time. There would not have been adequate time between the Third and Fifth Days, if those were solar days, for such huge river systems to have formed.

Finally, Genesis 2:4 reads, "These are the generations of the heavens and of the Earth when they were created, in the day that the Lord God made the earth and the heavens." The use of the word, day, here in the Genesis account is one of the many times that "day" does not mean a twenty four hour period. Other examples are "day of Abraham" and "The day of the Lord." The word, generation, in Scripture always refers to an expanse of time, never to a mere week of solar days. But, it is interesting that the plural form, generations, is used, indicating even much more time for the so-called creative week.

These are but a few of the many reasons that I believe that we fundamentalists and conservatives must believe that those Creative days were vast periods of time.

TROPICAL MEDICINE: IS THERE A MORAL IMPERATIVE?

Consider the following case history. An African Country, the year 1974. It had a per capita income of \$62, an infant mortality rate of 20 per cent, and a life expectancy of thirty years. Every man, woman, and child in the population had malaria, 40 per cent had tuberculosis (one out of four with active cases, spitting blood), 25 per cent suffered from river blindness (onchocerciasis), 3 per cent had leprosy, and 50 per cent of the children under five died. The national health budget came to less than one dollar per capita. The average health budget for all countries in Africa reporting was U.S. \$1.17 per capita. This is the quality of health and life, differing only in detail, endured by 500 million people in developing nations.

Compare this case with that of the United States, which allocates more than \$500 per capita on health. Ironically, perhaps 60 per cent of health care funds are spent on people who will be dead within one year.

Bloom, B. R., "Health Research and Developing Nations: Ethical Issues in International Health." *Hastings Center Report*, December 1976

A Christian Critique of Development Perspectives: Modernization and Dependency

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Two major competing theoretical models of national development in the third world, "modernization" and "dependency," have become prominent during the last several decades. The modernization model is rooted in the growth experiences of Western nations: it is assumed that development will occur in nations as they progress through stages of growth, beginning, in a "traditional society" and arriving at a final stage of high-mass consumption. Third world nations are expected to pass through these stages as technology, skills, and "achievement" attitudes are transferred from the industrialized nations to the lesser-developed ones via development aid and foreign investment. The dependency perspective, on the other hand, involves some sort of commitment to Marxist assumptions: here it is maintained that the industrialized countries of the West have enriched themselves at the expense of the third world nations first through colonial exploitation and later through capitalism and imperialism. In this case exploitative relations must be broken in order for true development to occur in the lesser-developed countries.

In both cases development is considered to be a transforming process in which nations build better societies through economic and social changes that change individuals and social structures. This paper will present a critique of these models in light of a Christian view of transformation and in terms of how these models compare to actual experiences of development and underdevelopment in the third world. Related themes discussed are the social consequences of the use of technology and ideology on human lives, the difficulties of using these models as predictors of better social orders where human suffering is reduced, and the effects of sin on man's ability to understand the magnitude of human needs in so many different cultural situations. The paper concludes with some comments on the need for Christians working in development to be better influences in the discipline.

Introduction

During the past twenty-five years leaders the world over have been concerned about reducing the tremendous social and economic inequalities which exist between nations. The term "development" has been used to refer to the transformations which must occur in the lives of individuals and societies in order to improve the human quality of life. In relation to Europe and North America, the third world nations are considered to be "underdeveloped." Transformation, then, has a lot to do with the vision for a better social order.

Alejandro Portes (1976), a Latin American sociologist, indicates that there are objectives which are common to all national development processes but which are emphasized to different degrees: economically, the gross national product should increase with a concomitant emergence of local decision-making; socially, there should ultimately be a more

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equitable distribution of income and public access to better housing, nutrition, education, and political participation; and culturally, a new national image should emerge which blends local traditions with a future societal vision without feelings of subordination to external hegemony. These are considered to be pre-requisites for more aesthetic objectives reflected in the philosophy of the New International Economic Order (NIEO): restoration of human dignity and achievement of peace among all peoples and nations. However, the vulnerability of the third world societies to rapid technological change, market fluctuations, and superpower rivalry in the world system compound the difficulties of the transformation process for these countries.

Social scientists have derived theoretical models in an attempt to evaluate the extent to which nations have achieved societal transformations that have liberated humans from oppression and want. The purpose of this paper is to evaluate two major competing theoretical models from a Christian viewpoint: modernization and dependency. The former tends to portray development as an emulation of the capitalistic growth experiences of Europe and North America that have produced modern consumer societies. The second involves some sort of commitment to Marxist assumptions and examines the negative effects of capitalist development on the poorer countries from a third world perspective; a more modern society is desired, but it is believed that a socialist alternative will bring it more in line with local needs. These models have emerged as a result of research and study of development processes in many countries, especially those in the third world.

A Christian View of Transformation

Recently, however, persons in development have questioned the utility of these models for evaluating the tremendous human needs expressed in so many cultural situations (Illich, 1969; Portes, 1976). Both models make judgements about what a future ideal society should be, but the basis for it in each case rests, fundamentally, upon material pre-requisites in the process of history. A Christian evaluation is in order because only Biblical themes can reveal the types of transformation necessary which must deal with the root of human depravity that goes deeper than solely material needs (Bragg, 1983). This is necessary for man to be fully liberated and truly human for freedom and dignity to have meaning.

The depraved condition is a result of man's attempt to live autonomously in the universe apart from his sovereign Creator. As a result, his ability to consistently form meaningful human relationships among the diversity of cultures in the world is warped, and this includes his ability to discern the effects of technology use upon his neighbor and the proper use of politics.

From a Biblical point of view true transformation is effected in individuals and society by God who is external to the process of history; this promotes constructive change. Christians, too, have a vision of a better society (Lyon, 1980) which is also a promise: a new heaven and a new earth composed of transformed people from different cultural and historical situations (Rev 19:1; 22:1-21).¹ The promise is based on Christ's overcoming of evil in all its cosmic dimensions by His death on the Cross and bodily resurrection. His compassion for the entire human race—including His enemies—was victoriously displayed at a time that seemed, from the point of view of the world, to be one of defeat and despair. The centrality of the Cross reminds one that total human liberation is spiritual as well as material and is the work of a sovereign Creator (Knapp, 1979). It exceeds the power of human-made models to accurately predict the ushering in of a better social order.

This allows one to see that God is at work transforming the lives of individuals and social structures (Samuel and Sugden, 1981) in history toward the arrival of the new order. However, its ultimate arrival will not be exhausted solely by historical processes (Costas, 1982); it will be accomplished by a supernatural act of God. Nevertheless, man plays a role in the working toward this new order now (albeit imperfectly). On one level this involves the special grace of conversion whereby an individual's coming to Christ not only assures him of being an heir in the new order, but it also gives him the power to empathetically relate to the needs of his neighbors in different cultural contexts in the present; and this includes having a different outlook on the proper use of the world's goods (e.g., technology) and a sensitivity for its effects upon others.

Then there is the means by which God works toward this new order in a more common manner in social structures and individuals inside and outside the Christian community. For example, a whole nation may change its ways as did Israel



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when it reinstituted proper worship in Jerusalem after Babylonian captivity (Neh 9:1–38; 10:29–39). With God's Word as an ethical foundation positive structural change occurred, social exploitation was arrested, just political rule was re-established, and a sense of dignity was restored. When Joseph was governor in Egypt, he had the ethics and wisdom from God to implement economic policies in a pagan nation and thereby save its people from severe famine. This included

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God's people, the Jews, and the Egyptians. The key to proper transformation (from a Christian point of view) is a dynamic and on-going relationship between man and his Creator and with his fellow-man. Man plays a responsible role in the transformation process which includes social, political, and economic development, but God is to be personally acknowledged as the source of change.

Modernization and Dependency

After World War II third world nations, many of whom were emerging from colonialism, looked to the Western democracies and the socialist bloc as references for their own development. At the same time the success with which the Marshall Plan had facilitated quick economic recovery in Europe encouraged the United States to allocate resources to overseas development programs in hopes of inducing strong patterns of growth in the third world; it was hoped that this would transform these "backward" nations into modern pluralistic societies and contain the spread of communism. Other third world nations opted for more socialistic courses of transformation and today serve as a source of inspiration for dependency proponents.

A. The Modernization Model

The modernization model adhered to in its various forms by national leaders and development planners has its philosophical roots in the Western evolutionary tradition of social Darwinism: society, like a biological organism, gradually evolves from a simple to a complex state. This thinking emerged during the last century in the wake of the Enlightenment. Human reason combined with industrial progress created tremendous societal transformations and new wealth. However, it was accomplished at the cost of much human suffering as evidenced by the grim conditions for workers.

Supernatural views on life became marginalized, and God, in the minds of humans, became de-centered as the source of transformation (Schaeffer, 1968). The crowning achievements of European and North American geo-political power were reflected in an uneasy mixture of colonialism and a benevolent (though condescending) "civilizing mission" to non-Caucasian peoples. This legitimized the capitalistic development experience as being the universal standard for all societies. It served as a forerunner to many of today's development strategies in third world countries. In fact, the use of the terms, "underdeveloped" and "developed" to characterize third world and industrialized nations respectively is often an indication of evolutionist thinking.

An assumption of the modernization model is that underdevelopment is equivalent to backwardness and is a starting point for all countries. At the societal level this is exemplified by Walter W. Rostow (1961) who uses the development experiences of Europe and North America as the prime reference points for his five stages-of-growth model. Accordingly, any society begins in a traditional agrarian or pre-Newtonian stage in which entrepreneurship and technological innovation are virtually non-existent. The next three stages are the pre-conditioning for take-off, the take-off, and the drive to maturity; during these periods progressive leaders emerge and make investments in agriculture, factories, and transportation. This occurs over many decades or for a century or more. Meanwhile, the agricultural population decreases and there is a convergence of available skilled labor and more technological innovations which are pushing the society into sustained development. The traditional sectors of society become transformed and made part of an integrated modern order as new ideas diffuse outward to these sectors. The last stage is one of high mass-consumption and is considered to be the most desirable. It is characterized by the corporate welfare state which should provide equitably for all social groups with minimal conflict.

At the level of the individual, a person's values and nature are supposedly transformed as society evolves through these stages. Modern man is defined in contradistinction to what is traditional: urban as opposed to agrarian; secular in contrast to religious and fatalistic; desiring modern media rather than ritual; individualistic as opposed to collectivistic; and appreciating pluralistic democracy and factory organization rather than an autocratic caste system (Inkeles and Smith, 1974; Kahl, 1974). Modern persons are also expected to have strong individual desires to achieve similar to those found in the cultures of Western Protestant countries (McClelland, 1961) and an empathetic attitude toward change which allows them to acquire new social roles (Lerner, 1958).

Such persons in the third world are often designated as "change agents" through whom new ideas are transmitted to so-called "tradition-bound" people. In many agricultural programs, for example, it is assumed that rural peasants will adopt externally-introduced modern farming techniques when it is demonstrated that they can increase their yields and incomes as well as their knowledge. Consequently, as they abandon counter-productive cultural and superstitious practices, inequalities between rural and urban areas should decrease; in a like manner as similar changes take place

simultaneously throughout societies of lesser-developed nations, inequalities between these and the more developed nations should be reduced. Practically speaking, this philosophy of change has been embodied in the agricultural development programs of the U. S. Agency for International Development (USAID) which have been patterned after the experience of modernized agriculture in the United States (Rogers, 1962).

The modernization model assumes that the burden of change rests on the third world nations themselves with little or no cost to the more industrialized countries. Furthermore, there is the belief that all change is unilinear and that progress is inevitable; an innate goodness in man should arise in the context of an a priori historical process of growth and technological breakthroughs. This should transform man so that he will act responsibly in the use of technology toward his neighbor. The achievement and role-playing attitudes are essentially self-centered.

While the development experiences associated with this model have benefitted some groups of people in third world countries, proponents of dependency rightly point out that it ignores inequalities that have resulted from them.

B. The Dependency Model

By the mid-1960's it was becoming quite clear to many social scientists in lesser-developed nations that several decades of aid and investment from the Western nations were not really transforming these countries into modern replicas of the United States or Europe. Rather, inequalities between nations had increased directly with efforts to modernize in accordance with the Western development experience. This gave birth to the dependency perspective.

Borrowing from Marxist theory, dependency proponents have argued that there are structural inequalities in the world capitalist system (Wallerstein, 1974) that has penetrated the third world since the early 16th century when European nations first plundered Latin America, Africa, and Asia for precious metals, spices, and slaves; inequitable bartering arrangements imposed upon local societies by Europeans eroded their social organization and paved the way for direct colonial rule; exploitation has intensified in the 20th century because each country is dependent upon earnings from the export of one or a few agricultural commodities, minerals, or petroleum, the operations of which are controlled by foreign corporations under the label of "free trade." (Chilcote and Edelstein, 1974). According to dialectical logic, the historical presence of capitalism has caused many third world countries to remain stagnant in a "pre-capitalist" phase (Quijano, 1982). Underdeveloped nations are really "peripheral" regions containing reserves of cheap labor and raw materials which are drained away for the development of the "core" countries in Europe and North America (Amin, 1977). Thus, the development of the Western nations takes place at the expense of underdevelopment of the third world (Frank, 1969).

Profits not repatriated out of these countries are reinvested in local industry that is capital-intensive and absorbs a small

percentage of local labor or rural infrastructure that helps only the larger farmers. The elite classes benefitting from this development are often associated with politically repressive right-wing regimes which have the backing of the U.S. military or former colonial power (Cardozo and Faletto 1979; Evans and Timberlake, 1980; and Gedicks, 1977). Overseas development programs are seen as merely reinforcing this status quo.

An illustration of this is the diffusion of modern farm technology to "progressive" farmers. Such farmers often have the income and material requirements (e.g., large land-holdings) to take advantage of new innovations (Havens and Flinn, 1976). This causes the prices of crops to drop due to increased supplies; land-holdings increase in size with each new round of profit generated (Brown, 1981), and poorer

The distorted views of history presented in each of the models relate to a false concept about the source of transformation, namely that it resides in the material order of things whose movement is conditioned by historical laws that exist independently in the universe.

farmers who cannot adapt must migrate to look for unskilled wage labor. Many of the crops produced are not consumed locally but are for the upper-middle class consumers in the richer countries. In this manner foreign aid programs increase inequalities between countries and among social classes within countries because of built-in value biases against the poor.

Dependency proponents also argue that a break with the world capitalist system and the undertaking of some sort of a socialist solution will bring about the transformations that are necessary for creating a more humane society in which a "new man" will emerge who is freed from selfishness. While the dependency model yields helpful insights as to the exploitative nature of capitalism in many lesser-developed countries, it is flawed, like the modernization model, in a number of ways: dependency and capitalism have not always produced underdevelopment in the third world; dependency is not always caused by Western nations or by capitalism; and a socialist solution no more guarantees the ushering in of a society that is more humane than does Rostow's stages-of-growth model.

Critique of Modernization and Dependency

In the evaluation of the effectiveness of each model important questions need to be asked. Do the experiences of development and underdevelopment in different cultural and historical situations bear out the predictions of these

models and bring in a social order where man is truly liberated and all his needs are met? And then how do the models approximate (imperfectly, of course) Biblical criteria for a society in which human suffering is reduced, leaders rule justly, and there is neighborly consideration in the use of technology? These issues are touched on below.

A. Comparison of Models with Experience of Development and Underdevelopment

Some would assert that the modernization model fits the development experiences of South Korea and Taiwan because these have exhibited the neo-classical transformation patterns similar to those of the Western countries: agriculture has become modernized in both nations; local industries have absorbed people leaving agriculture; each nation has had an availability of indigenous skilled labor; and growth with social equity has occurred, particularly in Taiwan (Barrett and Whyte, 1982; Sedjo, 1976; and Westphal, 1982). However, a closer look indicates that this is actually due to favorable historical circumstances in these countries, circumstances neither experienced by Western nations nor by most countries in the third world: legacies of sound rural infrastructure left by Japanese colonial rule; the ability of local industries to compete side-by-side with foreign capital; and commitments to strong economies by national leaders who felt threatened by communist neighbors (Barrett and Whyte, 1982; Westphal, 1982). Development has occurred so fast that the stages in Rostow's growth model would so grossly overlap as to render its application meaningless.

Although both countries are far more desirable places to live in than either of their communist neighbors, the modern man of South Korea and Taiwan hardly reflects the restored human image that is promised in Scripture. South Korea's nationalistic vision has been tied to a series of right-wing political regimes which have repressed freedoms—even of its students abroad in foreign universities. While many of the farmers have benefitted materially from land reform and new technology, they have had little opportunity to express their opinions in the government-initiated cooperatives which are supposed to be for their benefit (Kihl and Bark, 1981). In Taiwan, growth has occurred so rapidly that a strong materialistic orientation has overshadowed ethical issues among youth: in one study, for example, 78 per cent of the people interviewed maintained that there were no right or wrong ways to earn money, only easy and hard ways; and that it is legitimate to use others for the sake of one's own career (Li, 1983).

