# JOURNAL OF THE AMERICAN SCIENTIFIC AFFILIATION

*An evangelical perspective on science and the Christian faith*

(US ISSN 0003-0988)

*"And all the trees of the fields shall know that I the Lord bring low the high tree, and make high the low tree, dry up the green tree, and make the dry tree flourish."* *Ezekiel 17:24*

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

**VOLUME 32, NUMBER 4** **DECEMBER 1980**

MEMBER EPA EVANGELICAL PRESS ASSOCIATION



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JOURNAL OF THE
AMERICAN
SCIENTIFIC
AFFILIATION

DECEMBER 1980 PRINTED IN THE UNITED STATES OF AMERICA VOLUME 32, NUMBER 4

# Ancient Ecologies and the Biblical Perspective

EDWIN M. YAMAUCHI

History Department

Miami University

Oxford, Ohio 45056

The word "ecology" was first coined in 1873[1] but men in ancient times were at least partially aware of "the interrelationships of living things to one another and their surrounding environment."[2] Today we understand much more clearly the delicate balances involved in the relationships between nature and man's activities. But even now we do not always foresee all the results of constructing a project like the Aswan Dam in Egypt.[3]

Although we may comprehend the causes and processes, we are still unable to do much more than the ancients to prevent such natural disasters as droughts and locust plagues. In recent years disastrous droughts caused by the failure of the summer monsoon rains affected twenty million people in the Sahel region of Africa.[4]

Periods of drought kill the predators of locusts and grasshoppers, and also leave cracks in the ground which provide good nesting areas. If such periods are followed by moist seasons, conditions are ripe for the formation of plagues of such swarming insects. In the summer of 1978, 33 locust swarms were reported over Ethiopia and 17 over Somalia, some covering up to 40 square miles.[5] At the same time huge infestations of grasshoppers have been reported attacking the fields in Colorado, Kansas, Nebraska, Oklahoma, and Texas.[6] Such swarms of hoppers, so thick that they obstructed the view of the sun, devastated Kansas in 1873 and in 1919.[7]

In the following study I examine how the peoples of the ancient world viewed such calamities. I compare the view-

points of the pagans and those of Jews and Christians, noting both similarities and differences. Such a study raises questions which I consider in the conclusion.

## THE CLIMATE OF THE MEDITERRANEAN

The lands of the Bible include for the Old Testament period Palestine, Phoenicia (Lebanon), Syria, Egypt, and Mesopotamia (Iraq); for the New Testament period we have in addition the lands to which the Gospel was carried: Anatolia (Turkey), Greece, and Italy. Almost all of these areas border the Mediterranean Sea and are affected by the climatic conditions associated with it with, of course, local variations. The chief features of the common "Mediterranean" climate are: (1) a prolonged summer drought, (2) heavy winter rains, and (3) a relatively small range of temperatures.[8] Throughout the entire area, with few exceptions, rain water was precious and was conserved by cisterns.[9]

### Mesopotamia

The land "between the rivers," the Tigris and the Euphrates, was irrigated by two of the four streams associated with the Garden of Eden (Gen. 2:14). At the northern edge of the Fertile Crescent sufficient rain fell on the "hilly flanks" of the Zagros Mountains, which divide the alluvial plains of Mesopotamia from the upland plateau of Iran, to make this area Robert J. Braidwood's candidate for the first area to develop the Neolithic "revolution" of agriculture.[10] As for the central area of Mesopotamia itself, M. A. Beek observes:

> Because of the dryness of the climate the soil of Mesopotamia is hard and nearly impenetrable. Consequently, when the heavy rainfall in the northern areas coincides with the melting of the snow in the Taurus and Zagros Mountains, the rivers wreak destruction. . . .[11]

The Mesopotamian floods are not only destructive but they are highly unpredictable. They come in the spring rather than in the summer when the water is most needed. Especially swift are the flood waters of the Tigris, whose Akkadian name *Idiglat* (cf. Hebrew *Hiddeqel*, Gen. 2:14) means "Arrow." The people of Mesopotamia, however, were able to use the waters of the rivers through canals for irrigation purposes, though this demanded the combined efforts of communities as constant attention was required to maintain the dikes and canals.[12] In times of war, the canals would be neglected and the weeds would grow in them. In his lamentation over Ur, a poet cried out: "Your river which had been made fit for the *magur*-boats—in its midst the. . .-plant grows."[13]

### Egypt

In striking contrast to Mesopotamia is the felicitous situation of Egypt. The statement of Herodotus that Egypt was "the gift of the Nile" still holds true today. Fed by the tropical rains of central Africa, the White Nile and the Blue Nile from Ethiopia join together near Khartoum to flood with such regularity that the Egyptians were able to regulate their calendars by the annual floods.[14] The flooding also came at the most propitious time for agriculture. The four months of inundation (June to September) were called *Akhet* "Flood," followed by *Perit* "Coming Forth" (October to January) and by *Shemou* "Deficiency" (February to May).[15]

The Egyptians could tell how high the Nile would rise by a Nilometer which they had carved at the island of Elephantine near Aswan. A low Nile would mean that not enough fields would be irrigated and that famine would ensue. On the other hand, a Nile that was too high might mean the destruction of dikes. Ordinarily Egypt had a sufficient surplus to supply starving bedouins from Palestine such as the biblical patriarchs (cf. Gen. 12:10 ff., 26:1 ff., 43:1 ff.).[16] Down through the period of the Roman Empire Egypt served as the most important "bread basket" of the Mediterranean.

By the 14th cent. B.C. the Egyptians had invented the *shaduf*, a weighted lever to lift the water. The *saqiya*, the animal-drawn water wheel, was introduced only in Persian or Ptolemaic times (5th to 3rd cent. B.C.).[17] Archimedes (287-212 B.C.) is credited with the invention of the hydraulic screw.

Apart from the coastal region, rain rarely falls in Egypt. According to H. Kees:

> At the present day Alexandria enjoys annually about 25 to 30 days of rain with a rainfall of about 8 inches, while Cairo and its environs has on the average, mostly in January 1½ to 2 inches. In the upper Nile valley on the other hand for as far back as our knowledge reaches, rain has always been an exceptional phenomenon, the accompaniment of occasional storms and less a blessing than a catastrophe, associated in people's minds with the dangerous powers of the desert.[18]

### Greece

Greece enjoys a typically Mediterranean climate with a rainless summer from the middle of May to the middle of September. The stormy weather of winter generally brought sailing and fighting to a halt. As the prevailing winds are from the west, three times as much rain falls in the west as falls in the east, for example, in Corcyra (Corfu) as compared to Athens.[19]

In 1966 Rhys Carpenter offered a climatological explanation for the fall of the Mycenaean kingdoms c. 1200 B.C. in place of the traditional view of a Dorian invasion.[20] His theory was criticized by E. Wright, who pointed out that pollen samples from northwestern Greece from this period indicated no drought.[21] But climatologists have shown from records for 1955 that the climatic pattern which Carpenter posited, with an extensive drought for the Peloponnese but not for northwest Greece or for Athens, is quite possible.[22] Whether or not such a drought caused the Mycenaean decline is still a moot point.[23] It is more likely that a combination of factors, including drought and famine followed by the dislocations of such groups as the Dorians and the Sea Peoples, caused the Mycenaean collapse and the beginning of the Greek Dark Age.[24]

**Palestine.**[25]

*Meteorological Factors.*

Several factors produce the characteristic weather of Palestine. The country lies between 33' 15" and 31' 15" N as far south as Beersheba, which is the same latitude as the southernmost section of California. It is therefore on the northern margin of the subtropical region. The presence of the Mediterranean to the west, and the deserts to the south and the east play a major role, as does the great variety of topographical features.

The following regional generalizations may be made: (1) Temperature decreases with height and increases with depth below sea level. (2) The temperature ranges increase as one moves away from the moderating influence of the sea. (3) Rain tends to decrease from north to south. (4) Rain decreases from west to east. (5) Rain increases as heights are encountered. (6) As the prevailing moisture bearing winds are from the west, rain precipitates on the western slopes, leaving the eastern slopes in a "rain shadow."[26]

*Winds.*[27]

During the summer Palestine lies midway between a monsoon low over the Persian Gulf and a high pressure area in the Atlantic. It therefore enjoys steady NW Etesian winds and a sunny almost rainless summer, as there are no frontal storms of cold air clashing with warm air masses. In the winter, however, cold maritime air pushes south into the Mediterranean where it clashes with warm tropical air masses, creating wet and stormy weather (Job 37:9).[28]

In the winter season the moisture bearing winds from the W and SW precipitate rains as they encounter colder land and air masses (I Kgs. 18:44; Lk. 12:54). But during the summer the drier NW winds encounter only warm land and air masses and do not precipitate any rain. The winds do, however, mitigate the heat of the day. The westerly winds reach the Transjordanian plateau about 3 p.m. These regular winds are used for the winnowing of grain (Ps. 1:4) even to this day.

North winds are relatively rare. There are two types. Chiefly in October a cold dry wind seeps over the mountain barriers from Central Asia (Sirach 43:20). In March a surge of polar air across the Balkans may produce heavy rains (Prov. 25:23).

The scorching desert wind (*sirocco, khamsin*) from the E, SE, or S was and still is a dreaded phenomenon. It strikes for three to four days in the transitional seasons. A sirocco will produce the hottest temperatures of the year, often 20 degrees above the average (Jer. 4:11). What makes matters worse is the fact that it is an exceedingly dry wind, dropping relative humidity by 30-40%, fraying tempers, and debilitating energies. The air is filled with a fine yellowish dust which veils the sun and reduces visibility. The siroccos of the spring are particularly devastating, withering the winter vegetation in a few hours (Ps. 103:15-16; Isa. 40:6-8; Ezk. 17:10, 19:12; Hos. 13:15; Jon. 4:8). The fullest fury of the sirocco is experienced in the Transjordan, the Negev, and the Rift Valley. In coastal regions the sirocco winds may pour down the slopes at 60 miles per hour, shattering ships in the harbors (Ps. 48:7; Ezk. 27:26).

*Precipitation.*[29]

*The Rainy Season.* The exact commencement of the rainy season is not predictable but in general the rainy season runs from mid-October to mid-May.[30] The rainy season includes, but is also more extensive than our winter months (cf. Song 2:11). In this season three to four days of heavy rain alternate with dry days during which cold desert winds blow from the east.[31]

*The Early and the Latter Rains.* The Bible refers repeatedly to the early (RSV "autumn") and the latter (RSV "spring") rains (Deut. 11:14; Jer. 5:24; Joel 2:23), giving the average reader the impression that rains fall only at the beginning and the end of the rainy season. As a matter of fact most of the heaviest rains fall in the middle of the season (Lev. 26:4; Ezra 10:9, 13). These initial and final rains are stressed because they are crucial for agriculture. The early rains come in October before plowing and sowing. The latter rains fall in March and April and are needed to make the grain swell for a good harvest (Hos. 6:3; Zech. 10:1).

*Drought and Unseasonable Rains.* If the high pressure areas over Europe and Asia in the north link up with the high pressures over Africa and Arabia, this blocks cyclonic storms from arriving through the trough of low pressure in the Mediterranean. In this case rain is sometimes delayed until as late as December; in some years rain amounts to only 50 to 75% of the average. A catastrophic drought that lasted 3½ years is recorded for Elijah's day (I Kgs. 17:1; Lk. 4:25; Jas. 5:17. Cf. Deut. 28:23-24; I Kgs. 8:35; Jer. 14:3-6).[32]

If the thermal difference between the warm and cold air masses is not great, rainless clouds float by (Prov. 25:14; Jude 12). On rare occasions a late surge of cold Atlantic air penetrates into the area of Palestine in the summer, bringing unseasonable rain (I Sam. 12:17; Prov. 26:1).

*The Distribution of Precipitation.* As Amos 4:7 indicates, there are considerable local differences in the distribution of rainfall in Palestine.[33] Galilee receives the greatest amount of rain from 28" to 40". Haifa on the coast receives an average of 24", Tiberias 16-18", and Beth-shean in the Jordan Valley only 12". In Judea the foothills receive 16-22". Rainfall at Jerusalem generally fluctuates from 17" to 28", with an average of 25".[34] Jericho receives an average of 4-6"; in the very wet winter of 1944 it recorded 13".[35] The southern end of the Dead Sea receives only 2".

The steppe region around Beersheba receives between 12" to 16"; areas in the Negev to the south receive less than 8". In the Hellenistic and early Roman era, the Nabataean Arabs by a careful conservation of water by terraces were able to raise wheat, barley, legumes, grapes, figs and dates in the Negev.[36] Modern Israeli researches have attempted to reduplicate their feats.[37]

*Dew.*[38] The summer drought was not due to the lack of humidity, which is in fact twice as intense in the summer as in the rest of the year. The lack of rain storms is due to the absence of frontal clashes between warm and cold air masses. The summer humidity manifests itself in the dew that condenses as the ground cools during the night. At Gaza with its extremes of temperatures dew may form as many times as 250 nights per year. Gideon was able to collect a bowl full of water from the fleece which he had set out (Jud. 6:38).

Dew is vital for the growth of grapes during the summer (Zech. 8:12). It was indeed a calamitous drought when not even dew was available (II Sam. 1:21; I Kgs. 17:1; Hag. 1:10). Its value may be seen in the numerous comparisons of God's grace and goodness to the benefaction of dew (Gen. 27:28; Isa. 18:4; Hos. 14:5; Mic. 5:7; Sirach 43:22).

## THE MYTHOLOGICAL VIEWS OF THE PAGANS

### Mesopotamia

Among the early Sumerians (3rd millennium B.C.) the bringing of rain and subsequent flooding was attributed either to Enlil, the leading god of the pantheon, or to Enki, god of water and wisdom. Without Enlil "in heaven the rain-laden clouds would not open their mouths, the fields and meadows would not be filled with rich grain, in the steppe grass and herbs, its delight would not grow."[39]

For the later Babylonians (2nd-1st millennium B.C.) the pre-eminent rain god was the Syrian god Adad (Hadad). In the *Atrahasis Epic*, the full text of which was discovered only in 1965, we have the following developments preceding the catastrophic Flood. When Enlil is disturbed by the clamor of proliferating mankind, he orders:

> Cut off supplies for the peoples,
> Let there be a scarcity of plant life to satisfy their hunger.
> Adad should withhold his rain,
> And below, the flood should not come up from the abyss.[40]
>
> Let the wind blow and parch the ground,
> Let the clouds thicken but not release a downpour. (II.i.9-16)[41]

People sought to placate Adad with gifts of loaves and offerings, so that "he may rain down in a mist in the morning, and may furtively rain down a dew in the night." (II.ii.16-17)[42] But "Adad roared in the clouds," and sent not just rain but the Deluge.

From the *Gilgamesh Epic* we learn that when the Flood came,

> (Even) the gods were terror-stricken at the deluge.
> They fled and ascended to the heaven of Anu;
> The gods cowered like dogs. . . .[43]

Important mythological concepts regarding fertility centered on the Mesopotamian cult of Inanna (Ishtar) and her consort Dumuzi (Tammuz). In the text of the famous myth, "The Descent of Inanna (Ishtar)," the goddess descends into the Underworld and is slain by her sister. Upon her death procreation among animals and humans ceases only to be restored with her resurrection.[44] The Mesopotamians practiced a *hieros gamos* or "sacred marriage" rite between the king representing Dumuzi/Tammuz and a sacred prostitute representing Inanna/Ishtar to ensure the fertility of the land by sympathetic magic.[45]

### Egypt

The Egyptians honored the Nile River as the god *Hapy*, whom they depicted as a well nourished man with pendulous breasts. Thousands of miniature figures of this god were made and offered to him in temples prior to the flooding of the river.[46] The most important god of the Egyptians apart from the sun god was Osiris, the god of the underworld. As early as the Old Kingdom (3rd millennium B.C.) Osiris was identified with the life-giving waters. According to Breasted:

> It was water as a source of fertility, water as a life-giving agency with which Osiris was identified. It is water which brings life to the soil, and when the inundation comes the Earth-god Geb says to Osiris: "The divine fluid that is in thee cries out, thy heart lives, thy divine limbs move, thy joints are loosed," in which we discern the water bringing life and causing the resurrection of Osiris, the soil.[47]

### Greece

The seasonal cycle of fertility and drought is most vividly depicted by the Greek myth of Demeter and her daughter Persephone, who was abducted by Hades. While Demeter, the goddess of grain, mourned for her missing daughter, the entire land was afflicted with infertility.[48] After she was discovered, Persephone still had to spend four months each year in the Underworld because she had eaten four pomegranate seeds there. The mysteries of Demeter and Persephone were celebrated at Eleusis, just west of Athens.[49]

Because of the regularity of the seasons in Greece, it was seldom necessary to pray for rain. According to Nilsson:

> On Mount Lykaion (in Arcadia) there was a well called Hagno. When there was need of rain the priest of Zeus went to this well, performed ceremonies and prayers, and dipped an oak twig into the water. Thereupon a haze arose from the well and condensed into clouds, and soon there was rain all over Arcadia.[50]

### Syria and Palestine

The climate of Syria and Palestine played an important role in the development of Canaanite religion. Baly and Tushingham describe the situation as follows:

> Precariousness, indeed, is everywhere the dread companion of rain-fed agriculture in the Middle East, and especially toward the south and inward from the seacoast. Over very large areas it is impossible to exaggerate the sense of desperate insecurity which accompanies the farmer upon his rounds. . . . Almost the whole of Canaanite religion was built around this desperate anxiety, this passionate longing for a fertile earth, . . . .[51]

Our understanding of the Canaanites has been greatly advanced by the discovery of Ras Shamra (ancient Ugarit) on the coast of Syria, and the subsequent publication of Ugaritic texts. These reveal that the Canaanite *Baal* or "Lord" par excellence was Hadad, the god manifest in storms and rains.[52] Millard comments:

> Controlling the rains, mist, and dew, Hadad held the keys of good harvests, so the existence of a myth describing his battles with death, barrenness, and threatening flood waters among the texts of Ugarit is no surprise.[53]

As in Mesopotamia the vitality of the king was linked magically with the fertility of the land. When the legendary king Kret was sick, nature likewise languished. When prince Aqhat died, a great drought ensued:

> Thereupon Danel the Rephaite prayed (that) the clouds in the heat of the season, (that) the clouds should rain early rain (and) give plentiful dew in summer for the fruits. Baal failed for seven years, the rider on the clouds for eight (years, leaving the land) without dew, without showers. (Aqhat 1.i.38-44)[54]

Many scholars have supposed, in analogy with Greek mythology, that Baal died annually and rose to life, symbolizing the rainless summer and the rainy winter. But the epic does not speak of an annual event but of a prolonged drought. As Gordon points out, the summer is normally dry and what was dreaded were dewless summers and rainless winters.[55]

The priests of Baal, who were confronted by Elijah (I Kgs. 18), tried to arouse their god to produce rain not only by their prayers but also by magical rites such as leaping about the altar and shedding their blood—but in vain.[56] Patai has suggested that Elijah also used magical gestures. But it is quite clear that when Elijah had water poured on the offerings, he was not making a libation but was demonstrating the supernatural power of God by making the ignition more difficult.[57]

## THE OLD TESTAMENT PERSPECTIVE

Though some have blamed the Judeo-Christian tradition of man's relation to nature as expressed in Gen. 1:28's command "to replenish the earth and subdue it" as the grounds for our present ecological crisis,[58] further reflection demonstrates that this is not a sound conclusion. As John Black notes, the Hebrews evolved "a concept of man's responsibility to God for the management of the earth, a concept which was duly carried over into Christianity, becoming part of the western heritage."[59] Commenting on Judeo-Christian theology, Glacken observes:

> Most striking for our themes, is the idea of the dominion of man as expressed in Genesis, and repeatedly expressed in other writings, notably Psalm 8. But one must not read these passages with modern spectacles, which is easy to do in an age like ours when "man's control over nature" is a phrase that comes as easily as a morning greeting. . . . Man's power as a vice-regent of God on earth is part of the design of creation and there is in this fully elaborated conception far less room for arrogance and pride than the bare reading of the words would suggest.[60]

It is man's sinful exploitation of the universe, his contempt for God's creation, which has led to our present ecological crisis. As E. M. Blaiklock writes:

> The ravaged world, the polluted atmosphere, the poisoned rivers, dead lakes, encroaching desert, and all the irreversible damage to man's fragile environment comes from treating the globe we live on with contempt. Modern man is arrogant and domineering. Man was put in a garden, says the old Hebrew account in *Genesis* "to tend it."[61]

*Although we may comprehend the causes and processes, we are still unable to do much more than the ancients to prevent such natural disasters as droughts and locust plagues.*

If blame must be placed, we might well consider our western heritage from the Romans. From his survey of the ancient world and ecology, Hughes concludes:

> Our Western attitudes can be traced most directly to the secular businesslike Romans. Today the process of dominating the earth is seen not as a religious crusade following a biblical commandment but as a profitable venture seeking economic benefit. In this, we are closer to the Romans than to any other ancient people, and in this we demonstrate to a great extent our hertitage from them.[62]

**The Blessings of Rain** (Citations are from the RSV.)

According to Deut. 11:10-11, 13-14, the Lord said to the children of Israel:

> For the land which you are entering to take possession of it is not like the land of Egypt, from which you have come, where you sowed your seed and watered it with your feet, like a garden of vegetables; but the land which you are going over to possess is a land of hills and valleys, which drinks water by the rain from heaven, . . . And if you will obey my commandments. . . (I) will give the rain for your land in its season, the early rain and the later rain, that you may gather in your grain and your wine and your oil.

Jeremiah proclaims that it is only the Lord rather than the pagan gods who sends rain (Jer. 14:22): "Are there any among the false gods of the nations that can bring rain? Or can the heavens give showers? Art thou not he, O Lord our God? We set our hope on thee, for thou doest all these things." But the wayward children of Israel fail to recognize this (Jer. 5:24): "They do not say in their hearts, 'Let us fear the Lord our God, who gives the rain in its season, the autumn rain and the spring rain, and keeps for us the weeks appointed for the harvest.' "

Elihu, Job's friend, declares:

> Behold, God is great, . . . .
>
> For he draws up the water, he distils his mist in rain which the skies pour down and drop upon man abundantly. Can any one understand the spreading of the clouds, the thunderings of his pavilion? (Job 36:26-29)

Among the questions which the Lord Himself posed as He spoke out of the whirlwind to Job are the following:

> Who has cleft a channel for the torrents of rain, and a way for the thunderbolt, to bring rain on a land where no man is, on the desert in which there is no man; to satisfy the waste and desolate land, and to make the ground put forth grass? Has the rain a father, or who has begotten the drops of dew? (Job 38:25-28)

God has promised rain as a blessing for obedience: "If you walk in my statutes and observe my commandments and do them, then I will give you your rains in their season,

and the land shall yield its increase, and the trees of the field shall yield their fruit." (Lev. 26:3-4)

### The Judgment of Drought

Conversely for disobedience the Lord has threatened drought:

> Take heed lest your heart be deceived, and you turn aside and serve other gods and worship them, and the anger of the Lord be kindled against you, and he shut up the heavens, so that there be no rain, and the land yield no fruit, and you perish quickly off the good land which the Lord gives you. (Deut. 11:16-17)

The most famous instance of drought as a judgment of God is the three and a half year drought called down by Elijah in the reign of Ahab in the 9th cent. B.C. (I Kgs. 17; Sirach 48:2-3; Luke 4:25; Jas. 5:17). In the early 6th cent. B.C. when Judah forsook the Lord, Jeremiah called upon the heavens to be appalled, literally "be exceedingly dried up" (Jer. 2:12). Cf. Jer. 14:1-6 for a vivid description of drought conditions.

Still later in the 6th cent. after the Exile, the Jews returned from Mesopotamia and were challenged to rebuild the temple. When they were less than dedicated to the task, the prophet Haggai rebuked them with a paronomasia or play on words. He proclaimed that because the Lord's house had remained in "ruins" (*hareb*, Hag. 1:4,9) the Lord would bring a "drought" (*horeb*, Hag. 1:11) upon the land.

On the other hand, as a sign of God's displeasure Samuel called down rain during the late wheat harvest (June), when rain was not expected:

> "Is it not wheat harvest today? I will call upon the Lord, that he may send thunder and rain; and you shall know and see that your wickedness is great, which you have done in the sight of the Lord, in asking for yourselves a king." So Samuel called upon the Lord, and the Lord sent thunder and rain that day. . . . (I Sam. 12:17-18)

### Prayers for Rain

When a drought was prolonged, the remedy lay in repentance and in prayer as we see from Solomon's famous intercession (I Kgs. 8:35-36):

> When heaven is shut up and there is no rain because they have sinned against thee, if they pray toward this place, and acknowledge thy name, and turn from their sin, when thou dost afflict them, then hear thou in heaven, and forgive the sin of thy servants, thy people Israel, . . . and grant rain upon thy land, which thou hast given to they people as an inheritance.

The most dramatic instance of the prayer of a godly man to end a drought was, of course, Elijah's intercession in his contest with the priests of Baal (I Kgs. 18; Jas. 5:17). Joel called for a fast along with repentance to end the double calamity of drought and locust swarms in his day (Joel 1:14-20). Zech. 10:1 encourages such prayer: "Ask rain from the Lord in the season of the spring rain, from the Lord who makes the storm clouds, who gives men showers of rain . . . ."

Problematic is the interpretation of M. Dahood that Psalm 4 is actually a prayer for rain. His interpretation is based on rendering the Hebrew word *tob* "good" in verse 7 as a word for rain by comparing Jer. 17:6, Deut. 28:12, etc. where it is clear that "good" means "rain."[63]

## THE NEW TESTAMENT PERSPECTIVE

In the Sermon on the Mount Jesus commended the benevolence of God in that He "makes his sun rise on the evil and on the good, and sheds rain on the just and on the unjust" (Mat. 5:45). He further cited the heavenly Father's care over the birds of the air (Mat. 6:26), the lilies of the field (Mat. 6:28), and the grass of the field (Mat. 6:30) as ample reasons trusting in God's provisions and for eschewing anxiety.

In his sermon to the pagan Lycaonians of Lystra, Paul adduces God's provision in nature as evidence that He had not left the pagan nations without a witness (Acts 14:17): "yet he did not leave himself without witness, for he did good and gave you from heaven rains and fruitful seasons, satisfying your hearts with food and gladness." Cf. Rom. 1:19,20.[64]

As an example of the effective prayer of a righteous man, James cites the example of Elijah who first prayed for a drought and then ended it (Jas. 5:17-18): "Elijah was a man of like nature with ourselves and he prayed fervently that it might not rain, and for three years and six months it did not rain on the earth. Then he prayed again and the heaven gave rain, and the earth brought forth its fruit." In the Apocalypse the two witnesses of Rev. 11 "have power to shut the sky, that no rain may fall during the days of their prophesying" (Rev. 11:6).

A number of droughts and famines are recorded by Roman historians for the New Testament era. In 22 B.C. a mob shut up the Roman Senate in the Curia building and forced them to vote Augustus the dictatorship so that he could deal with the food situation. In his autobiographical *Res Gestae* (5.2) Augustus boasted: "I did not decline in the great dearth of grain to undertake the charge of the grain supply, which I so administered that within a few days I delivered the whole city from apprehension and immediate danger at my own cost and by my own efforts."[65] There was a later famine in his reign in A.D. 6.

During the reign of Claudius a noteworthy series of droughts and poor harvests culminated in a widespread famine during the procuratorial administration of Tiberius Julius Alexander over Judea (A.D. 46-48). Josephus reports (*Antiq.* III.320 ff.; XX.51-53, 101) that Queen Helena of Adiabene, a recent convert to Judaism with her son Izates, sent aid to the Jews in the form of monetary gifts, grain from Egypt, and figs from Cyprus. This is the same drought which was predicted by Agabus, a prophet from Jerusalem, to the church at Antioch (Acts 11:27-30):

> Now in these days prophets came down from Jerusalem to Antioch. And one of them named Agabus stood up and foretold by the Spirit that there would be a great famine over all the world; and this took place in the days of Claudius. And the disciples determined, every one according to his ability, to send relief to the brethren who lived in Judea; and they did so, sending it to the elders by the hand of Barnabas and Saul.

Kenneth S. Gapp correlates the famine under Claudius with an unusually high Nile in the year A.D. 45 when grain prices doubled.[66] He concludes that "the evidence of official documents among the papyri from Egypt and of independent sources, Pliny and Josephus, so supports Luke's account of the universal famine that the accuracy of the statement can no longer be challenged."[67] Gapp makes the acute observation that in the ancient world famine was essentially a class famine:

> Since the poor and the improvident never had large reserves either of money or of food, they suffered immediately upon any considerable rise in the cost of living. The rich, on the other hand, had large reserves both of money and of hoarded grain, and rarely, if ever, experienced hunger during famine. Thus, while all classes of society suffered serious economic discomfort during a shortage of grain, the actual hunger and starvation were restricted to the lower classes.[68]

Christ taught that one should be satisfied with one's "daily bread."[69] In view of the disparity of wealth, the Christian ethic inspired sharing with those in need (Acts 4:34, 6:1; II Cor. 8:8-15; Jas. 2:14-16; I John 3:17.)[70]

## POST-BIBLICAL JEWISH DEVELOPMENTS

The Jewish rabbis of the first three centuries of the common Era (1st-3rd cent. A.D.) elaborated upon biblical precepts, sometimes by fanciful exegesis.