The dependency model seems to challenge the inapplicability of the modernization model in much of Latin America and Africa by focusing on the negative effects of capitalism. In the West African Republic of Senegal, the government merely uses the weak rural infrastructure inherited from French colonial rule to promote "progressive" farming and better health practices. This has produced a new elite class of peasants in religious brotherhoods while the condition of the average peasant has worsened with drought and inflation (Amin, 1977). Senegal is more dependent than ever on France for the sale of its one export crop, groundnuts, which the latter purchases at a price above that of the world market.

Dakar, its capital, is an urban enclave composed of government offices, service industries, and foreign banks which mostly serve the needs of a bloated civil service and an international clientele (Cruise O'Brien, 1979).

In Colombia a similar situation exists where large-scale coffee production for export has required large amounts of imported equipment. While these larger farmers have benefitted from new technology and credit services, land reform

Under both of these models lies the common assumption that man is alone in the universe, and that he works out his destiny in accordance with these historical laws.

and the needs of the small-holder farmer have been neglected so that production of basic cereal crops has been stifled. Many peasants are forced to find low-paying off-farm work (Fernandez, 1979).

However, dependency and capitalism do not always produce negative consequences in the third world, as the cases of Taiwan and South Korea demonstrate. Moreover, the emergence of the OPEC cartel indicates that the richer third world countries are not above coercing energy-poor countries like Chad or Niger or are not capable of affecting the economies of the oil-dependent Western nations.

Then there are the limitations of Marxist categories for analyzing development and underdevelopment. Poverty-stricken areas of the third world are labelled "pre-capitalist" while the urban centers are called "imperialist" in order to conceptualize the very real inequalities that afflict the lesser-developed nations. But, according to Marxian dialectics, this terminology necessarily "justifies" the existence of a class struggle in order to make credible the inevitability of a socialist solution for development. Certain economic and social policies inevitably follow in accordance with an inflexible ideology, but these do not produce the better society or the "new man" hoped for. In the Republic of Guinea, for example, President Sékou Touré sought to abolish capitalism in an attempt to wipe out all types of exploitative relations among human beings. The result was that with the entrepreneurs abolished and the economy completely nationalized the black market generated more revenue than the "official" economy; astronomical inflation made the cost of basic necessities like rice and onions in the local markets prohibitively expensive for the average citizen. The blame, however, was deflected to "counterrevolutionary" sabotage in the national system (Adamolekun, 1976).

Like the Rostowian model, Marxist categories are symbolic abstractions whose logic is mostly rhetorical (Kirk, 1976); because their basis is solely a material one, they are not adequate for understanding the ways many people suffer in

situations of underdevelopment. In socialist Cuba the poorer segments of society, particularly people in rural areas, who suffered the most before the Revolution undoubtedly have benefitted from the guaranteed health and housing facilities that the government provides. What is seldom mentioned is that the "fraternal arrangement" Cuba has with the Soviet Union is necessary for obtaining the imports in order to meet the objectives of egalitarianism under Marxist-Leninism. This is another form of dependence which, when combined with absolutized ideological guidelines, leads to total state control over all aspects of society. This makes it difficult for Cuba to provide anything for her people beyond basic material needs. (Halprin, 1981).

When combined with Marxist solutions by underdevelopment, dependency locates the source of all ills in capitalism and, by close association, in the politics (past and present) of the Western countries. Paradoxically, the ideological commitment to egalitarianism is so strong that an elite-led totalitarian government is necessary to fulfill the socialist dream at a tremendous cost of human freedom and creativity (Kirk, 1976).

B. A Christian Critique

While each model provides valuable insights into the phenomena of development and underdevelopment, neither can fulfill its claims to bring in a new social order where humans do not mistreat each other. Both models present distorted views of the historical processes of change.

Modernization pronounces comparative judgements on the quality of all cultures from the terminus of four centuries of economic, social, and political development in Europe. To the extent that other cultures do not replicate these same patterns they are blamed as being backward or underdeveloped. Western modernization is treated as a strand of history autonomous from the rest of the world.

On the other hand, Christians should know that all cultures are part of God's creation; and He is dynamically involved in weaving aspects of them together toward His final objective. Europe could have never developed her technology without the rich contributions from Arabic cultures, trade with the Far East, and contact with the Sudanic kingdoms of sub-Saharan Africa. Even Israel which was God's own chosen nation developed her culture in the context of powerful Near Eastern empires like Egypt and Assyria. God sent Jonah (who went reluctantly!) to preach the Good News to the Ninevites. God did not forget about these peoples but prepared a place for them in His ultimate redemption plan whereby they would partake, along with Israel, in providing a "blessing in the midst of the earth" (Is 19:21-25).

The dependency model presents a view of injustice merely from the perspective of the third world. Leaders in lesser-developed countries who find it convenient to exonerate themselves and their societies from the responsibilities in their own development processes by attributing all difficulties to the colonial past or to "neo-colonialism" distort justice; and it affects the well-being of their own people as well. There is no assurance that oppressed societies will act any more justly

than their former oppressors. The northern kingdom of Israel under King Jeroboam lived in great material prosperity while imposing heavy rent and taxes on the poor. Yet these Israelites, along with the rest of the Hebrew groups, had at one time been an oppressed minority in Egypt (Amos 5:10, 11; 8:4-14). Moreover, when dependency is integrated with Marxist categories of analysis, it taps into a world-view which, like capitalism, is a product of the European Enlightenment (Lyon, 1979).

The distorted views of history presented in each of the models relate to a false concept about the source of transformation, namely that it resides in the material order of things whose movement is conditioned by historical laws that exist independently in the universe. This applies to the modernization model which claims to produce a modern consumerist man. It also applies to the dependency model which predicts inevitable negative consequences of capitalism and endorses socialism as being capable of creating a new human being devoid of selfishness. Under both of these models lies the common assumption that man is alone in the universe, and that he works out his destiny in accordance with these historical laws. From a Christian point of view, however, only God stands above history and is the source of transformation whereas humans are culturally and historically bound in space and time.

The false assumptions concerning human autonomy are a manifestation of man's sinful fallen condition. This reflects his depravity. He demonstrates his rebellion against God when he casts any historical experience as it may have occurred for any one society into an abstract model to serve as an ultimate standard for a better social order. The logical result of this is that ethnocentricity and self-righteousness consistently hobble man's ability to truly perceive the needs of his fellow-man in different concrete situations. For example, in the early 1960's deep-bore tube wells, funded with American money, were sunk in the West African Sahel without full consideration of nomadic transhumance patterns or local customs regarding water-use rights. This aggravated the already deteriorating ecological conditions being caused by drought which took the lives of many innocent people (Sheets and Morris, 1976). Or some leaders in third world countries who follow the logical course of the dependency model disassociate themselves so completely from the colonial legacy or the world system that they forfeit any positive attributes thereof: schools, hospitals, and factories deteriorate because no attempt is made to train local people to operate them; and foreign technicians are not welcome unless they share the "correct" ideological views of the country's leaders. A false sense of human dignity is achieved because the cost is often autarky, the stifling of human creativity, and political oppression.

Is there an alternative solution along Christian lines? A "Christian model" of development would be inappropriate because, being designed by fallen creatures, it would suffer flaws as does any other model. While rejecting the assumptions of modernization and dependency, one must still learn from the actual experiences, both positive and negative, which led to their conception. In order to avoid selling oneself out to either model, a better way should be sought. Portes (1976), provides a clue when he maintains that national

development efforts need a guiding ethic for transformation. The Christian knows that such an ethic must go beyond mere worldly means for creating an improved society (Knapp, 1979). God has broken into history at various times to provide man with ethical directives concerning the management of the creation, and this includes neighborly relations. This is evidenced by the giving of the ten commandments at Mount Sinai and Jesus' Sermon on the Mount. The Christian who is working as a development program planner in an international organization or who is a researcher specializing in third world issues has God's Word and His Spirit to ethically discern the true needs of people in different cultural situations and to empathize with them (Samuel and Sugden, 1981). He or she will be able to spot ethnocentric biases in programs which increase class differences or ignore traditional cultural patterns which could otherwise be integrated with new ideas (Portes, 1976) or which endorse worldly utopias. By focusing on the centrality of the Cross, we know that God is working at different levels of transformation toward a promised end result. But when God no longer serves as the main reference point for transformation, some relativistic ideology or historical experience is introduced as a false pro forma for change; but it cannot provide true human understanding and vision (Is 1:3, Prov 29:18).

For those who are working in missions and Christian service organizations there are a variety of opinions as to how to design outreach programs in the third world. Determining the proper combinations of evangelism, political involvement, technical assistance or provision of relief is a sensitive issue and goes beyond the scope of this paper. However, Christians involved in development can influence, directly and indirectly, the policies of international agencies and national planning ministries to bring about social, economic, and political transformations in their societies which will approximate God's criteria: "... to loosen the bonds of the yoke, and to let the oppressed go free, ... to divide ... bread with the hungry and bring the homeless poor into the house; ... Then your light will break out like the dawn and your recovery will speedily spring forth; ..." (Is 58:6-8).

¹ Scriptural references in this paper are from the New American Standard Bible.

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Orthodoxy and the Challenge of Positivist Biology

A Review Essay of

Neal C. Gillespie, *Charles Darwin and the Problem of Creation* (Chicago: University of Chicago Press, 1979), xiii + 156 pp., with notes and bibliography.

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In the last several years significant work has been done on the history of the development of Darwinism which enables us to gain a deeper insight into the complexity of the issues involved in the Christian community's response to it. Since its publication in 1979, James Moore's *The Post-Darwinian Controversies* has received extensive attention and high praise for its novel thesis that the orthodox theology of several prominent natural scientists enabled them to accommodate Darwinian natural selection with minimal dissonance. By all accounts this is a major work which will shape research in this area for years to come. However, in the wake of all the attention lavished on Moore's work, insufficient attention has been given to an equally provocative work of the same year, Neal Gillespie's *Charles Darwin and the Problem of Creation*, which challenges Moore's thesis at several crucial points.

Working within a framework suggested by Thomas Kuhn and Michel Foucault, Gillespie places the Darwinian theory of transmutation within the larger context of the struggle of an emerging Positivist paradigm of science to vindicate its claim to be the only worthy 'science' against the dominant theologically-based Creationist paradigm of science in the mid-nineteenth century. In tracing this struggle, Gillespie is able to weave other significant themes—the communal character of science, the warfare of 'science' and 'religion,' the impact of Positivism on Christianity, the dilemma Positivism posed for Christian natural scientists, the shape of Darwin's religious beliefs—into a lucid and compelling argument.

If Gillespie's argument holds, as I believe it does, it forces us to critically re-evaluate not only Moore's thesis, but, most importantly, the interpretation which evangelicals have generally followed in their histories of the rise of modern science and the Christian response to it. For this reason all those interested in the development of both Secular and Christian philosophies of science should pay close attention to Gillespie's work.

The Clash Between Creationism and Positivism

Ever since John William Draper and Andrew Dickenson White wrote their influential books in the late nineteenth century,² it has become commonplace to interpret the debate over evolution as but one more battle in the age-old warfare between the forces of enlightened 'science' and reactionary 'religion.' Although this thesis has been subject to minor criticisms, very few of the critics have challenged the very categories of "science" and "religion" to understand the issue. Evangelical historians of science have generally followed this tradition, arguing either that there was no warfare after all, or, even if there was, there need not have been.

Gillespie breaks new ground in this tired discussion by arguing that "science" and "religion" are simply the wrong categories with which to capture the underlying dynamic. There was a real conflict, he asserts, but it can best be understood "when it is seen, not simply as a clash between science and religion, but as one between two antagonistic

scientific epistemes. . . ." (p. 18), each struggling for the exclusive right to be called the only 'science.'

Approaching the conflict from this perspective allows Gillespie to probe the numerous theological references and overtones in *The Origin of Species* for a deeper understanding of the complex philosophical battles surrounding its appearance. In the past many scholars, wishing to portray Darwin as the first fully modern scientist, have brushed aside these references as at best Darwin's diplomatic effort not to offend the still-powerful orthodox establishment. Gillespie, however, argues that these references show Darwin, possibly the last pre-modern scientist, struggling to free himself from the constraints of the older, but still very influential, Creationist paradigm of science³ as he worked toward formulating a comprehensive alternative Positivist paradigm of biology and a theory of speciation which it required. Darwin was not alone in this struggle; virtually every natural scientist in the mid-nineteenth century was involved in it. *The Origin* can, therefore, best be interpreted as a watershed document of the paradigm conflict between Creationism and Positivism over what should count as 'good science.'

Creationism was the dominant philosophy of science in the early nineteenth century and had been since its rise in the late seventeenth century. It was essentially characterized by an inseparable union and presumed harmony between 'good science' (viz. a mixture of the Newtonian vision of the universe as a law-bound system of matter in uniform motion and the Baconian ideal of inductive factual certainty) and 'good theology' (viz. all phenomena in and including the world were the result of either the direct or indirect 'divine' activity; biblical revelation and biblical thought patterns could provide a solid epistemological foundation for 'scientific' inquiry; there was unmistakable evidence for intelligent 'design' in the world; the origin, dispersion, and extinction of species were best explained as a consequence of God's will.)

Within the parameters of these broadly-held assumptions, Gillespie distinguishes two main sub-groups prior to 1859, Miraculous Creationists and Nomothetic Creationists. (He adds two further sub-groups, Providential Evolutionists and Providential Darwinists, which appeared after the publication of *The Origin*. We will discuss them more fully below.) The Miraculous Creationists (e.g. Hitchcock, Miller, Sedgwick, Agassiz) argued for a direct fiat creation of the world and of species which transcended known or knowable means. 'Creation' for them was known only in the realm of 'theology' where it could only be defined as 'miraculous.' It was thus shrouded in mystery and, therefore, inaccessible to 'scientific' inquiry. The Nomothetic Creationists (e.g. Owen, Herschel, Dana), on the other hand, rejected this emphasis on 'miracle,' seeing it as capricious and, therefore, detrimental to 'scientific' study. They argued instead that God created the world and accomplished his will in the world by 'lawful' means. This meant that 'creation' of species fell within the purview of 'science' since it was 'lawful.'

Positivism, part of the over-all secularization of thought in the nineteenth century, was an emerging rival philosophy of science which attacked Creationist premises at two critical

points: the epistemic role of theological categories of thought in 'good science' and the limited scope of 'scientific' inquiry in understanding the world. The hallmark of Positivism was the effort to establish complete epistemological autonomy for a 'scientific', as opposed to a 'theological', understanding of the world. This meant that it had to free the theories and language of 'science' from their bondage to theology, the "God hypothesis," and all other biblical patterns of thought. 'Science', according to the Positivist redefinition, had to be free from all external restrictions in its comprehensive understanding of the world. It, therefore, dealt with 'nature' as a law-bound system of matter in uniform motion which was 'scientifically' explained in terms of mechanistic causal links. It had to reject as 'unscientific' and capricious the introduction of any telic purpose, guiding Intelligence, or 'supernatural' (i.e. miraculous) causation as epistemic foundations for 'good science.' In keeping with this new definition of 'science', Positivism extended the range of issues which fell within its realm to include issues which formerly had been reserved for theology and metaphysics. This was especially true for the issues of 'creation' and 'speciation' which now required some form of transmutation theory, of which there were many alternatives before and after Darwin, to satisfy the Positivist criteria for 'good science.'

It is particularly important to bear in mind that the Positivists successfully convinced the scientific community that God's relationship to the world could only be capricious and inscrutable; therefore, any appeal to it was 'unscientific'. The opposite of the capricious and inscrutable 'intervention' of God was the constant, uniform, and stable operation of 'law'. They thus drove a wedge between 'God' and 'law'.⁴ This made the Nomothetic position inherently ambiguous and unstable, according to Gillespie, since it was philosophically committed to Positivism yet shrunk back from its logical exclusion of 'God' as an epistemic foundation for their 'science'.

These were the two principle paradigms of 'science' that confronted all natural scientists in their quest for an understanding of the world in general and speciation in particular in the years prior to 1859. Although the spirit and direction of these two paradigms can be clearly delineated, individual scientists, as Gillespie shows, did not fall neatly into one group or the other. During this confusing period of transition, natural scientists held a complex and inconsistent amalgam of assumptions drawn from both paradigms which created much philosophical confusion and a tangled web of unresolved questions. The issues were so confusing that Gillespie is able to identify four different meanings of 'creation' and at least five different views on the origin of species, each representing different combinations of Creationist and Positivist assumptions, prior to 1859.

By 1859 Creationism, though increasingly criticized, was still the dominant paradigm of 'good science.' Positivism was gaining strength, but had not yet fully developed the implications of its assumptions into a comprehensive philosophy of science and biology so that it could permanently replace Creationism as the new 'scientific' orthodoxy. That task was completed by Darwin in *The Origin of Species*.