> Rabbi Simeon ben Yohai said: Three things are equal in their value: Earth, Man and Rain. R. Levi bar Hiyya said: And all the three are of three letters . . ., to teach you, that if there is no earth, there is no rain, if there is no rain, there is no earth, and without both of them no man can exist.[71]

In the early 2nd cent. A.D. the rabbis attributed a gradual diminution in rain to the sins of the people. Rabbi Eleazar b. Perata (fl. A.D. 110-35) said: "From the day the Temple was destroyed the rains have become irregular in the world. There is a year which has abundant rains and there is a year with but little rain."[72]

To assure the coming of rain the rabbis laid stress on the feast of Sukkoth (Tabernacles) on the basis of Zech. 14:16-17. They also laid down elaborate regulations for the observation of fasts in times of drought in the Mishnah (Ta'anith 1.2-7). If by the seventh of Marheshvan (around November) there has been no rain, one begins praying for rain. If none has fallen by the 17th, public fasts are ordered on Mondays and Thursdays all through the winter season.[73]

Commenting on Eccl. 10:11, "If the serpent bite before it is charmed, then the charmer (lit. whisperer) hath no advantage," Rabbi Ami said: "If you see a generation over whom the heavens are rust-colored like copper and do not let down dew or rain, it is because there are no 'whisperers' (i.e. people who pray silently) in that generation."[74]

One sage, Honi the Rainmaker, had a legendary gift for calling down rain. It is said that he drew a circle, and standing in the middle of it said:

> "Lord of the world! . . . I swear by your great name that I shall not move from here until you will turn merciful unto your children." When the rain began dripping he said: "Not thus did I ask but a rain for cisterns, pits and caves." Then the rain began to fall violently and Honi said: "Not thus did I ask but a rain of mercy, blessing and generosity." Then the rain fell as it should fall."[75]

Even in such calamitous times as droughts there were always the unscrupulous few who tried to exploit the situation for their own advantage. The rabbis denounced the wealthy who hoarded up large stocks of grain, wine and oil to sell them at inflated prices by quoting Amos 8:4-7. In the days of Rabbi Tanhuma, the people came to him and asked him to order a fast for rain. "He ordered a fast, one day, a second day, a third day, and no rain came. Then he went to them and preached: 'My sons, have compassion on each other and the Holy One blessed be He will also have compassion on you.' "[76]

## POST-BIBLICAL CHRISTIAN DEVELOPMENTS

During the early Roman Empire the pagans sought to blame the Christians for any unnatural disaster. As Tertullian so pungently expressed it: "If the Tiber reaches the walls, if the Nile does not rise to the fields, if the sky doesn't move or the earth does, if there is famine, if there is plague, the cry is at once: 'The Christians to the lion.' "[77] The pagan Symmachus blamed the famines of A.D. 384 upon the Christians.

Arnobius, a Christian apologist (fl. A.D. 300), in his work, *Against the Heathen,* asks:

> What is the ground of the allegation, that a plague was brought upon the earth after the Christian religion came into the world, and after it revealed the mysteries of hidden truth? But pestilences, say my opponents, and droughts, wars, famines, locusts, mice, and hailstones, and other hurtful things, by which the property of men is assailed, the gods bring upon us, incensed as they are by your wrongdoings and by your transgressions . . . . For if we are to blame, and if these plagues have been devised against our sin, whence did antiquity know these names for misfortunes?[78]

Augustine likewise responded by pointing out that such calamities had occurred long before the conversion of Constantine and the Christianization of the Empire: "Let those who have no gratitude to Christ for His great benefits, blame their own gods for these heavy disasters."[79]

Finally, Christians turned the accusation against pagans, Jew, Samaritans, and heretics, blaming them for unseasonable calamities. In the *Novellae Theodosiani* 3.1.8 (4th cent. A.D.) we read the following denunciation:

> Shall we endure longer that the succession of the seasons be changed, and the temper of the heavens be stirred to anger, since the embittered perfidy of the pagans does not know how to preserve these balances of nature? For why has the spring renounced its accustomed charm? Why has the summer, barren of its harvest, deprived the laboring farmer of his hope of a grain harvest? Why has the intemperate ferocity and the winter with its piercing cold doomed the fertility of the lands with the disaster of sterility? Why all these things, unless nature has transgressed the decree of its own law to avenge such impiety?[80]

## LOCUSTS

As noted in the introduction, periods of unseasonable heat and drought are sometimes accompanied by plagues of locusts. The Canaanite texts speak of the dreaded succesion

of dry or locust years.[81] Their frightening numbers made them an image of frequent appearance in the ancient texts. In the Sumerian lamentation the possessions of Ur are devoured as by a "heavy swarm of locusts."[82] In the Ugaritic *Keret Epic* (I.iv.29-31) the soldiers of an army are said to have "settled like locusts on the field(s), like hoppers on the fringe of the wilderness."[83]

At the end of treaties a frequent curse which was invoked upon those who might be tempted to break the agreement was the locust plague. In the Aramaic Sefire treaty of north Syria (8th cent. B.C.), we read: "For seven years may the locust devour (Arpad), and for seven years may the worm eat . . . ."[84] A similar curse is found in the treaty between the Assyrian king Esarhaddon (7th cent. B.C.) and his Median vassals: "Like locusts devour . . . may they cause your towns, your land (and) your district to be devoured."[85]

There are nine Hebrew words which designate locusts in the Old Testament.[86] Akkadian recognizes 18 names and the Talmud 20 names for locusts. Of the many Hebrew words *arbeh* is used most frequently, 24 times. The word is probably derived from the root *raba* "to become numerous." It occurs in Akkadian as *erebu, arbu,* and in Ugaritic as *irby*.

The *arbeh* plague (Deut. 28:38) is listed as one of the divine curses which would befall the Israelites if they disobeyed God's commands. The *arbeh* is one of the plagues which Moses called down upon Egypt (Ex. 10:4 ff.; Ps. 78:46, 105:34).[87]

Locusts are used in similes of vast numbers in Jud. 6:5, 7:12; Jer. 46:23; Nah. 3:15. Though they had no leader yet their mass movements are coordinated (Prov. 30:27). Resting at night, they stir with the heat and disappear (Nah. 3:17). Job is asked whether he can make the horse "leap like a locust" (Job 39:20).

Locusts belong to the order of the *Orthoptera* "straight-winged" insects. With the grasshoppers they belong to the sub-family, *Saltatoria,* "leapers," which were considered edible (Lev. 11:21-22).[88] Locusts belong to the *Acridiidae* family of "short-horned grasshoppers." Of the 91 species found in Palastine only the desert locust (*Schistocerca gregaria* or *Acridium peregrinum*) has served to plague the Near East from time immemorial. It was only in 1929 that the phase change from solitary green grasshoppers to the larger, yellow gregarious phase was first observed. According to Baron:

> Basically, the Desert Locust is a winged big brother of its fellow-acridid, the familiar grasshopper of English meadows, and quite often leads much the same sort of life. Like other species of locusts, however, it has the peculiarity of being able to change its habits—to live two lives, as it were—and it is this characteristic that makes it so great a potential menace.[89]

At maturity the desert locusts are two and a half inches long. They have two sets of wings and an enlarged pair of legs for jumping. Their appearance has been compared to horses (Joel 2:4; Job 39:20; Rev. 9:7; cf. German *Heupferd*, Italian *cavallette*.)

Desert locusts are phenomenal travelers. They are able to fly for 17 hours at a time and have been known to travel 1500 miles. The sound of their wings can be compared to the sound of chariots (Joel 2:5; Rev. 9:9). Their route of travel is determined by the prevailing winds (Ex. 10:13, 19). In the 1915 plague the locusts came to Jerusalem from the northeast (cf. Joel 2:20).[90]

The Bible does not exaggerate when it speaks of swarms of locusts covering the ground (Ex. 10:5). According to Baron:

> We know from modern measurements of swarm areas and volumes that the descriptions repeatedly given in the Bible and elsewhere, of the sky being darkened and the sun eclipsed, are literally correct. For instance, during the plague that continued from 1948 to 1963, several swarms were recorded as exceeding a hundred square miles; and one is said to have been the size of London.[91]

A truly large swarm may contain ten billion locusts! What is devastating is that each insect eats its own weight every day; a large swarm may weigh up to 80,000 tons.[92]

The four words used by Joel (1:4, 2:25) in his vivid description of the locust plague evidently represent stages of the locusts' development (RSV) rather than separate species of insects (KJV).[93] In Joel 2:25 we have first the *arbeh*, the mature locust which deposits the eggs.[94] The *yeleq* may be the larva as it emerges from the egg.[95] The *hasil* may be the intermediate instar (stage between moults). The *gazam* may be the ravenous nymph who strips the bark from trees.

To remove such insect plagues pagans resorted to prayer and to magical spells. From Sultantepe in northwest Mesopotamia we have "an incantation to remove caterpillar, devourer . . . cricket, red bug, vermin of the field from the field."[96] The Greeks prayed to Apollo *Parnopios* (Locust) to obtain aid against locusts, just as they prayed to Apollo *Smintheus* (Field Mouse) against the plague. To get rid of caterpillars the Roman writer Columella "directs that a young menstruous girl should walk three times round the garden with bare feet and loosened hair and garments."[97]

In contrast to the pagans, the Israelites resorted to fasting, repentance, and prayer in cases of locust plagues and other kinds of pestilences (I Kgs. 8:36-37; II Chr. 6:28). In the midst of a devastating locust plague the prophet Joel called the people to fasting and prayer (Joel 1:14, 2:15-17), and promised that the Lord would see their repentance and bless them (Joel 2:18-32). The later Jewish rabbis also prescribed the blowing of the ram's horn to announce a fast: "For these things they sound the *shofar* in every place: *blasting or mildew, locust or caterpillar*, wild beasts or the sword. They sound the *shofar* in that they are an overrunning affliction." (Ta'anith 3.5)[98]

## CONCLUSIONS

1. *How is the biblical revelation different from pagan mythologies*?

Unlike materialistic naturalism the biblical perspective shares with the ancients a belief in the supernatural. But it differs radically from contemporary mythologies in

upholding a single, omnipotent God, who though He may be depicted in human similes, wholly transcends man and nature—in contrast to the pagan gods who were crudely anthropomorphic and who were intrinsically a part of the natural order.[99] The Babylonian gods, for example, sent the Flood in capricious annoyance at man's rambunctious noisiness. Jehovah sent the Flood as a judgment against man's wickedness.

2. *Why was God's revelation given where it was?*

Certainly the local geographic and climate conditions of the Holy Land have qualified the human reception of the Lord's revelation. The sovereign God chose Palestine as the location for His revelation, a land whose climate made the Hebrews very conscious of their reliance upon God for rain and food.

3. *Now that we know the causes of droughts and the progression of locust plagues are they any less the works of God?*

Such a conclusion may be reached by unbelievers, but believers can only stand in greater awe as they learn more of the marvels and intricacies of God's creation. He is the God who uses the hurricane but also the lowly worm (Jonah 4:6) to reveal His power and purpose. As C. S. Lewis has remarked, "Each miracle writes for us in small letters something that God has already written, or will write, in letters almost too large to be noticed, across the whole canvas of Nature."[100]

4. *Why do natural disasters occur? Are they judgments of God?*

Natural disasters remind us that we do not live in a Paradise, and that the Creation itself groans for its redemption (Rom. 8:19-22). We cannot comprehend the reason for each tragedy but can realize that we live in a flawed universe. Though any given calamity may not be a specific judgment for sin (cf. John 9:1-3), each reminds us of our creaturely weakness and the fragility of our life. From the divine perspective death is not the ultimate tragedy but rather a life lived without recognizing the Creator (Rom. 1:19-21.[101] If we are not thankful for His daily provision (Jas. 1:17; I Tim. 4:3), He may get our attention by more drastic events.

5. *If God works through Nature, ought we do anything to interfere with it?*

Some extreme Calvinists opposed the introduction of anaesthesia in the light of Gen. 3:16. Within the past year members of a Dutch Reformed group have refused inoculations as an interference with God's natural order. But God does not call us to the passive fatalism of some Muslims who say to everything, *In sha'Allah* "If Allah wills," and then do nothing. Rather He has called us into partnership with Him as stewards of His grace and creation. Times of disaster provide us with opportunities for sharing and even witness as organizations like World Vision have demonstrated in our day.

*Natural disasters remind us that we do not live in a Paradise, and that the Creation itself groans for its redemption.*

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[62]Hughes (note 2), p. 149.

[63]M. Dahood, *Psalms I* (Garden City, N. Y.: Doubleday & Co., 1966) pp. 23-25.

[64]The writer of Hebrews (6:7) uses as an illustration of those who respond or do not respond to God's grace the following: "For land which has drunk the rain that often falls upon it, and brings forth vegetation useful to those for whose sake it is cultivated, receives a blessing from God."

[65]*Res Gestae Divi Augusti*, ed. P. A. Brunt and J. M. Moore (London: Oxford University, 1967), p. 21.

[66]Kenneth S. Gapp, "The Universal Famine under Claudius," *Harvard Theological Review* 28 (1935), 259.

[67]*Ibid.*, p. 265.

[68]*Ibid.*, p. 261. George E. Mendenhall, "The Ancient in the Modern," in *Michigan Oriental Studies in Honor of George C. Cameron* (Ann Arbor: University of Michigan, 1976), p. 234, likewise observes that famines often involve social as well as natural factors: "The many references to famine that almost always accompany warfare and disintegration cannot therefore be explained as archaeologists always tend to do—by appealing to natural phenomena such as drought. The repeated references in available sources to emergency shipment of grain

proves beyond question that regions quite near the center of famine have an available surplus. The famine is therefore the result of complex socio-economic processes."

[69]Edwin M. Yamauchi, "The Daily Bread Motif in Antiquity," *Westminster Theological Journal* 28 (1966), 145-56.

[70]Edwin M. Yamauchi, "How the Early Church Responded to Social Problems, *Christianity Today* 17 (Nov. 24, 1972), 6-8; Adolf Harnack, *The Mission and Expansion of Christianity* (New York: Harper & Bros., 1961), pp. 153 ff.; Martin Hengel, *Property and Riches in the Early Church* (Philadelphia: Fortress, 1975).

[71]Patai (reference 31), p. 251.

[72]Sperber (reference 25), p. 273.

[73]*The Mishnah*, tr. H. Danby (London: Oxford University, 1933), pp. 194-95.

[74]Sperber, p. 285.

[75]Cited in Patai, p. 282. Cf. J. Goldin, "On Honi (Onias) the Circle-Maker: A Demanding Prayer," *Harvard Theological Review* 56 (1963), 233-37; G. F. Moore, *Judaism* (Cambridge: Harvard University, 1955), II, 235-36.

[76]Patai, p. 285.

[77]*A New Stevenson*, ed. J. Stevenson (London: S.P.C.K., 1957), p. 169.

[78]Arnobius, "Against the Heathens," tr. Hamilton Bryce and Hugh Campbell, *The Ante-Nicene Fathers* (Grand Rapids: Eerdmans, 1975), VI, 414.

[79]Augustine, *The City of God*, tr. Marcus Dods (New York: Modern Library, 1950), p. 107.

[80]Cited in Sperber, p. 297.

[81]Cf. Gordon in Kramer (note 55), p. 184. Cf. Emmanuel Le Roy Ladurie, *Times of Feast, Times of Famine* (Garden City, N.Y.: Doubleday & Co., 1971), p. 256: "At all events, the little optimum of the Middle Ages caused Europe to experience various gusts of warmth, and even sometimes great heat. These were responsible for the plagues of locusts which in the ninth-twelfth centuries sometimes spread over vast areas, sometimes far to the north. In A.D. 873, a time of great famine, they were found from Germany to Spain; during the autumn of 1195, they reached as far as Hungary and Austria."

[82]Kramer, *The Sacred Marriage Rite* (reference 39), p. 47.

[83]Driver, *Canaanite Myths and Legends* (reference 54), p. 33.

[84]J. A. Fitzmyer, *The Aramaic Inscriptions of Sefire* (Rome: Pontifical Biblical Institute, 1967), p. 15.

[85]D. J. Wiseman, *The Vassal-Treaties of Esarhaddon* (London: British School of Archaeology in Iraq, 1958), p. 74; cf. p. 62.

[86]See Edwin M. Yamauchi, "*arbeh*," "*gazam*," "*hagab*," "*hasil*," "*hargol*," "*yeleq*," in *A Theological Word Book of the Old Testament*, ed. R. L. Harris, Gleason Archer, and Bruce Waltke (Chicago: Moody, forthcoming).

[87]Greta Hort, "The Plagues of Egypt," *Zeitschrift fur alttestamentliche Wissenschaft* 70 (1958), 49-54. U. Cassuto, *A Commentary on the Book of Exodus* (Jerusalem; Magnes, 1967), p. 124: "The locusts will even enter into the houses (it happened for example, in Israel in the year 1865, that the locusts in their multitudes invaded the houses by way of the windows and doors) . . . ." Cf. Exodus 10:6.

[88]L. Kohler, "Die Bezeichnungen der Heuschrecke im Alten Testament," *Zeitschrift der Deutschen Palastina-Vereins* 49 (1926), 328-31; George Cansdale, *All the Animals of the Bible Lands* (Grand Rapids: Zondervan, 1970), pp. 238-44: *Fauna and Flora of the Bible* (London: United Bible Societies, 1972), pp. 53-54.

In Lev. 11:22 the *arbeh* and three other types of locusts are listed as edible insects. Bas reliefs from Nineveh show servants bringing skewered locusts for Sennacherib's table.

John the Baptist (Mat. 3:4; Mark 1:6) subsisted on honey and locusts. Cf. F. I. Andersen, "The Diet of John the Baptist," *Abr Nahrain* 3 (1961-62), 60-75; C. H. H. Scobie, *John the Baptist* (Philadelphia: Fortress, 1964), pp. 138-39.

The Damascus Document of the Dead Sea Scrolls stipulates: "As for the various kinds of locust, these are to be put in fire or water while they are still alive; for that is what their nature demands." *The Dead Sea Scriptures*, tr. T. H. Gaster (Garden City, N.Y.: Doubleday & Co., 3rd ed., 1976), p. 85.

Many Africans and Arabs after removing the wings, legs, and heads eat locusts either cooked or ground up as flour.

[89]Stanley Baron, *The Desert Locust* (New York: Charles Scribner's, 1972), p. 30. Cf. F. S. Bodenheimer, *Animal Life in Palestine* (Jerusalem: L. Mayer, 1935), pp. 309-24; B. Uvarov, *Grasshoppers and Locusts I* (Cambridge: Cambridge University, 1966).

[90]John D. Whiting, "Jerusalem's Locust Plague," *The National Geographic* 28 (Dec., 1915), 511-50.

[91]Baron, p. ix.

[92]*Ibid.*, p. 123. Augustine (note 79), p. 108, reports with some exaggeration a locust plague of 204 B.C. as follows: "One may also read that Africa, which had by that time become a province of Rome, was visited by a prodigious multitude of locusts, which, after consuming the fruit and foliage of the trees, were driven into the sea in one vast and measureless cloud; so that when they were drowned and cast upon the shore the air was polluted, and so serious a pestilence produced that in the kingdom of Masinissa alone they say there perished 800,000 persons, besides a much greater number in the neighboring districts. At Utica they assure as that, of 30,000 soldiers then garrisoning it, there survived only ten."

[93]S. R. Driver, *The Books of Joel and Amos* (Cambridge: Cambridge University, 1897), pp. 82-91; Ovid R. Sellers, "Stages of Locust in Joel," *American Journal of Semitic Languages* 52 (1935-36), 81-85; John A. Thompson, "Joel's Locusts in the Light of Near Eastern Parallels," *Journal of Near Eastern Studies* 14 (1955), 52-55.

[94]Whiting, p. 516: "Each female, now loaded with eggs, seeks a place suitable to deposit them, and with her ovipositors is able to sink a hole as much as 4 inches deep through hard compact soil, such as would try the strength of human muscles even with iron tools."

[95]In Joel 1:4 and 2:25 the *yeleq* may represent the young larval stage of the locust. The *New English Bible* and *Jerusalem Bible* suggest "hopper." But in Jer. 51:27 the *yeleq* is described as "rough," alluding to the horn-like sheath which covers the rudimentary wings of the nymph stage. In Nah. 3:16 the latest nymph stage is indicated as the locust moults and then unfurls its wings.

[96]O. R. Gurney and J. J. Finkelstein, ed., *The Sultantepe Tablets* (London: British Institute of Archaeology in Ankara, 1957), p. 243, cited in Hayim Tawil, "A Curse Concerning Crop-Consuming Insects in the Sefire Treaty and in Akkadian," *Bulletin of the American Schools of Oriental Research* 225 (Feb., 1977), 59-62.

[97]W. R. Halliday, *Greek and Roman Folklore* (New York: Cooper Square, 1963), p. 60.

[98]Danby (reference 73), p. 198.

[99]Edwin M. Yamauchi, "Anthropomorphism in Ancient Religion," *Bibliotheca Sacra* 125 (1968), 29-44.

[100]C. S. Lewis, *Miracles* (New York: Macmillan, 1947), p. 140.

[101]C. F. D. Moule, *Man and Nature in the New Testament* (Philadelphia: Fortress, 1967), pp. 20-21.

# Is Clearcutting a Responsible Forestry Practice?

HARRY V. WIANT, JR.

Division of Forestry

West Virginia University

Morgantown, West Virginia 26505

*The history of clearcutting is reviewed, and ecological and economical justifications for its use are given. Objections to this practice and the dilemma for professional foresters are discussed.*

The clearcutting of timber, especially on national forests, has provoked much debate in popular and professional journals, in public forums, and in legislative deliberations. Just what is this practice? A technical definition (Ford-Robertson 1971) is:

> A silviculture system in which the old crop is cleared over a considerable area at one time; regeneration generally artificial, but natural regeneration sometimes possible by seeding from the air - from adjacent stands - or from seed and/or advance growth already on the ground.

It should be noted that clearcutting, as defined, includes concern and planning for regeneration. The removal of timber we often see on private lands, especially small woodlots, consists of the harvesting of all merchantable trees with no concern for regenerating the forest. This is not forestry nor is the practice, when almost all trees are logged, clearcutting.

It may be helpful to review the history of clearcutting.

## History of Clearcutting

The history of clearcutting in the United States, as in Europe, has followed a somewhat predictable pattern. Early inhabitants who existed mainly by hunting and fishing considered the forest as their larder and generally lived in harmony with it. This sometimes led to worshipping the forest or the gods thought to dwell in it. With the development of an agricultural society, the clearing of forest land became a noble endeavor. Trees were cut and burned, converting forests to fields, or forests were cut for use without thought for the future. Once the social structure developed to the point where philosophers were tolerated, voices arose warning of the need for preserving the forests and legal steps were taken to accomplish this. That stage was reached in the twelfth century in Germany (Glacken 1967), for example, and in the United States in the late 1800's.

As a reaction to the destruction of the forest when exploited without regard to its regeneration, it is often assumed that selecting only a few individual mature trees from the forest for cutting from time to time will best preserve the resource. The selection method, then, develops a forest with trees of many ages on an area, and this process is termed "uneveniaged management." That system was formalized in Germany in about 1760 (Troup 1928). The record-keeping and growth and age data necessary to use the selection method successfully are costly and complicated to maintain. Also, the small openings in the forest made by removing individual trees or small groups of trees favor those species that can grow in shade and discriminate against trees intolerant of shade, which are often the fastest-growing trees in the forest. Harvesting costs are high as large areas must be covered to obtain an operable volume. As a consequence of these and other complications, the

*Funding supplied by the West Virginia University Foundation.*

only good examples of intensive management under the single-tree selection method are found in the mixed forest of fir, spruce, and beech in some of the high terrain of Central and West Europe (Smith 1962). All those species are tolerant of shade. It is interesting to note that today only 4% of Germany's forests are managed under the selection method. In Switzerland, the citadel of the selection method, only 15% of the forests are managed this way (Roach 1972).

Many foresters in the United States advocated the development and maintenance of unevenaged stands by the selection method from the beginning of forestry in this country in the early 1900's through the 1940's (Smith 1962). Clearcutting was not generally favored. For example, E. G. Cheyney wrote in his 1942 American silviculture text:

> Although there are a few conditions under which clear-cutting is the only reasonable system to use, in general its disadvantages far outweigh its advantages. It is seldom used in Europe except in connection with artificial reproduction, and it will probably not be used any more extensively in this country when we have reached the stage of intensive management, except for handling certain species that are not grown in Europe, such as the serotinous-coned species and some light-seeded species like the cottonwood.

The lag in American silvicultural thinking is emphasized when the preceding statement is compared to one made by Troup in his 1928 British silviculture text:

> And, in general, the predicted world shortage of timber, particularly of soft woods, is a factor which is likely to raise the importance of this (clearcutting) system to a level never attained before, since measures necessary to meet this shortage must include the formation of extensive plantations of conifers on areas where they have not existed previously or where they have been depleted by wasteful methods of working. Everything therefore points to the increasing importance of the clear-cutting system in spite of any disadvantages it may possess.

As the problems inherent with the selection method became more and more apparent in America, emphasis shifted toward evenaged management. Clearcutting of all trees, drastic site preparation by burning or machinery, and artificial regeneration by planting or direct seeding was in the vogue by the late 1960's (Smith 1972). Clearcutting, long used in the southern pine and Douglas-fir regions, spread into other forest regions, including the Appalachian hardwoods. By 1970 half the total volume of wood removed from national forests came from clearcutting (Congressional Record 1972). Alarm was voiced by citizens disturbed by the ugliness which accompanies clearcutting, and various arguments were brought forth against this practice. A November 1973 judgment by a District Court in West Virginia ruled against clearcutting on the Monongahela National Forest on the grounds that it violates the Organic Act of 1897 which provided the Forest Service legislative authority for selling timber. Senator Hubert Humphrey and others submitted a bill in the 93rd Congress to repeal the Organic Act. The National Forest Management Act of 1976 which resulted allows clearcutting where it is determined to be the optimum method.

## Economic Justifications for Clearcutting

Clearcutting, by concentrating logging operations and maximizing the volume of timber removed from a given forest area, is often the most economical harvesting system. The seed-tree method, which usually involves leaving 2 to 10 trees per acre to provide seed for regeneration, may be almost as attractive economically, but that method has failed many times to reproduce the forest. The shelterwood method, which leaves perhaps half the trees in the original stand to protect the site and provide seed, the shelterwood trees to be harvested later, or the selection method is obviously not as economically attractive.

*Foresters are often faced with recommending clearcutting and suffering the wrath of a misinformed public.*

It should be pointed out that the use of less economical systems is reflected in increased cost of the product, hardly startling news to any who have paid a recent electric bill.

## Ecological Justification

Clearcutting is not unnatural. On the contrary, clearcutting simulates nature's fires and storms which create the conditions required for the regeneration of the species covering about half of the commercial forest land in the United States. Fire and storms are as much a part of the natural ecology of our forests as are droughts, diseases, and insect infestations. The vast forests of southern pine, Douglas-fir, and ponderosa pine or even redwood which greeted our first settlers had fire and storm midwives.

Major disturbances are the rule rather than the exception in nature. For example, pines are found in most sections of the country which depend on fires to melt the resins which seal their cone scales, allowing scales to separate and seed to fall. Examples are sand pine and jack pine in the East, lodgepole pine and Bishop pine in the West. Without fires or logging which causes limbs and cones to reach the warmer air-layers near the ground, it is conceivable that some of these species would become extinct.

Clearcutting produces evenaged stands as does nature. For example, aspen, jack pine, cottonwood, willow, and Virginia pine require bare mineral soil for establishment. Even the white pine, redgum, basswood, and yellow-poplar of the eastern hardwood types are generally the result of local or widespread disturbance.

Many of our fastest-growing trees, such as yellow-poplar, black cherry, and most pines, need nearly full sunlight to survive and grow. These are shade-intolerant species. The small openings made in the forest by the single-tree selection method do not provide sufficient light for survival and satisfactory growth of such species. As a result, when this selection method is used in a forest comprised of both shade-intolerant and shade-tolerant species, such as sugar maple and beech, the faster growing shade-intolerant

species tend to disappear from the forest. The amount of wood which can be produced in the forest is thereby reduced.

### Some Specific Objections to Clearcutting

It is often implied that clearcutting deteriorates the site by reducing the nutrient capital. Obviously, logging of any type removes some nutrients from the site, However, wood has a low nutrient content compared to the nutrient-rich leaves, buds, and branches left behind. Even if the entire tree from the stump up is utilized, as is being done with whole-tree chippers, a study in Wisconsin indicated that soil reserves, natural inputs and recycling of elements can supply N, P, and K for an apparently unlimited number of tree crops. Depletion of Ca reserves on that site may begin to limit tree growth after harvest of nine similar 30-year crops, and that could be overcome by additions of lime (Boyle *et al.* 1973).

Clearcutting is sometimes blamed for severe erosion or even floods. The cutting of trees, per se, causes no erosion in normal forests. Interception and transpiration losses are reduced, however, resulting in more infiltration of water into the ground and increased stream flow for a few years. Most erosion related to timber harvesting comes from poorly designed logging roads (Patric 1976), and roads are necessary with any system (single-tree selection, clearcutting, etc.) unless such exotic techniques as helicopter or balloon logging are used. The influence of clearcutting on floods in major streams is generally insignificant as only a very small fraction of a large watershed is involved.

Damage to wildlife habitat is often cited as an adverse consequence of clearcutting. For some species, such as the black bear, this contention is undoubtedly valid. For other species, deer, for example, clearcutting is very beneficial as it increases available browse.

When questioning the opponents of clearcutting, it becomes apparent that the major objections to this system are related to the unsightly debris, defective logs, tops, and limbs which are left after the harvest. Obviously, a fresh clearcut area is not beautiful, especially when compared to a mature forest. Within a few years after logging, this aesthetic problem is diminished by the natural decay of the residue and rapid growth of regeneration. It is interesting to note that when areas are clearcut and whole-tree chippers are used so the debris is minimal, there is less public objection to clearcutting.

### The Stewardship Dilemma

Professional foresters, recognizing the advantages and utility of the clearcutting method in many situations, find their conclusions are suspect by laymen, who are greatly influenced by ecologically and economically unsound information. Foresters are often faced with recommending clearcutting and suffering the wrath of a misinformed public or using a less appropriate silvicultural system. To this time, that's a dilemma with no ready solution.

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*What many Christians do not appear to realize is that* techne *is the trojan horse in the City of God. Innocently, we introduce techniques for counseling, tools for Bible study, organization for church life, only to find that when they become substitutes for the "fear of the Lord," technocratic religion usurps the sphere of the Holy Ghost. The Kingdom of God cannot be extended by the technological society, for it is not a kingdom of this world. The pastor was never intended to be an entrepreneur or a corporation manager.*

James M. Houston, *I Believe in the Creator*, Wm. B. Eerdmans Publishing Company, Grand Rapids, Michigan (1980), p. 161.

# Ecologic Concepts in Forest Management

LAURENCE C. WALKER

School of Forestry

Stephen F. Austin State University

Nacogdoches, Texas 75962

Concurrent environmental, energy, and raw material crises call for understanding how and why American foresters manage the Nation's timberlands as they do. For close to a century, roughly until the 1950s, criticism centered on the lumber industry as it converted a domain of virgin timber to usable products and profits. Foresters were among the critics. Now a new wave of objectors, this time in the name of ecology, focus on harvesting methods considered essential by foresters for meeting the country's requirements for timber products.[1] As the energy shortage threatens to curtail petroleum for plastic (wood's chief synthetic competitor), and cheap fuels are not available for smelting competing metals, the demand for wood products is expected to continue its upward trend. More intensive silvicultural practices are therefore inevitable.

Much has been made of the derivation of the term "ecology" from the Greek work *oikos*, meaning house. Thus the ecologist is concerned with his habitat and its care. In contrast, little has been made of the translation of *oikos* into Latin and the word derived therefrom. It is *i(e)conaea*, and, of course, the English "economics" is its offspring. Little, too, is made of the translation, by King James' scholars for instance, of both *oikos* and *iconaea* into Anglo-Saxon as "steward" and "stewardship."

Ecology and economics are inseparable in stewardship. Principles of both disciplines concern the ecologist as the manager of the household or the keeper of the accounts. As a faithful steward he acts accountably to the one who has entrusted the resources to his supervision. To the Christian professional conservationist, that one is God.

Perhaps for no other natural resource is the relevance of stewardship more appropriate than for forestry. Most people in this profession take seriously the Genesis directive of Hebrew-Christian persuasion to "replenish and subdue the earth." To subdue is to take charge, but to replenish implies the restoration of exploited sites as well as the care of those being used to provide for the needs of men. Foresters as the original professional ecologists are responsible for the care of the wildland estate for sustained yields of goods and services therefrom.

Christians and the Church are often faulted for abusing nature because of the command to subdue the earth.[2] Yet, many resource managers consider it a God-given responsibility to wisely manage natural resources. That man is believed by Christians to be the "head of creation" and the "apex of the system of livings" encourages the accusation. Those who join in the allegation—and some popular Christians are included—have their responsibilities too. These include knowing and understanding the facts, for, in regard to the subject here discussed, the availability of economic goods to serve those born a century hence depends on decisions now being made. So it seems pertinent to inquire into the scientific basis for current management practices for a

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*The author, Hunt Professor and formerly Dean, is a fellow of the Society of American Foresters and of the American Association for the Advancement of Science.*

*The author is indebted to George K. Stephenson, editor (ret.) of the School of Forestry, Stephen F. Austin State University, for his helpfulness.*

resource that occupies nearly a third of this Nation's land area.

America's 754 million acres of forest[3] constitute more than a major physical asset: they are intricately involved in the national economy and culture. Forests provide a fifth of the nation's industrial raw material, protect and regulate its most productive watersheds, graze a sizable portion of its livestock, produce most of its game and much of its non-sport wildlife, and attract millions of recreation visitors annually. The federally owned national forests and some other public lands are, by law, managed for all of these purposes. The public may have some right also to expect these benefits from the 400 or more million acres in private ownership. The obligation, legal or implied, to provide these amenities subjects forest managers to multifaceted public scrutiny.

Management of forests involves accommodations of widely varying viewpoints. In some instances these are essentially irreconcilable. Thus, the preservation of wilderness, though compatible with many watershed and wildlife objectives, requires abstinence from timber harvest and domestic cattle grazing. It even may necessitate limited recreation use. Yet recreation use is often given as the motivating reason for wilderness designation. How much potentially productive land the nation can devote to a use in which only a few may be able to participate—say, in the year 2020—requires a decision now. For decisions adverse to preservation tend to be irreversible: what we do today may set permanent limits on the acreage available for wilderness tomorrow.

Other uses of forest land are compatible or can be accommodated by allocating limited areas to a single use. But as no management system is optimum for all uses, the compromising decisions by which a particular forest is to be managed involve economics, objectives of ownership, and complex ecologic relationships. To manage even the 187 million acres of national forest lands for "the greatest good of the greatest number in the long run" may take the wisdom of a thousand Solomons.

## Wood in the Economy

Wood—along with products of agriculture and fisheries—is a renewable raw material. Its production requires only soil nutrients, rainfall, and sunlight. Forest regeneration has not been particularly significant in the world of abundance from which Americans are emerging. But in a world of diminishing resources, wood is one of the few materials that can be produced in perpetuity at modest energy costs.[4]

Wood is versatile. It is readily converted into products like wall-boards, newsprint, and rayon, and to substitutes for petrochemicals. Once our chief fuel, wood is being reconsidered as an energy source: between 5 and 20% of our forest area could supply our electrical demands,[5] and gas and liquid fuels like ethane and ethanol alcohol can be made from wood.

Wood's chief competitors for structural material are steel and aluminum. But steel requires 6 times as much energy to produce as wood of equivalent strength, and aluminum 38 times. Both are increasingly dependent on imported ores or on low-grade ores refinable at greater energy costs.

Wood products are practically indispensible. The amount used in construction or for furniture can be lessened only by substituting more expensive or less satisfactory materials. Suitable substitutes for wooden railroad ties or paper-board shipping containers are unavailable at any cost. As the 1980 demand for wood will be 8 to 34% above the 1970 level,[3] prompt intensification of forest management on a decreasing land base is essential.

## The Forest Resource

Demand for softwoods (conifers) and their generally faster growth give them priority over hardwoods in forestry operations. Fortunately, they grow profitably on sites where better quality hardwood species often do not.

Five species groups make up nearly two-thirds of the cut—the southern pines lead, followed by Douglas-fir, oak, western hemlock, and ponderosa pine (Table 1). Essentially all the harvest of southern pines and oaks is from east of the great plains; the other three species are western.

Concentration of a large portion of the cut among a relatively few species suggests the emphasis for future forestry. It tends, however, to obscure the complexity of forest resources and their management. In addition to groups listed in Table 1, some 15 softwood and four hardwood species are important in the West and 15 softwoods and 36 hardwoods are commercially important in the East. Dozens of other species are important for specialized uses or for their ecologic influence. Hundreds of trees, shrubs, and herbaceous plants which appear in ecological succession after timber cutting, but which have no economic value, present the forester with some baffling problems.

Over 30%, 234 million acres, of the forested lands in the United States do not produce merchantable timber and more than 20 million acres are reserved for wilderness and parks. Currently available for wood production are 500 million acres, ¾ of which are privately owned. Meeting national needs for wood is thus largely a matter of managing private lands.

## Forest Types in Ecologic Succession

Important timber species normally occur in ecological associations which foresters catalog as forest cover types. Some species are important in several types.[8] While certain ones grow successfully when introduced outside their native range, the use of exotics may be ecologically disruptive.

Large trees are old by human standards. One should not, however, assume that they are necessarily permanent or invulnerable to death and decay. All timber stands reflect stages in an ordered sequence of ecologic succession which

may be interrupted at any point by natural catastrophes such as windstorm, insect epidemic, and fire, or by logging. To produce the stable, or climax, forest, ecologic succession may require centuries without natural or human disturbance.[6] Most virgin forests of lumbering history were at sub-climax or even earlier stages when harvests for building materials were begun. For example, white and red pines of the North, the yellow pines of the South, and the Douglas-fir of the West seed in abundantly only on denuded sites. Yet these species were ready for harvest in the United States in the 18th, 19th, and 20th centuries because of earlier interruptions in ecologic succession. Indians burned the forest, and lightning fires and hurricanes laid bare the land.

**TABLE I**

*Timber Cut from U. S. Forests*, 1970[3]

| *Species* | *Growth* | *Removal* |
|---|---|---|
| | *(Million Cubic Meters)* | |
| Southern pines | 146 | 111 |
| Douglas-fir | 38 | 54 |
| Oaks (select plus other) | 75 | 46 |
| Western hemlock | 11 | 21 |
| Ponderosa & Jeffrey pines | 16 | 21 |
| True firs | 14 | 14 |
| Sweetgum | 11 | 11 |
| Spruce, balsam fir | 17 | 6 |
| Hickory | 7 | 5 |
| White & Sugar pines | 2 | 5 |
| All others | 186 | 98 |
| Total | 525 | 391 |

The key to forest succession is the relative tolerance of trees to competing demands for light, moisture, and nutrients by their neighbors. Species like sugar maple, beech, and the hemlocks persist under dense shade. Regenerating under their own canopies, such species dominate the climax forest.

At the other extreme are species intolerant of shade, including most pines and many hardwoods. Aspen, cottonwood, willow, and yellow-poplar, even though prolific seed-producers, compete poorly with established vegetation and are rarely found in understories. Their seeds germinate readily on exposed mineral soil, and their seedlings grow rapidly, if light is abundant, to "capture" growing space and exclude competitors. Stands of these species usually result from logging, abandonment of cultivated fields, or deposition of new river alluvim.

*Ecology and economics are inseparable in stewardship. Principles of both disciplines concern the ecologist as the manager of the household or the keeper of the accounts.*

Species' success in ecologic competition is also affected by morphologic and physiologic traits. Trees of some species may sprout from roots or stumps, using an established root system for nourishment to outgrow adjacent seedlings. Others produce many small seeds which are scattered widely; while species that produce few but large seeds, with much food stored therein, are able to outgrow competing plants.

Seeds of most plants appearing in ecologic succession are usually available. Thus, a disturbed site may be dominated the first season by annual weeds or grasses, followed successively by biennial and perennial herbs and shrubs. Eventually trees encroach. On fertile sites, some of the initial annual invaders may grow so rank as to inhibit establishment of the pioneer tree species, delaying the development of a tree cover until a new catastrophe exposes the site to full sunlight.

Stands of tolerant species are usually climax types, represented by beech, sugar maple, spruce, and hemlock of the Northeast, oaks and hickories of the Central States and the South, and redcedar, spruces, and firs of the Northwest. Harvesting individual trees in these forests by the selection system provides space for new stems and perpetuation of the type. While the single-tree selection system is often effective, in complex types such as those of the southern river bottomlands, encroachment of weed species in the openings may preclude the method.

Intolerant species typical of those found in the pioneer stage of succession include the southern pines, ponderosa pine, sugar pine, eastern and western white pines, aspen, cherry, ash, cottonwood, willow, yellow-poplar and Douglas-fir. Because seedlings and saplings of these species do not compete well in shade, reproduction after selection harvests is undependable. To regenerate the stand, foresters clear sites, using a legitimate early European silvicultural system called clear-cutting.

Five major associations[8] illustrate key commercial forest types and silvicultural systems necessary to perpetuate them.

### Maple, Beech, and Birch

An extensive forest cover type in the North consists mainly of sugar maple, American beech, and yellow birch. Its simplistic composition contrasts sharply with the

multiplicity of species—perhaps over 50—in the mixed mesophytic forests of the South.

These northern hardwoods are especially valuable for furniture. Small, misshapen trees can be sold for pulpwood. Thus markets are generally good. Second-growth, much now of merchantable size, naturally replaced the virgin stands following the cut-out-and-get-out policies of the early loggers.

The maple-beech-birch type is usually climax because all three species are tolerant of shade. On moist sites, however, the more tolerant eastern hemlock may invade and become dominant.[9] Birch, although the preferred species commercially, is less tolerant than its associates. Its light seeds, widely distributed by wind, and its poor deer browse encourage seedling establishment. Beech, least desirable because of fungus infections that cause rot, is most tolerant and has heavy seeds distributed mainly by animals. Maple is intermediate to its two associates in both tolerance and seed dispersal.[10,11]

On most sites, the maple-beech-birch type can be perpetuated by selection harvests.[9-12] This management system, recommended where stands include trees of many ages, causes minimal disturbance to soil, watershed, and aesthetic values, while providing small openings for wildlife browse. It favors the more tolerant beech, affording a greater number of hollow (because of rot) den trees and beechnuts, a key wildlife food. A chief drawback is nature's tendency to favor the less useful beech over the preferred birch and maple. It is also costly to log in this manner, and trees are often damaged, thus encouraging disease infection. Selection, however, affords opportunities to correct undesired ecologic trends by harvesting less-desirable stems at frequent intervals.

Widespread clearcuts were made in the past to regenerate overmature stands. Where such cuttings cover so large an area that the seed supply is limited, pioneer plants (such as blackberries) or light-seeded trees (aspen or paper birch) may invade and capture the site. While this drastic, though usually temporary, disturbance to watersheds and aesthetic values is an adverse consequence of clearcutting, temporary abundance of browse for wildlife usually occurs.

## White Pine

White pine, long the most valuable timber of northeastern America, was found as large, high-quality trees in many of the virgin forests of New England, the Lake States, and the Appalachians. It is not, however, a climax species, being less tolerant than most of its associates and unable to regenerate under their shade. This pioneer tree seeds-in on burned-over, cut-over, or abandoned farm lands. Long-lived, individual stems have stood in undisturbed situations until ecologic succession has surrounded them with climax species such as eastern hemlock.

Because of its intermediate tolerance, white pine can be regenerated by silvicultural systems ranging from individual tree selection to clear-cutting.[14] The shelterwood system—removing the old forests in several harvests—and clear-cuttings that simulate nature's hurricanes and lightning-caused fires remove enough tree cover and sufficiently scarify the soil surface for pine seeds to germinate and seedlings to thrive.

Regeneration of white pine by selection, favored by some environmentalists because it is least disturbing to soil, watersheds, and aesthetic value, is feasible primarily where associated species bear sparse foliage and are generally less tolerant than these pines.[14] Such intolerant associates include paper birch, red maple, jack pine, aspen, and pin cherry. Costly manual or chemical release from this competition is often essential, making selection cutting uneconomic. Single-tree selection also tends toward site domination by species with more tolerance but less economic utility than white pine.

Shelterwood cuttings are designed to achieve regeneration gradually, over periods of 10 to 30 years. A first cut stimulates seed production on about 60% of the trees left standing. A decade or so later, a second harvest removes 60% or more of the remaining trees, the soil is scarified to enable seed germination, but part of the parent stand is left for shade to protect the seedlings from sunscald. A final cut, after regeneration is established, removes the rest of the old stand.[15]

Seed-tree, like shelterwood, harvests, remove substantial overstory timber, leaving perhaps 10 choice stems per acre as a source of seed. For successful regeneration, a good seed crop, usually occurring at 3- to 5-year intervals, must fall during the first year or two after cutting.[16]

Clearcutting in strips or blocks combines the ecologic characteristics of the species with economic considerations for least-cost continuation of the type. Other advantages include its adaptability to heavy logging machinery, a timber-edge beneficial to wildlife, and ease for replanting by machine if natural regeneration fails. Size of harvest areas is limited by the distance to which adequate seed can be supplied by the adjacent stand. This should prevent openings so large as to be unacceptable for watershed protection and aesthetic appreciation.

Other constraints upon managers of white pine are a weevil which kills terminal shoots, a lethal rust controllable only by elimination of shrubs of the genus *Ribes*, and root and heart rots.[17] To rejuvenate forests with these problems may require clearcutting prior to regeneration.

## Southern Pines

The 10 species of southern pines produce essentially identical wood, marketed as a single material.[18] They are expected to provide more than half the Nation's softwood within two decades. Four species are of primary importance. Loblolly pine, the most widespread and abundant, is a fast-growing tree of intermediate tolerance and is highly regarded by timber growers. It now dominates much land formerly occupied by longleaf pine. Shortleaf pine extends farthest north, is intolerant, and out-produces its hard-

wood associates on many sites. Slash pine, fast-growing and on some sites relatively tolerant of competition, has been widely planted; genetically superior strains are available. Longleaf pine is most intolerant, grows slowly in youth, but develops straight, clean stems of excellent quality.[20] In an earlier day, longleaf pine timbers went to the shipyards of Greece for masts. Longleaf and slash pines, occurring mainly on the Gulf and Atlantic coastal plains,[19] produce commercial oleoresin as well as fiber.

The four principal species occur in pure stands, in mixtures with hardwoods, and with each other. None is a true climax species, for on most sites their seedlings are unable to survive under their own shade or that of invading competitors.

The ecologic climax for most southern pine sites is a hardwood type, with occasional relict pines.[21] Such forests occurred widely in the Georgia and Carolina Piedmont in pioneer days.[22] Many dry sandy sites now growing pine would, without disturbance, succeed to a forest of scrubby hardwoods. Windstorms and forest fires, under natural conditions, interrupted the ecological cycle to initiate the extensive pine stands of the South. Despite wasteful cutting and woods-burning, most existing pine stands originated by natural reseeding of cutover forest or abandoned farmland.

Management of southern pines requires maintenance of a sub-climax vegetative association.[23] The alternative, allowing stands to revert to predominantly hardwood types, is incompatible with optimum production of structural lumber, plywood, and long-fiber pulp. Only when managed primarily for pine can the South's 100 million acres of potential pine land meet the Nation's projected needs for such products.

Loblolly pine can, on favorable sites, be managed by a modified selection system, harvesting trees in small groups instead of singly.[24] Elsewhere,[25] similar cuttings have produced little pine regeneration and much brush. On most sites, expensive hardwood control, and thus higher wood-products prices, would be needed to grow continuous pine crops by selection harvests.

Managed southern pine is currently harvested under systems that remove most or all of the existing stand, permitting control of established hardwoods by fire,[26] mechanical means, or both. Harvests may leave 10 seed-trees per acre, be limited to strips or patches that will reseed from adjacent timber, or depend on artificial planting or seeding.[27]

Clearcutting, followed by burning of excessive debris, mechanical site preparation, and mechanized planting or direct seeding, is compatible with efficient logging, thus minimizing harvesting expense. The land is promptly returned to full production. The method has been criticized because it results in monocultures conducive to catastrophic disease or insect attack and for impairment of watershed, wildlife habitat, and aesthetic values.[28]

*Efficient, intensive, evenaged forestry can be compatible with watershed protection, wildlife production, and outdoor recreation.*

Monocultures can be vulnerable, although it is uncertain whether any of the known enemies of the southern pines—littleleaf disease, annosus root rot, or the southern pine beetle—are thereby fostered. Evenaged forestry, however, need not be the culprit, as ownership and land-use patterns confine "monocultural" forests to units smaller than those prevalent in virgin stands. Hardwoods occurring along streams also reduce the size of evenaged, single-species blocks.

Prompt establishment of herbaceous cover on regeneration areas limits accelerated erosion to a period of 4 to 6 months after each cutting. Prompt tree regeneration limits aesthetic insults to about two growing seasons. Since intervals between harvests are about 20 and 40 years for pulpwood and sawlogs, respectively, such exposure disturbance is not excessive for the moderate slopes of Coastal Plain and Piedmont sites. On mountain sites of Arkansas, less intensive clearing, more limited cutting areas, or special erosion control measures may be desirable.

Artificial regeneration, being more dependable than any form of natural seeding (because seed crops are often inadequate), is widely practiced. As genetically improved stock becomes available, planting occurs on larger acreages.

Pure pine stands dense enough to exclude understory plants are poor habitat for game animals. Thinned stands and the edges of openings produce wildlife food in the form of shrubby and herbaceous browse, seeds, and fruits. Regeneration areas, from the time of site preparation until crown closure of young trees, affords excellent deer and quail habitat. With small, well-distributed cutting areas, intensive pine management is compatible with large populations of deer, quail, doves, and turkeys.[29] Nearly as much game is produced as would be under intensive wildlife management, where fiber production is of little concern.

Managed forests in the South are aesthetically monotonous. Because terrain is gentle to flat, only where broken by farmlands and cutting do the forests not obscure everything more than a few rods distant from roads.

## Douglas-fir

One of the major timber species of the world,[30] Douglas-fir reaches its best development in the virgin forests west of the Cascade and Sierra Nevada ranges from nothern California to southern British Columbia. Most current harvesting and reserves of the species are concentrated in

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this region. The Douglas-fir found in Rocky Mountain forests is a distinct and generally less-productive race.[31]

Compared with other western conifers, Douglas-fir is intermediate in tolerance, but in comparison with its associates in the same forest, it is intolerant. It cannot regenerate under the shade of the more tolerant redwood, red cedar, hemlock, spruces, firs, and hardwoods with which it competes. Ecologically a fire subclimax species, Douglas-fir owes its dominance to fires and wind-throw and to its longevity. Disturbance provides bare soil for seed germination and openings where seedlings can outgrow competitors; a head-start and fast growth may enable Douglas-fir crowns to retain dominance for 350 years.

Faster growing and intrinsically more valuable than its associates, Douglas-fir best utilizes the sites when grown in pure stands. Clearing of some kind is essential if regeneration is to be accomplished by natural means.[32] Other factors that make clearcutting almost unavoidable are the heights and weights of the trees, necessitating large logging equipment which is difficult to maneuver among uncut ones without injuring them. Partial cuttings also expose residual stems to wind, precluding shelterwood and seed-tree harvests in dense virgin and second-growth stands.[33]

Most foresters of the Douglas-fir region consider clearcutting in relatively small patches the best approach to regeneration of existing old-growth stands. Prompt burning of logging debris after harvest reduces wildfire hazard and enhances seed germination.[34] Small blocks permit adequate seed production and dispersal from adjacent stands, a marked contrast with earlier extensive logging practices where the dearth of seed precluded adequate regeneration.[35] Small blocks also reduce adverse hydrologic effects by limiting the proportion of a watershed which is disturbed.

Good Douglas-fir seed crops are infrequent, occurring on the average at 5- to 7-year intervals.[7] Thus only 15 to 20% of the harvests coincide with heavy seed crops. Less-valuable trees, herbs, and shrubs may then capture the site. The uncertainties of natural regeneration cause many managers to regenerate harvest areas by site-preparation with bulldozers and planting.

As the Douglas-fir region shifts from virgin to managed forests, changes in harvesting methods are likely to occur. Trees will be cut at younger ages—50 to 75 years *vs.* 150 to 350. To promote high-value growth, fewer stems will be grown per acre.[36] As these trees will be smaller and more wind-firm than those in virgin stands now being harvested, partial cutting systems may be feasible, especially where wildlife,[37] watershed, and scenic values are paramount. For most commercial sites, however, the trend seems to be toward small block clearcutting followed by planting or direct seeding to insure prompt and adequate restocking.

### Eastern Hardwoods

Hardwoods comprised nearly a third of the total United States wood harvest in 1970. About 50 important species, ranging widely in ecologic characteristics and tending to grow in associations of many species, make hardwood silviculture complex.[38] One of the simpler types (maple-beech-birch) has been discussed as a classic example of tolerant tree species. At the other end of the scale are a few highly intolerant hardwoods—black willow, cottonwood, aspens, gray birch, and yellow-poplar. Like the intolerant conifers, these are pioneer species, requiring exposed soil and full sunlight for regeneration, and growing in pure, even-aged stands. Cottonwood and black willow, fast-growing species, are commercially important where earlier seeded-in on new sand deposits along rivers and other alluvial sites. Their value has encouraged intensive management even though several cultivations to control weeds are required.

Aspen and gray birch in the Lake States prefer well-drained sites. Yellow-poplar in the Southeast prefers mesic conditions. All three grow rapidly, appearing as pioneer species following clearcutting or other denudation. Aspen and gray birch, being short-lived, are managed primarily for pulpwood. Old growth yellow-poplar has been prized since colonial times as a soft, easily worked wood for cabinets, pattern-making and interior finish. On fertile, permeable soil with high nitrogen content, it outgrows other hardwoods and most conifers.[39] For natural regeneration, openings of at least one-half acre are required for seedling survival. Harvests of up to 50 acres are effective if seedfall is adequate and the soil is scarified. Prescribed burning also exposes mineral soil to enhance seed germination. In areas where deer populations are high, large seed-tree or shelterwood blocks may be appropriate as deer tend to congregate in small openings to feed on palatable yellow-poplar seedlings.

Despite major acreage losses to agricultural clearings, water control impoundments, and urban sprawl, the nation must look to management of the mixed forests of its bottomlands and drainage-ways for the bulk of its quality hardwoods. Such stands tend to include trees of all sizes, if not all ages, and lend themselves to the selection system. This is not inconsistent with customary commercial logging, which has long selectively removed trees on the basis of value. The tolerance of most lowland species permits them to occupy small openings, even those created by removal of single trees. The selection system, however, is handicapped by the appetite of deer, which destroy the palatable seedlings of the preferred tree species.

Clearcutting systems are feasible for bottomland hardwoods, as seedlings of tolerant species are usually present in the understory before harvest begins. These broadleaf trees also are regenerated by fast-growing sprouts that arise from roots or stumps. Light-seeded species, like the quality ash and maples, have advantages over heavy-seeded mast producers, like the oaks and hickories, because of the ability of the former to disseminate winged seeds great distances. Even where preferred species are retained as seed trees, species composition of a new bottomland forest is uncertain. Competition among the young trees and vigorous growth of brush and vines further alter the mixture, making hand labor necessary to release selected crop trees.

## Summary

Dwindling reserves of non-renewable raw materials heighten the need for increased forest productivity to meet current and prospective demands of the American people. The time lag between initiation of forestry measures and the marketability of wood products resulting from those measures call for action now to assure meeting requirements for the years 2000 and beyond.

Many Americans have voiced objections to the manner in which forests are being managed to meet the expected demand. Clearcutting methods of harvesting are particularly criticized, as destruction of watersheds, wildlife, and scenery is alleged.

Because the Nation's fastest growing and most versatile timber trees are pioneer species, requiring bare soil and full sunlight for regeneration and growth, they cannot be economically regenerated by systems which remove only a small part of the stand. While such selection silviculture would minimize disturbance and disruption of non-timber resources, it would either convert stands to less valuable tree species or require costly means—by chemicals, fire, or machinery—to eliminate competition. Greatly increased consumer prices for housing, paper, and other wood products would result.

Fortunately there is room for compromise. Productive sites revegetate promptly and erode but little during the temporary denudation between harvest and establishment of regeneration. Clearcutting in small blocks benefits wildlife by increasing the length of timber margins. With prompt regeneration, naturally or artificially, scenic values are quickly restored. Thus, efficient, intensive, evenaged forestry can be compatible with watershed protection, wildlife production, and outdoor recreation; while in some sensitive situations, timber harvest may be inappropriate.

Users of forest resources—those who live in houses, read books, wear clothes, and use energy—may be unaware that they force environmental insults upon the land. So all Americans face decisions now for which they must eventually pay a price. One choice is to endorse forest policies which will insure increased and efficient wood production from the best forest sites while accepting minimal reductions in other amenities. Alternatives which divert commercial forest from efficient wood production will be costly in dollars and in energy resources spent for substitutes from non-renewable raw materials.

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much as 6 feet (2m) in a single season. Slash pine thus predominates on moist sites where fires are less frequent, while longleaf occupies drier sites which may burn almost annually. With effective fire control, slash pine is now grown on much land formerly dominated by longleaf pine.

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*The real meaning of enjoyment is not happiness, which can be selfish, but the act of going outside of one's self, as a small child does, to be involved with other objects for their own sake. It is therefore the antithesis of introspection, of being imprisoned within one's self. Such joy is a desire, yet it is not entrapped in self-seeking. It is a response, even an intellectual response, such as a mathematician may have to the beauty of numbers, yet it is not self-congratulatory. It is love, but not self-love; rather it is love of everything for its own sake. Joy is akin to humility, to unconscious self-forgetfulness and to kindness in respecting the uniqueness of the other. When, therefore, it is joy in God, it is joy indeed, for then it is the response of being in contact with the source and sustenance of all reality. It is the joy of seeing all things as God meant them to be recognized, not for our selfish, utilitarian purposes, but for their own sake. Such joy, then is deeper than reason, for it binds our lives to the coinherence of all things under the Creator.*

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# Psychological Anthropology's Neglected Concept: Love

GEORGE J. JENNINGS

Associate Professor of Anthropology

Geneva College

Beaver Falls, Pennsylvania 15010

*The anthropologist Ashley Montagu asserts that love is "man's most important behavior" (1975). Yet in both theory and research, ethnologists in general and those pursuing psychological anthropology in particular have neglected almost completely the concept while emphasizing negative and aggressive models for personality and culture study. This essay assumes that human beings have a potential for "creative altruism" (Sorokin) or love if the concept is extracted from romantic misconceptions in favor of definition by psychologists, sociologists, ethnologists, philosophers, and theologians. When conceived as human ability (as procured through enculturation) to become empathetically concerned in promoting welfare to benefit others, the concept escapes the "instinctual" and sexual excesses in Freudian thought to emerge as a motivational base for both understanding personality in society and culture with sensitive potential for developing effective vehicles in applied or "action" anthropological projects in cross-cultural situations.*

As an early and eminent scholar in psychological anthropology, the late Ralph Linton may have established a rather unfavorable precedent for such study with his brief interpretation of love. In his single indexed reference to love in the classic text, *The Study of Man* (1936:174-175), he offers what has been wittingly or unwittingly a view emulated in succeeding research and writing which limits analyses of love to sexual dimensions (undoubtedly under the Freudian shadow), or to disparaging amusement about the romantic excesses as stereotyped by Hollywood.

It is probable that with his somewhat sneering observations about love, Linton was unaware that an ancient non-Western people, the Hebrews, carried "romantic love" to such a high pitch that its expression found its way into their sacred texts, as for example:

> How beautiful you are, my love!
> How your eyes shine with love behind your veil . . . .
> How beautiful you are, my love;
> how perfect you are! (Song of Songs 4:1,7 TEV)

Nor were ancient Hebrew concepts of love always "romantic" as between man and woman. As a matter of fact at that early period we are informed that one love situation exceeded heterosexual love in depth and intensity with this emotional appraisal by the soon-to-be-crowned King David:

*Paper presented in modified form at the 10th International Congress of Anthropological and Ethnological Sciences in New Delhi, India, December 13, 1978.*

I grieve for you, my brother Jonathan;
how dear you were to me!
How wonderful was your love for me,
better even than the love of women (2 Samuel 1:26 TEV).