Darwin's Positivist Critique of Creationism

As early as the Sketch of 1842 Darwin had become convinced that the principle roadblock to a breakthrough in understanding speciation was the lingering influence of the Creationist paradigm, especially its appeal to inscrutable supernatural explanations, nescience, and idealism. He therefore set himself the task in *The Origin* of thoroughly discrediting Creationism as 'bad science' and banishing it once and for all from meddling with 'scientific' issues, and replacing it with a Positivist philosophy of biology, along with its requisite theory of speciation. Darwin clearly recognized, according to Gillespie, that "a complete shift from special creation to descent with modification, from mystery and miracle to secondary causes" was absolutely mandatory. "The conceptions of the new positive biology were so philosophically interrelated that no compromise with the old view was possible." (pp. 70-71) He simply could not tolerate a rival paradigm of 'science'. Creationism had to be driven out of the scientific community. Stating Darwin's purpose in these strong terms is meant to emphasize the direction in which his thought was moving. Gillespie is careful to point out that, although Darwin was clearly moving in this direction, his arguments in *The Origin* were ambiguous and inconsistent due to the lingering influence of the Creationist paradigm on his thought.

The popular view of Darwin is of a scientist, eschewing the trappings of theory, patiently collecting a mountain of diverse 'facts' which, when finally presented in *The Origin*, offered irrefutable 'proof' of modification by descent through natural selection. Of course, he did nothing of the sort, as even he recognized. Gillespie, along with several other recent Darwin scholars,⁵ points out that Darwin was very conscious of the importance of a Positivist philosophical foundation on which to build his transmutation theory. In fact, Gillespie argues that "when Darwin began to consider the problem of species extinction, succession and divergence, he did so as an evolutionist because he had first become a positivist, and only later did he find the theory to validate his conviction" (p. 46). Darwin thus wrote *The Origin* as a "manifesto for positive science" and an attack on its rival, Creationism.⁶

Creationism was 'bad science' in the first place, according to Darwin, because it blocked inquiry into the physical 'laws' giving rise to species by its constant appeal to direct or

indirect 'divine' intervention which were either unknown or unknowable. This kind of explanation, he argued, would render 'science' impossible. A consistent 'science' must allow inquiry into the 'secondary' means of origin and extinction which the 'Creator' had originally "impressed on matter." Secondly, Creationism was 'scientifically' sterile since its appeal to purposive design in the contrivances of nature only masqueraded as an explanation. In reality, it only restated what needed to be explained. In the third place, Creationist assumptions failed to accurately predict results and to explain numerous anomalies and unused niches in nature. On the contrary, Darwin contended, his theory of descent solved many puzzles in taxonomy, homology, paleontology, extinction, the fossil record, and the horizontal unity of nature. In sum, Creationism was not even worthy of being called 'science'; only Positivism, with its theory of modification by descent through natural selection, could qualify as 'science' due to its rigorous 'scientific' criteria and superior power of generalization.

The Origin of Species spelled the doom of the Creationist paradigm. Gillespie maintains, however, that this occurred, not because of its theory of evolution (there were many alternative theories), but because of its persuasive presentation of a comprehensive Positivist philosophy of biology. Henceforth, all discussion of the issues of speciation would be carried on within the paradigm of Positivism.

The Challenge of Providential Evolution and Providential Darwinism

In the years following the publication of *The Origin* Darwin faced an unexpected challenge to his Positivist biology from two groups within the Creationist paradigm, the "providential evolutionists" and the "providential Darwinists," who maintained that it was possible to harmonize some form of evolution, by whatever mechanism, with their creationist commitment to the presence of intelligent design in nature. The providential evolutionists (e.g. Owen, Argyll, Mivart) believed that the entire evolutionary process was designed by 'god'; the providential Darwinists (e.g. Gray, Wallace, Lyell) argued that natural selection was the means by which 'god' created new variations and species. Both groups felt that they had thus blunted Darwin's critique of Creationism by effectively synthesizing Creationist 'design' with his theory of evolution and natural selection. Although



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Darwin welcomed their support, especially from Gray, he was exasperated by their inability to comprehend that his theory of natural selection was meant to *replace* 'design' as an explanation for speciation, not *supplement* it.

The crux of their crucial misunderstanding of this key point, according to Gillespie, was their inability to recognize the transformed meaning of 'design' in the Positivist universe. From its modern formulation by the Puritan virtuosi in the late seventeenth century down to its influential popularization by William Paley in the early nineteenth century, the

The hallmark of Positivism was the effort to establish complete epistemological autonomy for a 'scientific,' as opposed to a 'theological,' understanding of the world.

'design' argument had played a central role in the Creationist paradigm. It was assumed that the unmistakable evidence of 'design' in nature offered irrefutable proof for the existence of God. This being the case, God's 'design' could then serve as an epistemic foundation for a 'scientific' explanation of the adaptation of phenomena to their environment. In the Creationist paradigm 'design' meant God's purposive ordering of means to ends in the world. Whenever and wherever they saw order, stability, and lawfulness in the universe (and they saw it everywhere), they understood it as 'design'. In their paradigm, 'order' demanded an 'Orderer', 'law' demanded a 'Lawgiver', and 'design' demanded a 'Designer', each of whom they assumed was the Christian God. The only alternative to 'design', as they never tired of pointing out, was 'chance'. Since the world was obviously ordered and not chaotic, it must be 'designed' by God. Thus, if Darwin's theory of the 'lawful' continuity of speciation were true, it must be an expression of God's superintending providential 'design'.

Darwin steadfastly maintained in his discussions with them, however, that this attempted synthesis, while satisfying to them, misrepresented his theory. Since Positivism was intent on stripping all 'scientific' terms of their biblical and theological connotations, Darwin had to oppose any definition of 'design' which suggested God's guidance or manipulation of the law of 'natural' selection. After all, from Darwin's perspective, this is precisely what 'natural' meant: the autonomous operation of the 'law' of speciation through the mechanism of 'natural' selection. Since this 'law' was autonomous, it did not need, much less tolerate, the guidance of God. Although as Gillespie (along with others) points out, Darwin was often troubled by the force of the Creationist 'design' argument (e.g. his trouble with the evolution of the eye) and often inconsistent in his definition of the term, he never wavered in his opposition to any theological explana-

tion of speciation. 'Natural' selection was the only acceptable 'scientific' alternative to 'supernatural' selection.

Darwin and the Positivists agreed with the Creationists that the world was 'ordered'. The critical question, however, in the struggle between the two paradigms was what this meant and how it ought to be explained. In the Positivist universe Darwin showed "how blind and gradual adaptation could *counterfeit* [italics mine] the apparently purposeful design that . . . others had seen in the contrivances of nature. . . ." (p. 83) Darwin argued that adaptations could arise out of the fortuitous variations of an organism which were neither the result of 'design' nor 'chance', as the Creationists understood those terms. In giving this Positivist theoretical account of the order, stability, and continuity in nature, without appealing to a superintending Providence, Darwin believed that his theory of natural selection was "logically adequate to account for the forms of organisms and philosophically more appealing to the positivist outlook" (p. 84).

Gillespie argues that neither the providential evolutionists nor the providential Darwinists grasped the significance of Darwin's counterfeiting argument for their synthesis position. Darwin and the Positivists were arguing that the order of the world only appeared to be the product of Intelligence to those who, on prior ground, were committed to it; it could not be logically inferred from the phenomena themselves. George Romanes, a perceptive Darwinist, pointed out that "It is one thing to show that, if we assume the existence of mind in nature, organic adaptations must be due to design; but it is quite another to prove the existence of mind in nature from the known occurrence of such adaptations." (p. 115) In other words, the Creationists were guilty of mistaking a prior assumption of intelligent 'design' for an inductive inference.

Darwin and the Positivists further pointed out that it was only a prejudice of anthropomorphic thought, a product of biblical patterns of thought, which convinced the Creationists of the analogy between human and non-human phenomena. Therefore, although terms like 'design', 'purpose', and 'law' were meaningful in describing and explaining human activity, they could not be carried over univocally into describing and explaining non-human activity. At best they were only metaphors derived from human experience to describe the natural world. They must not, however, be regarded as 'true' descriptions. Thus, the Positivists argued, the existence of a 'Designer' could neither be logically inferred from the adaptations of nature nor be used as an explanation of such adaptations. Consequently, the Creationist choice between 'design' and 'chance' begged the question of the meaning of those terms which were paradigm-dependent. (Gillespie rightly points out that the Positivists begged the question as well, but did so successfully.) In the Positivist universe it was possible to account for the order of the world without being forced to choose between God's existence and chaos.⁷

Another way in which Darwin's definition of 'design' confused the providential evolutionists and providential Darwinists was his restriction of 'design' to the *general* operations of 'law' in the universe as opposed to the *specific* 'design' of individual phenomena. He thereby fixed his attention on the autonomous 'law' which ruled the phenomena rather than on the phenomena themselves. Darwin argued that the phenom-

ena of natural history were the result of the general laws which were "first impressed on matter by the Creator." Lest this frequently quoted statement be mistaken as agreeing with the providential evolutionists and providential Darwinists, Gillespie points out that "while Darwin acknowledged the theological origin of the laws of nature, *the operation and end of those laws were not predetermined by divine will nor executed under any kind of divine supervision.* [italics mine] It followed that there could be no point in seeking a knowledge of purpose or in giving a place to such a postulate in scientific inquiry." (p. 107) For Darwin, what he took as 'god' was not present in natural history in any way, so was not present to 'scientific' inquiry. Only the 'natural laws' of speciation through 'natural' selection were present and accessible to 'science.'

The popular view of Darwin is of a scientist, eschewing the trappings of theory, patiently collecting a mountain of diverse 'facts' which, when finally presented in The Origin, offered irrefutable 'proof' of modification by descent through natural selection. Of course, he did nothing of the sort, as even he recognized.

The Creationist difficulty in appreciating the force of Darwin's theory is poignantly seen in Asa Gray, Darwin's most influential advocate in the U.S. Gray's case is particularly instructive since he is one of Moore's prime "Christian Darwinists" who harmonized orthodox theology with natural selection. According to Gillespie, Gray only dimly recognized that natural selection counterfeited purposive intelligence, and then only late in his life. Believing that Darwin was really a providential evolutionist, Gray earnestly hoped that he would eventually come out explicitly for the harmony of 'design' (as Gray understood it) and natural selection. That Darwin never did, and that he, in fact, opposed such harmony, caused Gray continued anxiety as can be observed in his *Darwiniana*.

Gray's anxiety was rooted in his futile attempt to remain true to both his Creationist sympathies and his Positivist philosophy of science. As a good Positivist he steadfastly denied that God 'intervened' or in any way 'interfered' in a 'miraculous' way in the 'creation' of new species. On the other hand, as a good Creationist and orthodox Christian, he was uncomfortable with the full implications of the Positivist logic which denied an epistemic role for God in 'science.' He consequently held out for the possibility that God was somehow, possibly as the unknown cause of variation, involved in guiding variation "along certain beneficial lines." His prob-

lem was to explain how a Guide could guide who never was involved in the physical process. As Gillespie sums up "Darwin's theory had no place for a Guide and Gray's view seemed to have no role for one except as he moved in that realm of mystery which existed at the end of every chain of scientific reasoning, the reality of which everyone had to admit" (p. 114). In the end Gray was able to accept Darwin's theory of natural selection only by consoling himself that Darwin's denial of God's presence in the world was a personal quirk and not logically entailed by his Positivist biology.

Having been deprived of the traditional Creationist 'design' argument based on the adaptations of nature, the providential evolutionists and providential Darwinists fell back on 'design' really existing in the mind of God rather than in the world. God was no longer involved in *particular* creation of individuals, so was not accessible to 'science'; He was only involved in the *general* over-all plan or 'design' of evolution. Although they maintained that God was still somehow involved in the processes of nature, they agreed that such involvement was neither 'miraculous' or distinguishable from the 'natural law' of speciation. An incognito God was, evidently, better than no God at all.⁸

This move, as Gillespie argues, was obviously fatal for the traditional Creationist understanding of 'design'. By substituting a plan behind the adaptations for the adaptations themselves, they left the realm of 'science', where its epistemic strength had always been, for the inaccessible realm of 'faith'. 'Design', to be sure, had been salvaged, but at the heavy price of replacing its original role as an epistemic foundation for 'science' with an act of 'faith' whose assertions provided no guidance for 'science' and were unverifiable by the new Positivist canons of method.

The consequence of trying to harmonize the Creationist paradigm with the unexamined Positivist assumptions meant the ultimate break-up of the

unstable Newtonian legacy of nature as matter in motion coupled with the idea of a supervising Creator . . . Its materialist, or positive, tendencies had long been gaining ascendancy and had long been an increasing source of worry to its supporters. Design was the means by which it had been anchored to a theological base. Without design, a material science was almost irresistible. (p. 85)

Although many providential evolutionists and providential Darwinists continued to talk as though their views could be harmonized with natural selection, there was, in fact, a marked contrast between their views and Darwin's.

Providential evolution showed that design could be reconciled with descent by natural birth as the cause of new species. But from Darwin's point of view, and from the positive point of view, this was done at the cost of resting in theological explanations that were both redundant and beyond the reach of science, or, worse, by disregarding a priori any explanation based on a randomly operating mechanism of evolution. (pp. 107-108)

They had, in fact, harmonized 'design' and evolution, but only by misunderstanding Darwin's Positivist biology and conceding the Positivist claim that God could serve no epistemic role within 'science'.⁹

Darwin's Religious Beliefs

Darwin's religious beliefs have always attracted attention, mostly to praise his agnosticism, but most recently from James Moore who applauds his "Christian base." Gillespie maintains that past interpreters have erred in reading the self-confessed agnosticism of Darwin's Autobiography back into the years prior to the writing of *The Origin*, thus making him a committed agnostic during the formative years of his theory construction. The transformation of his religious beliefs was more complex than that. Gillespie argues that Darwin moved from a weak orthodoxy in the '30s and '40s to a general theism in his middle years, and, finally ended in an agnosticism marked by troubling questions which haunted him for the remainder of his life. Thus, during the formative years of his theory and the writing of *The Origin*, Darwin was a theist.

Darwin's theism must not, however, be understood as Christian. Although Darwin was greatly influenced by orthodoxy and the Creationist paradigm through his frequent references to 'God', the 'Deity', and the 'Creator', it is fairly clear from the perspective of his religious journey that he was not referring to the "God of Abraham, Isaac, and Jacob, the Father of our Lord Jesus Christ." At best Darwin's 'God' was a "numinous awe" and a "gratuitous support" drawn in to "underwrite the possibility of science, to guarantee its rationality, . . . and to preserve his optimistic view of the evolutionary process". (p. 124) His 'God' remained aloof from the world, delegating its operation to the fortuitous operation of 'natural law' so as not to be held responsible for the glaring waste and cruelties of nature. "In the final analysis, Darwin found God's relation to the world inexplicable; . . . a positive science, one that shut God out completely, was the only science that achieved intellectual coherence and moral acceptability". (p. 133) However one chooses to characterize Darwin's religious beliefs, they certainly do not form a "Christian base".

The Legacy of the Collapse of the Creationist Paradigm

The keystone of the Creationist paradigm was the vital epistemic role which theological beliefs ought to play in the forming of 'scientific' theories. But by the mid-nineteenth century, under the influence of incipient Positivist assumptions in their own science, a growing number of Christian natural scientists willingly abandoned the "God hypothesis" as an epistemic foundation for knowing the world. They accepted the Positivist argument that allowing an epistemic role for 'theology' in 'science' would severely inhibit its practice and introduce an 'unscientific' element of caprice. Consequently, God and his revelation could no longer serve as sources of 'scientific' knowledge about the world. At best they could only provide 'spiritual' knowledge accessible only to 'faith'.

To accommodate this change, the Christian natural scientists did not have to give up their Christian faith per se; they only had to accept the Positivist premise that their Christian commitment be confined to the 'spiritual' realm of life and not dictate any a priori beliefs about the structure of the world and how we come to understand it. In doing so they

were able to retain their belief in God, but at the heavy cost of making it

private, subjective, and artificial. One could keep God in the positivist cosmos only by constantly reminding oneself that he was there . . . He was, at best, a gratuitous philosophical concept derived from a personal need and not entailed by the new system of science. Neither its rationale nor its logic required his presence to get on with scientific work. (p. 16)

By replacing revelational assumptions with Positivist ones as foundational for 'scientific' work, the Christians "took God out of nature (if not out of reality) as effectively as atheism," (p. 153).

Many orthodox natural scientists were able to accept this profound transformation in the meaning of the Christian world view, primarily because they were still able to retain their 'religion' and harmonize it with their Positivist 'science'. Their new harmony, however, was distinctly different from the harmony of Newtonian natural theology. Although Gillespie does not say so directly, this transformed meaning of the harmony of 'science' and 'religion' was a legacy of the Kantian premise that 'science' and 'religion' were two autonomous realms of life which could coexist as long as each respected the territorial boundaries of the other. Few people recognized the profound changes.

Popularizers of the new science who spread the gospel of metaphysical materialism based on science's supposed certain authority appreciated the real significance of what had happened as little as did the theologians who thought successful accommodation of a divinely revealed religion to the new science was a simple matter of shedding a few antiquated superstitions. (p. 153)

Creationism collapsed, not because it was over-run by the forces of atheism, but because its most influential proponents quietly conceded the Positivist redefinitions of 'science' and 'religion' and then pronounced their concessions a victory for the harmony of 'science' and 'religion'—and Christianity.