This essay seeks to remind ethnologists that there is a disturbing hiatus in both theory and research in psychological anthropology. This hiatus can be exposed sharply by this question: Why has love, which can be regarded as a basic motivational factor necessary for understanding human behavior common to diverse cultures, been minimized in cultural research or even ignored? Empirical evidence, in spite of this omission, makes imperative that this motivational force in various forms be recognized in cross-cultural research with a quest for cognizance about human behavior and the nature of man. This imperative is unusually clear in a world that finds people with contrasting cultures increasingly involved in cross-cultural experiences. The attending acculturational effects usually include tensions that might be avoided or at least ameliorated significantly when members of one culture affectionately empathize with members of contrasting cultures. The nature of love as defined in this essay is postulated to be a critical concept for studies in psychological anthropology. To be succinct, this essay's premise is that love is as essential in understanding cross-cultural personality differences as are the much more commonly proposed aggressive features and associated negative interpretations of human nature and cultural characteristics.

## The Ethnological Omission of Love

It is indeed surprising, even puzzling, to discover that most ethnological writings give little or no attention to the love concept however it may be defined. And one can peruse through volume after volume devoted to general or introductory texts in anthropology completely devoid of any index reference to the subject. The same obtains in practically all ethnographic monographs. Perhaps few anthropologists equaled A. L. Kroeber's comprehension of ethnological materials in his time—he was considered the "Dean of American Anthropologists"—but if one examines his classic introductory text, *Anthropology* (1948), one finds in the chapter, "Cultural Psychology," only incidental comments as:

> Everyone agrees that physiological sex impulses underlie love and marriage . . . Even below the level of socialized culture, psychologists long since realized that the erotic psychic life of individuals varies enormously according to the conditioning and experience to which they have been exposed, and that only the simplest denominators of the [love] phenomena can be explained by the organic sex equipment (1948:578).

Today we ought not be content with such abbreviated suggestions, interesting though they may have been and often shared by contemporaries, for such passing glances at what seems to be a basic motivational force in behavior deserves extended investigation.

A survey of current introductory American anthropology texts reveals the conspicuous omission. In examining 132 texts that are most commonly used in America for introductory students, we discovered that only one provided a single index reference to love! Even more telling in terms of this essay is the failure of writings in psychological anthropology to offer insights into what must be in some form a universal behavioral factor within any culture. One may seek with resultant frustration for some analyses of love in psychological anthropology as pioneered by Malinowski (1927), Sapir (Mandelbaum, 1956), Benedict (1934), Mead (1939), Linton (1945), or Hallowell (1955). There is a startling avoidance of extended and cognizant effort in that early genre which provides only rare notices.

To continue our survey, we find that whether one scans the more elementary college-level texts in culture and personality as those by Barnouw (1973) and Honigmann (1954, 1967), or the more advanced texts in the field by Wallace (1970) and LeVine (1973), the absence of love as a behavioral concept is striking, even though contrasting concepts such as aggression, stress, and hostility are commonplace. Incredibly, with comparable omission, the Chinese anthropologist, Francis Hsu, who has devoted much research and prolific writing in psychological anthropology, makes only incidental references to love in his many works (e.g. *Psychological Anthropology*, 1972.)

It is of course possible to document this neglect in research and writing about the love concept, however conceived, by others in psychological anthropology. Likewise the omission of the subject is obvious in related disciplines such as psychology and sociology except, as one may well anticipate, in specialized treatments involved with courtship, marriage, and family. Even in most such studies, it must be noted that the approach by most social scientists is usually limited to erotic considerations that cast the concept almost wholly in a sexual matrix of meaning. This conclusion leads us logically to exploring definitions and characteristics of the love concept, for only as psychological anthropologists gain greater sophisticated cognizance of this motivational force will they be able to engage in cross-cultural research to determine its presence or absence as a personality component.

## Toward a Definition of Love

It goes without saying that some identification of something significant in human behavioral phenomena is the logical beginning point for further research. This identification becomes a compelling imperative if the thing to be studied suffers from either multiple or elusive characteristics, or popular and romanticized usage. Both of these problems attend our effort to identify and define love. But we must make an effort to so understand the concept that it can provide operational means for increasing knowledge about human personality and nature. Undoudtedly it is wise to set the psycho-biological stage first for the love phenomenon, that is, to review a classic

ethological and psychological study conducted under controlled laboratory conditions.

### The Views of the Psychologist, Harry F. Harlow

In his compendium, *The Practice of Love* (1975), Ashley Montagu introduces Harlow's article entitled "The Nature of Love" with this telling comment:

> In this contribution Professor Harlow gives an illuminating account of his famous experiments on the nature of love. His opening comments draw attention to "the apparent repression of love by modern psychologists," and he might have added, also by other scientists. As for politicians, it is a matter of record that when Professor Harlow received a grant from a government sponsoring body, the matter was raised in the U. S. Senate, where the idea of money being spent for research on such a subject as love was greeted with laughter and derision . . . Professor Harlow, whose work represents the pioneering, fundamental, and classical scientific study of *man's most important behavior* (1975:17 Italics added).

From laboratory experimentation with rhesus monkeys, Harlow identified five major interactions which he labeled "affectional systems," all related, overlapping, and built one upon the other. The intertwined systems are: (1) Maternal love, or the love of mother for child, which is the earliest of affectional interactions. This behavior is derived from more than nursing or feeding, as was once believed, but especially on tactility in physical contact. (2) Infant, love, that of child for mother, is an affectional system that complements the stages of maternal affection. In response to mother's care and protection, the infant desires to be physically close. (3) Age-mate affection is the love of peer to peer. This originates at about the time the baby is separating from mother. Since mother begins to discourage clinging as time passes, it appears natural that growing babies turn to one another for physical contact. Through mutual exploration and play activities they learn cooperation and organization.

(4) The heterosexual affectional system rests on age-mate passions that have been triggered by the hormonal changes at puberty. Accompanying behaviors depend to a large extent on previous systems; any romance must be based on trust, acceptance of contact, and sex-role indentification. Again Harlow emphasizes that these are responses that evolve from antecedent interactions. (5) Paternal love seems to be the final affectional system, one that is concerned with protection and enculturation. While maternal love is deeply rooted in innate biological tendencies, this may not be true for males. In many cases, the paternal services and relationships are behaviors learned through contact and association with mother. Paternal affectional behavior tends to differ, therefore, from culture to culture, though in general a loving father contributes greatly to a child's intellectual growth and maturation (Harlow, 1971).

Harlow has been criticized, perhaps rightly, by social scientists for indulging in some reductionism with his interpretative anthropomorphisms, that is, he ascribes human attributes to nonhuman animals. He admits to this tendency, yet in defense he insists that since a similar "human laboratory" is not likely, his findings can be used with caution for application by observation of some actual human interactions as the mother-child dyad, or the sibling situations.

*Why has love, which can be regarded as a basic motivational factor necessary for understanding human behavior common to diverse cultures, been minimized in cultural research or even ignored?*

It seems therefore that there are manifestly biological components basic to any definition of human love despite strictures that may be directed toward Harlow's studies and similar efforts. However serious study of love must ever attend the sociocultural dimensions offered in psychological anthropology. In other words it is imperative to recognize that both biology and culture are at play in the origin phenomena characterizing humans who are born with a potential only to be realized by learning. Admittedly Ashley Montagu makes excessive claims for the sociocultural experience, but he has emphasized, correctly we think, the critical importance that the enculturational process bears upon love as human behavior. He reasons that being human depends upon the conditioning process tranforming innate potential or capacity into realization or ability. To Montagu, love is as much a possibility for the infant as is speech, for in either case the ability to love or to speak must be achieved through enculturation (1976:235-236).

### Pitirim Sorokin's Altruistic Love

Few social scientists have devoted as much thought and persistent energy as has the distinguished Russian-born sociologist, Sorokin, to the problem of how to use the power inherent in man's potential to love in order to make human beings less selfish and more creative. While directing the Harvard Research Center in Creative Altruism, he ominously announced:

> I came to the conclusion that if individual human beings, groups and cultural institutions in general did not become notably more creatively altruistic, nothing could save mankind. Popular prescriptions, such as political changes, religious changes, and education as a panacea against war, won't do it. This century, in which science and education have reached unrivalled heights, is the bloodiest of all the twenty-five centuries of Greco-Roman and European history (Krich, 1960:260).

A central concept in Sorokin's "law of polarization" in his altruistic thought runs contrary to the Freudian claim that calamity and frustration uniformly generate aggression and hostility in mankind. His views also challenge an old conclusion, reiterated by the famous historian, Toynbee, that adverse experiences lead uniformly to the moral and spiritual ennoblement of human beings. What the law of polarization postulates, in Sorokin's thinking, is that, depending upon the type of personality, frustrations and misfortunes may be reacted to and overcome by positive polarization, resulting either in an increased creative effort

(he cites the cases of Beethoven's deafness and Milton's blindness) or in altruistic transformation as in the instances of St. Francis of Assissi and Ignatius Loyola. On the other hand the adversities may induce negative polarization in the shape of suicide, mental disorder, brutalization, increase of selfishness, dumb submissiveness, or cynical sensualism. Sorokin believes that this works both individually and collectively. This is the basic assumption underlying Sorokin's survey of the "manifoldness" of love out of which emerges the possibilities, even probabilities, of altruism (1968).

When explaining "altruistic love," Sorokin insists that love is like an iceberg in that only a fraction of it is visible but even this exposed segment is little known. Still less understood is love's transempirical component, its religious and ontological forms. As he attempts to explain this somewhat enigmatic force in human behavior, he asserts that love appears to be a universe inexhaustible qualitatively and quantitatively. In order to continue his ontological struggle with the love concept, he follows along a path in his thinking that leads him to identify the following categories (1954).

(1) To Sorokin the *religious aspect* of love is linked with God, the highest value in the Christian and other great religions as in Islam and Hinduism. Since God is believed to be the absolute value, love participates in God's absolute value. And since God is an Infinite Manifoldness, love is also qualitative and quantitative infinity. As such it cannot be defined by any words or concepts; at best these can be only symbolic indicators of the infinite cosmos of love. By identifying this love as supernatural to be represented only symbolically, Sorokin infers that this category cannot be essentially biological but cultural with psychological responses and implications in behavior.

To consider love in a religious category, Sorokin finds himself confronted by no less than three general conceptions of love which have pervaded oriental and occidental religious, philosophical, and ethical thought: love as *Eros*, love as *Agape*, and love as a synthesis of *Eros* and *Agape*. Certain typologies treating the two first forms see Eros and Agape as direct opposites: Eros is human and "selfish" while Agape is divine and "selfless." Sorokin, however, finds that the oriental as well as the occidental ethico-religous and philosophical conceptions usually combine Eros and Agape in positing the way of salvation and the achievement of love at its highest and best. Personal effort reinforced by the grace of God is considered the only real way to accomplish the purpose of human fulfillment.

In essence then, Sorokin's proposed synthesis of Eros and Agape goes something like this. Properly understood, self-centered love, as an effort by man to liberate himself for attaining his real and divine self, must seek to reach union with God and God-centered love. Thus man's effort with Eros finds divine grace or Agape in this endeavor; these two are linked in all true systems of love, oriental and occidental, though some systems stress the Agape, and others the Eros.

(2) *Ethical love* is Sorokin's second category and is to be identified with goodness itself (Sorokin seems to see "goodness' in functional sense as "suitable" or "desirable" for those involved). Love is thus viewed as the essence of goodness inseparable from truth and beauty. Since these definitive terms are value-laden, Sorokin, the sociologist, believes that all societies find common agreement or a marked degree of consensus as to what appears most beneficial to that group. Concisely, Sorokin maintains that real goodness is always true and beautiful; pure truth is always good and beautiful; and genuine beauty is invariably true and good. Of course the social scientist may accept such assertions as being allowable only to artists and novelists, but certainly not for scientific rigor in serious research. We may do well, however, to remind ourselves that Ruth Benedict and others in psychological anthropology proposed that the humanities and the arts are not to be shunned in the quest to understand personality in the cultural context.

(3) To Sorokin, the *ontological aspect* of love is, in alignment with truth and beauty, one of the highest forms of a unifying, integrating, harmonizing, creative energy or power. Obviously this view is a direct challenge to the Marxian conflict model of society. Love is conceived as a cohesive quality or energy that operates in the physical, the organic, and the psychosocial worlds. Without the operation of love energy the physical, the biological, and the sociocultural cosmos would disintegrate; no harmony, unity, or order would be possible; universal disorder and enmity would reign supreme.

Moreover Sorokin argues that as a creative energy of goodness, love unites what is separated, elevates what is base, purifies what is impure, and enables what is ignoble. Love raises man as a biological organism to the level of divinity, infinitely enriches the human self, and empowers humanity with much greater mastery over the inorganic, organic, and socio-cultural forces. Love, in consequence, is the universal creative force that counteracts evil. Love replaces the struggle for existence by harmonious unity and mutual aid. Its constant endeavor is to make the whole universe one harmonious cosmos.

(4) The *physical aspect* of love according to Sorokin's scheme is what relates it specifically to the inorganic world. That is to say, the physical counterpart of love in the inorganic world is reflected in all physical forces that unite, integrate, and maintain that inorganic world in unity. This cohesive energy begins with the tiniest unity of the atom to end with the whole physical universe as one unified, orderly cosmos.

(5) Sorokin's *biological aspect* of love is that energy that manifests itself in the very nature and basic process of life. He concludes that this mysterious energy, sometimes called *elan vital* or "vital energy," unites various inorganic substances into a startling unity of a living-unicellular or multicellular-organism. The life of the cellular entities depends upon "biological love energy." Perhaps Sorokin would suggest that the classic example of this energy at play is at the moment of human conception when the two gametes of male sperm and female ovum unite to form the

zygote, the imperative in natural reproduction.

In essence then to Sorokin, the cooperating or "love" forces are biologically more pronounced and vital in normalcy than the competitive or antagonizing forces that tend toward disintegration in life. Clearly in Sorokin's logic life itself is not possible without the operation of the biological counterpart of love energy; it is imperative for the survival of the species. The implications for human behavior and personality normalcy or mental health are readily apparent for studies in psychological anthropology.

(6) When considering "the *psychological aspect* of love," Sorokin views the experience of love as a complex consisting of emotional, affective, volitional, and intellectual elements. Its qualitative forms are expressed in such terms as empathy, sympathy, respect, adoration, friendship, and other similar words. These conceptual terms are of course in sharp opposition to hatred, enmity, envy, jealousy, and like expressions. Sorokin insists, rightly in our opinion, that love as a psychological experience is altruistic by its very nature; whereas the opposite experience of hatred is inherently selfish. In its maximal realization, love (a) is the experience that annuls our individual loneliness, (b) constitutes a life-giving force (thus negating suicidal possibilities), (c) produces beautification for life and its perspectives, (d) eventuates in what may be called noble and good in life, and (e) in experience means freedom at its loftiest attainment (that is, to love is to act freely without compulsion or coercion from without oneself).

In reference to this last experience, Sorokin proposes that fearlessness and freedom inherent in love equate with power. Such a loving person cannot be intimidated, hence there is nothing in this inner "coiled-up energy" to be wasted by internal conflicts and external friction. The final result is that the love experience is equivalent to the highest peace of mind and a persistent serene happiness in personality.

(7) Sorokin concludes his categories of altruistic love by affirming that in the *social love* experience there is a meaningful interaction—or relationship—between two or more persons where the aspirations and aims of one person are shared and aided in their realization by other persons. While expanding about altruistic love on the social plane, this Russian-born sociologist, with grim concentration camp experiences in earlier years still vivid in memory, pleads for a "positive emphasis" among social scientists in their research and interpretations. This "evangelistic" fervor that accompanies some of Sorokin's writings finds him accusing many social scientists, and undoubtedly this means most psychological anthropologists, of being unwittingly immersed philosophically in negative presuppositions.

Let us pursue this charge a bit further. In our "sensate" culture, Sorokin deplores the social scientific predisposition to concentrate on the pathological traits and conditions in societies and cultures. He charges that this pathological

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cynosure in the study of behavior reveals itself in a proliferation of various "debunking" interpretations of man, culture, and values: mechanistic, reflexological, biological, materialistic, behavioristic, and others. These interpretations have deprived man and his cultures of values and ethos, of everything divine, supernatural, or human. To Sorokin such perspectives equate man and his ways of life, and supporting postulates, with atoms, electron-protons, reflex mechanisms, reflex organisms, the libido, and so on. The manifestation of this pathological bias in behavioral sciences which concentrates on a study of the negativistic in human life and actions, and the reluctance of scientists to study the positive types of Homo sapiens and human relations, are most deplorable to Sorokin (1950:3-4).

## De Rougemont's Philosophical View on Love

Sorokin, in his analysis of altruistic love, becomes involved in what are clearly humanistic or philosophical interpretations of love as a key human behavioral component such as we have already noted. However, he does not allow the philosophical dimension to eliminate or overshadow his conclusions as a social scientist; therefore it seems appropriate to give attention to a more thoroughly philosophical stance in defining love. Here we find numerous writings, so selectivity is made more difficult. With some reservations we choose the thinking of Denis de Rougemont as presented in what some regard as a classic statement, *Love in the Western World* (1966). Here he seeks to describe the inescapable conflict in Western culture between passion and marriage. His analysis therefore is not merely a probe into love per se, but it is an attempt to correct erroneous views about it and marriage. His conclusion is that marriage in Western culture is threatened in part by inextricably linking marriage with romantic love or a "passion" completely dependent on sexual attraction and experience. In de Rougemont's words: Western culture "will have to recognize that marriage, upon which its social structure stands, is more serious than the love it cultivates, and that marriage cannot be founded on a fine ardour" (1966:vi).

In disentangling marriage from love, de Rougemont examines carefully the distinction between "Eros" or "Boundless Desire" and "Agape" which he identifies with "Christian Love." He notes that the Platonic love concept is a "divine delirium" with eros as an "ecstatic state" which removes the experience from reason and natural sense. But de Rougemont offers his argument with felicitous expressions that warrant quoting:

> Eros is complete Desire, luminous Aspiration, the primitive religious soaring carried to its loftiest pitch, to the extreme exigency of purity which is also the extreme exigency of Unity. But absolute unity must be the negation of the present human being in his suffering multiplicity. The supreme soaring of desire ends in non-desire. The erotic process introduces into life an element foreign to the diastole and systole of sexual attraction—a desire that never relapses, that nothing can satisfy, that even rejects and flees the temptation to obtain its fulfillment in the world, because its demand is to embrace no less than the All. It is *infinite* transcendence, man's rise into his god. And this rise is without return (1966:64).

In sharp contrast, de Rougemont finds "Agape" or "Christian Love" to be the supernatural God intervening in human life ("incarnation" or "God with us") to introduce a radically different orientation toward the supernatural, others, and self. This act of intervention is conceived as being the essence of love or "agape." The Person of Christ is in this view the Incarnation of God and the event is unique (1966:70).

The essence then in this philosophical and mystical presentation is that "agape" love enables the individual to engage in not only the "desire" but also the "doing" to alleviate unfavorable conditions experienced by others. The "needs" served in such love are not merely for physical survival but also—and here the view bears directly on psychological anthropological study—for a psychological state of peace and equanimity irrespective of adverse sociocultural circumstances and experiences. This agape love thus provides a paradigmatic triad that is deemed essential to the "abundant" or "fulfilled" life: an attitude with action toward the supernatural (the theological parameter), toward others (the sociological parameter), and toward the self (the psychological parameter).

While preparing this paper, I chanced to scan Raphael Patai's recent book, *The Jewish Mind* (1977), to discover that he identifies at the core of Jewishness something akin to de Rougemont's attributes, which are of course directed at the Christian influence in Western culture in so far as he understands love. Patai cautiously disclaims that his presentation represents a single personality type for the Jewish people, but his assignment to understand just what enables a people to retain certain distinctives, including behavioral patterns, in diverse cultural systems through millennia forces him to establish some enduring value system or ethos for the Jews. In answering his own question "What Is the Essence of Jewishness?" Patai writes:

> The common denominator in these distillations of the essence of Jewishness, except for the earliest one which was partly ritualistic, is that they all insist on moral qualities only, nothing else . . . A Gentile could join the Jewish community by accepting the Jewish morality.

> Hillel's [1st Century Jewish sage] formulation of the essence of the Tora is . . . but a recasting into negative form of what in the Bible itself appears as a positive commandment: "Thou shalt love thy neighbor as thyself." It is remarkable, and characteristic of the direction of the development of Judaism took in Talmudic times, that it was this commandment which was considered "the whole Tora," rather than the complementary one which imposes the duty of *amor dei*: "Thou shalt love the Lord thy God with all thy heart and with all thy soul and with all thy might." This second "Thou shalt love" is, incidentally, part of the *Sh'ma* prayer whose daily recitation has been a religious duty for Jews for at least two thousand years. The two commandments of Judaism . . . (1977:9).

The relevance of this citation from Patai is that, in psychological parlance, the behavioral components provide commonality or identification to a people centered with emotional supports in a love for the deity and for others; at least that seems to have been the ideal maintained by the imposition of the law and obedient response. Of course this Jewishness distinguished the people from the Gentiles which is usually the category where most Christians are to be found. But it is remarkably significant that de Rougemont finds much in that Jewish essential, namely love toward God and toward mankind, to give rise to what he concludes to be the ultimate explanation for agape and eros; this to distinguish the basic idea from the sexual encumbrances derived from exaggerated Freudianism or the romantic cynosure in Western culture. If one may simplistically consider a culture's ethos as the "ought" in respect of the individuals to others within a cultural system, the psychological implications of love are obvious indeed.

## Maslow's Ideas on Love and Mental Health

Psychologically oriented anthropologists invariably give attention to mental health problems which, it is commonly postulated, arise to some degree from sociocultural circumstances. Commonly the better texts in culture and personality studies devote a chapter or two to what Barnouw, if we may cite his work as an example, labels "Culture and Mental Health" (1973:405-422). To appreciate this psychological orientation, we may seek pertinent information from the psychologist Abraham H. Maslow. He expresses amazement to discover how little the empirical sciences have to offer on the subject of love. And he finds it particularly strange for psychologists (and undoubtedly he includes ethnologists who pursue psychological studies cross-culturally) who neglect what he believes is to be expected as a basic obligation. Here are some rather biting comments:

> Sometimes this [omission] is merely sad or irritating . . . More often the situation becomes completely ludicrous. One might reasonably expect that writers of serious treatises on the family, on marriage, and on sex should consider the subject of love to be a proper, even basic, part of their self-imposed task. But I must report that no single one of the volumes on these subjects available in the library where I work has any serious mention of the subject . . . And yet our duty is clear. We *must* understand love; we must be able to teach it, to create it, to predict it, or else the world is lost to hostility and to suspicion" (Montagu, 1975:90 Italics in the original).

After he admits to the inherent difficulty confronting those seeking to study love, Maslow argues that the core in descriptions of love must be subjective or phenomenological rather than objective or behavioral. Such reasoning confirms what we have cited from de Rougemont's philosophical interpretation earlier in this paper. However Maslow suggests that, even though one cannot communicate the full quality of the love experience to one who has never experienced it (I wonder how many of us in psychological anthropology have experienced agape love?), the desire for intimacy is both physical and psychological with certain effects that can be observed and even provide empirical data. Maslow's major thrust has to do with love's relationship to or bearing upon the matter of health,

especially mental health or what he would identify as "normalcy." Let us at the risk of some misrepresentation summarize what seems to be Maslow's basic ideas:

(1) *"Self-actualizing love relationships" make for mental health* in that these human interactions reflect an absence of defenses accompanied by increasing spontaneity and honesty. In other words, love is impaired less by the feeling that a person is not appreciated than by a dread, more or less dimly felt by everyone, lest others see through one's mask, the mask of repression, that has been imposed upon one by society and culture. It is this that causes the person to shun intimacy, to maintain "friendships" on a superficial level, to underestimate and fail to appreciate others lest they come to know the individual too well.

(2) Maslow contends that *to be healthy mentally one must develop both the ability to love and to be loved.* In such a view we are reminded of Ashley Montagu's conclusion which emphasizes this essential trait; that is, individuals in any culture, by the very fact that they are Homo sapiens, are born with both the capability (potential) to love and the need to learn to love (ability) in order to be fully human; this clearly infers what is imperative for psychological health. Among those who have provided empirical data to support this required behavioral characteristic for health, John Bowlby has convincingly demonstrated the need in his research dealing with maternal deprivation and associated phenomena (1966).

(3) In relating sex to love in mental health, Maslow contends that *sex and love can be and most often are completely fused with each other in healthy persons.* He is not saying that sexual pleasure is impossible apart from love; it is his understanding that the two are quite distinct behavioral phenomena. His evidence leads to the conclusion that the fusion of the two usually characterizes the mentally healthy person. To restate this, he clearly infers that when the individual is characterized by only one of the two, the result commonly leads to maladjustment. In essence this argument charges Freud with confusing the two or failing to recognize that there are at least two forces of love potentially at play in the individual. Maslow's view is that to those in mental health sex provides whole-hearted enjoyment; that is, it can be an ecstasy far beyond the possibility in the average person, yet simultaneously it is not a cynosure in the philosophy of life. This significant idea is reminiscent of D'Arcy's thesis which holds that erotic and agapean love are fundamentally distinct and different but the two merge in personalities enjoying mental health (1947).

(4) Maslow finds that *care, responsibility, and the pooling of needs are essential to mental health.* This inclusion means that a good love relationship rests upon what may be called need-identification, or when the pooling of the basic needs' hierarchies of two persons fuse into a single hierarchy. The effect is that one person feels another's needs as if they were his own and for that matter also feels his own needs to some extent as if they belonged to the other. An ego now expands to cover two people, and to some extent the two people have become for psychological purposes a single unit, a single person, a single ego. Those familiar with the biblical account of origins might recall this union of two, Adam and Eve, as stated thus: "That is why a man leaves his father and mother and is united with his wife, and they become one" (Genesis 2:24 TEV).

(5) *Fun and gaity,* says Maslow, *should characterize the healthy person in his love relationships.* He points out that even such advocates of love for mankind as Erich Fromm (1947) and Alfred Adler (1958) stress productiveness, care, and responsibility, but they omit the important aspect in a healthy love relationship: namely, fun, merriment, gaity. To enjoy mental health is to have love that is cheerful and playful. It is not primarily a striving as Fromm implies; it is basically an enjoyment and a delight, which is another thing altogether.

(6) Maslow emphasizes *acceptance of the other's individuality, which posits respect for the other, as a basic element in love for mental health.* The love for a person implies, not the selfish possession of that person, but the affirmation of that person. It means granting to his unique manhood or to her unique womanhood this characteristic gladly, not with suppressed reservations or reluctance. While it is impossible to respect a person without loving that person, mental health always means that to love a person is to respect the person, especially in terms of that person's potential response.

(7) To Maslow, *love always leads to what he calls the "end-experience": admiration, wonder, awe.* Hence the love that characterizes mental health may be described in terms of spontaneous admiration and the kind of receptive and undemanding awe with enjoyment similar to what we experience when encountering an art masterpiece or majestic mountain scene. A significant implication in this observation by Maslow is that it contradicts effectively most theories of love, for many theorists assume that people are *driven* (a form of cultural determinism) into loving another rather than being *attracted* (exercising individual volition) to love. In short, healthy love involves one in an overwhelming awe, an aspect of human *Being* as well as human *Becoming.*

(8) *Within a personality marked by healthful love,* Maslow proposes *"detachment and individuality."* To suggest that a person identifies or empathizes with another in a love relationship and then to say a healthy personality maintains detachment and individuality seems to posit a paradox. Not so, however, states Maslow, for the fact appears to be that the individuality is strengthened, that the ego is in one sense merged with another, but yet in a complementary sense remains separate and as strong as always. The two tendencies, to transcend individuality and to sharpen and bolster it, must be seen as partners and not as contradictions. Here Maslow's explanation brings to mind the second of what Jesus Christ proposed as two supreme commands by God for man. The first was of course a love for God with all possible ability, while the second command was "to love your *neighbor* as you love *yourself*" (Matthew 22:37-39 TEV Italics added). It would seem then, if we may modify or expand Maslow's point a bit, there is a love triad in healthy personality structure that includes love

for the Supreme Being, love for the other being, and love for one's own being; each of the three retaining individuality to be confirmed even during immersion in love.

(9) Maslow further finds that *love and mental health are linked closely with what he defines as "the greater taste and perceptiveness."* He affirms that healthy lovers can perceive truth and reality far more efficiently than the average run of people, whether such love is structured or unstructured, personal or non-personal. This acuity manifests itself in the area of love-relations primarily in an excellent taste or preference that disregards or minimizes physical traits (e.g., "handsome face" or "beautiful body" etc.) in favor of such perceptions as compatibility, decency, companionship, and considerateness. Significantly as Maslow's research reveals, this quality in healthy love contradicts the generally accepted notion that love is blind or, in the more sophisticated version of this error, that the lover necessarily overestimates his or her partner.

Paul Tournier, a Swiss psychiatrist with long experience and numerous writings, argues this in a theistic vein. According to him there can be no question of denying the "animal in us," or disowning this "highly developed machine" which is intended to react perfectly adequately to every stimulus. It is the mainstay of our very existence. But if that is all there is in us, we are not human beings. Love, he notes for example, in so far as it can be studied scientifically, is "merely a natural function." Whether it be the sex instinct, or simple emotional states, or the need to love and be loved, which the animal feels as much as we do, these are still nothing more than automatic reactions to external stimuli (1957:98).

But, reasons Tournier, when love suddenly springs up when we least expect it—love for a hostile individual substituted for the "natural riposte," prompting forgiveness, displacing self-interest—then we are in the presence of a creative act (we may compare this with Sorokin's "creative altruism") that is really free and undetermined. It is the "bursting forth of life," in the sense of a positive choice for a new direction which breaks the chain of natural reactions.

But Tournier confesses to a problem for the scientific investigator in this dramatic volitional exercise or event. This action properly so called is truly spontaneous and creative, and as such it remains isolated, unique and unforeseeable, hence it is impossible to study scientifically. Notwithstanding, it is remarkably relevant in personality studies for it is the "manifestation of the person thrusting aside the personage" ("personage" in Tournier's terminology refers to the characteristic mask that all wear to conceal the covert assemblage of behavioral traits or "personality"). But, continues Tournier, this emergent action will become in its turn the source of a new set of automatic reactions to a multitude of situations, reactions which will be accessible to the objective examination of psychology. They will be the evidence of the new force that is at work, just as we may be certain the moving vehicle such as an automobile has a motor to propel it while the motor is not seen by the bystander. Concisely, Tournier as a theist who possesses familiarity with biblical statements is saying that the overt expressions of a mystical covert conversional force is available for scientific research, hence, is to be considered relevant in all useful models in psychological anthropology. He thus significantly agrees with such a biblical assertion by the Apostle Paul: "For the love of Christ controls us . . . Therefore, if any one is in Christ, he is a new creation; the old has passed away, the new has come" (2 Corinthians 5:14, 17 RSV).

## The Apostle Paul's Classic View on Love

Apparently as a thoroughgoing humanist, Ashley Montagu feels that any work devoted to a serious analysis of love would be incomplete without the biblical statement that the Apostle Paul penned in the first century to a group of Corinthian Christians in need of much corrective admonition to overcome aggressive contentions, immorality, and irreverence among themselves. Montagu is of the opinion that:

> St. Paul's description is both beautiful and sound. In addition, it is quite astonishing, for it represents the first statement concerning the place and importance of love in the world of humanity. It is the teaching of Jesus presented in St. Paul's language. What a pity it is that so few Christians have understood its meaning (1975:175).

*Love is the volitional and intense, involved concern for the welfare of others.*

Although Montagu does not specify just which of Jesus' teachings influenced St. Paul to adopt such an attitude with insights that represent the "first statement," we do find St. Paul confessing to those same Corinthians such assertions as:

> We know what it means to fear the Lord, and so we try to persuade others . . . Are we really insane? It is for God's sake. Or are we sane? Then it is for your sake. We are ruled by the love of Christ, now that we recognize that one man died for everyone, which means that they all share in his death. He died for all, so that those who live should no longer live for themselves, but only for him who died and was raised to life for their sake (I Cor. 5:11-12 TEV).

With this self evaluation of his radical transformation in attitude and behavioral patterns, St. Paul attributes the force in his change to a mystical interpretation of God's love in Jesus Christ as God's son or Incarnate Being. Hence the transforming power of divine love enabled St. Paul to write what is a classic statement of love: I Corinthians 13.

## Conclusion

Barnouw summarizes several contrasting views on personality which he categorizes into three models possibly

useful for studies in psychological anthropology (1973:16-21). These are (1) *The Conflict Model* which sees a person trapped between opposing sociocultural forces with compromises by the individual as the customary resolution to reduce the dual tensions. (2) *The Fulfilment Model* assumes that a dominant force, located in the individual who so equipped is able to withstand the conflict as life unfolds, permits the individual to realize continuing possibilities. And (3) *The Consistency Model* wherein forces and conflicts are minimized or give way to individuals' efforts expended toward maintaining consistency. Cognitions, such as attitudes and beliefs, are the basic elements in causing consistency in the resultant personality. Barnouw seems to favor this model because it overcomes objections attending the others, although it too does not eliminate all problems in comprehensive explanations of personality types, either individually or collectively as in "social personality."

When listing various approaches to personality study, Barnouw suggests (1) the physiological, (2) childhood determinism, and (3) the situational (1973:23-29). However he concludes that it is best to keep all three in mind for personality research because they do not operate with mutual exclusion. He admits as well that it is often a problem to assess the relative importance of the different determinants in personality formation, because all work simultaneously with changing degrees of influence. Of course we must note that his personality models are always to be regarded as helpful categories to facilitate study; the "reality" characterizing the sociocultural group under investigation may be attended by varying influences of the "conflicts," the "fulfillment," and the "consistency" forces. The reasons for this is that both personality and culture are not only abstractions, but they as concepts incorporate an almost infinite number of uncontrollable variables; hence, the study of mankind is so difficult that controversial, or at least contrasting, models and conclusions emerge in research efforts.

While admitting to this persistent problem inherent in the challenging assignment for psychological anthropology, we wish to offer what may seem to be overly simplistic, enigmatic, and mystical as a possible model for personality study. We propose formulating a personality model which includes the love concept (as herein discussed) as a major, if not dominant, component with a potentiality for behavioral systems in all cultures. We have avoided offering a concise or minimal definition of love up to this point in order that various interpretations could be examined without prior statement of our view. If, however, we are to propose love as a valid and fundamental motivating force with universal application for research in all cultures, we feel compelled to define what we conceptualize love to be. *Love is the volitional and intense, involved concern for the welfare of others.*

Since we assume that love is a matter of choice by the individual, we see it as a possible, and even eruptive, force capable of breaking the behavioral "chain" that has been forged through enculturation; hence it challenges the postulate held in extreme cultural determinism and insists on freedom in the individual as stressed by Goodman (1967). The intensity ascribed in our view refers to a commitment that implies tenacity with the likelihood of emotion, but not necessarily to the same degree or in every person because other factors may be at play. To include "involved" is to suggest that while a "secret" love may exist, in the overwhelming number of cases where empirical evidence is available, love as we see it leads to various avenues of expression, some rational while others are deemed irrational by some who do not share in the experience. In including "welfare," we seek to see involvement seeking to promote "what is best" or desirable as conceived by the individual in general agreement with the norms and values shared in one's sociocultural group (unless some of those norms and values run counter to universals that appear with minor variations in all cultures; e.g., complete promiscuity, or unrestrained homicide, etc.).

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# Toward the Development of a Christian Psychology: Social Psychology

RONALD L. KOTESKEY

Asbury College

Wilmore, Kentucky 40390

*Social psychology is placed in a Christian perspective where some human social behaviors resemble that of animals and some are seen as a result of the image of God in humans. Implications of this are discussed in the dyad, the family, and the larger group as well as in the contemporary topics of attitude, aggression, and altruism.*

Human beings are social beings. They spend most of their lives in the presence of other humans. Although a few hermits may spend much of their lives alone, most people experience great loneliness and a strong desire for human companionship when undergoing prolonged periods of social isolation. Social psychology studies the behavior of individuals in society. In previous papers (Koteskey, 1973; Koteskey, 1975) I have developed a basic Christian perspective into which all areas of psychology can be placed. This perspective is that humans are simultaneously created beings (similar to animals, different from God) and personal beings created in God's image (thus resembling him, and different from animals) (Schaeffer, 1968). Let us now place social psychology in this perspective.

In his text on social psychology, Berkowitz (1975) discusses the question of the uniqueness of humans and concludes that they have some characteristics not possessed by animals, but in other respects they have a number of animal-like qualities. From the perspective taken here we agree with Berkowitz and say that human social needs are similar to those found in animals in some respects and yet in some respects are different due to the fact that humans are created in God's image.

Some human social behavior resembles that found in animals. In colonial groups of animals, for instance, a division of labor is found where individual animals are specialized for certain tasks. Caste systems are often found

among insects where the members are not morphologically linked but are independent and have a good system of communication. Social hierarchies in which one animal is dominant over others and receives certain privileges are found in many species. Some species show territoriality, where an animal is aggressive toward, dominant over, other animals of the same species when they invade the area he is defending.

There are obvious similar patterns of social behavior among humans. Many writers have pointed to parallels between different types of human and animal social behaviors. These parallels to animals do exist so that we can certainly find some insights to help us understand human social behavior, but we must not forget that differences exist as well. T. C. Schneirla used the comparative study of behavior, but when Tobach and Schneirla (1968/1972) present some fundamental concepts for the comparative study of social behavior, they emphasize the concept of "levels of integration." Any one level of integration of behavior, although similar to lower levels, is different enough to require separate categorization. For instance, the analysis of physiological and behavioral interactions in a hive of bees is not an adequate base for studying human societies. Human societies are not only more complex than bee hives, but they present new aspects. We must not only beware of an anthropomorphic interpretation of the social organization of the beehive but we must also guard against a zoomorphic representation of human social behavior.

While humans are similar to animals, we must not overlook the fact that they are also similar to God. God himself is a social being in that he is a Trinity of Persons, the Three-in-One. This social aspect of God is revealed in the first chapter of the Bible where, before creating humans, God was a social being communing with himself. He then created humans, male and female in his own image. Maleness and femaleness are intrinsic to the image of God in humans. Five times in the first chapter of Genesis God looked at some new aspect of his creation and saw that it was good. After creating humanity he noted that it was *very* good. The first thing in all of creation that was not good was that it was not good that "man should be alone." God brought birds and animals to Adam who named them, but none were adequate to satisfy his loneliness. Only another person, also made in God's image, can satisfy this loneliness.

Evidence that it is not good for humans to be alone can be found by reading accounts of people who have spent extended periods of time in social isolation, such as prisoners in solitary confinement, explorers, or survivors of shipwrecks. Isolated subjects in experiments indicate that loneliness impairs psychological functioning. Subjects become less efficient in their thought processes and become more preoccupied with their own thoughts, dreams, and memories.

## INDIVIDUALS IN SOCIETY

The need to affiliate is a basic social need reflecting a similarity to both animals and God. Let us now look at some of the specific relationships in which humans function: the dyad, the family, and the larger group.

*The need to affiliate is a basic social need reflecting a similarity to both animals and God.*

### The Dyad

The dyad, or two-person group, is a good place to begin since it is the simplest case of social interaction. Further, most of our social interaction takes place in the dyad and our most intensive and influential interactions also occur in dyads. Since there are so many potential dyadic relationships, let us concentrate on the one most familiar to all of us: the marriage relationship.

Ethologists have studied the pair-bond in a number of species. Lorenz (1963/1966) has an entire chapter on "the bond" in which he discusses Cichlids (fish), dabbling ducks, and finally Greylag Geese. He discusses "normal" goose-gander bonds, "homosexual" gander-gander bonds, triangle relationships, adolescent crushes, promiscuity, infidelity, and so forth. He says that it is superfluous for him to point out the analogy between the social behavior patterns of geese and those of humans. From the Christian perspective taken here, it does not surprise us to find humans similar to animals in some ways.

Of course, humans do form pair-bonds, but the marriage relationship is more than a pair-bond. After God had noted that it was not good for man to be alone and brought the animals before Adam without finding anyone to fill this void, he created woman. This then explains why a man leaves his father and mother and is joined to his wife so that the two become one flesh. The two becoming one in the marriage relationship is a reflection of the three-in-one of the Trinity. The scriptural reason for limiting sexual intercourse (the one-flesh relationship) to marriage is this image of God in humans, the very nature of humans themselves. The Scriptures never mention the negative reasons we often give, such as the possibility of pregnancy, venereal disease, or mental illness.

Since the marriage relationship is a reflection of the Trinity, let us explore some of the implications. First, the three persons of the Trinity are equal. God the Father, God the Son, and God the Holy Spirit are all God. Although they have differences, they are all God. Human beings were created male and female in the image of God, different but equal. Even the apostle Paul, so often quoted in terms of women submitting to their husbands, points out that male and female are equal in Christ. Before he speaks of wives submitting to their husbands, he mentions submitting to one another.

Equality does not mean that there are no differences. The Father, Son, and Holy Spirit are equal, but they differ,

and authority and submission exist here, too. As Jesus approached his death on the cross, he prayed three times that if it were possible, he would like to avoid it. However, he wanted the Father's will and not his own. Jesus also showed his submission to the Father's authority when he told the mother of James and John that he did not have the right to say who would sit on the thrones next to him in his kingdom. In the same way men and women, although equal in status, have different roles. Women are not inferior to men in general, nor are they to be subservient to all men, but a wife is to be under her own husband's leadership. This does not mean that she is to become a doormat to be walked over, but that her husband is the head of the home. Yet while wives are to be subordinate in the home, husbands are not to be ruling tyrants. Husbands are to love their wives as Christ loved the church and gave himself for it. They are to love their wives as they love their own bodies, to nourish them, cherish them, and to give honor to them.

## The Family

The next larger social unit is the family. In our culture at the present time that usually means the nuclear family in which mother, father, and dependent children live together. Family relationships among animals have been widely studied. Birds build nests, incubate the eggs, and care for the young. This behavior seems to be mainly under the control of hormones and the presence of certain environmental stimuli, such as eggs, a mate, or the young. Likewise, in mammals the building of nests and retrieval of young that stray from the nest is often under hormonal control.

Harlow (1971) discusses in detail family relationships among monkeys. He found that there were sex differences specifically related to maternal behavior in preadolescent monkeys with females responding to infants by caressing and cuddling while the males responded by threatening and aggressive behavior. Similar sex differences were found in the way humans respond to baby monkeys. Maternal care of infant monkeys is in many ways parallel to maternal care of infant humans. Harlow also discusses behavior between age-mates or peers. Play in infant monkeys is surprisingly similar to that in human children. Harlow's observers were totally unprepared for the enormous differences between male and female monkey babies in rough-and-tumble play. Males consistently engage in about three times as much rough-and-tumble play after two months of age and about twice as much before that. Harlow concludes that males and females are innately different in their approaches to play and that this serves as the biological basis for later cultural learning of appropriate sex roles in monkeys as well as humans.

Obvious parallels exist between the primate family and the human family but humans are also made in the image of God. The basic pattern for the human family is found in God himself. God is *the* Father. Since humans are made in the image of God, we share his parenthood, and we are to deal with our children as he deals with us. Just as God teaches, loves, and disciplines us, we are to teach, love, and discipline our children. We are to teach our children both by giving instruction and setting the proper example.

We are to discipline our children as God disciplines us. The question is, what does discipline include? Psychology has emphasized reward while Christianity has traditionally emphasized punishment. Both psychoanalysis and behaviorism have opposed the use of punishment, but for different reasons. Psychoanalysis has proposed that people become neurotic because their basic instinctual drives are not allowed expression. Thus, to prevent neurosis, such drives should not be repressed. Behaviorists have emphasized that punishment only suppresses behavior rather than bringing about a lasting change in behavior. Furthermore, punishment also has numerous negative side effects which should be avoided if possible. As typified by Christenson (1970) the church has too often emphasized punishment. His subheadings under discipline are (a) The Rod: The Way of Love; (b) The Rod: The First Response, Not the Last Resort; (c) The Rod: It Works; and (d) The Rod: God's Appointed Means of Discipline. Christenson states that the scriptural method of discipline is simple and unequivocal—it is the rod. Rather than using only punishment, what we need is a balanced approach to discipline. The parents who only punish their child are doing only half the job of discipline; the other half is to reward and praise the child. We need a balance between reward and punishment.

Children are to obey their parents. Unfortunately, many people carry this tendency toward obedience with them into adulthood and generalize from obeying parents to obeying any authority. Milgram (1974) has run a series of experiments in which obedience to authority is pitted against a person's moral imperatives against hurting others. Even with the screams of the victims ringing in their ears, people still submitted to authority about two-thirds of the time when told to give electric shocks to the subjects. While we are to submit to those in authority, we must put away this childish type of obedience that is so often displayed.

## The Larger Group

Outside the family most people belong to a variety of groups within which most of their social behavior occurs. Animals also have groups larger than the family in which they interact, some in organized societies. Let us look from a Christian perspective at roles, status and leadership, and norms and conformity in both animal societies and in human society.

Of course, much of what was discussed above in terms of husbands, wives, parents, and children has been a description of their roles, what is expected of people occupying that position. Attempts to analyze animal social behavior in terms of role theory have not proven successful if one wants to go beyond talking about age and sex roles. Beyond the role of leader or dominant male it is difficult to distinguish specific roles.

Within the church we are to play a variety of complementary roles. The church is repeatedly referred to as the body of Christ, with different members playing various roles forming a complex organism. Just as the different parts of the

human body have different functions and are all needed and useful, so it is with members of the church, the body of Christ. The most important thing about these different roles is that they all make up the one body of Christ. Whenever these different roles are discussed, the emphasis is on unity, not division.

Although some have recently questioned the concept of hierarchy in animal societies, most still consider it basic in the animal social order. It has been questioned because initially we had an over-simplified concept of hierarchy. While the peck-order of chickens is simple and obvious, the hierarchy among primates is complex. The status of a male baboon depends not only on his personal attributes, but on his relationships with other males. Among monkeys the standing of young is complicated by the fact that when a high-ranking mother is present, her young are allowed to feed in advance of many adult males.

Similar status hierarchies are easily observed among humans. Along with attaining a given status in human hierarchies come various status symbols. There are also differences in social status among roles Christians play. Although passages of Scripture point out that some parts of the body of Christ which seem weakest and of least importance are really the most necessary, Christians tend to give status to those parts of the body which occupy the most prestigious positions. Pastors are rated high while janitors and ushers are rated low.

The concept of status or greatness should be quite different from a Christian perspective. The question came up during Jesus' ministry when his disciples were arguing about which of them would be greatest in his kingdom. Jesus then laid down the principle that the one who serves and cares for others is the greatest of all. The lesson obviously did not sink in because he had to repeat it several more times during his ministry, the final time at the Last Supper when he insisted on washing the disciples' feet. Of course, the basic idea is that humans are created in God's image. When we serve them, we are really serving him. Just because all roles are necessary and important does not mean that there are no differences and no hierarchy in the church. Qualifications and duties of ministers, bishops, and deacons are given throughout the New Testament.

Animal groups have their norms, to which individual members conform. Kawamura (1959/1963) reviews the process by which subcultural traits originate and are transmitted in macaque monkeys. Each troop has a food list of its own. Kawamura tells how candy-eating, wheat-eating, and even sweet-potato-washing became a part of the tradition of the troop. He found that special social (family) relationships were important in the propagation of habits. New habits, such as sweet-potato-washing, start among the young, whose behavior is more "free floating," and spread upward to others rather than in the normal downward direction in which the original culture of the group is transmitted.

One has only to look at changes in style and behavior in our human cultures to see parallels. Any group of people establish a set of norms, accepted and expected patterns of behavior and belief. Norms are likely to become traditions which remain even when the membership of the group changes. Such traditions can be very useful and contribute to the smooth functioning of the group, or they can become nonsensical as the situation changes. Whether or not they make sense, they tend to persist through several generations of a particular group. Jesus severely reproved the religious leaders of his day for making their traditions more important than God's commandments. We must periodically reevaluate our traditions to see how they measure up to the Word of God and make sure that they have not become too important to us.

*Although the message of Christianity is against prejudice, the church has often only rationalized existing prejudices.*

As norms and traditions develop, great social pressures come upon individuals to conform to them. During the 1950's Solomon Asch (see Asch, 1955) conducted a classic series of studies on conformity. Even in such a simple task as judging the length of a line, subjects conformed to the judgment of the group about one-third of the time. Knowing our tendency to conform, in both the Old and New Testaments God warned against being conformed to the world around us. It is not conformity itself which is wrong, but conforming to something inadequate or inappropriate. We are to be conformed to the image of Christ. Since we are likely to conform, we must carefully choose to what we will conform.

## CONTEMPORARY TOPICS

The preceding section has given an overall Christian perspective on social psychology. Let us now turn to a few selected topics that have been of much interest in recent years.

### Attitudes

The most widely discussed attitudes today are our prejudices toward people of other races and nationalities. As we examine the origin and maintenance of both our culture-wide and our personal prejudices we find that the church has been involved in originating and perpetuating some of these prejudices. For example, the church was involved in originating the concept of Jews as rich, grasping, and shrewd. During the tenth and eleventh centuries, the development of cities led to a demand for capital in the form of money. The church prohibited Christians from loaning money at interest, but allowed them to borrow money and pay interest. Jews, who had no rules against collecting interest from Gentiles, became bankers at a time when it was very profitable. Whenever people borrow money, they nearly always feel that they are paying too much interest. They believe that the lender is getting rich

from their interest payments. Thus, this part of our prejudice toward Jews came as a direct result of Christian prohibitions.

The church is also involved in maintaining prejudices. Although the message of Christianity is against prejudice, the church has often only rationalized existing prejudices. For example, Blacks in some way became the descendants of Ham, the youngest son Noah who was cursed by his father as he (Noah) awakened from a drunken stupor. In the curse Noah said that Ham's descendants would be servants of the descendants of the other sons. The rationale then goes that they turned black because of the curse and moved south to Africa. When whites made slaves of the blacks, they were only making Scripture come true. During the years of slavery in our country many could quote selected scriptural references on slavery to justify it.

With their emphasis on exclusivity, Christians are prone to prejudice. Old Testament references to God's "chosen people" and New Testament references to "the elect" make it easy for superficial Christians to see themselves as superior to others. Prejudice was prevalent in Jesus' time also. When he asked the Samaritan woman for a drink, she was surprised that he, a Jewish man, would ask her, a Samaritan woman, for a drink. When his disciples returned and found Jesus talking with her, they were no less astonished. When Peter first preached to the Gentiles, the church back home reproved Peter. However, when he explained what had happened, the church officials changed their mind and glorified God that even the Gentiles had eternal life.

Such prejudice is not a God-like trait. God is no respecter of persons. Our racial, sexual, and other prejudices must be discarded. Although we are not to be prejudiced, it is very difficult to avoid acquiring our culture's prejudices. As an example, the apostle Paul had left Titus on the island of Crete to strengthen the church. When writing to Titus, Paul noted that one of the Cretans had said that the people of Crete were all liars, evil beasts, and idle gluttons. Paul went on to say that it was all true. If the apostle Paul still held these prejudices late in his life, we must examine our own prejudices frequently because we may have similar ones.

We must also examine our attitudes toward God. Some people think of God as a remote force, or as cosmic energy, or as eternal values, or as the absolute. Others think of God in the father image. This may be a father as a kindly old man with a long grey beard who reclines on a cloud somewhere in the sky or as a ruling tyrant in the sky who is just waiting for the person to do something wrong so that he can be punished. Still others have a more biblical conception of God.

If people think of God as an impersonal force or in the tyrannical father image, he may inspire fear or anger in them. On the other hand, if God is seen as the loving father or friend, the most likely emotion is that of love. Of course, a person's relationship with God will affect the emotion experienced. The person who is living in sin may well experience fear rather than love.

Actions, as well as cognitions and emotions, are a part of one's attitude. The person who views God as an impersonal force or as a tyrant, the person who has feelings of fear, and the person who has sinned against God, are all likely to move away from him. This was the first response of Adam and Eve after they had sinned. If we view God as the loving father, love him, and are "in Christ" so that we are under no condemnation, our response should be to move toward him.

*We are not only animal-like in our aggression, we are worse.*

## Aggression

During the mid-1960's several popularized books appeared relating aggression in animals to aggression in humans. These primarily concentrated on relating aggression to territory, dominance hierarchies, and sexual behavior. Lorenz' (1963/1966) book *On Aggression* was published first. In it he argued that aggression is not always bad, but has many important functions which help preserve the species. It spaces the animals over adequate territory, chooses the best mother and father to reproduce, and protects the offspring through a stable, organized community. The aggression is innate, but certain species-specific rituals have evolved to inhibit the full expression of aggression. Thus full-blown aggressive behavior seldom occurs. Lorenz has made popularized generalizations of these behaviors to humans, but many scientists question these generalizations.

Storr (1968) points out that we describe human cruelty as brutal or bestial, implying that such behavior is characteristic of "brutes" or "beasts." Really, there is no parallel in nature to our savage treatment of each other. That is, from the perspective taken here, we are not only animal-like in our aggression, we are worse. Several writers have pointed out the similarity between Lorenz' concept of aggression and original sin or innate depravity. That is, the aggressive instinct was brought about by the Fall of humanity into sin. Since man was made in the image of God, this makes him capable of being even worse than animals, as is revealed by the murder of Abel by his brother Cain. Of course, murder was forbidden by God because killing a person is killing one made in God's image. That is, we should be inhibited from killing others because we recognize the God-likeness in them. The greatest difference from a Christian perspective is in our response to aggression directed against us. The God-like response to aggression does not come easily. The first impulse in most people is retaliation, when God's response is reconciliation. We see this God-like response of the one hurt being the one to initiate reconciliation in the person of Joseph, sold by his own brothers as a slave. Even though they did not really

believe it for many years, he forgave them and did not retaliate.

Jesus explained that we are not to take an eye for an eye and a tooth for a tooth. If someone slaps one cheek, turn the other. If someone takes your shirt, give him your coat too. Furthermore, he said we should love our enemies and pray for those who persecute us. In doing this we will be acting as true sons of our Father in heaven. If we love only those who love us, we are like everyone else. Jesus demonstrated this response to aggression at the end of his life. Someone has said that to return evil for good is devil-like, to return evil for evil is animal-like, to return good for good is man-like, but to return good for evil is God-like.

Some might note that God is a God of vengeance, avenging himself and punishing evildoers, and infer that we are to be God-like in this respect. The Crusades where Christians were trying to regain the Holy Land are ample evidence that religious aggression can be some of the most brutal of all. *Fox's Book of Martyrs* (Forbush, 1926) is concerned mainly with Christians being aggressive against each other, with hundreds of actual cases described. However, a closer look at Scripture reveals that this is an attribute of God that we are *not* to have. We are *not* to avenge ourselves. Vengeance belongs to God alone and he will repay those who deserve it.

### Altruism

While evidences of the non-God-like characteristic of aggression are easily found all around us, one must look harder for its opposite, the God-like trait of altruism. Attention was drawn to our reluctance to help others by the 1964 murder of Catherine Genovese. The murder took a full 35 minutes and was witnessed by 38 people. None of these 38 came to her rescue or even so much as called the police from the safety of their apartments. This and similar incidents resulted in psychologists becoming interested in our lack of helping each other.

*Many Christians are so involved in their own personal affairs or the internal affairs of their churches that they do not even notice lost individuals around them.*

Aronson (1972) notes that the concept of "survival of the fittest" (aggression) has been so firmly rooted in our thinking that we tend to ignore or play down nonaggressive and noncompetitive behavior. He cites evidence beginning in 1902 showing that cooperative behavior and mutual aid may have great survival value itself in many forms of life. There is ample evidence for this even in insects and fish, to say nothing of species nearer humans. Aronson speculates that this line of research may not have been given much attention because it did not fit in with the temper of the times.

Food sharing has been reported among primates. This type of sharing has been known for some time and is not always done willingly. When chimps in captivity are put in the situation where one has food and one does not, the one without food begins to beg. The chimp with food gives away some of his food reluctantly. Aronson notes that this very reluctance makes the gift all the more significant. Since it indicates that the chimp likes the food and would like to keep it, it suggests that the urge to share may have very deep roots.

The two major forces in psychology during the first half of this century played down the role of altruism in human behavior. In addition to "thanatos" (the drive for aggression) psychoanalysis described "eros," which maintained that humans were primarily motivated by what brought pleasure to them. Behaviorism had a similarly hedonistic orientation with its reinforcement theory. However, humanistic psychology has come out with a more positive view of humanity, and many now maintain that altruistic behavior is possible.

Although norms that promote altruism exist in all cultures, such behavior is not always manifested. Darley and Latané (1968) summarize some of the research on what has come to be called the "bystander effect." That is, even in emergency situations people fail to respond to those in distress. Darley and Latané point out that three things must happen before observers get involved. They must notice that something is happening, interpret the event as an emergency, and decide that they have a personal responsibility to get involved. The presence of other people is likely to result in the person not noticing or misinterpreting the event or not feeling responsible.

Altruism is an attribute of God which should be manifest in the lives of Christians. Also, the research on altruistic behavior (or lack of it) may give us some clues to our religious behaviors. For instance research on the bystander effect gives us some insight into why Christians seem to face a lost world so complacently. First, Christians must notice the lost world around them. Many Christians are so involved in their own personal affairs or the internal affairs of their churches that they do not even notice lost individuals around them. Second, Christians must interpret being lost as an emergency. Lost people are going to spend an eternity in hell, but few Christians see this as an emergency situation. Finally, Christians must feel a personal responsiblity to get involved with the lost to lead them to Christ. Many seem to look around and believe that there are plenty of others who could (and should) be doing the job.

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# A Positive Approach to Creation

GEORGE L. MURPHY

Wartburg Seminary

Dubuque, Iowa 52001

*An attempt is made to discover ways in which the Christian doctrine of creation can contribute to our understanding of physics in general, and physical cosmology in particular. An important role is played by the idea that the laws of physics are themselves a major part of creation. This concept provides insight into the meaning of creation, but must be balanced by the emphasis on the creation and value of matter which is required by the Incarnation. Concepts of creation in modern cosmology are examined in the light of these ideas.*

Creation has been a focus of debate between scientists and theologians for many years. Much of this debate, however, has been concerned with the origin of biological species, and more general questions of cosmogony have often been considered only to the extent that they shed light on such biological questions. The problem of creation as part of physical cosmology has thus been overshadowed, and theology and science have not interacted as fruitfully in this area as they might have. In addition, much of the work which does deal with physical origins has been devoted to the necessary, but ultimately sterile, task of "reconciling" orthodox theology with science. Such work is merely a reaction to scientific developments, and cannot ultimately enhance our understanding.

My purpose here is to suggest positive contributions which Christian theology can make to our understanding of the physical universe. After noting some statements on

creation in the Christian tradition, I describe one fruitful approach to an understanding of the status of natural laws, for I contend that these laws are a central object of creation. The question of physical origins is then considered, and the extent to which the doctrine of creation is linked with specific cosmological models is investigated. Finally, the importance of the Incarnation for our view of the material world is considered.