Conclusion

In the aftermath of this costly purchase of harmony we need to face the critical weaknesses of the entire harmony of 'science' and 'religion' apologetic tradition. This strategy, undoubtedly undertaken in the sincere desire to secure the integrity of Christianity and maintain communication with unbelievers and skeptics, failed to do both. The whole enterprise is itself symptomatic of the secularization of western thought by accepting the modern definitions of 'science' and 'religion' as the proper categories for discussing the range of pertinent issues. They are not, as Gillespie has shown so well. The history of western thought, especially since the breakup of the Thomist synthesis, can best be understood as the articulation of a world view in which *scientia*, the knowledge of the whole of reality, and *religio*, that which binds the whole of reality together, including that which can be known about it, were increasingly split apart. *Religio* was deprived of providing orientation for the whole of life and confined to a 'religious' realm; *scientia* was deprived of its integral knowledge of the whole and confined to the 'scientific' realm of life. Faced with the alleged existence of these

two realms of life, a number of critical problems emerged: what part(s) of reality were contained in each and what was their comparative size; how are they related, if at all; and, most importantly, on what new ground of certainty were they

What was needed, and is still needed, to secure the integrity of God's claim on the whole of life, including our deepened investigation of reality, and maintain communication with the Secularists, is a comprehensive Christian world view and philosophy of science forthrightly anchored in our commitment to Jesus Christ, Who holds all things together.

established. This is a highly condensed summary to be sure, but it does establish the context in which the modern harmony of 'science' and 'religion' tradition arose of necessity.

By the early nineteenth century the Creationists had had a long time to consolidate their particular paradigm of how these two realms ought to be harmonized. They were so successful in this that their paradigm was considered both by themselves and their critics as 'normal science.' They, therefore, found it increasingly difficult to recognize that the Positivists were not simply friendly critics who misunderstood the meaning of 'normal science'; they were, in fact, defining a completely different paradigm of 'science,' 'religion,' and their proper relationship. They failed to see that the philosophy of science was not a discipline to be studied apart from their orienting faith commitments or grounds of certainty, that there was not so much a philosophy of science to be agreed upon by all as much as philosophies of science, each rooted in their respective faith commitments and world views. They consequently struggled to come to a mutual agreement with the Positivists on a philosophy of science. This tactic took at least two forms: 1) they answered the Positivist paradigm with a restatement of their own paradigm, which was irrelevant since it missed the issue; 2) they abandoned their philosophy and accepted the Positivist one, which was trivial since it conceded the Positivist claims. In both cases vital communication with skeptics and unbelievers was cut off. It is a sad story, which needs to be told in greater detail, that many left the Church in the late nineteenth century, not because they stumbled over the cross of Christ, but because the Christians were not addressing the issues at the depth they deserved.

What was needed, and is still needed, to secure the integrity of God's claim on the whole of life, including our deepened investigation of reality, and maintain communication with the Secularists, is a comprehensive Christian world

view and philosophy of science forthrightly anchored in our commitment to Jesus Christ, Who holds all things together. Such articulation would: clarify the paradigm-dependency of all 'scientific' terms; challenge the Secularists to probe their paradigms for their orienting faith commitments; maintain the integrity of God's people in the special sciences by abandoning the search for ultimate unity with Secular paradigms; and, establish greater cultural freedom for alternative paradigms in the 'scientific' establishment. Such an approach would itself be a powerful apologetic, and would at least have the potential of Christians being recognized and respected rather than patronizingly ignored, as is so often the case at present.

In view of Gillespie's provocative and sobering argument, there is much work for Christian historians and philosophers of science to do. We need in-depth analyses of: the presuppositions of various philosophies of science in history; the transformation of key terms of 'scientific' discourse which accompanied those philosophies (e.g. science, religion, theology, law, nature, natural, design, creation, miracle, etc.); and, a critical reassessment of how Christians in the past (and the present) have dealt with these issues.¹⁰ For too long the dualistic approaches of Newtonian natural theology, post-Kantian theologies of science, and science but not scientism have been uncritically adopted as the appropriate philosophical framework for a Christian philosophy of science.

NOTES

¹Throughout the essay I will be using single quotations to mark off terms and concepts which were themselves paradigm-dependent. Since it is central to Gillespie's argument that this was not understood in the mid-nineteenth century, I have followed this unorthodox convention to alert the reader to the terms which were in dispute. I trust this will not impede the flow of the essay unduly.

²John William Draper, *History of the Conflict between Religion and Science*, International Scientific Series, vol. 13 (London: Henry S. King & Co., 1875); Andrew Dickenson White, *A History of the Warfare of Science with Theology in Christendom*, 2 vols. (London: Macmillan, 1896).

³It is not clear whether Gillespie chose the term "Creationism" because of its current popularity. Although there are clear lines of connection between the two positions, they should be carefully distinguished when approaching Gillespie's argument.

⁴In a real sense the Positivists were simply taking Occam's voluntarist view of God's relationship to the world to its logical conclusion. In reacting against the Thomist view which he felt bound God to logic, Occam argued that God was totally 'free' in his relationship to the world. Henceforth, God's relationship to the world was related only to his 'free will.' God could do anything he 'willed' to do in the world with no restrictions. This clearly laid the groundwork for the notion that God's will was capricious and contrary to 'law.' Since the secularization of 'law' in the sixteenth and seventeenth centuries was meant to replace this capricious 'will' of God, it caused a great deal of confusion to the Positivists and blindness in the Creationists when they tried to wed 'God' and 'law.' The unfortunate consequence of this development, from which many evangelical philosophers of science have not yet fully recovered, was the placement of a reified 'law' between God and his creation. The logical consequence of this development, clearly seen already by LaPlace, was that with this understanding of 'law' there was no further philosophical need for the "God hypothesis." It remained only for the Positivists to take full advantage of this opening provided by the Christians.

⁵cf. Martin Rudwick, *The Meaning of the Fossils* (London: Macdonald, 1972); David Hull, *Darwin and His Critics* (Cambridge, MA: Harvard University Press, 1973); Michael Ruse, *The Darwinian Revolution* (Chicago: The University of Chicago Press, 1979); Dov Ospovat, *The Development of Darwin's Theory* (Cambridge: Cambridge University Press, 1981).

⁶It should be pointed out that Darwin was really offering a dogmatic critique of special creation: he was already assuming the Positivist philosophical position in his attack. He was clearly not a dispassionate collector of 'facts'

standing aloof from the struggle between these two competing philosophies of science. Once having assumed that Positivism was the only philosophy worthy of the name 'science,' he could only attack special creation as 'unscientific.' Of course this was begging the question of the meaning of 'science,' among other issues, but it was, and continues to be, an effective ploy in the battle of ideas. It would have been more accurate, though less forceful in its polemic appeal, for Darwin to say simply that Creationism was not Positivism.

⁷After laying dormant for over 75 years, due largely to the popularity of Paley, David Hume's argument against the earlier argument for 'design' was finally making its mark.

⁸The distinction between 'general' and 'specific' has some interesting parallels with similar theological distinctions being made in the nineteenth century between 'general' and 'special' revelation, grace, and providence.

⁹James Moore seems not to have caught the force of Gillespie's argument at this crucial point when he maintains in his review of Gillespie's book that the Newtonian tradition enjoyed a

tense but harmonious, and historically long-lived integration of positivism with theistic metaphysics. . . .

. . . For a high Newtonian theistic and a consistent believer in God's concursive providence [the mechanization of the physical universe] need not have posed a threat, for "it could be granted that all of nature was within the domain of God's law," and that "science laid no claim to the faith of the believer."

Gillespie, as I read him, does not deny that many made these claims; in fact, he shows that they did. He only argues that, in doing so, they had misunderstood Positivism and Darwin's arguments since these were not their claims. He further argues that they were no longer offering them as epistemic presuppositions for their 'science'; they were only using them as an *ad hoc* apologia for the possibility of retaining their personal faith along with their Positivist 'science.' The implications of Gillespie's argument,

with which I wholeheartedly agree, is that Positivism was always philosophically inconsistent with a Christian ontology and epistemology, even though many held them together in their personal lives, and that this underlying inconsistency was finally brought to the fore by those who had no apologetic interest in the harmony of 'science' and 'religion.' Interestingly enough, the rise of modern apologetics took place in the late seventeenth century precisely when many Christian natural scientists felt it necessary to reassure themselves and their leary contemporaries that a materialistic view of the world, such as that envisioned by Galileo and Newton, 'really' did not lead to atheism, but could effectively be reconciled with a transformed view of God's relation to the world. This issue needs much further critical study. (cf. James Moore's review of *Charles Gillespie and the Problem of Creation in The British Journal for the History of Science* 14 [July 1981]:189-198.)

¹⁰Let me suggest in conclusion, that more serious attention be paid to the significant work that has already been done along this line within the Kuiperian stream of the Reformed tradition. Although it takes time and patience to grasp the philosophical categories of this tradition, it is time well-spent in getting to the roots of the history and philosophy of science from an integral Christian philosophical standpoint. The following works, among many, are good places to begin: Herman Bavinck, *The Philosophy of Revelation* (Grand Rapids, MI: Baker Book House, 1979 [1909]); Abraham Kuyper, *Principles of Sacred Theology* (Grand Rapids, MI: Baker Book House, 1980 [1898]), especially part 2; Herman Dooyeweerd, *A New Critique of Theoretical Thought*, 4 vols. (Nutley, NJ: The Presbyterian and Reformed Publishing Co., 1969); Herman Dooyeweerd, *The Secularization of Science* (Memphis, TN: Christian Studies Center, n.d. [1954]); Herman Dooyeweerd, *Roots of Western Culture* (Toronto: Wedge, 1979); Jan Lever, *Creation and Evolution* (Grand Rapids, MI: Grand Rapids International Publications, 1958); Hendrik Van Riessen, *The Christian Approach to Science* (Toronto: Wedge, 1960); H. Evan Runner, *The Relation of the Bible to Learning* (Toronto: Wedge, 1970); Hendrik Hart, *Understanding our World* (Washington, D.C.: University Press of America, 1984).

John C. Greene in his 1959 book on the impact of evolution on Western thought (*THE DEATH OF ADAM*) quotes the geneticist, Theodosius Dobzhansky,

"Judged by any reasonable criteria . . . man represents the highest, most progressive, and most remarkable product of organic evolution. . . . Most remarkable of all, he is now in the process of acquiring knowledge which may permit him, if he so chooses, to control his own evolution."

Greene concludes his book with this comment:

"'If he so chooses'—ah, there was the rub. A free, intelligent agent, man is in a position to plan all sorts of things, himself included. But who is to plan the planners? Who will prevent them from using the powers entrusted to them to establish a tyranny over man's mind and body? Who is to restrain man from choosing the evil which he would not do in the place of the good which he would do? Is man in truth a kind of Prometheus unbound, ready and able to assume control of his own and cosmic destiny? Or is he, as the Bible represents him, a God-like creature who, having denied his creatureliness and arrogated to himself the role of Creator, contemplates his own handiwork with fear and trembling lest he reap the wages of sin, namely, death? The events of the twentieth century bear tragic witness to the realism of the Biblical portrait of man. The planned society looks less inviting in its grim reality than it did when still a dream. The conflict of nations and races, far from raising mankind to ever higher levels of virtue, freedom, and culture, threatens to accomplish the destruction of the human race. Science and technology which were to have led the way to a bright new future, have become increasingly preoccupied with devising new and more dreadful weapons of obliteration. The historical Adam is dead, a casualty of scientific progress, but the Adam in whom all men die lives on, the creature and the creator of history, a moral being whose every intellectual triumph is at once a temptation to evil and a power for good."

Some of us are not ready to give up "the historical Adam," but we should all appreciate that Greene is much closer to biblical reality than was Dobzhansky.

Book Reviews

SCIENCE, SCRIPTURE AND THE YOUNG EARTH, by Henry M. Morris, San Diego: Creation-Life Publishers, 1983, 34 pp., \$1.00 ISBN 0-932766-06-4

This small book is subtitled *An Answer to Current Arguments Against the Biblical Doctrine of Recent Creation*, and it consists almost entirely of a response to the book *Christianity and the Age of the Earth* by Davis A. Young (Zondervan, 1982). Davis Young's book, which argues for an ancient Earth on the basis of geological evidence, and presents theological arguments for accepting that conclusion, has received favorable reviews in a wide range of Christian journals. Young's book was listed among the best books of 1982 by *Eternity* magazine. Henry Morris, a leading spokesman for the young Earth view, has written this book to argue against Young's conclusions on both scientific and theological issues.

Morris uses only a few pages at the beginning of his book to criticize Young's acceptance of uniformity and Young's non-literal understanding of Genesis 1. Most of the book consists of comments on the geologic evidence which Young had presented in support of his conclusion that the Earth is old. Morris argues that the results of radiometric dating are not valid, claiming that initial conditions cannot be known, that the systems are not sufficiently closed, and that decay rates may not have been constant throughout Earth history. Morris claims that coral reefs, evaporites, and lake deposits can best be interpreted as the result of catastrophic events rather than gradual sedimentation processes. Morris also claims that the history of Earth's magnetic field is evidence for the Earth being young; he dismisses Young's arguments against other young Earth claims as of no significance.

"So what?" someone says, "Young has a Ph.D. and Morris has a Ph.D. How can I judge who is correct? It's all just a matter of opinion, isn't it?"

No, it is not just opinion. The age of the Earth is no more a matter of opinion than the distance to the moon is. It is a matter of measurement. But, yes, it does require some judgment to decide whether or not the methods of measurement are valid methods. So are we all back in the opinion soup? No, not unless you are content to be there.

This reviewer is convinced that it is important for the general populace to be as informed as possible about the

technical details before any resolution can be found in our disagreements about the age of the Earth, geologic history, and related matters. The book *Christianity and the Age of the Earth* was written by Davis Young in order to help others understand those details. More of us ought to be writing and speaking and listening.

The details of the methods for measuring the ages of rocks are quite technical, it is true. But those who are not technically trained can gain some understanding of the validity of those methods, just as we can for the validity of the evidence which leads us to conclude that the Earth rotates on its axis and revolves around the sun. It certainly will require some time and effort to gain that understanding, but there are written materials available, and there are people available to answer your questions.

In his arguments for a young Earth and catastrophic deposition of fossil-bearing rocks, Morris claims support from observations and scientific data, but he has included and considered only part of the data which are important to the issue. He has not given the reader the whole story. We have space for only a couple of examples: (1) On page 12 Morris quotes from an article about the fossil bird *Presbyornis* and claims that the large concentrations of those fossils in the Green River formation "surely ought to satisfy anyone that this is not a varved lake-bed formation at all, but a site of intense catastrophism and rapid burial." But in that article on *Presbyornis*, the author, Alan Feduccia, describes one site of concentrated fossil bones in which "The many egg shells in the deposit indicate that it was almost certainly a large nesting colony near the shoreline of a lake." The observation of many egg shells with the fossil bones at that site was not mentioned by Morris, and the presence of those egg shells argues strongly against the claim of intense catastrophism and rapid burial. And, in the caption of a photograph of the fossil bones, Feduccia writes "there is no reason to assume that a catastrophe suddenly destroyed great numbers of the birds; normal attrition within a large population of the highly colonial *Presbyornis* could easily account for such a dense collection of bones in the bottom of a lake." Thus, Morris' claims of evidence for catastrophism are refuted by the article from which he has quoted only a part, taken out of context. (2) On page 13, in a footnote, Morris says "Even in modern lakes, the so-called 'varves' may well be formed by catastrophic turbid water underflows, with many being formed annually. See A. Lambert and L. J. Hsu..." and

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the journal reference is given. So I went to see that article, and it describes laminar deposits in one lake, Walensee in Switzerland, which "are considered to be deposits of continuous-fed turbidity current generated by hyperpycnal inflow during river flood stages." The authors report 300 to 360 such laminar deposits in the 165 years between 1811 and 1976, an average of about 2 per year. They report a measured turbidity current velocity of 50 centimeters per second (1.12 miles per hour) which hardly seems catastrophic. And in the closing paragraph of the article, Lambert and Hsu write "We do not intend to make an unwarranted generalization that no varves are deposits of annual cycles," and, by way of comparison, they refer to the annual varve deposits of Lake Zurich. Thus, Morris' claims of evidence for catastrophism are refuted by the article to which he refers for support.

As is the case in much of his writing, Morris includes a large number of quotations in *Science, Scripture and the Young Earth*. Many of those quotations are from widely recognized scientists and from widely read scientific journals. There is a misquotation on page 12 which Morris says was an inadvertent misprint. Morris is arguing that fossils are often transported to the site of their fossilization by violent catastrophes, and he quotes from a paper published in the journal *Geology* (p. 198, April 1977). The quoted section in the original reads as follows:

"In some specimens, even the skin and other soft parts, including the adipose fin, are well preserved . . . strongly suggests that the catfish were a resident population. It is highly improbable that the catfish could have been transported to their site of fossilization."