## Traditional Views of Creation

The idea that the world was created from nothing, *ex nihilo*, is not as common as those brought up in the Judaeo-Christian tradition may assume. Even Plato has his creator begin with pre-existing matter in the *Timaeus*.[1] The creation account of Genesis, though consistent with *ex nihilo* creation, does not compel such a doctrine.[2] The first unambiguous statement in the scriptural tradition that the universe was created from nothing seems to be in the Old Testament Apocrypha, II Maccabees 7:28 ff. Here a Jewish mother, exhorting her son to endure martyrdom, says to him:

> I beg you child, look at the sky and the earth; see all that is in them and realize that God make them out of nothing, and that man comes into being in the same way. (NEB)

The fact that this does not come as a part of any philosophical discussion on creation may indicate that the view expressed was widely held when the passage was written.

In the New Testament, Hebrews 11:3 is often taken as an assertion of *ex nihilo* creation, though the statement that the world was formed "of things that do not appear" leaves room for the possibility of creation from invisible matter, an idea that can be supported from the Septuagint rendering of Genesis 1:2. But by the middle of the second century A.D., we find in the *Shepherd of Hermas* an unambiguous statement of what comes to be a commonplace of orthodox Christian theology:

> First of all, believe that there is one God who created and finished all things, and made all things out of nothing.[3]

An emphasis on the creation of the universe from nothing is valuable, setting as sharp a contrast as possible between the biblical idea of the complete sovereignty of God and any dualistic notion of the universe which might be associated with pre-existent matter. However, it is not necessary to hold that the creation of matter from nothing is the most important aspect of creation. Modern physics does not allow us to make any clean separation between matter and the laws which (in inadequate classical terminology) "govern" matter. A study of this aspect of physics is therefore essential for a proper understanding of the topic of creation.

## "Platonic" Physics

A traditional view of physics is that it deals with the relationships of matter and energy, summarizing their behavior in mathematical formulae. According to classical physics,

*The distinction between "substance" and "structure" has become obsolete.*

any portion of matter interacts with any other portion via forces, and it is the matter and the forces which are "really real". Newton's $F = ma$ and the other equations of mechanics summarize in a convenient way the results of observations. This applies equally to more complex theories, such as Maxwell's electrodynamics, and the frequent pedagogic procedure of "deriving" the four Maxwell equations from experimental results—the laws of Coulomb, Faraday and Ampère and the absence of magnetic monopoles—provides an illustration of this view of the operation of physics.

Such a view of science—and especially of the role which mathematics plays in it—fails to do justice to one of its most fundamental features. The equations of physics not only summarize the results of previous observations, but are also capable of predicting new—and sometimes qualitatively new—phenomena. This can happen when equations have been suggested by previous observation and experiment, but the possibility is increased by the fact that the theorist is not constrained by existing empirical knowledge. Newton's assertion that gravitational attraction is universal, when there was no direct evidence for the influence of one planet upon another, is an excellent example of the power of such freedom, for it led, among other things, to the prediction of the existence and position of Neptune. Similarly, Maxwell's equations are not, as the previous paragraph might suggest, simply a summary of experimental results. It was Maxwell's theoretical insight, rather than direct empirical evidence, which gave rise to the displacement current term in the field equations, making possible the prediction of electromagnetic waves which was verified by Hertz.

Mathematical structure is thus not subordinate to observational data. Indeed, if our primary goal is understanding, we are seeking ultimately for pattern, always remembering that the pattern must, in the last analysis, match observation. The situation has become clearer in this century with the advent of relativity and quantum theory. The distance between observational fact and the primary level at which theory operates has continued to increase, and intuitive models have become of less and less importance for an understanding of fundamental physics. The only models that are really helpful are mathematical ones. We are not discovering details of sub-atomic or cosmic machinery, but mathematical structure. This structure is consistent with the rational patterns that our minds are able to evolve but, as predictability indicates, also has an objective existence. Einstein expressed his view of the importance of mathematics for the understanding of nature very clearly:

> Experience remains, of course, the sole criterion of the physical utility of a mathematical construction. But the creative principle resides in mathematics. In a certain sense, therefore, I hold it true that pure thought can grasp reality, as the ancients dreamed.[4]

Even a distinction between the laws of nature and the matter which "obeys" those laws is, to a certain extent, artificial. Equations of motion[5] govern the structure of matter—for example, the types of particles that can exist—as well as the ways in which particles interact with one another. Particles are, in fact, composed of interactions, and interactions are mediated by the exchange of particles. The distinction between "substance" and "structure" has become obsolete.

We are thus led toward what can be described as "Platonic physics": "the universe begins to look more like a great thought than like a great machine" is the way that Jeans expressed it.[6]

According to Plato, the sensible world is merely a representation or image of the eternal world of forms. In the *Timaeus* he tries to picture, in the crude way allowed by Greek mathematics, how the universe might have been constructed from mathematical pattern.[7] It is this view toward which we seem to be driven by developments in modern physics.

It is perhaps surprising that this apparent abstraction of our physical theories from the world of sense allows us to recover a belief in the objective character of an external world, something often considered to be endangered by the successive demolition of the theories of the past. On the usual view of things, it is difficult to maintain the belief that the purpose of science is to discover truths about an objective external world. McVittie, for example, argues that science has apparently had little success in discovering such truths.[8] The structure of Aristotelian physics was overthrown by Newtonian mechanics, and the latter has been destroyed by relativity and quantum theory. We have no reason to believe that equally radical changes will not be necessitated by our work in cosmology or high energy physics.

It is not even possible to argue that we are making successively better and better approximations to the real world, for there is no way in which the physical concepts of the Newtonian world view can be said to be approximations to those of the newer theories. In dealing with gravitation, for example, it makes no sense to say that the concept of particles interacting via forces is an approximation to the concept of curved space-time.

If, however, we are concerned with the mathematical patterns which the theories display, then we can speak meaningfully of Newtonian theory as an approximation to the relativistic theory of gravitation. If one considers a space containing isolated regions of high space-time curvature separated by regions of slight curvature, the highly curved regions, representing matter, must move in accordance with Einstein's equations of general relativity. (The words used here are, of course, simply circumlocutions for the appropriate mathematical concepts.) In the limit of weak fields and relative speeds slow in comparison with that of light, the relativistic equations of motion are well-approximated by the Newtonian ones.[9] More generally, Einstein's equations, under the stated conditions, yield Poisson's equation for the gravitational potential and Newton's second law for the motion of a particle in that potential.

Naturally there must be in both theories an appropriate identification of mathematical symbols with observational quantities. Furthermore, observation plays an indispensable role in showing that the relativistic theory is "better" than the Newtonian in some cases. This is, of course, why we say that the Newtonian theory is an approximation to general relativity rather than *vice versa*. But it is only an insistence on the importance of mathematical pattern which allows us to maintain that Newtonian theory retains any fundamental significance at all, and is not simply a convenient working rule for engineers.

It is important to note that nothing has been said here about the general theory of relativity as a final theory of gravitation. On the contrary, it seems fairly likely that further advances will be necessary. But our emphasis on mathematical structure allows us to believe that any new theory will be approximated in some limit by Einstein's, though the geometric interpretation of the Einstein equations, for example, may be dropped.[10] This relieves us of the melancholy duty of anticipating that our successors will regard our work as a series of empirical discoveries, guided by theories which have no basic significance.

As one might now expect, classical mechanics also appears as an appropriate limit of quantum mechanics. In fact, the way in which the classical Hamilton-Jacobi equation and the Bohr-Sommerfeld quantization conditions come out of the Schrödinger equation provides a beautiful example of our thesis.[11]

Having thus sketched a Platonic view of physics and the advantages of understanding which accrue from it, we must note immediately that there are serious dangers inherent in such an approach. In the first place, it is clear that an emphasis on mathematical structure as both the tool and goal of science *can* endanger the essential experimental aspect of science. One might be tempted to insist that a theory which he considers to be sufficiently beautiful *must* be true, in spite of experimental evidence to the contrary. Even worse, the existence of a sufficiently beautiful theory might be considered to obviate observation. This is more or less what happened during the domination of western science by Aristotle's theories. Dirac's insistence on the search for "beautiful equations" and his caution—using Schrödinger's discovery of the first relativistic wave equation as an example—that no *single* experimental verdict on a theory is final, should be kept in view.[12] The danger is that the emphasis on mathematics will get out of hand. For a purely Platonic physicist, there may be nothing to balance that emphasis.

What, then, will provide the balance? What basis do we have for a claim that the material world is important? Orthodox Christian theology is at least one thing that does this. With its repeated statements that the creation was

"good" and "very good", with its doctrine of the Incarnation and belief in a physical Resurrection, Christianity is, in one sense of the adjective, a very materialistic religion. The strong emphasis on unity of body, mind and soul which it receives from its Old Testament background serves to balance the Greek philosophical views that have been important in the formulation of its theology. The tension between these approaches resulted in the classical Christian statements of faith of the fourth and fifth centuries, contributed strongly to the development of modern science during and after the Renaissance, and can serve to keep science on course today.

The secular scientist may be tempted to scoff at any suggestion that Christianity is needed to save science from Platonism. He knows what's real and what isn't, and knows that matter is important, in spite of Plato and without St. John Damascene.[13] Dr. Johnson's refutation of idealism may be repeated in some form. But this is as if one had slept through the past century of physics. Matter is not anything kickable, and its importance is hardly obvious. We scarcely can say what matter *is*, but any image of classical "stuff" is inadequate.

*Both aspects of reality, mathematical structure and matter, aspects that cannot be disentangled, must be considered when we discuss creation.*

Platonism in physics is not simply wrong—we might, for example, note its importance for Heisenberg[14]—but it cannot serve as a complete philosophy of science. Mathematical pattern is an essential aspect of reality, but so is matter. One might picture the Platonic theory as saying that the world is like a game of blindfold chess, with the pieces actually used on a board being only convenient markers to help us remember the pattern of the game. Now the game obviously does not exist without the pattern, but Christianity insists that the pieces themselves are important, and that the *real* game would be quite different without them. Both aspects of reality, mathematical structure and matter, aspects that cannot be disentangled, must be considered when we discuss creation.

### The Creation of Physical Law

The Christian belief that God created the matter of the universe out of nothing has had the consequence that we look down perhaps too far upon other creation accounts in which there is prime matter. But this is rather unfair to, for example, the Norse gods (or, more precisely, to their creators!). It is true that Odin and his brothers had their material on hand to begin with, in the form of the body of the giant Ymir. However, they still had to impose pattern on this matter. Their creative activity was not negligible.[15]

The same considerations apply, *a fortiori*, to the God of the Judaeo-Christian creation accounts. If we are to speak of creation at all, *the creation of the laws of nature must be considered an essential part of the creator's activity.* The successes of big-bang cosmologies have made scientists more willing now to speak of creation than they were at the end of the nineteenth century, when the law of conservation of energy could be adduced in support of a belief that the universe must have existed forever.[16] But it is, of course, necessary to examine the situation critically.

In the simplest cosmological models of general relativity, a *singularity* occurs at a finite time in the past. The cosmic scale factor $R$ (which determines the distance between representative particles as a function of time) obeys the equation $\frac{1}{2}\dot{R}^2 = GM/R$ near the beginning of the expansion of the universe: here $M$ is a constant mass, $G$ the usual gravitational constant, and $\dot{R}$ the time rate of change of $R$.[17] (Spatial curvature may be neglected at times very close to the beginning of the expansion. I have here considered matter as pressure-free dust, since pressures which are limited by energy and causality conditions do not change the results qualitatively.) We see that the "velocity" $\dot{R}$ becomes infinite at the instant when $R = 0$, the beginning of the expansion of the model universe. (This instant is labelled, arbitrarily but suggestively, $t = 0$.) In the mathematics of general relativity, components of the curvature tensor, which are related to the density of matter via the field equations, blow up at $t = 0$. Einstein's equations reduce to the physically useless statement $\infty = \infty$. Extensive work on the problem of singularities in general relativity during the past fifteen years has shown that this result is not simply a consequence of the highly symmetric and oversimplified model employed here, but that a singularity must occur if only certain very general conditions, such as causality and positivity of energy, are met.[18]

Thus the presently known laws of physics fail at $t = 0$, precluding the possibility of retrodiction before that instant. In fact, a more fundamental, and perhaps more disturbing, way of considering singularities does not even allow us to say that the instant $t = 0$ *exists*—the space-time manifold is incomplete.[19]

The beginning of the expansion in big-bang models has thus come to be identified by some with an instant of creation. Milne was one of the first to present such an idea in connection with his own rather idiosyncratic "big-bang" model of kinematic relativity.[20] But let us examine carefully just what can be said to be created at $t = 0$, short of an act of faith. The origin of matter is not so much the point here as is the beginning of the operation of the laws of physics. It is only the Einstein equations of general relativity that can be said to come into being at $t = 0$, for they cannot be "analytically continued" to earlier instants. The object of creation suggested by the big-bang models is the *pattern* of the universe. It would be too much to insist that this entails the creation of matter as well, but our previous discussion has indicated that it is unwise to attempt too sharp a separation between matter and laws. I return to this point in my last section.

Such an emphasis on the creation of pattern is also scriptural. Whether or not the first verses of Genesis intend to teach *ex nihilo* creation may be debated. What is certain is their emphasis on God's creation of order: the earth was "Without form, and void" when God said "Let there be light." This emphasis on the creation of order is not restricted to the Old Testament. The prologue of the Fourth Gospel, which emphasizes the role of the *Logos*, the Word or Reason of God, in creation, is especially significant in this regard. The use of such a Hellenistic concept here is probably not fortuitous.

The idea of God as the creator of the laws of nature may summon up a deistic picture of Him writing down an elaborate set of equations twenty billion years ago, activating them somehow and then letting the universe go. In fact, a belief that God was "merely" responsible for the laws of nature, and that the origin of the solar system (in particular) was then due to the operation of those laws, was often attacked by Christians of the nineteenth century.[21] But as soon as we begin to think of the origin of the laws of nature as a significant part of the creative activity of God, we realize that this activity is not something that can be restricted to a time in the past, not even to a unique "first instant". We emphasize the *maintainence* of the universe through the laws of nature as much as any initial calling into being of those laws. While the big-bang cosmologies bring out with especial clarity the idea that the mathematical pattern of the universe *is* created, the Christian doctrine of creation and its significance for modern physics are not dependent on this class of cosmological models.

The idea of maintainence or sustenance as an essential part of the doctrine of creation might have saved a good deal of grief if it had been stressed in debates about creation and evolution. The biblical statements that Christ "Sustains the universe by the word of his power" (Heb. 1:3) or that "In him all things hold together" (Col. 1:17) emphasize this aspect of the creative activity of the Logos rather than his initial creative activity. God's continual activity in maintaining the universe in existence was stressed by Augustine and Aquinas,[22] and Luther gives the doctrine of creation this direction in his explanation of the First Article:[23]

> I believe that God has made me and all creatures; that He has given me my body and soul, eyes, ears and all my limbs, my reason and all my senses, and still preserves them.

This traditional approach to the doctrine of creation deserves much more emphasis, not only in everyday life but in the ongoing dialogue with science.

It is fortunate that the Christian doctrine of creation is not tied to big-bang cosmologies or to any specific cosmological model, for it would be unwise to base fundamental theology on the current state of astrophysics. There are a number of ways in which our present models may change, and the whole position in regard to the fearsome "initial singularity" may be altered radically. The mathematical conditions of the relativistic singularity theorems can be violated, most obviously by allowing the existence of negative local energy, such as could occur with bulk viscosity or massive scalar fields.[24] Another oft-discussed possibility is that a proper quantization of general relativity, which is required anyway when we encounter lengths on the order of $10^{-33}$cm or less, will eliminate the failure of physical laws found at the classical level.[25] The most recent work on this subject does not encourage this belief, but it cannot be dismissed at our present stage of understanding. Finally, the recent work of Hoyle and Narlikar, which returns to an action-at-a-distance view of physical interactions, replaces the usual picture of the expansion of the universe with that of a continual change in our length scale. This also changes the masses of particles, and leads to the cosmological redshift.[26] Our "instant of creation" becomes in this theory simply the time when all particle masses were zero in our relatively small portion of the (perhaps infinite) universe.

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To tie the doctrine of creation to the big-bang would be simply another "God of the gaps" attempt, in danger of the usual dismissal when science removes the gap. An emphasis on creation as maintainence avoids this pitfall, yet leaves the doctrine with real content. Even in the classical steady-state cosmology, infinite in space and time, with matter being created continuously in order to keep the large-scale aspect of the universe always the same, one would still have to account for the mathematical structure which made such a universe possible.

### Is the Universe Unique?

In spite of my attempts to avoid a "God of the gaps" argument, the last section might be criticized as presenting only a more subtle version of such an argument from ignorance. One might argue that perhaps there is no need to go beyond the laws of nature in order to understand that those laws must be as they are. One of the basic ideas behind some lines of development of the steady-state cosmology was the desire to remove not only an instant of creation, but the need for any arbitrary initial conditions on the universe, and hence any contingent features of the cosmos. The universe should be unique. There would be no need to account for the origin of matter by hypernatural means, for that would be taken care of by the laws describing the continuous creation of matter. Furthermore, there would be no need to explain the existence of these laws, for they would be the only laws which *could* exist without even-

tual self-contradiction. Perhaps the clearest exposition of this approach to the steady-state theory is that of Sciama.[27]

In fact, this type of thought is not peculiar to the steady-state theory. Without pursuing its antecedents in antiquity, we should note that the idea of a single self-consistent universe is central to the philosophy based on the bootstrap theory of strongly interacting particles, and that far-reaching philosophical and even religious claims have been based on this theory.[28] In the cosmological realm, Milne was able to associate a somewhat weaker view with a Christian belief in creation. He argued, for example, that God, in creating a universe consistent with the special theory of relativity, *had* to give it a point origin, for otherwise the relativistic prohibition of the idea of absolute simultaneity for spatially separated events would have made an instantaneous creation impossible.[29]

According to the most extreme views of this type, this is not the best of all possible worlds but the *only* possible world. There is no need for a God to create either matter or pattern, and any sort of divine interference with the unique laws of nature is prohibited. Miracles, in the usual sense of the word, are impossible.

But this idea of the necessity of the universe, as it was, is, and shall be, loses its plausibility when we consider the developments in mathematics of the past two centuries. Until the discovery of non-Euclidean geometries, it was possible to regard Euclidean geometry as a "necessary truth", and to believe in the existence of a single consistent system of mathematics. This is simply no longer possible. There is no *a priori* reason to suppose that the universe could not have been the embodiment of, for example, finite arithmetic systems or multi-dimensional times—though such universes might be lethally dull or intolerably bizarre to our minds.[30]

A demonstration of the logical consistency of any universe other than the one we inhabit would dispose of all arguments concerning the necessity of the universe. However, we encounter here an aspect of mathematics more jarring than the existence of multiple geometries. This is the renowned Gödel theorem, according to which any mathematical system of reasonable complexity must contain "formally undecidable propositions"—theorems which cannot be proved or disproved within the framework of the system itself.[31] This means that a complete mathematical model of the universe, providing answers to all questions, cannot, even in principle, be constructed. Thus a proof that a single complete and self-consistent universe could exist seems to be impossible.

Two further conclusions, one fairly safe and one quite speculative, emerge from this discussion. First, we have clear support here for the Christian idea that God created and maintains the universe freely—the doctrine of the contingent rationality of the universe.[32] Of all the possible mathematical structures which the universe might have embodied, the one that we observe is chosen. God cannot be constrained by the consistency requirements of the merely physical universe, which are not sufficiently rigid to prevent divine intervention.

Secondly, a literal application of the previous comments on Gödel's theorem to the Platonic view of physics suggests that the physical universe *must* be an open system. *If* the physical universe is a representation of mathematical pattern, and if all mathematical systems contain formally undecidable propositions, then the physical universe is incomplete. This does not, of course, constitute a proof of the existence of God, but it does suggest that there must be something beyond physical reality.

## The Matter of Matter

The view presented in the preceding sections, that the creation of the mathematical structure of the universe is an essential part of the creative activity of the Word of God, already makes possible some important contact between theology and science. But this is not the end of the story, for Christianity also insists on the importance of matter. While the New Testament emphasizes the creating and sustaining activity of the Word, it does not yield to the temptation to leave matter behind and ascend to realms of pure mind or spirit. It would have been easy for the author of the Fourth Gospel, with his emphasis on the pre-existence of the Word, to have presented a picture of Christ freeing men from the trammels of matter, or to have completely spiritualized the Resurrection. Instead, Christ does miracles of feeding and healing and, risen, shows Thomas His hands and side in order to prove that He is not a ghost or a vision. Matter, which was declared "good" in the beginning, is sanctified by the Incarnation and perpetuated in the Resurrection.

We may still say that matter is, in one sense, subordinate to pattern, and thus to mind—at least to the mind of the creating and sustaining God. The mathematical pattern of which our universe is a representation is not to be thought of in a Platonic fashion as eternally existing alongside God. God created the pattern of the universe freely when the universe was made, and the universe displayed this pattern in its material arrangement. But to say that matter is subordinate to pattern is not to say that it is unimportant or evil. Man is not inferior to an amoeba because the amoeba came first, nor is the amoeba inferior to a carbon atom. In fact, we tend to think of the later stage of development, the one showing more organization, as superior. In the same spirit, matter may be considered superior to unclothed mathematical pattern, though it could not exist without the pattern—just as we could not exist without carbon.

There are suggestions in modern cosmology that it may be possible to explain the origin of what is commonly called matter—electrons, protons, etc.—in terms of quantum-mechanical creation of particles from the "anisotropy energy" of the rapidly expanding early universe.[33] This process could have created the matter content of the universe *and* smoothed out any initial anisotropy. Lucretius certainly would have regarded the creation of particles from empty space as a violation of his *nihil ex nihilo* doctrine,[34] but modern physics does not allow us to call "empty space"

"nothing". This emphasizes again that our whole distinction between structure and substance is artificial, and must not be pushed too far.

In the last analysis, the doctrine of creation can be fully understood no more than the universe can be fully described. We may, however, hope to reach a more mature understanding of this doctrine, and one that will make more likely the information of science by theology. An emphasis on the Christological aspect of creation allows Christian theology to make a positive contribution to the dialogue which should occur between theology and science when they meet at the frontiers of space-time, which are, at the same time, the frontiers of our understanding.

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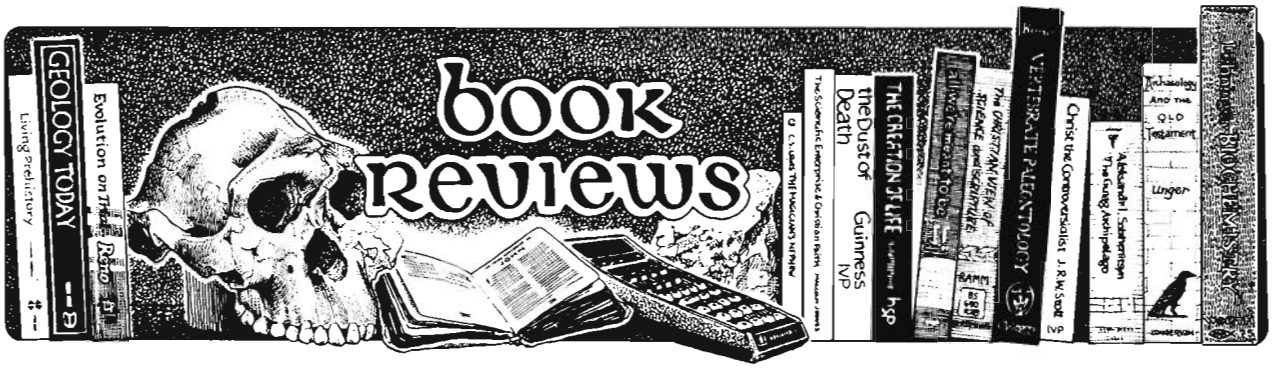
*The heresy of the "-ism' is to assume that its explanation is the absolute reality. Marxism, materialism, evolutionism, romanticism—all parade through the history of philosophy as idols of the mind and spirit of man that cannot take the place of the Creator. It is futile to try. If therefore any part of creation is made an end in itself, whether it be nature (Eccl. 1:5-7), history (Eccl. 1:8-11), knowledge (Eccl. 1:12-18), pleasure (Eccl. 2:1-3), wealth (Eccl. 2:4-11) or work (Eccl. 2:18), it becomes a source of futility. In God's world the maxims of work for work's sake, knowledge for knowledge's sake, even nature for nature's sake, are false and idolatrous. Nor is man called of God to master life as a landlord, for his tenancy on earth is short, and he is limited in both understanding and possession. Rather, he is to enjoy God's gifts and accept the givenness of life.*

James M. Houston, *I Believe in the Creator*, Wm. B. Eerdmans Publishing Company, Grand Rapids, Michigan (1980), pp. 200, 201.




**PSYCHOLOGY AS RELIGION:** ***The Cult of Self-Worship*** by Paul C. Vitz. Grand Rapids, Michigan: William B. Eerdmans Publishing Company, 1977. 149 pp. $3.95.

This is a nasty, wonderful little book. It is almost guaranteed to discomfort all who will read it, and therein lies its greatest value. The author, an experimental psychologist at a secular university and a recent convert to the Christian faith, advances the following thesis.

Psychology as "religion" (which he defines following Erich Fromm as any system of thought which provides an object of devotion) is not just alive and well in America, but deeply anti-Christian, and insidiously pernicious for individuals, families, and communities alike. Moreover, self-theory psychology, or selfism, received popularity not because it had a legitimate scientific foundation, argues the author, but because of its suitability for rationalizing a consumer mentality in a prospering industrialized society, and for justifying natural tendencies toward narcissistic self-indulgence in an age of leisure and great wealth.

Leading this cult of self-worship the author identifies as four main gurus: Erich Fromm, Carl Rogers, Abraham Maslow, and Rollo May. Although the treatment these four receive is perhaps insensitive and unfair at points, there is still much that rings true amidst the scandalous polemics. And beyond the immediate scope of the book, other tantalizing associations and fundamental questions arise.

For example, Helmut Thielicke, although unmentioned by the author, would also seem to be working along similar lines when he argues that the crucial distinction within contemporary theology is not liberal vs. conservative, but Cartesian vs. Non-Cartesian (akin to selfist vs. non-selfist). Christopher Lasch would probably want to add that the ideology of personal growth, superficially optimistic, radiates a profound despair and resignation; that the cult of intimacy originates not in the assertion of personality but its collapse; that much that passes for hedonism is really a desperate concern for survival. Psychology as religion could therefore as easily stem not from idolatrous self-worship as gods but rather from the fear of having no final individual significance at all.

And then clinically, for those of us who are involved in the helping professions, how are we to square the author's criticisms of the alleged evils of selfist psychologies with the many relationships we see in which one person is living totally under the command of the other? What seems called for is more selfist assertiveness, not less, especially when such an internecine dynamic is equally debilitating, Paul Tournier reminds us, for the master as the slave, the strong as the weak.

### *Books Received and Available for Review*

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

Allen, Bird and Herrmann (editors), *Whole-Person Medicine*, Intervarsity.

Ashwin, *God's Mountain*, Welch.

Ashwin, *Josh: The Walls Come Tumbling Down*, Publications Chretiennes.

Beach, *The Wheel and the Cross (A Christian Response to the Technological Revolution)*, The John Knox Press.

Coleman, *Issues of Theological Conflict*, Eerdmans.

Court, *Pornography: A Chistian Critique*, Intervarsity.

Gutierrez and Shaull, *Liberation and Change*, John Knox.

Johnston, *Who Needs the Family*, Intervarsity.

Kirk, J.A. *Liberation Theology (An Evangelical View from the Third World)*, Intervarsity.

Kysar and Kysar, *The Asundered: Biblical Teachings on Divorce and Remarriage*, John Knox.

Owens, *The Total Image : or Selling Jesus in the Modern Age*, Eerdmans.

Packer, *God Has Spoken*, Intervarsity.

Peters, *Futures: Human and Devine*, John Knox.

Peters, *UFOS: God's Chariots?* John Knox.

Peterson, *A Long Obedience in the Same Direction: Discipleship in an Instant Society*, Intervarsity.

Punt, *Unconditional Good News: Toward an Understanding of Biblical Universalism,* Eerdmans.

Sprinkle, *Hunger (Understanding the Crisis through Games, Dramas & Songs)*, John Knox.

Thiselton, *The Two Horizons: The New Testament Hermeneutics and Philosophical Description,* Eerdmans.

Utke, *Bio-Babel: Can We Survive the New Biology?* John Knox.

White, *Biblical Ethics*, John Knox.

More fundamentally, what would it mean for psychology to be Christian? Is there any such thing as "the" Christian psychology, selfist or not? And can someone who personally would seem to be an opponent of Christianity, as the author contends the four selfist gurus are, still have something to offer Christians? I believe they do. After all, the author himself centrally employs in his critique of self-worship the definition for religion framed by one he calls a chief selfist (Fromm).

Clearly, Dr. Vitz has done us a great service by sharing of himself and his sincere struggle to pursue what it means to be a good scientist and also a lover of Christ. All who spend time in this little volume will likely benefit from the experience.

*Reviewed by Randall C. Sorenson, Ph.D. Student in Clinical Psychology, Graduate School of Psychology, Fuller Theological Seminary, Pasadena, California 91101.*

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**SCIENCE IN THE MIDDLE AGES,** by David C. Lindberg, ed. Chicago: University of Chicago Press, 1978. xvi+ 549 pp., $40.00.

Although the title of this volume may appear as a contradiction to some, its contents provide ample proof of the extensive study of the nature of the world which was pursued well before that era which we label the "Scientific Revolution." Here fifteen essays by sixteen scholars, most of them noted authorities in their fields, are collected under the editorship of ASA member David Lindberg. The result is not a general survey of the history of scientific study in the Middle Ages, but rather a key to that world of long ago that differed so much from ours. Considering this difference, perhaps the title does involve a contradiction, since a good deal of what this book is about is not "science" in the current sense of the word. For example, the medieval classification and hierarchy of "the sciences," which included everything from rhetoric to farming, is the topic of the essay by James A. Weisheipl. Although such a general taxonomy of knowledge is of interest to few people today, it formed an important part of the philosophical understanding of the Aristotelian world.

Weisheipl's contribution is typical of the better essays in the book in that he effectively conveys an essentially foreign idea (to modern minds) in a very well written interpretive essay which spans the centuries from the ancient Greeks to the early Renaissance. In another essay, Michael Mahoney deals with the more recognizably scientific subject of mathematics, although to cover the period in question, he moves from market-place finger-reckoning to the abacus, the recovery of Greek mathematics via the Arabic intermediaries, and then the eventual establishment of an autonomous, abstract discipline of mathematics. Mahoney does a superb job of helping the reader to understand the different problems and concepts involved, and provides, like most of these authors, extensive textual notes which form a useful bibliography for further study. David Lindberg's own contribution on optics provides a convenient precis of some of the conclusions of his well-received book, *Theories of Vision from al-Kindi to Kepler*, (Chicago, 1976), introducing the reader to the aim and scope of "perspectiva"—the medieval endeavor which included the physiology and psychology of vision as well as physical and mathematical optics.

It would be impossible here to give an adequate account of all of these essays; one must actually read them to get a real sense of the Medieval world they describe. There are very good sections on astronomy by Olaf Pedersen, motion by John Murdoch and Edith Sylla, and cosmology by Edward Grant (readers of this review may be interested to find that Grant concludes his contribution with a lengthy quote from C.S. Lewis' *Discarded Image*). Lindberg also writes on the transmission of Classical and Arabic learning to the West, while other essays deal with the universities and with the philosophical or sociological setting of medieval science. In the Middle Ages, of course, even scientific studies were never very far removed from theology, and this volume includes a good deal on the interaction of science and religion, although some authors seem more comfortable with the topic than others. While there is no section on "Science and Religion" a look at the index under "Christianity" shows that the topic is covered throughout the book.

Unfortunately, not all of these essays are uniformly good: Robert P. Multhauf seems to have too much of an eye on modern chemistry while writing on the science of matter, and the resulting discussion deals mainly with alchemy, providing little insight into the more sophisticated philosophical understanding of matter which was of greater significance for the time. C.H. Talbot's survey of medicine also tends to be preoccupied with tracing the progress to the present rather than understanding the past, and Bert Hansen's treatment of "Science and Magic" is spoiled by too heavy a reliance on the approach of Yates, Zilsel, and Thomas, historians whose work, once fashionable, is beginning to be more carefully criticized.

These are just a few of the pluses and minuses of this large book. All in all it is an excellent resource and an extremely important contribution to the field. It is most regretable that it could not have been made more affordable. It is to be hoped that a paperback edition will soon be available within the range of student budgets.

*Reviewed by Charles D. Kay, University of Pittsburgh, Pittsburgh, Pennsylvania 15227.*

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**LIFE WITHOUT PAIN: *Komar's Secrets of Pain Control*** by Komar [Vernon E. Craig] with Brad Steiger, New York: Berkley Publishing Corp., 1979. 170 pp., $1.95.

It is obvious that rational medicine's traditional ways of treatment as if people were spleens, or colds, or brain tumors, instead of people, is being reexamined. It is also obvious that pain control is an active field of inquiry. For evidence on the first point, see such articles as "Is Health a State of Mind?" by Leon Eisenberg (*New England*

*Journal of Medicine*, Dec. 6, 1979) and the study which prompted such a question (by George E. Vaillant, in the same issue). For evidence on the second, see such articles as "Pain, Enkephalin and Acupuncture" by Shin-Ho Chung and Anthony Dickenson. (*Nature*, Jan. 17, 1980)

I was expecting, based on the book's cover, ("Komar: A Guinness World Record Holder for pain control! He can walk on hot coals. He can lie on a bed of nails. He can show *you* how to get rid of a headache.") to read a bunch of nonsense. Much of the book, at least, is what is now referred to, generally with approval, as holistic medicine. It is commonsense stuff about getting along with others and yourself, sleeping and eating sensibly, and the like. Most of the rest of it is exercises. Since I am not currently suffering any pain, I did not test these. Perhaps they work, perhaps they don't.

If I was surprised at the common-sense approach, I was not surprised at the religious implications. I was advised to commune with myself, and/or the God-force. People with electric religious beliefs were held up as examples. I was told that I am an undeveloped God. Surely there are dangers here for the Christian, however sound the rest of the advice. However, I wonder if these dangers are any more than the dangers from misguided Christians prescribing grass-sprout enemas for cancer, or of charlatans masquerading as Christians, peddling health quackery as revelation. There is much unfortunate writing about how to achieve health that may have its theology in the right place, but be misguided about health. We don't need either Eastern Mysticism *or* Western hogwash! Nor can we expect a life free from pain.

It is not clear, at least to me, that to be a Christian is to espouse the rationalistic, reductionist medicine of our day. On the other hand, it is not clear that we should discard it, either. Probably there is much to be gained both from treating a patient as a person, and from treating a disease as a disease. This book is an example of the former. I think there are better approaches, and cannot recommend it, except as an example.

*Reviewed by Martin LaBar, Central Wesleyan College, Central, South Carolina 29630.*

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**THE DARWINIAN REVOLUTION: SCIENCE RED IN TOOTH AND CLAW** by Michael Ruse, University of Chicago Press (1979). 320 pp., $20.00.

There have been many works devoted to Darwin and his impact on the world, and they have been valuable in helping us understand the complexities of the innovative Victorian scientist. It may seem unwarranted for another book to be added to that number. However, such seems not the case, considering the scope and detail of this new book.

Professor Ruse (of history and philosophy) has incorporated recently uncovered material relating to the whole Darwinian Revolution and has woven those strands together with the more common Darwinian knowledge to form a magnificent tapestry.

Beginning in 1830, and working a decade at a time, he traces the somewhat circuitous development of organic evolutionary theory to its fruition in 1859 with Darwin's publication of the *Origin of Species*, and on to 1875, by which time most of the sentiments from the primary forums had been adequately aired. Ruse, in each decade, considers separately the various thoughts of the scientific, religious, and philosophical communities, and where appropriate, adds general public feelings as well.

At times the arguments and documentations seem to resemble legal briefs, serving to complicate the reading process. However, given the nature of the subject and the intent of the author, I doubt this could be avoided. The antagonisms, alliances, arguments and agreements between such principals as Whewell, Chambers, Lyell, Huxley, Owen, Darwin and others is fascinating. The imprint of Victorianism and the religious doctrines of those times is seen indelibly impressed on everyone (even Huxley!). One can feel the early theorists squirm as they search for a resolution to the problem of organic origins and speciation.

Though this book was not intended for the Christian audience, it is a valuable one to us by providing details of all the basic evolutionary and/or creationist positions held then. I think we all will find it interesting to view our own representatives within the Victorian milieu, and to see how little some things have changed since.

The author's style at times reveals his own prejudices against theistic explanations, though this is held to a minimum. For the most part, an adequate consideration of all major positions is given.

As Ruse says in his overview:

> The Darwinian Revolution cannot be considered a single thing. It had different sides, different causes, and different effects. Often it is portrayed as a triumph of science over religion; but, though there is some truth to this idea, as a total assessment of the Darwinian Revolution it is far from adequate. The supposed triumph of science over religion was questionable, more was involved than science and religion, and in some respects religion helped the cause of science (p. 273).

He has managed to show the complexities of scientific inquiry in an earlier day. Few of the actors, if any, escape the criticisms of Ruse's pen, and conversely, most have their brighter sides painted too. The Darwinian Revolution took place in anything but a vacuum. The interactions revealed in this book allow us "moderns" to better appreciate the religious, scientific, and philosophical struggles that preceded us and to put into perspective our own grapplings with the whole concept of organic evolution.

*Reviewed by E. Steve Cassells, President, Plano Archaeological Consultants, Longmont, Colorado 80501.*

**THE MYSTERY OF THE INCARNATION**, by Norman Anderson, Downers Grove, Illinois: Intervarsity Press, 1978, 162 pp., $3.95.

Theology, they tell me, used to be considered the queen of the sciences. That is no longer true, and, as a remark attributed to Kenneth Boulding puts it: "Science might almost be defined as the process of substituting unimportant questions which can be answered for important questions which cannot."

Norman Anderson attempts to answer a very important question. That is, what is the nature of Christ? Is He God, man, or both? It is symptomatic of the divergence between science and theology that this complex of questions is irrelevant to science. It is not so, I trust, to the membership of our Affiliation.

The question has been asked for almost two millenia, and one chapter of Anderson's book is mostly a recitation of heresies, some obscure, surfacing and resurfacing. But the book is not merely an analysis of past controversy, as another major portion is devoted to an analysis and response to current thought. Anderson responds, in particular, to *The Myth of God Incarnate*, edited by John Hick; to John Knox (*The Humanity and Divinity of Christ*); to John Robinson (*The Human Face of God*) and others.

Anderson, who is actually a lawyer by training, closes with his own view, which is impossible to summarize completely in the space of this review. Approximately, it is that Christ became human, without losing His divine nature. As a man, He was completely dependent on the Father. He suffered real temptations, was killed, but rose again. As a result of His becoming man, He has permanently accepted some limitations to His Godhood, but is God. There is much here that neither I, nor Anderson, can comprehend, but Jesus is Lord, truly man and truly God, in his view.

As a biologist reviewing a lawyer's critique of theologians, I was impressed with *The Mystery of the Incarnation*. In particular, Anderson seems to examine the scriptural evidence critically. His analysis of opposing views seems insightful and penetrating. His attempt to deal with an important question which cannot be fully answered is worthy of perusal by those of us who are grappling with unimportant problems that, we think, can be.

*Reviewed by Martin LaBar, Central Wesleyan College, Central, South Carolina 29630.*

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**CULTURE AND CONTROVERSY**, by R. Clyde McCone. Dorrance, 136 pp., $6.95.

R. Clyde McCone, professor of anthropology at California State University in Long Beach, presents a new dimension in the biblical and anthropological investigation of the tongues of Pentecost. He argues cogently that the early Christians at Pentecost spoke in the learned Gentile languages familiar to them and their hearers rather than in the sacred Hebrew expected in a religious service.

This work which was turned down by several publishers as too controversial, raises an issue with which every biblical scholar needs to grapple. McCone argues that the "tongues" of Pentecost were not ecstatic utterances (after Montanus) nor miraculously given languages (after Jerome and Augustine) but were the Holy Spirit's gift working through the filled personalities of the early Christians. With such a conclusion he has taken the initiative from the traditional interpretation of "glossolalia" (which term does not occur in Scripture) and will have to be reckoned with by Pentecostals and non-Pentecostals alike.

In order to reconcile the Corinthian passages with "tongues" as learned languages—Aramaic, Greek and Latin, McCone carefully exegetes I Corinthians 12-14 in light of the context of the entire letter and its occasion. "Gifts are the divinely-given potential of the spiritual being called man" (p. 49). While not supernatural powers, their quickening and use by the Holy Spirit is a supernatural work. Such a view does not limit the gifts of God, but spiritualizes man's activities and places his gifts in humble service before the Divine Giver.

Crucial to the argument are McCone's carefully thought out principles of biblical interpretation. "1. Observe what the portion read *does not say*. 2. Limit one's conclusion to what the portion read *does say*. 3. Form one's understanding (a) in the scriptural context of the event or statement, and (b) in the cultural and historical context of its occurence or expression" (p. 5). In applying these principles to the biblical text, he reaches startling conclusions on the meaning of "tongues"—conclusions supported by his anthropological data.

McCone's interpretation throws new light on the whole problem of "tongues" and "gifts" in the church today. Evangelicals need to take a careful look at this issue which is often approached psychologically or sociologically rather than biblically. The issue is not a new look at Pentecostalism but a new look at Pentecost and its meaning for the church today.

*Reviewed by Bert H. Hall, Azusa Pacific College, Azusa, California.*

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**READINGS IN MORAL THEOLOGY, NO. 1: MORAL NORMS AND CATHOLIC TRADITION**, by Charles E. Curran and Richard A. McCormick, S.J., eds., New York: Paulist Press, 1979. 363 + viii pp. $5.95 paper.

*Readings in Moral Theology* has a place as supplementary readings or a text for upper-division or graduate courses in Catholic moral theology. This discipline, with a history extending back at least as far as Thomas Aquinas, has a great deal of theory and a special terminology all its own, not unlike, say, that of theoretical population genetics

or of nuclear physics.

The book is a compendium of essays published between 1967 and 1977, inclusive. Some were translated from German for this book. Some of the Latin in the book should have been translated! One of the editors, and five of the other contributors, are Jesuits. The titles: "The Hermeneutic Function of the Principle of Double Effect;" "Ontic Evil and Moral Evil;" "The Absoluteness of Moral Terms;" "Direct Killing/Indirect Killing;" "Problems on Norms Raised by Ethical Borderline Situations: Beginnings of a Solution in Thomas Aquinas and Bonaventure;" "Various Types of Grounding for Ethical Norms;" "Processive Relationism and Ethical Absolutes;" "The Direct/Indirect Distinctism in Morals;" "Morality of Consequences: A Critical Approach;" "Morality by Calculation of Values;" "Reflections on the Literature;" "Utilitarianism and Contemporary Moral Theology: Situating the Debates." It has no index or glossary.

Based on the likely utility of *Readings* to readers of this *Journal*, neither a full summary of the book, nor a definition of the terms in the titles of the essays is justified. The book appears to be largely about how some acts done for good purposes may be reconciled with the evil consequences of such acts. Few examples are given; the book does not use a case study approach. One example briefly mentioned is that of Mrs. Bergmeier, who submitted to extramarital intercourse while in a Soviet concentration camp in order to be released and be allowed to rejoin her family. Was this action morally right? This book treats the academic discipline of theoretical moral responsibility.

*Reviewed by Martin LaBar, Central Wesleyan College, Central, South Carolina 29630*

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**THE FUTURE OF SCIENCE, 1975 NOBEL CONFERENCE,** edited by Timothy C. L. Robinson, John Wiley and Sons, New York, 1977, 145 pages.

On October 1 and 2, 1975, twenty seven Nobel laureates and six theologians met before a group of 4,000 at Gustavus Adolphus College to discuss "The Future of Science". This book samples four of the topics discussed during the conference. The format follows that of the conference, a prepared address followed by open discussion. The four topics chosen by the editor are Dr. Glenn Seaborg's (Chemist) "New Signposts for Science", Dr. Polykarp Kusch's (Physics) "A Personal View of Science and the Future", Sir John Eccles' (Medicine) "The Brain-Mind Problem as a Frontier of Science", and Dr. Langdon Gilkey's (Theologian) "The Future of Science". The ensuing discussions cover a wide range of topics: pollution, population, government funding, technology, ultimate responsibility, to identify a few.

Predictions as to the directions the various disciplines would take in the future 25 or 50 years were very cautious, noting as Dr. Kusch did that physicists of the 1890's felt all the fundamental laws had been discovered and the future lay in refinement, not at all anticipating the new physics of relativity and quantum phenomena, or the availability of vast federal funds for research after World War II.

As a group, the scientists were optimistic that scientific pursuits in all areas would continue to provide increased knowledge of the world about us, and be beneficial to mankind. They were less certain that the eventual application by technology would be "good". There were spirited discussions on the ethical dimensions of research with the views ranging from deep involvement to semi-detachment.

The theologian, Dr. Gilkey, has the last word in this volume, and he likens scientific inquiry and the knowledge gained therefrom to a religious force that is dominating the modern culture, just as organized religion dominated the medieval period. Most everything has to be "scientific" if it is to be respectable. He wonders if the future of science is to be dethroned as a dominating force, and to be replaced by an as yet unidentified unifying and philosophical force.

> In the end, science and applied science—like every other aspect of human creativity—must learn to live and deal with the vast ambiguity of their own creativity—which is an existential, moral, and religious problem facing every profession, but new, I suspect, to the scientist as it once was new to the priest. For the lesson of history—and surely also the message of the gospel—is that it is the very creativity of man that can spell his doom, and his knowledge can be turned into blindness, and his power into self-destruction.

I found the volume stimulating to read but providing no answers to the question raised by its title.

*Reviewed by Robert Carlstrom, 8666 Cooperhawk Court, Columbia, Maryland 21045.*


## *An Evangelical Commitment to Simple Lifestyle*

*"An Evangelical Commitment to Simple Lifestyle" was written and endorsed by the International Consultation on Simple Lifestyle, held at Hoddesdon, England on March 17-21, 1980. The Consultation was sponsored by the Lausanne Committee on World Evangelization's Lausanne Theology and Education Group and the World Evangelical Fellowship's Theological Commission's Unit on Ethics and Society. For further information and additional copies, write to Unit on Ethics and Society, World Evangelical Fellowship, 300 W. Apsley St., Philadelphia, PA 19144.*

### *Preamble*

For four days we have been together, 85 Christians from 27 countries, to consider the resolve expressed in the Lausanne Covenant (1974) to "develop a simple lifestyle." We have tried to listen to the voice of God, through the pages of the Bible, through the cries of the hungry poor, and through each other. And we believe that God has spoken to us.

We thank God for his great salvation through Jesus Christ, for his revelation in Scripture which is a light for our path, and for the Holy Spirit's power to make us witnesses and servants in the world.

We are disturbed by the injustice of the world, concerned for its victims, and moved to repentance for our complicity in it. We have also been stirred to fresh resolves, which we express in this Commitment.

### *1. Creation*

We worship God as the Creator of all things, and we celebrate the goodness of his creation. In his generosity he has given us everything to enjoy, and we receive it from his hands with humble thanksgiving (I Timothy 4:4, 6:17). God's creation is marked by rich abundance and diversity, and he intends its resources to be husbanded and shared for the benefit of all.

We therefore denounce environmental destruction, wastefulness and hoarding. We deplore the misery of the poor who suffer as a result of these evils. We also disagree with the drabness of the ascetic. For all these deny the Creator's goodness and reflect the tragedy of the fall. We recognize our own involvement in them, and we repent.

### *2. Stewardship*

When God made man, male and female, in his own image, he gave them dominion over the earth (Genesis 1:26-28). He made them stewards of its resources, and they became responsible to him as Creator, to the earth which they were to develop, and to their fellow human beings with whom they were to share its riches. So fundamental are these truths that authentic human fulfillment depends on a right relationship to God, neighbor and the earth with all its resources. People's humanity is diminished if they have no just share in those resources.

By unfaithful stewardship, in which we fail to conserve the earth's finite resources, to develop them fully, or to distribute them justly, we both disobey God and alienate people from his purpose for them. We are determined, therefore, to honor God as the owner of all things, to remember that we are stewards and not proprietors of any land or property that we may have, to use them in the service of others, and to seek justice with the poor who are exploited and powerless to defend themselves.

We look forward to "the restoration of all things" at Christ's return (Acts 3:21). At that time our full humanness will be restored; so we must promote human dignity today.

### *3. Poverty and Wealth*

We affirm that involuntary poverty is an offense against the goodness of God. It is related in the Bible to powerlessness, for the poor cannot protect themselves. God's call to rulers is to use their power to defend the poor, not to exploit them. The church must stand with God and the poor against injustice, suffer with them and call on rulers to fulfill their God-appointed role.

We have struggled to open our minds and hearts to the uncomfortable words of Jesus about wealth. "Beware of covetousness" he said, and "a person's life does not consist in the abundance of his possessions" (Luke 12:15). We have listened to his warnings about the danger of riches. For wealth brings worry, vanity and false security, the oppression of the weak and indifference to the sufferings of the needy. So it is hard for a rich person to enter the kingdom of heaven (Matthew 19:23), and the greed will be excluded from it. The kingdom is a free gift offered to all, but it is especially good news for the poor because they benefit most from the changes it brings.

We believe that Jesus still calls some people (perhaps even us) to follow him in a lifestyle of total, voluntary poverty. He calls all his followers to an inner freedom from the seduction of riches (for it is impossible to serve God and money) and to sacrificial generosity ("to be rich in good works, to be generous and ready to share"—I Timothy 6:18). Indeed, the motivation and model for Christian generosity are nothing less than the example of Jesus Christ himself, who, though rich, became poor that through his poverty we might become rich (II Corinthians 8:9). It was a costly, purposeful self-sacrifice; we mean to seek his grace to follow him. We resolve to get to know poor and oppressed people, to learn issues of injustice from them, to seek to relieve their suffering, and to include them regularly in our prayers.

### *4. The New Community*

We rejoice that the church is the new community of the new age, whose members enjoy a new life and a new lifestyle. The earliest Christian church, constituted in Jerusalem on the Day of Pentecost, was characterized by a quality of fellowship unknown before. Those Spirit-filled believers loved one another to such an extent that they sold and shared their possessions. Although their selling and giving were voluntary, and some private property was retained (Acts 5:4), it was made subservient to the needs of the community. "None of them said that anything he had was his

own" (Acts 4:32). That is, they were free from the selfish assertion of proprietary rights. And as a result of their transformed economic relationships, "there was not a needy person among them" (Acts 4:34).

This principle of generous and sacrificial sharing, expressed in holding ourselves and our goods available for people in need, is an indispensable characteristic of every Spirit-filled church. So those of us who are affluent in any part of the world, are determined to do more to relieve the needs of less privileged believers. Otherwise, we shall be like those rich Christians in Corinth who ate and drank too much while their poor brothers and sisters were left hungry, and we shall deserve the stinging rebuke Paul gave them for despising God's church and desecrating Christ's body (I Corinthians 11:20-24). Instead, we determine to resemble them at a later stage when Paul urged them out of their abundance to give to the impoverished Christians of Judea "that there may be equality" (II Corinthians 8:10-15). It was a beautiful demonstration of caring love and of Gentile-Jewish solidarity in Christ.

In this same spirit, we must seek ways to transact the church's corporate business together with minimum expenditure on travel, food and accommodation. We call on churches and para-church agencies in their planning to be acutely aware of the need for integrity in corporate lifestyle and witness.

Christ calls us to be the world's salt and light, in order to hinder its social decay and illumine its darkness. But our light must shine and our salt must retain its saltness. It is when the new community is most obviously distinct from the world—in its values, standards and lifestyle—that it presents the world with a radically attractive alternative and so exercises its greatest influence for Christ. We commit ourselves to pray and work for the renewal of our churches.

## *5. Personal Lifestyle*

Jesus our Lord summons us to holiness, humility, simplicity and contentment. He also promises us his rest. We confess, however, that we have often allowed unholy desires to disturb our inner tranquility. So without the constant renewal of Christ's peace in our hearts, our emphasis on simple living will be one-sided.

Our Christian obedience demands a simple lifestyle, irrespective of the needs of others. Nevertheless, the facts that 800 million people are destitute and that about 10,000 die of starvation every day make any other lifestyle indefensible.

While some of us have been called to live among the poor, and others to open our homes to the needy, all of us are determined to develop a simpler lifestyle. We intend to reexamine our income and expenditure, in order to manage on less and give away more. We lay down no rules or regulations, for either ourselves or others. Yet we resolve to renounce waste and oppose extravagance in personal living, clothing and housing, travel and church buildings. We also accept the distinction between necessities and luxuries, creative hobbies and empty status symbols, modesty and vanity, occasional celebrations and normal routine, and between the service of God and slavery to fashion. Where to draw the line requires conscientious thought and decision by us, together with members of our family. Those of us who belong to the West need the help of our Third World brothers and sisters in evaluating our standards of spending. Those of us who live in the Third World acknowledge that we too are exposed to the temptation to covetousness. So we need each other's understanding, encouragement and prayers.

## *6. International Development*

We echo the words of the Lausanne Covenant: "We are shocked by the poverty of millions, and disturbed by the injustices which cause it." One quarter of the world's population enjoys unparalleled prosperity, while another quarter endures grinding poverty. This gross disparity is an intolerable injustice; we refuse to acquiesce in it. The call for a New International Economic Order expresses the justified frustration of the Third World.

We have come to understand more clearly the connection between resources, income and consumption: people often starve because they cannot afford to buy food, because they have no income, because they have no opportunity to produce, and because they have no access to power. We therefore applaud the growing emphasis of Christian agencies on development rather than aid. For the transfer of personnel and appropriate technology can enable people to make good use of their own resources, while at the same time respecting their dignity. We resolve to contribute more generously to human development projects. Where people's lives are at stake, there should never be a shortage of funds.

But the action of governments is essential. Those of us who live in the affluent nations are ashamed that our governments have mostly failed to meet their targets for official development assistance, to maintain emergency food stocks or to liberalize their trade policy.

We have come to believe that in many cases multi-national corporations reduce local initiative in the countries where they work, and tend to oppose any fundamental change in government. We are convinced that they should become more subject to controls and more accountable.

## *7. Justice and Politics*

We are also convinced that the present situation of social injustice is so abhorrent to God that a large measure of change is necessary. Not that we believe in an earthly utopia. But neither are we pessimists. Change can come, although not through commitment to simple lifestyle or human development projects alone.

Poverty and excessive wealth, militarism and the arms industry, and the unjust distribution of capital, land and resources are issues of power and powerlessness. Without a shift of power through structural change these problems cannot be solved.

The Christian church, along with the rest of society, is inevitably involved in politics which is "the art of living in community." Servants of Christ must express his lordship in their political, social and economic commitments and their love for their neighbors by taking part in the political process. How, then, can we contribute to change?

First, we will pray for peace and justice, as God commands. Secondly, we will seek to educate Christian people in the moral and political issues involved, and so clarify their vision and raise their expectations. Thirdly, we will take action. Some Christians are called to special tasks in government, economics or development. All Christians must participate in the active struggle to create a just and responsible society. In some situations obedience to God demands resistance to an unjust established order. Fourthly, we must be ready to suffer. As followers of Jesus, the Suffering Servant, we know that service always involves suffering.

While personal commitment to change our lifestyle without political action to change systems of injustice lacks effectiveness, political action without personal commitment lacks integrity.

### *8. Evangelism*

We are deeply concerned for the vast millions of unevangelized people in the world. Nothing that has been said about lifestyle or justice diminishes the urgency of developing evangelistic strategies appropriate to different cultural environments. We must not cease to proclaim Christ as Savior and Lord throughout the world. The church is not yet taking seriously its commission to be his witnesses "to the ends of the earth" (Acts 1:8).

So the call to a responsible lifestyle must not be divorced from the call to responsible witness. For the credibility of our message is seriously diminished whenever we contradict it by our lives. It is impossible with integrity to proclaim Christ's salvation if he has evidently not saved us from greed, or his lordship if we are not good stewards of our possessions, or his love if we close our hearts against the needy. When Christians care for each other and for the deprived, Jesus Christ becomes more visibly attractive.

In contrast to this, the affluent lifestyle of some Western evangelists when they visit the Third World is understandably offensive to many.

We believe that simple living by Christians generally would release considerable resources of finance and personnel for evangelism as well as development. So by our commitment to a simple lifestyle we recommit ourselves wholeheartedly to world evangelization.

### *9. The Lord's Return*

The Old Testament prophets both denounced the idolatries and injustices of God's people and warned of his coming judgment. Similar denunciations and warnings are found in the New Testament. The Lord Jesus is coming back soon to judge, to save and to reign. His judgment will fall upon the greedy (who are idolaters) and upon all oppressors. For on that day the King will sit upon his throne and separate the saved from the lost. Those who have ministered to him by ministering to one of the least of his needy brothers and sisters will be saved, for the reality of saving faith is exhibited in serving love. But those who are persistently indifferent to the plight of the needy, and so to Christ in them, will be irretrievably lost (Matthew 25: 31-46). All of us need to hear again this solemn warning of Jesus, and resolve afresh to serve him in the deprived. We therefore call on our fellow Christians everywhere to do the same.

### *Our Resolve*

So then, having been freed by the sacrifice of our Lord Jesus Christ, in obedience to his call, in heartfelt compassion for the poor, in concern for evangelism, development and justice, and in solemn anticipation of the Day of Judgment, we humbly commit ourselves to develop a just and simple lifestyle, to support one another in it and to encourage others to join us in this commitment.

We know that we shall need time to work out its implications and that the task will not be easy. May Almighty God give us his grace to be faithful! Amen.

## *The Foundation Upon Which Science Rests: The Correlation Between the Human Mind and Physical Reality*

> When the scientist attempts to understand a group of natural phenomena, he begins with the assumption that these phenomena obey certain laws which, being intelligible to our reason, can be comprehended. This is not, let us hasten to note, a self-evident postulate which leaves no room for qualifications. In effect, what it does is to reiterate the rationality of the physical world, to recognize that the structure of the material universe has something in common with the laws that govern the behavior of the human mind.[1]

In this manner one of the pioneers of 20th century physics, Louis de Broglie, describes how a scientist goes about doing his work. The scientific enterprise is seen as a creative dialogue between the human mind and physical reality (nature), a correlation existing between the two distinct entities. Two recent statements by physicists of today emphasize that scientists in their work are motivated by a faith that such a correlation exists. In a recent article the distinguished particle physicist, Steven Weinberg, stresses that our current understanding is that certain entities called *quantum fields*, highly abstract mathematical products of the human mind, are basic to forming a coherent representation of current elementary-particle physics. To quote Weinberg:

> The laws of nature give a fundamental role to certain entities. We are not really sure what they are, but at the present level of understanding they seem to be the elementary quantum fields. They are highly simple because they are governed by symmetries. These are not objects with which we are familiar. In fact, our ordinary notions of space and time, causation, composition, substance and so on really lose their meaning on that scale. But it is just at that scale, at the level of the quantum fields, that we are beginning to find a certain satisfying simplicity.[2]

In a similar vein, the fact that highly abstract mathematical concepts are found to "mirror" physical reality is marvelled at by Eugene Wigner, a Nobel prize winner in physics, who states that "one is confronted again and again with an unreasonable effectiveness of mathematics while investigating the physical world."[3]

Today mathematics, an imaginative product of the human mind, plays a fundamental role in representing physical reality. The discovery of anti-matter, specifically the positive electron by Paul Dirac is a particularly good example of this as Nigel Calder points out:

> In inventing 'anti-matter' Dirac was guided by his mathematics. He had imposed upon himself the very important task of reconciling two great new theories of physics, the quantum mechanics of sub-atomic behavior, and Einstein's relativity. With self confidence even greater than Anderson's (the experimentalist who discovered the positive electron) he interpreted a minus sign in his equations as meaning the existence of negative matter rather than negative energy. It implied an extraordinary and unlooked-for symmetry at the heart of the microuniverse, such that for each particle there was an antiparticle, its opposite in every respect.[4]

It should be stressed that the mathematical patterns used in representing physical reality become recognized in acts of discovery rooted in observation and experiment, not in flights of *a priori* reasoning. Furthermore, it is an interesting fact that many of these mathematical patterns were created by the human mind for sheer intellectual pleasure prior to when they were found to be useful in explaining the nature of physical reality. This is a rather surprising fact and an explanation for it cannot easily be found from within a purely scientific perspective.