The quotation in Morris' book has omitted a full line from the paper in *Geology*. The misprinted quotation reads as follows:

"In some specimens, even the skin and other soft parts, including the adipose fin, are well preserved . . . strongly suggests that the catfish could have been transported to their site of fossilization."

The misprint gives the quotation a meaning which is the exact opposite of the correct original statement in the article from *Geology*.

It is difficult to imagine how that misprint could have been entered into the text of Morris' book or how it could have escaped notice during proofreading. It is difficult to imagine why Morris would use a quotation from that *Geology* article at all, since he wants to support his argument that fossils are often transported to the site of deposition by violent catastrophic events, while the correct quotation and its context plainly state that those fossil catfish were almost certainly NOT transported to the site nor deposited by violent catastrophe.

Before the days of "product liability" and consumer protection efforts, the only way to guard against buying inferior goods was by the old adage "Let the buyer beware." When people are selling ideas, we might paraphrase the adage as "Let the reader beware." In anybody's writing, when quotations from other sources are included, the reader does well to check the original source for accuracy of meaning in the

original context. If we are to make progress in finding a correct understanding of the age of the Earth, geologic history, or any other matter, we have to get the information straight. We should insist on correct and complete information, and we should check the sources thoroughly enough to make sure we get it.

The frequent quotations from respected sources gives this book by Morris an aura of scientific respectability, but the misquotation and the biased selection of only part of the pertinent data from the sources which are quoted will only mislead the reader and frustrate anyone who is seriously interested in getting a better understanding of the issue at hand.

Reviewed by Clarence Menninga, Calvin College, Grand Rapids, Mich.

IS GOD A CREATIONIST? THE RELIGIOUS CASE AGAINST CREATION-SCIENCE, by Roland Mushat Frye, ed., Charles Scribner's Sons, New York (1983). 205 pp. Paperback (\$9.95), Hardcover (\$15.95).

This is a book that deserves the widest possible dissemination. With all the books on the market that profess to deal with the issue of whether scientific interpretation of data is consistent with the Bible, this book treats the question: "Is a scientific interpretation of the Bible consistent with its own integrity?" Twelve authors contribute to the total perspective on this issue. The book admirably overcomes two potential drawbacks: (1) once one has shuddered at the deplorable title, it can be forgotten; and (2) the pitfalls of incoherence in an anthology, especially one such as this—a collection of published papers or abstracted publications—are largely avoided. The editor is Professor of English at the University of Pennsylvania, and a member of the Center of Theological Inquiry in Princeton. His purpose has been to gather together a group of essays presenting the central understanding of the doctrine of creation within the mainstreams of biblical religion, so that the biblical and theological legitimacy of the interpretations of biblical creation advocated by proponents of "creation science" can be evaluated.

The book is divided into four main sections: Understanding the Misunderstandings; Rebutting Creationism; Affirmations, Scientific and Christian; and Affirmations, Biblical and Theological. The editor provides an Overview at the beginning and an Epilogue. Each of the authors is committed to one of the major religious traditions (Protestantism, Roman Catholicism, and Judaism), each believes in divine creation, and each regards "creation science" as a misinterpretation and misapplication of the biblical revelation.

In his opening Overview, Frye emphasizes that this book is to complement those written to repudiate "creation science" on scientific grounds; the purpose of this book is to repudiate "creation science" on biblical grounds. It is important to Frye that the "creationists" deviate from the religious mainstream and represent "a kind of 'do-it yourself' approach to the

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knowledge of scientific and religious subjects." Such an argument *per se* may not have as much impact on evangelical Christians as intended, since evangelical Christians have most often not been part of the religious mainstream themselves. Yet this critique, properly understood, should not be neglected completely, for it is because of their deviation from the mainstream of authentic science that the "creationists" are also criticized. Frye sees the "creation science" movement as a specific product of 20th century America, growing out of a desire to propose very simple answers for very complex questions. As one who participated in some of the considerations, I did not recognize the accuracy of the statement,

Mrs. Segraves urged the State Board of Education (of California) to include the literalist understanding of biblical creation alongside evolution in the public school textbooks, and the Board was persuaded to do so. (Page 11)

To my knowledge, this was never the case.

The first section of the book includes papers by Edwin Olson, Professor of Geology and Physics at Whitworth College, Richard W. Berry, Professor of Geology at San Diego State University, and Langdon Gilkey, Professor of Theology at the Divinity School of the University of Chicago. The first two are reprints of papers in *Christianity Today* and *Theology Today*, respectively, and the third is adapted from previously published work. Olsen stresses the hidden agenda of "creationists" in their sincere desire to argue for the existence of God, the relationships of God to the universe, and the "purpose and destiny of human life," but he argues that "the wrong battle is being fought and a potent weapon silenced." He argues instead for the responsible integration of scientific and biblical truths. Berry analyzes the issue as one between the biblical story of creation (a God story that is inherently not verifiable) and a scientific description of the universe (a testable story); when people choose to argue for the truth of the God-story on the basis of another testable story, the consequence is usually intense conflict. This is the now oft-repeated lesson of the danger of making the truth of the biblical revelation depend upon the accuracy of some specific scientific description. Berry draws the simple conclusion that we should "Avoid saying that one cannot believe in both God and evolution." A similar theme is followed by Gilkey when he states,

The basic error reflected in the Arkansas law is to regard these two models—one religious (creationism) and the other scientific (evolution)—as equivalent, logically comparable and therefore mutually exclusive theories or interpretations. (Page 59)

Commenting on the Arkansas trial, Gilkey points out that many people with scientific credentials provided the central testimony for the "creation science" perspective, whereas "they could not, I warrant, have found a single biblical scholar or theologian with the same level of professional degree to support them."

The second section contains papers by Bruce Vawter, Professor of Theology at De Paul University in Chicago, Davis A. Young, Professor of Geology at Calvin College, and Conrad Hyers, Professor of Comparative Mythology and the History of Religions at Gustavus Adolphus College. Vawter

argues that "creationism seriously misconstrues the meaning and purpose of the Bible, . . . introduces a false dichotomy between religion and science, . . . (and) is a concept both theologically and philosophically unsound, derived from bad premises." Young summarizes material from his book, *Christianity and the Age of the Earth*, to argue that the scientific evidence argues overwhelmingly for the great antiquity of the earth. He charges that "Flood Geology . . . is nothing more than a fantasy," and that "People must realize that this modern, young-Earth, Flood-geology creationism is simply not truthful." Finally Hyers, in a paper from *The Christian Century*, challenges the literalist interpretation underlying "creation science," and charges that such literalism is really a form of modernism since it partakes of the reductionistic spirit of this technological age, substituting "a modern arithmetical reading for the original symbolic one" for the Genesis days of creation.

The third section contains a paper by Asa Gray, extracted from his 1880 lectures at the Yale Divinity School, in which this well-known Christian advocate of the theory of evolution made his case over 100 years ago. A second paper is by Owen Gingerich, Professor of Astronomy and of the History of Science at Harvard. Gingerich, keynote speaker at the annual meeting of the ASA in 1981, argues again for the informed integration of authentic science and authentic theology on the basis of a review of insights into the processes active in the formation of the universe. Through the eyes of faith he sees many evidences for God's design in the universe, a design so apparent that currently non-Christians have invented the so-called "anthropic principle" to express the unique preparation of the earth for human life.

The fourth section contains more or less general papers by recognized leaders of the mainstream religions. Portions of two addresses by Pope John Paul II on science and Christianity compose the first paper. The next is by Nahum M. Sarna, Professor of Biblical Studies at Brandeis University, excerpted from his book, *Understanding Genesis*. Sarna provides a Jewish perspective on the account of Genesis, which, like that of Hyers, argues for the specific historical and cultural relevance of this material as primary. A reprint by Bernhard W. Anderson, Professor Emeritus of Old Testament Theology at Princeton Theological Seminary, completes this section with an assessment of the meaning of the biblical doctrine of creation. He finds that this biblical doctrine stresses that "God alone is the creator of the meaning which supports all human history and the natural world," that the world is totally dependent on God, and that "every creature is assigned a place in God's plan in order that it may perform its appointed role in serving and glorifying the Creator." He sees creation-faith as being intrinsically eschatological, "the beginning" being inseparable from "the end."

The book concludes with an Epilogue by Frye stressing "The Two Books of God," and tracing through history how learning from both the Book of Scripture and the Book of Nature has been a common ingredient in enlightened thought.

A final parochial comment: There appears to be a universal edict that prevents any member of the ASA calling attention

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to that membership (and hence the possible relevancy of the ASA itself) on occasions in which the member achieves some measure of public prominence. Three of the authors of this book have made outstanding contributions to the ASA, but none of them is listed as a member of the ASA in the biographical material, and only one mentions the ASA at all in the text of the chapter in passing.

Be sure that this book plays an important role in the interactions between science and biblical faith where you are.

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

JUST BEFORE THE ORIGIN: ALFRED RUSSEL WALLACE'S THEORY OF EVOLUTION, by John Langdon Brooks, Columbia University Press, New York, 1984, 284 pages, \$30.00.

This account of Wallace's travels, collections and theories of origin is fascinating as it shows the ideas Wallace had which obviously influenced Charles Darwin, with whom Wallace had considerable correspondence. Author Brooks was a biology professor at Yale University for 25 years before he became director of the division of Biotic Systems and Resources at the National Science Foundation. He has brought "Wallace's work out of its undeserved obscurity."

Wallace first studied plants in his environment in western England and southern Wales. His admiration of Malthus' *Principle of Population* gave him "the long sought clue to the effective agent in the evolution of organic species." Other current writings influencing him are related, including his reading of Lyell's geology and Darwin's voyage of the Beagle.

Wallace went to Brazil in 1848. Chapters two and three record letters to friends outlining his thinking, collecting, travels, and his bouts with yellow fever and a fire on his boat. He wrote an "interpretation of the general features of the geologic history of the Amazon basin and of the consequent distribution patterns in certain animal groups."

In March, 1854, Wallace left England for Singapore from which he wandered 8 years in the Malay Archipelago. A detailed account is given of his travels and collections but this review will concentrate on his thinking and influence upon Darwin. "His first contribution to the theory of evolution was written in Sarawak, Borneo, in February 1855." "He begins his explanation of the system of natural affinities with a statement of the kinds of affinity relations that would develop if each species arose from a closely related one." Brooks gives us a detailed account of the collections and locations of butterflies that influenced Wallace's thinking. Knowing much of the habits of the orangutan, he made a "statement of his belief that man and orangutan had a shared ancestry," a first declaration "by a biologist who had actually observed

one of the great apes in a state of nature." He predicted that intermediate fossils would be found between man and ape. He made a diagram showing the affinities of several bird families. Carefully documented accounts are given of his geographical studies which "provided the basis for a public challenge to the Lyellian theory of special creation, as well as an opportunity to present his own views of how organic change followed geographic change." His paper "*On the Tendency of Varieties to Depart Indefinitely From the Original Type*" is printed in its entirety.

Differences in the views of Darwin and Wallace are documented, even though Darwin wrote, "Mr. Wallace, who is now studying the natural history of the Malay Archipelago, has arrived at almost exactly the same general conclusions that I have on the origin of species." And the significant contributions that Wallace made to Darwin's ideas are related. Author Brooks comments, "I think it can be concluded that Wallace's 1855 paper—and Lyell's various urgings in a relation thereto was fundamental in forcing Darwin to write" and he concludes that Darwin failed to give Wallace credit for some of the beliefs Darwin had on natural selection. Some of the details are as interesting as a detective novel. A very scholarly work; congratulations, Dr. Brooks.

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

A CASE FOR CREATION, by Wayne Frair and Percival Davis, Moody Press, Chicago, 1983, 155 pages.

In spite of various problems, *A Case for Creation* is a valuable contribution to the growing list of publications on this subject. The writing is lucid and technical subjects are clearly presented. A reader might logically expect the book's thesis to be reflected in the title. However, as in many such efforts, the "Case" presented is actually a case against (macro)evolution and all its trappings. The multiple lines of evidence discussed by biologists Frair and Davis expose deficiencies in evolutionary theory. Creation wins by default after the opponent is disqualified, primarily on biological grounds. (See similar comments by S. Scadding at the end of a review in vol. 35, n.4, JASA)

The book's nine chapters include: 1) Evolution and Science (essentially the mechanisms of scientific thought applied to the controversy); 2) Reasons for Similarity; 3) Comparative Arguments; 4) The History of the Earth and its Organisms; 5) The Nature of Life and its Origins; 6) Genetics and Evolution; 7) The Origin of Behavior; 8) The Study of Mankind; and 9) Creation and the Bible. In all, over thirty subtopics are discussed. Three sections following the formal chapters conclude the book as a call for readers to become involved in the controversy. These sections are, Epilogue: Creation's Unfinished Business, Appendix (a listing of selected creationist organizations), and For Further Study (preferred books and articles).

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It is always pertinent to ascertain the biblical position of authors in Bible-science writing. Unfortunately, here we have to wait until the last chapter to get an official statement of biblical interpretation. This makes it difficult to evaluate what if any predilection is expressed by the authors' interpretations of evidence. Obviously creationists in the broader sense, Frair and Davis seem to stress objectivity in a desire to be consistent with the demands of scientific inquiry (page 23, for example). They nearly succeed in their own realm of biological sciences, but they are less successful with their geologic viewpoints.

Chapter four indicates a presupposition of six literal creation days and a young Earth. Frair and Davis imply that geologists with other biblical views should not impose "an *a priori* structure on the interpretation of Scripture" (page 128). In practice, the authors' own position certainly tends to impose one preferred hermeneutic on geology (page 74, for example). This without any firsthand expertise as geologists. It seems that here as always the rub comes in trying to reconcile geology with a literal-historical reading of Genesis chapters one and two. The reader should note that the two best sources on geology and the Bible, both by Davis Young, are not mentioned in chapter four nor in the supplemental reading list. This is taken as a philosophical omission and not as an oversight. The overall treatment of geologic phenomena is weak and outdated.

I regret the general absence of references that should have been used to support argumentation. The authors state in the preface that they want to reach the informed layman and not-yet-advanced student with their message. Fine, but without adequate documentation it is impossible to separate data and interpretation from unsupported opinion. Veracity should not suffer in the name of readability.

The good aspects of *A Case for Creation* can and should be separated from the above shortcomings. Chapter one develops a framework to enable scientific thinking. Readers are urged to apply verification methods in scrutinizing evidence. Pages 19 through 21 present a relatively up-to-date (1981) analysis of the asteroid-explosion dinosaur-extinction hypothesis. The concept's main proponents allegedly ignored conflicting data and interpretation. This is cited both as an example of unscientific bias and of an unfalsifiable hypothesis.

Page 36 ends a short section discussing the possibility of evolution through mutation(s). The authors see random changes as disadvantageous to organisms and "the chances of a concert of appropriate mutations occurring together and staying together is infinitesimally small."

In chapter three, classification of organisms on the basis of similar characteristics is shown to be harmless enough until an evolutionary link is assumed. This is well demonstrated in discussions of comparative embryology (page 41) and biochemistry (page 45). The concept of evolutionary classification reminds me of a high school science movie referring to "our cousins the tunicates" (sea squirts). Do we really resemble those little gelatinous blobs?

Pages 80 through 91 of chapter five present the complexity of cells and reproduction as strong arguments for Creation. The intricacies of molecular structure (proteins, DNA, etc.) are especially well illustrated. To this reviewer, nothing should be more scientifically feasible to unbelievers than a creator behind the mind-boggling order in the universe. Creative intelligence and order are also the logical explanations given for the unique nature of mankind as presented in chapters seven and eight.

A Case for Creation probably does approach the authors' goal of reaching laymen and beginning students. On the other hand, I doubt if this could much influence agnostic scientists, especially if well versed in earth sciences. This inability to persuade is ultimately more a limitation of scientific evidence than a weakness of the book. A faith in the supernatural is still a prerequisite for understanding Creation.

Reviewed by Jeffrey K. Greenberg, Wisconsin Geological and Natural History Survey

GOD DID IT, BUT HOW? by Robert B. Fischer, Zondervan Publishing House, Grand Rapids, MI 1983, 113 pages, (reprint), \$4.95.

To begin with, may I compliment this book by regretfully noting that I didn't write it. Not only I, but most of the faithful readers of this journal probably know enough to have written *God Did It, But How?* That might seem to be a weakness, but it is also a strength. The strength is that this is a good, well-written book, staking out a position on origins that is congenial to most of the readership of this journal. That position is that the earth is quite old, but that God is sovereign.

The title of the book is quite suggestive of its contents. Fischer concentrates on the why, what, how and Who of origins in chapter 1. The remaining chapters are entitled "God Uses Human and Natural Means," "What About Origins," "What About Miracles?" and "Fitting It All Together." Note that part of his strategy is to get a lot of preliminary work done before dealing with origins as such. This seems to be a good strategy.

It will again be no surprise to readers that Fischer feels that most, or all, of the controversies over origins are because of a false dichotomy—a belief that there are only two alternative views about origins. He clearly indicates reasons why things aren't this simple.

The last plus readers should be informed of is the author's careful discussion of what to do when biblical revelation and scientific data/theories seem to conflict. His conclusion to this section is worth quoting:

... it is inevitable that there be a degree of ambiguity and of uncertainty in human knowledge, whether based upon one or the other or both of our two sources of information. There are

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numerous points on which we must suspend final judgement, even throughout human life. At the same time, we should recognize that the fact that neither science nor Biblical theology can provide explanations which are absolutely perfect and complete does not mean that they cannot provide explanations which do have considerable meaning and validity. (p. 107)

Now let us turn to the negative. I have one negative criticism for the author. Although this book is written dispassionately, surely Fischer is not so naive as to think that there are no other positions on origins held by Christians. On p. 44, he says, quite correctly, that "the Hebrew word *yome* [sic] can mean a period of daylight, or it can mean a 24-hour period, or it can mean a longer, indefinite period of time." But then he says, seemingly based on scriptural considerations, that "it likely is the longer, indefinite period of time." I don't think that he has drawn that conclusion from his understanding of the scripture, but that he is interpreting scripture in a certain way because of what he believes God has revealed in nature. Perhaps that procedure is valid. It dates back at least to Galileo (see Gingerich's "The Galileo Affair," in the August, 1982 *Scientific American*. Galileo said that the Bible taught "how to go to heaven, not how the heavens go") but if that is the procedure used, then we ought to know and say what we are doing.

Fischer, an experienced scientist and administrator, has written a good book. Probably its major use would be to introduce those who haven't thought much about origins to the issues, in the context of God's revelation of His own nature.

This book was originally published by Cal Media of La Mirada, Cal. in 1981. Zondervan published a new printing of it in 1983.

Reviewed by Martin LaBar, Central Wesleyan College, Central, SC

THE GENESIS CONNECTION by John Wiester, Thomas Nelson. Nashville, Tennessee, 1983. 254 pp., \$14.95.

John Wiester's first book is a well-written attempt by a geologist to relate current scientific facts to the first chapter of Genesis. It is an excellent book for anyone teaching an introductory course in a Christian school or for an interested layman who wants to know what current scientific thought is in the area of the origin of the universe and how it might relate to Biblical faith.

The thesis of *The Genesis Connection* is that the facts of science are better correlated with the biblical materials of Genesis One than they are by scientific theories.

Wiester starts with the big bang and says that Genesis 1:1, "In the beginning God created the heavens and the Earth" corresponds to this event of 18 billion years ago. He delights—as do most of us who are Christians—in pointing out, "At the point of beginning, there can be no discoverable cause! The implications for pure rationalism are awesome."

(p. 17.) The standard current explanation for the origin of stars, galaxies and planet Earth then follows.

As readers progress through the book, they are introduced—all with currently accepted time scales—to blue-green algae, the various phyla and tectonic plates. The origin of the blue-green algae is given in a quote from Robert Jastrow. (p. 94.)

Perhaps the appearance of life on earth is a miracle. Scientists are reluctant to accept that view, but their choices are limited; *either* life was created on the earth by the will of a being outside the grasp of scientific understanding, *or* it evolved on our planet spontaneously, through chemical reactions occurring in non-living matter lying on the surface of the planet.

Wiester likes Jastrow's view that both approaches are acts of faith. The scientific view is an act of faith "in assuming that the scientific view of the origin of life is correct, without having concrete evidence to support that belief." (p. 94.)

Darwin's view of evolution is presented and criticized, primarily because of its inability to account for the Cambrian period explosion of life forms and the observed homeostatic fossil record (pp. 130–131), punctuated equilibrium and adaptive radiations are viewed more positively. In fact, adaptive radiation is an apt description of the response to God's command when He blesses them and said, "Be fruitful and multiply, and fill the waters in the seas, and let the birds multiply on the earth." (Genesis 1:22.)

The author does admit (p. 156) that links between aquatic and land animals are found. The Hebrew word, *Bara*, is analyzed and it is found that it is not restricted to creation ex nihilo, but can also be used when God creates using existing materials. So, Wiester sees no problem with "links" in the development of land animals from aquatic forms.

The development of man is presented as an unsolved puzzle to the scientists, and both the "Piltdown hoax" and "Homini hoax" are examined.

By p. 191, the author has given about 90% of his time to the current scientific model and 10% to Biblical harmonization. The remaining 26 pages discuss philosophy, the problems of time and present the following conclusion:

There is sufficient Biblical authority to interpret the six days of Genesis as six major eras of creation. I believe that Moses was originally speaking to prescientific Hebrew people in a time frame they could comprehend. He used poetic language which was not only beautiful but easy to remember. Genesis was written for our modern era as well, and we should make the linguistic and cultural transition.

Using R. Youngblood as a source, it is stated: "The omission of the definite article *the* from all but the sixth day allows for the possibility of random or literary order as well as rigidly chronological order." (p. 198.) What this means is that Wiester can modify the order or creation when needed.

Along the way, the author argues against a young earth view, presenting scientific data clearly. He pleads with

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"young earth creationists" (p. 213) to essentially recognize the variety of positions Christians hold on this issue and to stop "defining God and His concept of time too narrowly."

So what are the strengths and weaknesses of Wiester's approach? It is beneficial for people to see that the Bible's first chapter—with work—fits the scientifically-found data. Both science and scripture, however, are left with some unanswered questions. And each generation has as one of its tasks the searching out of answers to these unsolved mysteries.

The most noticeable weakness of the book is the absence of any discussion of Genesis 2. No effort is made to relate the two Biblical creation accounts found in Genesis 1:1 through 2:4 and Genesis 2:4 through 3:24. The book, then, leaves all of us still wondering about Adam and Eve and the sequence of creation in the second account vis-a-vis the first account.

Another difficulty of this approach, whether it be made by Wiester or Ramm (*The Christian View of Science and Scripture*), or Newman and Eckelmann (*Genesis One and the Origin of the Earth*), is that one wonders what happens to the synthesis when new scientific theories come along? The message of Genesis is not only in its descriptions of the origins of earth and its living forms, but, more importantly, in its theology, a timeless statement of man's dependence on his Creator.

Wiesters is aware of these things and has worked to keep his approach open and non-dogmatic. For this he is to be commended. His is a book of excellent spirit and scientific honesty.

Reviewed by Fred Jappe, San Diego Mesa College, San Diego, Ca.

ANGELS, APES, & MEN by Stanley L. Jaki, LaSalle, IL, Sherwood Sugden & Co., 1117 Eighth Street, 61301, 1983, 128 pages (paperback book-price not given).

Many readers of this journal will have heard of Jaki's *The Road of Science and the Ways to God*, or other books by this author, who has doctorates in physics and theology, and is a Benedictine priest. In *Road*, Jaki argued at length, and with obvious scholarship, that science has progressed satisfactorily only when its practitioners steered carefully between the Scylla of rationalism and the Charybdis of empiricism. Examples of physicists who did, or did not, steer with the prescribed care were given. The present volume, like *Road*, was originally presented as a series of lectures, this one to the Institute for Christian Studies in Toronto. *Angels, Apes, & Men* also has the same theme, but uses different examples of proper and improper steering. It is worth reading, and a more digestible version of Jaki's ideas than *Road*.

Although, as indicated above, Jaki is writing about science and how it must keep to the straight and narrow path, he is also explicitly writing about the role of man. There have

been, he says, two principal wrong views of man. One of these is that he is an angel, or, in more "practical" terms, that he is capable of deducing the structure of the universe through sheer brainpower. The Angels were scientists, or more properly philosophers, who sought for truth in their own "interiorized minds." (p. 37) Descartes was an important Angel.

Descartes' failure is still instructive because he spelled out all the reasons for it. Those reasons are rooted in his anthropology—his wholly-mistaken notion of man. Descartes' man is a ghost in a machine . . . a mere thinker—that is, an abstraction . . . [but] the real man, the real Descartes, slipped back to the scene almost immediately. This was to be expected as no man can discourse for long as if he were a disembodied spirit. (pp. 17–18, partly a quotation of Unamuno by Jaki)

Another important Angel was Kant:

The Critique of Pure Reason is a vast effort to establish on the so-called critical principle the claim that universe, soul, and God—the three main objects of metaphysics—were but the bastard products of the cravings of the human intellect. . . . Kant makes it clear that . . . God is man himself: "God is not a being outside me but merely a thought within me." (p. 31)

Hegel also is treated as an important Angel.

The Apes had a different, but also wrong anthropology. They thought of man as an ape. Rousseau is the first Ape dissected, Darwin is the second, and those who presently wish to derive ethics from an evolutionary standpoint also come in for a goodly share of Jaki's scholarly ire.

Any recognition of man as a moral being strikes at the very foundation of Darwinist evolutionism. To be sure, its chief believers keep asserting that they have succeeded in deriving values from facts and they continue to obtain prominent forums in which to reassure their fellow believers and persuade the unwary that the impossible is possible. (p. 61)

Jaki believes that Christians have been subverted by Darwin's anthropology:

Had Christians been deeply steeped in the understanding provided by their faith, they might, from the start, have distinguished the gold from the straw in evolutionary theory. All too often they even failed to notice the huge piles of straw. Why is it, one may ask, that Christian analysis of Darwinian evolution places so little emphasis on the weakness of a view which turns time into a hopeless treadmill? (pp. 66–67)

Jaki is not, however, an ideological disciple of Henry Morris and Duane Gish. He notes that there are some flaws in their views.

The book closes with a reiteration of a Christian anthropology—man is both body and mind, irreducibly both, and a philosopher, or scientist, who ignores this vital truth does so at peril.

Although I am personally untrained in philosophy, I found this book stimulating and interesting to read. Most of it rings true. It is well written, if a bit turgid, and apparently serves as a reasonably easy introduction to Jaki's thought.

Martin LaBar, Central Wesleyan College

EVOLUTION: NATURE AND SCRIPTURE IN CONFLICT? by Pattle P.T. Pun, Zondervan, Grand Rapids, Michigan, 1982, 336 pp., \$11.95.

The conscientious Christian, in struggling with the evolution question, must examine it at two levels—an empirical one and a philosophical one. Pattle Pun attempts this unified approach in *Evolution: Nature and Scripture in Conflict?* He reviews both the revelation from nature which we have through scientific investigation and the special revelation we have from the Bible, God's inspired Word.

In the first section, the "Scientific Bases of the Theory of Evolution," Pun develops the empirical side of the issue. His summary of the evidence for evolution constitutes the longest chapter of the book, almost 120 pages, and covers an enormous range of disciplines—geology, paleontology, anthropology, biogeography, anatomy, molecular biology, and genetics. Becoming conversant in each of these topics may be beyond the average mortal. However, the author does an adequate job of presenting the basic data and provides you with an ample list of pertinent references with which to do additional homework.

Despite the mass of supporting data, evolutionary science has its weaknesses. Pun evaluates the "empirical adequacy" and "rational coherency" of evolution in a chapter which greatly expands on his June 1977 article published in this Journal. According to his analysis, the strengths of evolutionary theory lie in microevolution, i.e., in the realm of changes that occur primarily within a population. On the other hand, serious deficiencies, seven in all, are evident in macroevolutionary data. Chief among them, says Pun, is the fact that macroevolution—the belief that all living forms have arisen from a single common ancestor—is empirically unfalsifiable.

Part two, entitled "A Christian View of the Origin of Life," delves into the revelation that comes from Bible exegesis, particularly of Genesis. The author is an unabashed proponent of "progressive creationism" and compares this approach with that of "fiat creationism" and "theistic evolution." Pun feels that fiat creationism, which includes all the "literal" views demanding young earth and cataclysmic flood, is prone to be close-minded to vast amounts of scientific data. Theistic evolution, on the other hand, errs in being overly figurative in interpreting Genesis and thereby weakens several fundamental doctrines of the Christian faith. Progressive creation, he argues, avoids both of these excesses in that this model "maintains the scriptural integrity of the Genesis account and at the same time does no injustice to known scientific facts."

To those who have read the books of B. Ramm, R. Mixer, D. Young, and others, the tenets of progressive creationism are familiar. The primary issues are interpreting the word day ("yom") and the genealogies. Are days indefinite or 24-hour periods of time? Are genealogies abridged or literal charts of descent? For proponents of progressive creationism, Bible exegesis is compatible with the indefinite time frame of a geological time scale. However, the exact fitting of "days" with specific geological periods leads to some interesting variations in belief. There are, for example, day-age advo-

cates, overlapping day-age advocates, and modified intermittent-day advocates.

Although Pun favors the progressive creation model, he does recognize at least two weaknesses. For him, a search continues for a better fit between Genesis and the scientific data for the antiquity of humans. In particular, what criteria should be used to link fossils with humanness? Did the Fall immediately precede the advent of human civilization or, as the fossil record might indicate, does a large gap exist between the first human and the beginning of civilization? The second area of tension for Pun is the Noachian flood. After considering some of the pros and cons, he tentatively adopts a local-flood view which "seems to be facing fewer obstacles than the universal-flood theory."

The final short chapters of *Evolution* give warning of the dangers of evolutionism—a philosophy which elevates biological evolution to a "paradigm to explain human experience." Philosophically, eighteenth century naturalism set the stage. Now evolutionism may appear in virtually every aspect of modern thought—philosophy, educational theory, societal structure and development, economic and political models, psychology, and religion. The "life transforming power" of evangelical Christianity may yet awaken and revitalize American religious life. But as Pun admonishes in the final chapter, Evangelicals will need to be well informed in science, familiar with the post-Christian mind, biblically literate, and aware of the pervasive evolutionary philosophy of life. *Evolution: Nature and Scripture in Conflict?* may provide a useful workbook for beginning our journey.

Reviewed by Paul E. Rothrock, Department of Biology, Taylor University, Upland, Indiana 46989.

THE FAITH OF THE CHURCH, by M. Eugene Osterhaven, William B. Eerdmans Publishing Company, Grand Rapids, Michigan, 1982, xiii & 248 pages. Paperback, \$11.95.

No reader will be disappointed with the author's enlightening presentation of the theological history of reform. In fewer than 100 pages, Osterhaven scans more than 1500 years. The remainder of the book focuses upon the Reformers and their evolving ideas of Church, ministry, and sacraments. Flashbacks serve to illuminate areas of controversy.

That very strength is also the weakness of this volume which purports to be a history of the Church. Treatment of the christological councils is superficial and erroneous in significant details. Cyril of Alexandria prevailed at Ephesus empirically because he was not only a skilled theologian but also an able politician with the backing of Celestine of Rome. Prior to the Council, the Antiocheans were thought to be supporters of Nestorius. When John of Antioch arrived after the Council had already concluded, he convoked his own council in his hotel room and condemned Cyril.

Historians emphasize Cyril's arrogance and discourtesy. For Duchesne, he was "the Pharaoh of Alexandria." Nonethe-

less he remains a notable example of the Spirit's ability to work within the lines of human limitations.

The Creed of Chalcedon "direct(ed) christological doctrine . . . into the main channel of biblical teaching." But the test as well as the language of Chalcedon and the other councils came not from the Bible but from the teaching of the Church. Some Church Fathers objected to the nonbiblical character of conciliar language but neither they nor subsequent Christian generations have successfully improved upon it. The Chalcedonian creed remains part of the common heritage of Christianity.

Osterhaven might also have written with greater precision about the relationship between the Church and the Jewish people. It is true that Paul wrote of the Jews who failed to accept Christ that their "minds were hardened" (2 Cor 3:14). He also wrote that God had caused that hardening so that gentiles might believe in Christ. Paul's perception was that Jewish disbelief was part of God's plan, the bottom line of which included the salvation of all Israel (Rom 11:26).

That plan was to be achieved by Christian people living their faith in Jesus Christ with such intensity as to awaken the jealousy of the Jews (Rom. 10:19). Christian history has done much to elicit hatred and fear; one could hardly speak of jealousy.

No author can be expected to include everything. However Christian references to the Jewish people have been so reckless in the past with such fatal consequences that extreme care must now be exercised to state only the truth.

These criticisms are aimed more at what Osterhaven has not done rather than what he has done so well. Perhaps the title of the book is really at fault. The subtitle is more accurate: *A Reformed Perspective On Its (The Church's) Historical Development*. This book is a valuable overview of Christian Faith history with significant insights into the thought of the Reformers.

Reviewed by William J. Sullivan, Dept. of Religious Studies, St. John Fisher College, Rochester, NY

EPISTEMOLOGY: THE JUSTIFICATION OF BELIEF by David L. Wolfe, InterVarsity Press, Downers Grove, IL, 1982.

Wolfe's book is the first to be published in InterVarsity's "Contours of Christian Philosophy" series. The series is intended to provide introductory level texts in diverse fields of philosophy which "evaluate alternative viewpoints not only with regard to their general strength, but also with regard to their value in the construction of a Christian world and life view" (editor's preface). How well, then, does Wolfe achieve the admirable goals set out for the series?