In the act of discovery the human mind utilizes a store of rational structures or patterns which it can use to formulate a hypothesis about the nature of physical reality. Propositions are then deduced from the hypothesis that may be compared to physical reality in acts of observation and experiment. If the results are positive the credibility of the hypothesis is enhanced; if the results are negative, changes are made drawing again upon the stockpile of rational patterns stored in the mind and new deductions drawn from the modified hypothesis are tested experimentally. By this cyclic pattern of hypothesis formulation and testing against physical reality science proceeds. Today in physics these hypotheses are highly complex and abstract mathematical representations of reality; simple mechanical or everyday experience analogies are no longer found to be useful in describing the really basic building blocks of matter-energy. The formulation of such hypotheses requires great physical intuition and mathematical creativity (often partly gained by serving an apprenticeship to creative members of the physics community). Science has abandoned cruder representations of physical reality couched in the language of the senses for much more ambitious representations couched in the language of that most abstract area of human reason, pure mathematics. In the following extended quote the theologian Thomas F. Torrance nicely summarizes the nature of modern science with its emphasis on mathematics as a means of exploring a rational, objective, external reality:

> . . . In every science we presuppose that what we know is accessible to rational inquiry, that it is somehow inherently intelligible or rational. If it were not there could be no knowledge, let alone any science. Hence a primary operation that must be undertaken in any science, e.g., in developing verification, is to probe into the inner rationality of the object or field of knowledge, into its inner logic . . . What the scientist does in any field is to seek to achieve an orderly understanding of events in which he can group them as a connected and intelligible whole and so be able to penetrate into their inner rationality. He does not invent that rationality but discovers it, even though he must act with imagination and insight in detecting and developing the right clues and act creatively in constructing forms of thought and knowledge *through* which he can discern the basic rationality and let his thinking fall under its directions as he offers even a descriptive account of the events. Undoubtedly a two-way movement of thought is involved in working out the way in which his account of the events is related to the grounds upon which it is based, for it is the coherence in the pattern of his thought that enables him to discern the systematic connection in the nature of things and yet it is only as he reaches that discernment that he is able to separate out the actual evidence upon which his account of events must be allowed to rest. In so far as he can reduce to consistent and rational expression the ways in which his knowledge is related to the grounds upon which it is based, he is convinced that he has come to grips with the inherent rationality of things and is convinced of the truth of his constructions. Hence the crucial importance in many natural sciences of achieving wherever possible mathematical representation of our understanding of things, for it is in that way that we bring the objective rationality to view. Yet we may treat that representation only as an explicatory model or a disclosure model through which we interpretatively apprehend the reality that we are investigating and not as a descriptive formula or as the equivalent of some ontic structure of the reality itself . . . We are engaged properly in scientific activity only when we pass beyond description and narration to explanation, in which we penetrate, clarify, and explicate the inner intelligibility of what we investigate.[5]

## *A Theological Explanation*

What has been testified to is the assertion that central to the doing of science is the correlation between the subject of science, the scientist's mind, and the object of science, natural phenomena. Why does such a correlation exist? As the Dutch theologian, Abraham Kuyper, pointed out over seventy years ago, the Judaic-Christian perspective provides an answer:

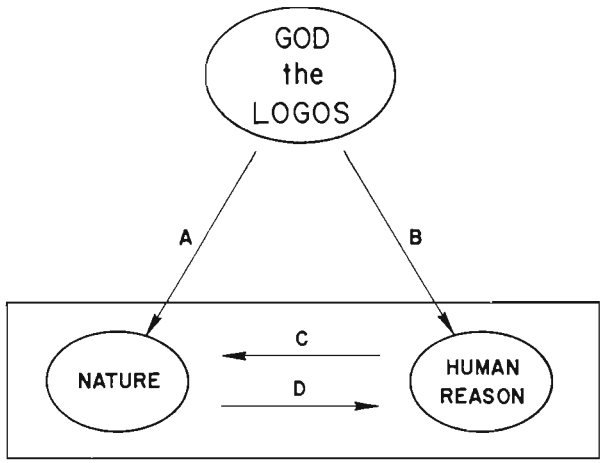


Figure 1. *The Scientific Enterprise* -
Its dependency upon the trustworthiness of a supremely rational, imaginative, purposeful, all-caring, personal God who holds in being both man, with his human reason, and nature thereby causing the two distinct entities to be correlated.

*Nomenclature:*
GOD the LOGOS-The divine, creative word as set forth in the first chapter of St. John's Gospel. The *Logos* means that within the presence of God there is present a creativity which is personal, which orders the universe, which awakes the response in man corresponding to his order, and lastly which existed eternally but was manifest in the Jesus of history.

HUMAN REASON—The cognitive powers of man.

NATURE—All of physical reality.

A - God created the universe and sustains it in continuous being.

B - God makes man in the Image of God.

C - Human rationality guides the exploration of nature.

D - Nature's behavior affirms and modifies human conceptions about it.

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> . . . by our abstract thinking we constantly form conclusions, which presently are seen to agree entirely with actual relations. In this way object and subject stand over against one another as wholly allied, and the more deeply our human consciousness penetrates into the cosmos, the closer this alliance is seen to be, both as concerns the substance and morphology of the object, and the thoughts that lie expressed in the relations of the object. And since the object does not produce the subject, nor the subject the object, the power that binds the two organically together must of necessity be sought outside of each. And however much we speculate and ponder, no explanation can ever suggest itself to our sense, of the all-sufficient ground for this admirable correspondence between object and subject, on which the possibility and development of science wholly rests, until at the hand of Holy Scripture we confess that the Author of the cosmos created man in the cosmos as microcosmos *after his image and likeness.*

> Thus understood, *science* presents itself to us as *a necessary and ever-continued impulse in the human mind to reflect within itself the cosmos, plastically as to its elements, and to think it through logically as to its relations; always with the understanding that the human mind is capable of this by reason of its organic affinity to its object.*[6]

Thus Kuyper asserts that the Judaic-Christian tradition teaches that science, a creative dialogue between reason and all reality, is dependent upon the trustworthiness of a supremely rational, imaginative, purposeful, all-caring, personal God. That nature is not a chaos but a highly ordered structure, a cosmos, is a direct consequence of the nature of God; that man has the ability to create mental structures which are faithful representations of physical reality is a direct consequence of man being made in the creator-God's image. Hence human reason and nature must be correlated as schematically shown in Figure 1. The fact that mathematical patterns were created prior to a physical application being discovered is easily explained if it is recognized that the mind that developed the pattern is made in the image of the designer of the natural order.[7]

Furthermore, the creator-God's inherent rational and purposeful nature offers a plausible explanation for why highly rational mathematical structures are so useful in the physical sciences while in other fields in particular the human sciences, purpose and teleology play vital roles. Some scientists of mechanistic persuasion might object to the latter comment. One example will show the fruitfulness of the concept of purpose in the human sciences. Victor Frankl in his important book *The Will to Meaning* more than adequately justifies the validity of a psychology named logotherapy based upon the precept that a person who has found purpose and meaning in his life is free to shape his own character and remains capable of always resisting and bracing even the worst conditions.

Lastly, the all caring, loving nature of the creator-God is deeply reflected in the human activity of science; scientific discoveries were and are most often made by men and women deeply committed to their task, often sacrificing much in the way of time and rejecting material benefits in order that their research efforts bear fruit. To be truly creative in science you must love your work. The knowledge of physical or mathematical structure cannot be separated from a loving appreciation of their beauty, such intellectual acts are not only acts of understanding but also acts of love.

## *Conclusion*

We have shown that a theological perspective derived from Holy Scriptures (in existence long before the birth of modern science) provides a satisfactory explanation for the strong faith of the scientific community that human reason can successfully guide the exploration of nature, the two distinct entities being correlated. Furthermore, the most recent advances in modern science eloquently testify to the validity of this correlation. Relativity theory with its utilization of a four-dimensional geometry to represent physical reality is a striking illustration of this. As Thomas F. Torrance has pointed out:

> No doubt four-dimensional geometries have chanced into science through free postulatory thinking, but when it was found that they could and did in fact apply to actual existence, it was realized that they were not just ideal possibilities which the human mind happened to think up, but involved a far-reaching correlation between abstract conceptual systems and physical processes that carried us into an objective state of affairs beyond all our intuitive representations. Hence the dismantling by relativity theory of the old cosmologies and the kind of objectivities bound up with them, has brought to light a new and far profounder objectivity which is invariant with respect to our subjectivities.[8]

## *Postscript*

Some might deny the full validity of the theological argument by invoking the scientific theory of evolution. They argue that the subjective cognitive structures of the human mind coincide to some extent with the objective structures of the real world, because they have developed as an *adaptation* to the real world which maximizes survival. From the point of view of a single individual, a postulate about experience is a postulate *a priori* in a strict sense. However, from the point of view of evolution, the same postulate is made *a posteriori*; it is based upon experience, namely on the experience of our ancestors, which is preserved and stored in the genetic information we have inherited from our parents. In this manner it is argued man can "invent" statements that later are found to explicate physical reality. But is the emergence of the human mind's ability to do this explicable in terms of the survival advantage it confers on its possessors for the range of activities we have been considering? What is the survival value to its author or its observers of a Beethoven trio, a Ming vase, a poem of Dante, or an understanding of relativity?

The example of general relativity is striking. Human beings have adapted to the flat, 3-dimensional space of Euclid seemingly separated from an absolute time. However Riemannian geometry, a non-Euclidian geometry of many dimensions, is found in general relativity to faithfully represent space and time, no longer considered separate but fused together as a space-time continium. Thus 4-dimensional Riemannian geometry which was developed by the human mind for no other purpose than to delight in its intellectual beauty brings into being a new vision of physical reality very different from the common sense 3-dimensional world we thought we were adapted to. And this new vision of reality accurately predicts physical behavior, i.e. the gravitational bending of light, that common sense notions never called attention to.

Indeed considering the possible validity of evolutionary theory

> . . . the structure of matter and of space and time was established long before men appeared on this planet equipped with a brain which seemed to be only the accidental product of natural selection on chance mutations in a changing environment. But now we have discovered that systems spun out by that brain, for no other purpose than our sheer delight with their beauty, correspond precisely to the intricate design of natural order which predated man and his brain. That surely has led to the discovery that man is amazingly like the designer of that natural order; how better to describe this discovery than to assert that man is indeed made in the image of God![9]

[1]Taken from Arthur March and Ira M. Freeman, *The New World of Physics*, Vintage Books, New York, 1963, p. 143.

[2]Steven Weinberg, "Is Science Simple?" Taken from *The Nature of the Physical Universe*, edited by Douglass Huff and Omer Prewett, John Wiley & Sons, New York, 1979, p. 62.

[3]Eugene Wigner, "The Unreasonable Effectiveness of Mathematics in the Natural Science," *Communications on Pure and Applied Mathematics* 13, 1960, p. 1.

[4]Nigel Calder, *The Key to the Universe*, Penguin Books, New York, 1977, p. 25.

[5]Thomas F. Torrance, *God & Rationality*, Oxford University Press, New York, 1971, pp. 94-95.

[6]Abraham Kuyper, *Principles of Sacred Theology*, Eerdmans, Michigan, 1968, p. 83.

[7]This argument is forcefully made in William G. Pollard's book *Science and Faith—Twin Mysteries*, Nelson, New York, 1970.

[8]T. F. Torrance, *op. cit.*, p. 103.

[9]William G. Pollard, *Science and Faith: Twin Mysteries*, Thomas Nelson Inc., New York, 1970, p. 86.

**W. Jim Neidhardt**
Physics Department
New Jersey Institute of Technology
Newark, New Jersey 07102

## *Toward an Applied Anthropology of Beliefs*

### *The Need*

We are defining belief as a reality or cognitive judgment. As such, beliefs constitute knowledge in the broadest sense: that the earth revolves on its axis and orbits the sun, that the sun is a creator god, that God created the sun and the earth, that the earth and the sun developed from a dust cloud are all beliefs. The diversity of the bases of the acceptance of these beliefs suggests a useful analysis that is relevant to a number of problem areas in anthropology.

Raymond Firth held that the naturalistic truth claims of his beliefs as a scientist were superior to those of the supernatural beliefs of the primitive cultures which he studied; yet he had to act as if he believed them in order to obtain information. At the same time the anthropological doctrine of cultural relativity does not permit us in western culture to apply our reality and value judgments to the beliefs of other cultures. Is Firth then as an anthropologist above culture, or is he ethnocentric?

Some anthropologists find it difficult to differentiate among belief systems of the supernatural. Leslie White, followed by G. G. Simpson, the biologist, distinguished Christianity from the spiritual beliefs of the primitives as the higher and the lower superstitions. Simpson claimed that since his faith in the unknown ruled out the supernatural and the spiritual, his beliefs were therefore not superstitions. He held that evolution is an enormous stride from superstition to a rational universe. White's own commitment to a philosophy of materialism and naturalism constituted for him a superior cultural world view that was the goal toward which the determinant process of evolution was leading mankind. Obviously there is some conflict between the beliefs of cultural relativism and those of cultural evolution in anthropology.

Not always aware of these cultural problems among themselves, anthropologists often point with professional disapproval at the missionaries who take the message of divine revelation to primitive peoples who already have their own spiritual and supernatural beliefs. Does the missionary ethnocentrically judge his beliefs to be good and those of the peoples of New Guinea to be bad? But, is

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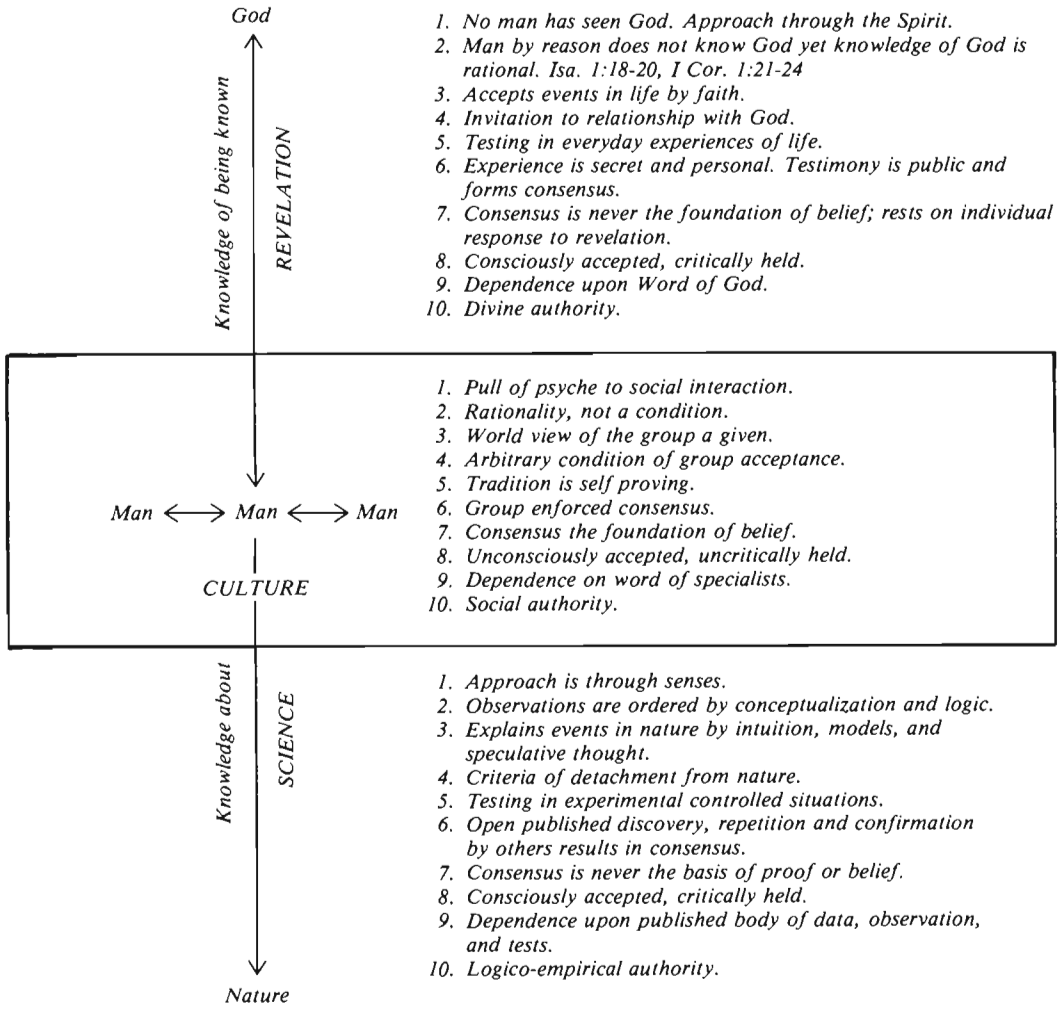
### *An Applied Cognitive Anthropology*

*Three Bases of Belief: Revelation, Science, and Culture*



the anthropologist also ethnocentric when he judges all beliefs in the supernatural to be superstitions in contrast to his own that are rational and true?

Briefly we outline a distinction in the objects of belief and make an analysis of the bases of belief that will remove us, at least one step, from the conflicts regarding the contents of belief. In so doing, we may be able to think more objectively rather than emotionally taking up cudgels of attack or defense.

If all beliefs are included within culture, then no critical approach is possible; we are all locked in to our own respective groups. Then science is not possible; anthropology is not possible; there are no absolute absolutes; the claims of Christianity are limited to the minds of its adherents. But, it can be rationally, and I think empirically, demonstrated that all beliefs are not cultural.

In both science and in revelation the objects of belief lie outside of culture..Science assumes a nature out there that exists apart from man's observation of it and knowledge about it. Divine revelation gives to us a God who created man and who is in no wise dependent upon human belief in him.

Since the Bible reveals to the mind of man the Spirit who is creator of the heavens and the earth, and since science proceeds by observation through the senses and by organization through the mind of man of the existing material order which is the heavens and the earth, there is no necessary conflict between the content of their respective belief systems. Yet, conflict does exist between some who claim intellectual and/or scientific superiority and some who claim the authority of God for their beliefs.

## *The Analytical Plan*

First, an important distinction must be made between the kind of beliefs and knowledge that come from divine revelation and the kind that comes from science and other intellectual disciplines. The beliefs of all these disciplines are *knowledge about things*. Revelation results in the knowledge of One who knows me. In our complex modern civilization there has been a tremendous advance in the amount and extent of *knowledge about things*. Those things may be of the heavens as in astronomy, of the physical world as in physics and chemistry, of life as in various branches of biology, of man as in history, anthropology, and the social sciences, of God as in theology, and of knowledge itself as in philosophy. The depth and extent of learning in each of these areas, and even in subfields and subfields of subfields, requires concentrated specialization that is reached only by scholars. To the general lay public these scholars become authorities in their respective fields.

In sharp contrast are the beliefs based on revelation. "God has spoken to us in these last days by his Son whom he has appointed heir of all things and by whom he made the worlds." He has not chosen to speak by ecclesiastical specialists such as priests, nor by intellectual specialists such as scholar theologians. What he has said does not call first for interpretation, but for obedience. And the obedience of the believer is the essence of its interpretation to the world. This does not negate the sovereignly chosen positions in the body of Christ which includes teaching pastors having gifts of wisdom and knowledge. But they are no more the head than any of the other members of the body. Christ alone is the head, he by whom God has spoken.

Christ said to the school of scholarly Sadducees, "Do ye not therefore err, because you know not the Scriptures neither the power of God?" But Isaiah said that the highway of holiness should be for those "wayfaring men, though fools, shall not err therein." For each individual believer God's Word alone is the authority.

> I will put my laws into their mind, and write them in their hearts: and I will be to them a god and they shall be to me a people: and they shall not teach every man his neighbor and every man his brother saying know the Lord for all shall know me from the least to the greatest.

A current controversy among Christians centers around *beliefs about* inerrancy and inspiration and is therefore theological. In the realm of revelation the issue is not interpretation but obedience. Jesus said, "He who hears these sayings of mine and does them." On numbers of occasions he said, "He that has ears to hear let him hear." In the book of Revelation it says, "Blessed is he that reads, and they that hear the words of this prophecy and keep (observe or obey) those things that are written therein." For the purposes of this essay it is important to distinguish revelation from theology.

## *Application to Problems in Christian Beliefs*

In a number of ways the cultural bases of belief may produce unresolvable issues regarding divine revelation and science. Western man's concern with history and the future has called for prophetic theologies that treat the Bible as a divine crystal ball in which it becomes history prewritten. Conflicting beliefs about the future take the forms of premillenialism, postmillenialism, and amillenialism, also in a rapture that is pretribulation, midtribulation, or post-tribulation. All these belief systems are attempts to find biblical answers to questions that have cultural assumptions and motivations hidden within them. Assumptions are those beliefs that constitute models around which scientists and historians order their observations. In this case it is the assumption that Bible prophecy is a prewritten history of world sociopolitical events surrounding the second coming of Christ as an event in time. The uncritical acceptance of this assumption results in the development of cultural systems of beliefs. These beliefs then become institutionalized in the structures of religious groups. Since the second century dominance by Greek cultural influence, the history of the Christian church has been a history of conflicting beliefs: prophecy, baptism, Calvinism versus Arminianism, Pentecostalism, etc. Not only do these issues have cultural roots, the plants that grow from them are distinctly cultural. When diverse biblical (?) answers develop to culturally rooted questions, then communities of belief as schools of thought or as religious groups spring up around these scholars and/or religious leaders. Membership requires consensus around the uncritical acceptance of the developing traditions. As small groups gain acceptance and recognition in the society at large, their differences are justified as denominational distinctives which then become sacred traditions. In the cultural dynamics of this process authority moves subtly to specialists as God's representatives, ecclesiastical and/or intellectual. The authority of God diminishes as an every day personal dynamic in the individual's behavior. "Born again" becomes a shibboleth of identity with the right group. The right group then protects its membership from apostacy by lining up and signing up its constituents according to their beliefs about spiritual things. The seriousness of this situation is compounded when the revelation is taken to peoples of other cultures and with it the embedded cultural roots that have been justified and sanctified.

## *Application to Evolution Versus Creation Controversy*

Culture controls the beliefs of science as well as those based on revelation. The scientist in studying the existing order of nature

develops models that are beliefs in the form of assumptions. These he uses to order his observations and to explain behavior in nature. When those models square with the observations and predict results in laboratory tests, they are accepted as useful and scientific. However, when he makes a grand assumption about the origin of that order, he no longer has a scientific model to be used and tested in the laboratory. Instead, he has a cultural worldview. The sacred quality of the world view is evidenced when any scientific questioning requiring proof is dismissed by categorizing it in negative outgroup terms such as ignorant, fundamentalist, higher superstition, or Judeo-Christian bias. The authoritative word of tradition and specialists combine to form the basis of credibility as in G. G. Simpson's article "The World into Which Darwin Led Us." After claiming that this is a worldview, it is then propped up by the proof of Darwinian tradition: "No evolutionist has since (Darwin) seriously questioned that man did originate by evolution." The fact of evolution was not established by observation, but by a "single step that was taken a hundred years ago and is not a matter of simple rational acceptance or superstitious rejection." Consensus plays a frequent role in establishing credibility: "almost all biologists agree that the problem (the origin of life) can be attacked scientifically." Consensus is buttressed by the authority of the specialists as when "a highly distinguished international panel of experts was polled. . . . all considered the experimental production of life in the laboratory imminent." In a similar manner the humanist statement sought to culturally establish evolutionary beliefs by the consensus of a long list of signatures of specialists. The ingroup/outgroup dynamics are also very explicit when we are assured that evolution is accepted by "scientists and other reasonable persons." Statement of tradition is given in lieu of specific historical or experimental proofs: "For many years it has been established scientifically that all forms of life, including human beings, have developed by a lengthy process of evolution."

The prestige with which science is held in our modern culture has been a social pressure for almost all beliefs to seek some basis in its supports. When the revelation of the Creator is made to serve the role of an assumption in a model alternate to and competing with "evolutionary pseudo-scientific model", then along with evolution it becomes cultural in its basis. This is done by attempting to explain creation as a process in time and in dating it as an event in time. The result is a time perspective that is characteristic of all cultural world views. When this happens creationism and evolutionism become two conflicting belief systems which are distinctively cultural in character. Neither include the logico-empirical authority of science or the divine authority of revelation. These authorities are socially transformed into pseudo authorities in the service of those who would dominate the thinking and beliefs of others.

## *Application to Western Civilization*

To conceptually distinguish between culture, science, and revelation in terms of their bases of belief does not imply that a scientist and/or Bible believer can or does live in total independence from his culture. It does, however, point to two important areas in which an individual is not necessarily imprisoned by his culture. At the same time it points to the unique cultural character of western civilization.

The fact that anthropologists for almost a century focused their attention on kinship-based societies led to a concept of culture as a system of beliefs within which socially and intellectually there are no conceivable radical alternatives. For the Dakota Indian to deny the all-powerful, impersonal Wakan or to become anti-kinship would be to commit cultural suicide—but it is culturally impossible. In contrast, the door in the cultures of western civilization is open to extreme challenge. So much so that philosophies and/or movements may arise around such beliefs as anarchism, atheism, anti-family, and nudism.

The other side of the coin of this characteristic of cultural openness is the opportunity that it presents for the acceptance of divine revelation and the development of science. Because of this distinctiveness of western culture, at least three applications of our analysis of concepts may be made.

First, in the fulness of time, with the rise of western civilization, God took on human flesh and entered the world of culture through Jesus of Nazareth. The message of his life, death, resurrection, and ascension in response to Paul's Macedonian call was taken specifically to the western world. Missionary anthropology has consistently insisted that the gospel message of divine revelation be distinguished from western culture. The conquest of the Great Commission is not to become the tool of or an aspect of the conquest of western civilization. However, missionary anthropologists seem to have given little attention to the fact that there are characteristics of western culture that make it and it alone the potential bearer or medium that can serve the goal of world evangelization.

Second, we must observe that it is only in western civilization that science has risen in its conquest of the mysteries of nature. However, science cannot establish the basis for the absolute good or even the ultimate reality. Only in revelation, the Bible, is the absolute good made known in the Creator-Redeemer God.

Third, and finally, western civilization with its openness to challenge does not have an absolute as a basis for its morality. Because of this vacuum the Christian message took over this role from the residue of polytheism that was so much in evidence as Paul observed at Athens. With the conversion of Constantine, Christian revelation was converted politically to a cultural position and as a result both the development of science and the expression of the revelation suffered. In the Renaissance and the Reformation the progress of science and of revelation has continued within western culture to our day. The potential of cultural suicide in the west has recently found expression in such movements as "the death of God," "the new morality," and in the turning to various forms of eastern mysticism. However, the fact still remains that in the west we are uniquely dependent upon the Judeo Christian revelation for the necessary moral foundations for social order. Nations rise and fall in terms of their people's response to the revelation of Jesus Christ. Christians need not apologize for imposing "their" moral convictions upon society. Our society has no enduring morality that does not have its roots in the Christian witness. Without the responsible participation of Christians as the salt of the earth the national result is social disorganization and moral degeneration.

The potential suicidal protest of the cultural west: "you cannot legislate morality" must be met by the Christian redemptive corollary: "morality must legislate."

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**R. Clyde McCone**
1901 Snowden Avenue
Long Beach, California 90815

# INDEX, VOLUMES 29-32, 1977-1980

*The location of Indices for previous Volumes is listed on the inside back cover. Numbers refer to volume, issue, page, and year. The letter is the initial of the month (March, June, September, and December).*

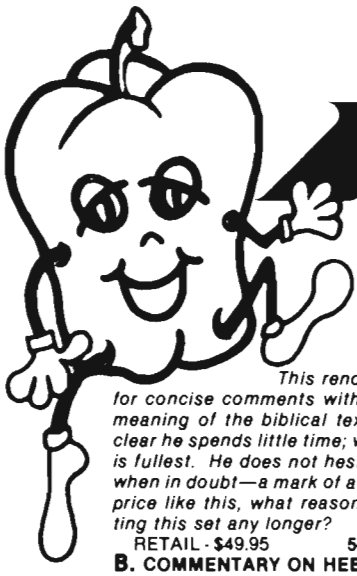
# INDEX 1977-1980

## *Communications*

## *Book Reviews*

*(Reviewer's name is given in parentheses.)*

# INDEX 1977-1980



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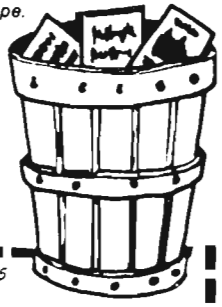

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INDICES to back issues of the *Journal ASA* are published as follows: Vol. 1-15 (1949-1963), *Journal ASA* 15, 126-132 (1963); Vol. 16-19 (1964-1967), *Journal ASA* 19, 126-128 (1967); Vol. 20-22 (1968-1970), *Journal ASA* 22, 157-160 (1970); Vol. 23-25 (1971-1973), *Journal ASA* 25, 173-176 (1973); Vol. 26-28 (1974-1976), *Journal ASA* 28, 189-192 (1976). *The Journal ASA* is indexed in the CHRISTIAN PERIODICAL INDEX. Present and past issues of the *Journal ASA* are available in microfilm at nominal cost. For information write University Microfilms, Inc. 300 North Zeeb Road, Ann Arbor, Michigan 48106.

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VOLUME 32, NUMBER 4 DECEMBER 1980