Wolfe begins with a brief survey of what we are to take as the traditional options regarding the justification of belief:

rationalism, naive and inferential empiricisms, relativism, and what Wolfe calls "critical interpretation," on which warranted beliefs are admittedly interpretations of experience which survive critical examination. Each of these is held up to criticism, leaving us, seemingly, with no justification for our beliefs. But Wolfe does not abandon us. He offers an alternative to these epistemological options, one which betrays strong doses of fallibilism and pragmatism. Wolfe's claim is that given that we are engaged in a particular project of inquiry, the nature of that project dictates certain criteria for warranted beliefs. Thus he claims that our project of interpreting the world—of "making sense out of total experience"—requires minimally that a set of claims (as opposed to any individual claim) be acceptable insofar as it is coherent, consistent, comprehensive (i.e., applicable to all experience), and congruent with (i.e., appropriate to) experience. This differs, we are told, from critical interpretation in that the criteria for warranted belief are relative to a project of inquiry (hence the pragmatic tone of the book), while for critical interpretation they are fixed criteria transcending any specific project. Moreover, the interconnected nature of beliefs and the failure of inductive justifications of beliefs leave us with something short of certainty or the conclusive verification of our warranted beliefs (thus Wolfe's fallibilism). Warranted beliefs are simply those that have, according to the criteria outlined above, survived criticism so far; at no point are we to claim they are conclusively true (even though it may be rational to believe they are true).

Given his fallibilist position, Wolfe can claim that any theory contains some faith-like element, since any set of beliefs is less than conclusively demonstrable and is always subject to possibly fatal criticism. Christianity, Wolfe claims, can be shown to be epistemologically legitimate or warranted in this sense insofar as it is open to revision in the face of criticism yet has held up fairly well so far against criticism. The reader looking for the ultimate conclusive defense of Christianity will be disappointed, but Wolfe argues that we should not and cannot look for such in regard to any set of beliefs.

Wolfe provides a clear introduction to some of the issues surrounding the justification of belief, and to the view he advocates. Where the book suffers, it does so in a way often characteristic of introductory books: brevity to the point of caricature. For example, many a modern empiricist or rationalist is likely to be upset with Wolfe's presentation and demolition of his or her views in so short a space. (Can one really even present rationalism in two and one-half pages, much less refute it as well?) The positions Wolfe criticizes are far more powerful and subtle than the image of them in the book. Indeed, if the failures of rationalism and traditional empiricisms are so obvious and so easily seen as Wolfe seems to imply, one is left wondering why such presumably intelligent people as Descartes and Locke would have held such positions. Wolfe's presentation of his own views could also contain a clearer indication that he is assuming answers to some rather controversial questions. To mention just one example, views such as Wolfe's are routinely subject to the criticism that they are unable to judge the relative truth-likeness among several theories each of which has so far withstood criticism. While it is desirable that Wolfe present

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his own position, the reader (especially the novice reader of an introductory text) deserves a stronger clue to the open-ended nature of the debate. Nevertheless, if the reader approaches the book less as a survey text and more as a contribution to developing part of a particular position in the theory of knowledge, these oversights can be ignored, and Wolfe's book viewed as a valuable aid to a Christian scholar seeking to grapple with the justification of his or her beliefs, and the relationship of faith and theoretical inquiry.

Reviewed by Gary R. Weaver, Philosophy Department, Northwestern College, Orange City, Iowa 51041

THE CAUSES OF WORLD HUNGER, William Byron, ed., New York: Paulist Press, 1982, 256 pp., \$8.95.

This book is a collection of 18 essays: an introduction, a conclusion, and an essay devoted to each of sixteen causes of world hunger. A project of the lobbying organization, Bread for the World, the book is aimed at members or potential members of the group. Thus the book is written for a lay audience, not a professional one. The essayists are all present or former members of the Board of Directors of Bread for the World. That means that all of them have an interest in and commitment to the alleviation of world hunger, but it also means that most of their backgrounds are in theology rather than in the natural or social sciences.

It should be no surprise, then, that these essays are uneven in quality. Some of them are thorough and analytical while remaining brief and accessible, which is a difficult feat. Particularly notable are W.P. Henegar's essay on geography and climate, J. Millar-Wood's on food reserves, J.A. Cogswell's on U.S. foreign aid, and E. Egan's on the refugee problem. Even those who teach in this area could benefit from studying these fine expositions. However, some of the authors seem uncomfortable with their subjects, or preoccupied with their own agenda, so the essays lose their focus. R.J. Neuhaus's article on colonialism becomes more an apology than an analysis, though the theological points he makes are worthwhile. C.D. Freudenberger documents and deplores the rate of soil erosion, but doesn't analyze it. Sen. M. Hatfield's essay is mostly hortatory, as is M.S. Augsburg's. Neither is able to establish any links between our political or economic behavior and the hunger problem. E.C. Blake's contribution on the arms race presents a similar difficulty. To call the arms race a cause of world hunger seems to me to be stretching the language of causation past its limits, and Blake's rambling essay is not sufficient to convince me otherwise. J.B. Hebr's essay on population is given to digression and equivocation.

I will give some special attention to N. Faramelli's essay on trade barriers since it is within my professional field, and since Faramelli bears some misconceptions and confusions. He accepts the Prebisch Hypothesis concerning the poor countries' terms of trade, in spite of the fact that most economists have rejected it on the basis of the evidence long ago. Early in the piece he seems to be making an argument

for development policy based on import substituting industrialization, another discredited concept, but then spends much of his remaining pages arguing for reduced First World trade barriers against Third World manufactures, which is more suitable to an export-led growth strategy. At various points he is distracted from the main task by digressions on Third World agricultural development and First World employment policy. Overall, I do not think this essay is useful even for lay readers.

If the book can be said to have a theme, it is that foreign aid given by the U.S. and other First World governments to poor countries can and indeed must be part of any successful development strategy. The authors thus at several points make a sharp distinction between their views and those of Frances Moore Lappe, who argues in *Aid as Obstacle* and elsewhere that official development assistance is a wrong-headed approach to the hunger problem, and that poor countries should endeavor to become self-sufficient in food. As a lobbying organization devoted to reform of aid and trade laws, Bread for the World is obviously committed to a view opposite to that of Lappe. Perhaps the book would have been more clear and more interesting if this divergence in position had been more clearly set out and argued.

There are very few serious books about world hunger that are written at a lay person's level, so it is hard not to recommend this one. However, some of Bread for the World's earlier efforts have been more successful. If you can still find Arthur Simon's 1975 book entitled *Bread for the World*, get it instead of this newer volume. Simon's work is accessible and responsible, if by now somewhat dated. The 1979 anthology *Growth with Equity* is also a better book, though written at a somewhat more professional level.

Reviewed by John P. Tiemstra, Calvin College, Grand Rapids, MI.

SOCIAL JUSTICE AND THE CHRISTIAN CHURCH by Ronald H. Nash, Mott Media, Inc. Publishers, Milford, Michigan, 1983, 175 pp, \$12.95 (cloth).

During the past decade, the evangelical community has manifested an increasing concern about social justice and the theological implications of economic systems. Ronald Nash, head of the Department of Philosophy and Religion at Western Kentucky University, has addressed a broad spectrum of social concerns from an evangelical perspective in a new book. His book, written for the intelligent Christian, avoids the jargon so often found in the writing of economists, theologians, and political philosophers but directly tackles tough questions about the nature of justice, the morality and rationality of capitalism, and the proper role of the state in economics. Christians who are serious about being responsive to Biblical social mandates must face the issues raised in this book.

The author concisely summarized the arguments of those with politically liberal and conservative views about econom-

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ics and justice as well as examining socialism and capitalism. He does a good job of showing the way arguments can be twisted because of poorly defined concepts and by failure to consider all relevant factors. Nash provides a cogent challenge for those who would try to capture Evangelical Christians for leftist causes and makes a strong case for the proposition that socialism hurts the needy more than it helps them.

Topics treated in this book include Liberalism, Conservatism, and the State; contemporary theories of justice; the welfare state; capitalism, socialism; and liberation theology. Nash's treatment of these topics will help the reader who is not immersed in political and economic literature appreciate the frequent caricatures of capitalism, free market ideas, and conservatism found in the writings of statist (ie, those who advocate that the State should intervene in economic affairs to redistribute wealth).

Reviewed by D. K. Pace, Johns Hopkins University Applied Physics Laboratory, Laurel, Maryland

STEPS ON THE STAIRWAY by Ralph Ransom, Bantam Books, New York, 128 pages, \$2.95, paperback.

Anyone who likes apple pie, the flag, and baseball will love this book. It is definitely a "motherhood" book. Including many of the verities which civilization has accumulated over the past 3,000 years, it abounds with cliches and truisms.

Who can argue with the virtues of success and happiness? Or the eight steps which Ralph Ransom, a Roman Catholic priest, claims lead to them: listening, struggling, giving, learning from failure, doing, being thankful, respecting yourself and others, and being a self-starter.

This book, full of Pollyanna goodwill and positive thinking, is a cheerleader for such maxims as "everywhere you look you behold the goodness of life (p. 16)." "smile at life and it returns the smile (p. 4)." The view is through rose-colored glasses with one eye closed. The empirically minded will find little solace here.

Reviewed by Richard Ruble, Department of Psychology, Siloam Springs, Arkansas, 72761.

ABORTION & THE EARLY CHURCH: CHRISTIAN, JEWISH & PAGAN ATTITUDES IN THE GRECO-ROMAN WORLD by Michael J. Gorman, NY: Paulist Press, 1982, 120 pp., \$3.95.

Gorman's book was originally a paper written for Bruce Metzger's course on the Life and Letters of the Early Church. With the encouragement of the Princeton Professor, the book has been published by Paulist Press, although for some

unexplained reason the copyright is held by InterVarsity Press.

The book has chapters on the ancient world, the pagan world, the Jewish world, three chapters on the early church, and one entitled "The relevance of the early church for today." Although it is relatively easy to read, Gorman documents his book well, and, as befits such a controversial subject, uses many quotations (English translations of Celsus, Plato, Juvenal, Josephus, Clement, Tertullian, Basil, Origen and Augustine).

Books Received and Available for Review

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

- Miriam Adeney, *God's Foreign Policy*, Eerdmans
- Peter & Evelyn Blitchington, *Understanding the Male Ego*, Nelson
- Janet Britton, *To Live Each Moment* (One Woman's Struggle Against Cancer), IVP
- Colin Brown, *Miracles and the Critical Mind*, Eerdmans
- Kieran Burns, *Life Science and Religions*, Philosophical Library
- Thomas John Carlisle, *Even and After* (Old Testament Women in Portrait), Eerdmans
- Arthur Custance, *Two Men Called Adam* (Creation/Evolution Controversy from the Theological Point of View), Doorway
- Ron Davis, *Gold in the Making*: Where is God when bad things happen to you, Nelson
- Jack Dominian, *The Growth of Love and Sex*, Eerdmans
- Jacques Ellul, *Money & Power*, IVP
- Finley & Lutz, *The Family Tie* (World Missions), Nelson
- Ora Graham, *Season of the Carnival* (Mid-life Crisis), Nelson
- Arthur Holmes, *Ethics: Approaching Moral Decisions*, IVP
- David Hubbard, *The Second Coming*, IVP
- Robert Johnston, *The Christian at Play*, Eerdmans
- Calvin Miller, *A Hunger for Meaning*: Gaining Confidence in the Face of Doubt, IVP
- William Murray, *My Life Without God*, Nelson
- Bolt and Myers, *The Human Connection*: How People Change People, IVP
- V. Nalimov, *Realms of the Unconscious: The Enchanted Frontier*, ISI Press
- Stephen Neill, *The Supremacy of Jesus*, IVP
- John Polkinghorne, *The Way the World Is* (The Christian Perspective of a Scientist), Eerdmans
- David Porter, *The Practical Christianity of Malcolm Muggeridge*, IVP
- J. Oswald Sanders, *Paul the Leader*, Navpress
- Frank Schaeffer, *Bad News for Modern Man*, Crossway
- Robert Schaper, *In His Presence: Appreciating Your Worship Tradition*, Nelson
- Frances Sharkey, *A Parting Gift* (how to face dying), Bantam
- M. Blaine Smith, *One of a Kind: A Biblical View of Self-Acceptance*, IVP
- John Stott (ed.), *The Year 2000*, IVP
- Thomas Torrance, *The Mediation of Christ*, Eerdmans
- Thomas Torrance, *Transformation & Convergence in the Frame of Knowledge*, Eerdmans
- Earl Wilson, *Sexual Sanity: Breaking Free from Uncontrolled Habits*, IVP
- Hart, Van der Hoeven & Wolterstorff (eds.), *Rationality in the Calvinian Tradition*, Univ. Press of America
- N. Wolterstorff, *Reason within the Bounds of Religion* (2nd Ed.), Eerdmans

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I am not an authority on the writings of any of the above, or their contemporaries, but if Gorman has read the ancients fairly, there is little or no support to be found for any position short of complete opposition to abortion in the writings and practice of the early church. The reason is that abortion was considered equivalent to murder. Gorman treats opposition to contraception, as well, but indicates clearly that such opposition came *after* opposition to abortion was established in the early church.

The book actually goes on to preach a message, but it is not so much one on anti-abortion as a more generally pro-life one:

The earliest Christian ethic, from Jesus to Constantine, can be described as a consistent pro-life ethic. It was in favor of human life regardless of age, nationality or social standing. It pleaded for the poor, the weak, women, children and the unborn. This pro-life ethic discarded . . . war in favor of peace, oppression in favor of justice . . . to follow Jesus was to forsake bloodshed. (p. 90)

Gorman goes on to plead that the foes of abortion, who have often condoned capital punishment, nuclear arms buildup and lax gun laws, be consistent (and that those who oppose capital punishment, the nuclear arms race and want to tighten gun controls also oppose abortion). In spite of the stand he takes on these matters, Gorman's book is relatively low-key, and more an examination of history than a prescription for the present.

Readers can find many interesting items in this short book, such as that the early church recognized that abortionists could be forgiven, that pagan opposition to abortion was not because it was held to be murder, and that a Christian ethic on the unborn ought to include love for an unwanted fetus, on Matthew 5:44 grounds.

Reviewed by Martin LaBar, Professor of Science, Central Wesleyan College, Central, SC

GOD'S MOUNTAIN, by James Ashwin. G.R. Welch, Toronto, 1978, 105 pp.

God's Mountain is James Ashwin's chronicle of his spiritual pilgrimage. It begins with his reading that "God causes all things to work together for good to those who love Him," and gives highlights of ways he has experienced that truth.

Ashwin went to India in 1953 to work at the Ludhiana Christian Medical College. Two years later he was in an iron lung because of poliomyelitis. Incidents he recounts show the joys and hardships of adapting to work in a new culture as well as his struggles in coping with his crippling illness.

This book has the ring of truth because it was forged over years in the life of its author. It deals with missiology, missionary biography, and the problem of pain. It is not, however, a treatment of any one of these themes, but rather

Ashwin's testimony to the fact that God is working all things together for good in his life.

Reviewed by Joseph M. Martin, Professor of Missions, Edward Lane Bible Institute, Patrocínio Minas Gerais, Brazil

JUST AS I AM by Harvey Cox, Abington, 1983, 160 pp. cloth \$10.95

This book is the latest in the interesting series on "Journeys in Faith," edited by Robert A. Raines. It is by the maverick theologian Harvey Cox, who brags that he does not belong to any group of professional theologians; he claims to be a disciple of Dietrich Bonhoeffer's "religionless christianity." He is convinced that "Life is not an unfathomable mystery. We know there is no ordered universe, awaiting the discovery of it by man . . . The universe is a human invention." Despite a Ph.D. in the history and philosophy of theology after a B.D. from the "liberal" Divinity School of Yale, he is keenly conscious of being an outsider at Harvard, where he chairs the Department of Applied Theology (a paradoxical term). This ecumenically minded activist confesses, "I am sure there are people in the world who are embarrassed to admit that I am Baptist just as it pains me to admit any links to them." This high priest of the popular *Secular City* has so little appreciation of complex social science per se that he does not realize that teaching "social ethics and the techniques of philosophical analysis" are insufficient to save man. He has the strange notion that "some type of atheism is always necessary for social change." He began *The Secular City* with the statement, "The rise of urban civilization and the collapse of traditional religion are the hallmarks of our era"—quite different from "The glorious city of God," the beginning of St. Augustine's work amid another crumbling age. He seems to be running away from what he calls "the faith of my father." He joins Camus in rejecting "the God of traditional Christian theism."

The present book is a reflection of his basic faith in man; in this case in himself. "We experience the universe as the city of man." "The world has become man's task and man's responsibility"—God has been shunted off into space. He insists, "History will go where man takes it and nowhere else . . . Stop worrying whether God exists or is a being. "Secular man relies on himself and his colleagues for answers. He does not ask the church, the priest, or God."

It is not surprising to find such a theologian, who claims "the Old Testament is not a very religious book," making few references to the role of the Bible in his own life. After all, he believes that "the world no longer conceives of moral principles as absolutes." In his attempt to escape from the Teheran airport he boldly confesses that he would have lied or cheated—"and possibly more." It never occurred to this so-called man of God to pray, to ask God's help.

This reflection upon the meaning of his life is concerned primarily with the unlikely places he has been and the

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unusual people he has met—particularly famous ones: Gdansk, the Berlin Wall, Teheran, Hiroshima, Selma, the Williamston (NC) jail, (for breaking the law while protesting), the Roxbury black ghetto in Boston, where he lived eight years as an exhibit—not as a humble witness for service like Kagawa.

A disappointing chapter is the one in which he constructs a dialogue with his 20-year-old son, a physics student. The father reluctantly admits that his civil rights activities in the sixties may have made only "some difference"; he thinks, "God knows I have neglected the kid's religious education."

This book is a readable account of an activist who practiced what he preached. It is an interesting autobiographical sketch; it reveals a lonely egoist lacking spiritual guidance and sustenance on a journey of faith—in man. He seeks salvation for himself and the world, not in the crucified Christ whom he has left behind, but in some social change of man's own contriving. As he claims, "Apathy is the keynote form of sin in today's world." He lives in obedience to his earthly vision.

Reviewed by Raymond Seeger, Bethesda, MD

THE HARMONY WITHIN: THE SPIRITUAL VISION OF GEORGE MACDONALD By Rolland Hein. Grand Rapids, Michigan: Eerdmans, 1982. 163 pages, \$6.95

From time to time we meet in life or in literature an individual who seems to possess a depth of wisdom and penetrating insight that sets him or her apart. A sage, a saint, a wise man—call them what you will—these people evidence a perceptivity, a glory, a weightiness, and a power to illumine life that seems to incorporate the very rays of heaven.

Many find George MacDonald to have been such a man. I confess myself to be one of his admirers. His most noteworthy admirer, however, was none other than C.S. Lewis, the man *Time* magazine called "this century's most-read apologist for God." In MacDonald Lewis found (speaking of *Phantastes*) the enchantment of the real universe, "the divine, magical, terrifying and ecstatic reality in which we all live."

Lewis acknowledged his debt to MacDonald to be "as great as one man can owe to another" and consequently he would have been pleased to see how good the years have been to his mentor. The fact is, judging by the growing number of titles being brought back into print (MacDonald's dates are 1824–1905), MacDonald is being discovered by more and more people and is currently riding a crest of popularity.

If credit is to be assigned to this revival, a good bit of it must go to Rolland Hein. He has edited and made available a number of MacDonald's publications including *Life Essential* (1974), *Creation in Christ* (1976), *The World of George MacDonald: Selections from His Works of Fiction* (1978), and *The Miracles of Our Lord* (1980).

Now, with the publication of *The Harmony Within*, Hein has come forth with a study focusing on MacDonald's major fiction—especially fantasy—which endeavors to explain how it expresses MacDonald's underlying theological convictions and spiritual vision. It is an intriguing study, a valuable aid, and a book that serves the dual purpose of providing both a helpful introduction for those just making MacDonald's acquaintance and a substantial book of reflection and insight for those already familiar with his works.

Hein begins with an overview of MacDonald's life and then proceeds in the next four chapters to discuss MacDonald's major works of fantasy. Particular attention is focused on *Phantastes* and *Lilith* with considerable space also devoted to *The Princess and the Goblin*, the *Princess and Curdie*, and *At the Back of the North Wind*.

The concluding three chapters provide an overview of MacDonald's novels, a discussion of representative themes developed in his shorter fantasies, a summarization of his theory of the imagination, and an evaluation of his achievement as a writer of literary myth.

This is a book to read and re-read. Quite apart from its value as a well-written and engaging work of literary criticism, many will read this book primarily for the treasures of wisdom and theology they expect to find and they will not go away disappointed.

Reviewed by Martin R. Johnson, P.O. Box 18916, Asheville, N.C. 28804

RACE FOR LIFE: THE JOEL SONNENBERG STORY, by Jan Sonnenberg. Zondervan, 1983. 178 p. \$9.95.

While this book is not directly related to science, the father of the subject of this book is Mike Sonnenberg, an officer and active member of the Metropolitan New York–New Jersey section of the A.S.A. He teaches Biology at Nyack College, Nyack, New York. Medical science saved his son's life. One could ask, does science have anything to say about how human beings are treated by society, a topic raised by the author?

Three and a half years ago Mike Sonnenberg and his almost two-year old son, Joel, were in a severe automobile accident. Both were burned, with Joel almost fatally. Mike's wife, Jan, has written this book describing the accident and the ordeal of struggle, first for life itself, and then for rehabilitation and acceptance.

Race for Life, is more than an account of the tragedy and courage of this family. It is also a testimony of the faith and love of the many people involved in the Sonnenberg's experience: friends, relatives, church family, and college faculty and students. Even strangers showered help and hospitality on them during the first 24 hours after the accident.

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Jan Sonnenberg, who was in another car just behind her husband's, saw the crash and fire, and then minutes later the badly burned body of their son, Joel, who was pulled from the flaming wreckage by a passerby. Seeing the totally charred body of her unrecognizable son, Jan knew from her nursing experience that he could not live with such massive burns. She questioned why he had been saved from the burning car only to suffer for a time and then die.

But he did survive, and later her love and faith praised God for saving him and the long ordeal of skin grafts and other medical treatment began.

Several weeks after the accident Jan Sonnenberg faced a crucial question in her role as mother. Joel was unable to talk, he was inside a special tent to avoid infections, and from outward appearances, this boy was not at all like her bouncy, happy, handsome son before the accident. Sonnenberg wondered whether he was the same boy "inside" or had his personality changed as much as his appearance.

One day she was reading from a book on boats to him through the plastic tent. As she read, he laughed the same kind of laugh he had before the accident. "He's the same boy," she cried. And from then on it was a little easier to struggle with and for him through the many forms of treatment that he needed to get well.

Burned over 85% of his body, Joel lost the toes on both feet, one hand completely and fingers on the other hand. His face was so badly burned that his facial features were practically gone. During the more than 4 years of rehabilitation since the accident he has had over 30 operations to restore some functional ability and improve his skin conditions. He wears a helmet daily to protect his head which was recently covered with skin.

Joel began school at the age of five with a regular class. Most people feel very uncomfortable looking at him because of his physical deformities. The book describes the personal discrimination he has experienced because of his condition. His parents have felt the pain with him every time someone has blurted out a cruel comment about his physical deformities.

Sonnenberg raises a crucial question regarding the place of physically handicapped people in our country. "Joel is ready for society," she explains, "but is society ready for Joel?"

The real Joel is not the one we see with our eyes—the facial disfigurement, the physical deformities, the strange skin. The real Joel is the inner person—"a bundle of potential and promise"—a thinking, feeling person just like others whose outward form is "prettier" than his.

The book is inspiring though sometimes disheartening when reading about the way insensitive people have treated Joel. Jan Sonnenberg asks her readers to accept the people who have the handicap of physical disfigurement. This is a real challenge to the Christian community.

I recommend this book to all who care about changing the way they and society treat handicapped people.

Reviewed by Janet Neidhardt, free-lance writer and educator, 146 Park Ave., Randolph, N.J. 07869.

FAITH AT THE BLACKBOARD: ISSUES FACING THE CHRISTIAN TEACHER, by Brian V. Hill, Grand Rapids, Eerdmans, 1982. Paper, 143 pp., \$6.95.

Awash in the debate over nearly every aspect of education, Christian teachers and others concerned with educational issues must navigate numerous countercurrents. In the eddies of this debate, can their faith serve as a compass?

In this book, Brian Hill, Professor of Education at Murdoch University (Australia), proposes to encourage both public and private school teachers "to think Christianly about his or her profession"—that is, interpret professional conduct in the light of Biblical insights about human nature and the world. He does so by discussing a number of current issues, in question form, "in the light of relevant Biblical principles and current educational theory" (p. 10).

Hill's approach to relevant issues via the questions, and his well supported and well reasoned answers to them, rates as the strong point of the book.

In answer to the question, "Is it possible or desirable to teach religion in schools?" Hill argues it is both possible and desirable. He counters the humanist objection that religion cannot be taught without embracing it personally by pointing out that humanists misunderstand commitment as something non-rational. "In all high religions, faith is represented neither as blind devotion nor lame belief, but as reasonable commitment" (p. 58). Hill responds to the idea that teaching religion leads to indoctrination by saying, "The converse denial that faith is operative in the humanist stance is also implausible" (p. 58).

To resolve the dilemma posed by humanists Hill contends that religion can be taught by focusing on cognitive awareness. The subjective elements of religion can be conveyed by C. S. Lewis's idea of "reception"—the exercise of empathy and imagination to 'try on' new experiences.

Furthermore, religion should be taught, Hill says, since it is a part of human experience in the world. Religion should be studied as a many-sided phenomenon, including its doctrinal aspects.

"How far can the classroom teacher go in revealing his own religious convictions and seeking to influence beliefs?" Hill asks in one chapter. He advances the principle of "committed impartiality." In this manner the teacher fosters critical analysis in students, yet the teacher does not project indifference. Rather, the teacher embraces commitment for good reason and shares his beliefs at appropriate points while also treating students impartially and with respect.

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Hill begins his discussion of Christian schools with the question, "Should I really be teaching in a Christian school?" How one answers this question reveals an attitude toward culture, and thus a position on Christian involvement in schooling.

While he sees no clear Scriptural mandate for establishment of Christian schools, Hill provides a good discussion of guidelines for choices between private and public schools, including an assessment of cultural conditions presently operative. He presses for Christians to spearhead reform in the schools rather than bemoaning the influence of humanism. He thinks Christians are too ready to leave the community and go on their own educationally.

Hill handles well the matters he discusses. He gives adroit answers to difficult questions. Though presently teaching in Australia, Hill is no stranger to the American scene. Both he and his children have attended U.S. schools. While forewarned in the preface, at times Hill gets too conceptual in developing his arguments.

This book fills a void. We would hope others pursue these issues in greater depth. Following Hill's example, Christian teachers and others should be able to use a thinking faith as a compass in considering educational issues.

Reviewed by Thomas L. Siekmeier, who is enrolled in an Master of Divinity Program at Denver Conservative Baptist Seminary, Denver, Colorado.

GOD'S GRACE & HUMAN HEALTH by J. Harold Ellens, Abingdon, Nashville, 1982, 156 pages (paperback book-price not given).

In all honesty, I must preface this review with a statement of incompetence. I am not a psychologist. I may need a psychotherapist, but have never sought one. However, I suppose myself as good as the next at reviewing a book entitled *God's Grace & Human Health*.

The author has positions as executive director of the Christian Association for Psychological Studies (CAPS), and editor of the *Journal of Psychology and Christianity*. But, alas, the book is mistitled. Author Ellens, who has been known to review books in this column, has nothing to say about prevention or cure of infectious, degenerative or metabolic diseases, or about proper nutrition. The book might better have been called *God's Grace & Human Emotional Health*.

The chapter titles, unlike that of the book, are indicative of content. They are "Anxiety and the Rise of Religious Experience," "The Biblical Theological Underpinnings," "The Psychodynamics of the Fall Story," "Contemporary Notions of Human Nature," "Implications for Psychology Theory

Development," "Consequences for Psychotherapy" and "Concluding Observations: Transference and the Christian Therapist." Parts of the book have already been published as articles in *The Bulletin of CAPS* and in *The Journal of Psychology and Theology*. Three chapters were developed for an invited lectureship at Fuller Theological Seminary.

There are two negative criticisms I wish to offer. The first is related to Ellens' apparent view of scripture. I quote: "The [fall] story is intriguing because . . . it is dependent for its formal elements upon archaic Mesopotamian sources. . . . The story is equally intriguing, for the manner in which the Hebrew editors attempted to adapt it for Yahwist use." (pp. 68-69) And again: "The story may be helpfully viewed as a theological myth, imported into the sacred canon by the Hebrew believers from pagan sources for the purpose of describing the state of affairs they perceived to afflict humanity." (p. 70) This, added to the statement that there "is the plain implication of a significant and dangerous state of anxiety existing in the life and spirit of Adam and Eve before the Fall . . ." made interesting input for my simple neo-fundamentalist mind. I thought Adam and Eve lived an anxiety-free life before the Fall, although the Bible doesn't seem to say so. More important, isn't it possible that the Mesopotamians and the Hebrews both got the story from the same source, namely from the fact that it actually happened to their first ancestor, which accounts for the similarity?

The second criticism is that Ellens seems to have a simple neo-Freudian mind. As evidence of this, he states that the "native sense of psychological and spiritual fallenness universal to humans is surely rooted in that initial loss of the paradisiacal world of the womb," (p. 54) and that "the story of the Fall describes a psychospiritual experience akin to the general human trauma of birth, combined with the postpubertal, oedipal entrenched process of adolescent disengagement from parents and home . . ." (p. 55) Surely other interpretations are possible.

By no means are all my comments negative. Ellens is familiar with a number of previous attempts to integrate Christian faith and psychology, and makes concise comments about them. He can write well, the quote immediately above notwithstanding. He makes an insightful comment on the old question about whether or not God can make a rock too heavy for Him to lift: He could, but has chosen not too. And the book is an attempt, probably a good one, to integrate psychology with Christian belief. Certainly Ellens' ideas are at least thought-provoking, and seem to deserve the careful attention of Christian psychologists.

Perhaps the best statement I can offer is to say that *God's Grace & Human Health*, which I, as a biologist, may have served poorly, was written by an author with broad interests. To do it justice, it would have needed a reviewer who combined a working knowledge of psychotherapy, theology and the ancient classics.

Martin LaBar, Central Wesleyan College

Letters

Newcomb's Problem and Election

I would like to express my appreciation to you for including Edward Davis's excellent article *Newcomb's Problem and Divine Foreknowledge* in the March issue of JASA. I found it to be a very stimulating and enjoyable treatment of a subject that is important to Christians.

By discussing Newcomb's Problem, Davis has very ably dealt with a formulation of the usual objection to the doctrine of divine foreknowledge. His footnotes, though go even further by mentioning another subject, the doctrine of election, whose discussion tends to touch on the topic of free will. It is unfortunate that for many centuries what the Bible calls *election* theologians have been referring to as *predestination*, for this tends to give many the impression that the relation between man's free will and God's foreknowledge is the central issue. Actually, in discussing election and the meaning of grace, it is the relationship between man's nature and the freedom of his will which seems to be the pertinent area of debate. This gives further evidence that the subject of free will is a very slippery one to handle.

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Creationism—Brother against Brother

Philosophy, biology, geology and Christianity have all changed to various degrees since and because of the formulation of the General Theory of Organic Evolution as a scientific theory. The subject of evolution or origins is fundamental to the continuing strife between powerful contemporary ideologies. Such strife is also seen within Christianity itself. The subject of origins can divide Christian groups due to the great input coming from pagan philosophies and non-Christians. There is always that distrustful hesitation in accepting change promoted by pagans.

If two sources of knowledge contradict each other, there are four possible explanations for the contradiction. Geology and Biblical hermeneutics are said by some to lead to incompatible appreciations of the history and antiquity of life on earth (We are not addressing the identity of the Creator.). Either 1. geology is incorrect and hermeneutics is correct, or 2. vice versa; or 3. both are incorrect; or 4. both are correct but their compatibility is not yet apparent. Except

for the third choice ("both incorrect") every option has drawn great following as a stand on the issue within Christianity. I would propose that the third choice also has some merit.

In more specific terms, it appears to me, as a person trained in both relevant disciplines: geology and Biblical interpretation, that the traditional accepted view in each discipline, taken in its totality, is inadequate. That is, it is not true.

The traditional interpretation of Genesis one is inadequate for ascertaining the presence of conflict because it is non-unique. Until information from the sciences began to raise questions about the traditional interpretation of the Creation Account, there was no need to investigate other interpretations.

On the other hand, the traditional view from geology for the chronological order of first appearance of fossils, encounters so many exceptions in the geologic record, that its usefulness as an interpretive tool should not be taken for granted. There are too many embarrassing situations.

No one can claim they have observed invertebrates evolving completely into vertebrates today. Special evolution is an observed phenomenon, but not its extrapolation to account for the major transformations General Evolution proposes. The truly scientific aspect of the General Theory of Organic Evolution is geological. It has to do with Natural History and not only with empirical science. Thus its character should be recognized and not equated with theories on processes observed in innumerable controlled experiments today.

The fundamental argument for the historicity of General Evolution (what is generally agreed upon—that it in fact occurred) is the geologic principle of faunal succession, stating that:

"Groups of fossil plants and animals succeeded one another in a definite and determinable order and each period of time can be recognized by its respective fossils."

That is a statement that can actually be tested!

Thus, questioning the adequacy of the theory from a scientific point of view necessarily becomes an examination of the geological principle on which the belief in its historicity rests.

For more information on our developing Christian perspective on origins, please write to The Office for Research on Origins, Houston, TX 77272-2153. The issue urgently needs to be honestly and objectively pursued for the sake of the Christian testimony.

John W. DeVilbiss, Ph.D.
Geologist and Geophysicist
Director of Office for Research on Origins



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

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