Faculty Forum President's Letter

At the beginning of the 2003-2004 academic year at Union University, we can look with anticipation and excitement toward the days ahead. Each year provides a new beginning—new schedules, new duties, new personnel, and new students. As we progress through this academic year, each of us should hope to make (and work diligently toward making) a positive difference in the lives of our students, our colleagues, and our university.

One way in which each of us can make positive contributions to Union University is to be involved actively with the Faculty Forum. As stated in the Constitution of the Faculty Forum, our organization has as its purpose “to provide a means for the faculty to express its interest/concerns to The Greater Faculty and the Provost, and to make recommendations about issues affecting Union University.” Last year, our organization took some very positive steps by establishing several task teams that will be able to study various topics in order to bring recommendations to the Faculty Forum, thus enabling us to have a more beneficial impact upon our Union community. As an organization, we always should strive toward beneficial changes for our colleagues and the entire university.

Any organization is only as good as its members and the nature of their participation in the activities of the organization. I encourage you to attend each meeting of the Faculty Forum, to participate in our discussions, and to contribute your knowledge, ability, and wisdom via service on the committees and task teams of our group. Your active participation will provide input that can help to enhance the overall quality of Union University in its mission to be Excellence-Driven, Christ-Centered, People-Focused, and Future-Directed.

Another way in which members of the Faculty Forum can express themselves is by providing items for inclusion in the Journal of the Union Faculty Forum (JUFF), which consists exclusively of material produced by our colleagues. I encourage you to read this issue of JUFF and also to consider what contribution(s) you could make to the next issue.

Persons serving with me as officers of the Union University Faculty Forum for this academic year are Sean Evans (Vice President), Kelvin Moore (Secretary), and Roger Stanley (editor of JUFF). We look forward to serving you this year.

Michael John Mada
A Word from the Editor

As Union emphasizes research more and moves toward a trichotomy model of faculty evaluation which may ask us to “specialize” among either (1) evaluation according to teaching; (2) evaluation according to research; or (3) evaluation according to advising/service, some might question the continued need for an in-house publication like this one. After all, more and more faculty are finding outlets for their scholarly papers or performance/creative endeavors in respected venues within their disciplines, venues not necessarily accessible to the campus-wide community. To my mind, JUFF can keep us abreast from year to year of what our colleagues are doing as an extension of their classroom service—whether or not a particular colleague’s area of specialization may have an affinity with our own. Union will always be primarily a teaching institution, but what you read in the pages which follow both springs out of classroom experience and flows back into it by way of vital enrichment.

Thus, Jenny Brooks White sets the stage for an issue dominated by theologians and natural scientists with a brief poem evoking in its title and subject matter both the Old Testament and the wonders of empirical observation of created matter. Randy Bush then takes us up the mountaintop in the service of a symbolic theological quest, followed by Jim Huggins’ leap into the seventeenth century universe of rising science. From there, Carrie Whaley reminds us not to forget methodology in our pursuits of diverse subject matter, nicely balancing theory and practice in the centerpiece article. Scientist Glen Marsch and theologian Jim Patterson then disseminate their cutting-edge research in physics and eschatology respectively; we close with a bookend poem by Ms. White which tests the boundaries between prose and verse engagingly.

I am most pleased to see a spectrum running from one-semester Visiting Instructor through University Professor among this year’s contributors, and equally delighted to feature a non-Arts and Sciences colleague in a publication all too often dominated by this largest subset of our schools and divisions. Please consider our July 1, 2004 deadline for next year’s issue; we especially welcome other areas of the academic community (e.g., professional librarians, School of Business, School of Nursing) which are not represented in this year’s JUFF.

Thanks again this year to Marjorie Richard in College Services and to Provost Carla Sanderson for logistics and funding respectively. And while JUFF operates independently from the Center for Faculty Development, kudos to that entity for a spirit of encouragement which lies behind products such as this one.

Roger D. Stanley
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Genesis

by Jenny Brooks White

Your Father's blessings are greater...than the bounty of the age old hills.
—Genesis 49:26

I can hear the corn leaves reaching upward
and outward, pulling themselves up from the roots
and stretching to the sun. After green months
of this tall, scratchy life they will turn,
appearing to have given up everything.

This is not the rattle of a barren land.
The endless rolling hills of dry brown,
the parched raspy rustle of their leaves sound of plenty.
Among these dying leaves, golden kernels wait.
Bushels upon bushels sit in silence,
abundance yet to be harvested.

And out in the fields, down the long straight rows
a blessing buds, roots itself deep
inside me, stretches beyond the tips of my fingers,
pulls me from this black soil,
and grows through me, around me.
Reflections on the "Son of Man":
Implications for a Christian Transforming Worldview

by Randall B. Bush

The designation of Jesus as the Son of Man is of obvious importance for New Testament theology. Not only is this title used of Jesus more often than any other, but the designation is linked to networks of related symbols that elucidate understanding of apocalyptic themes in the New Testament. A preponderance of research and speculation has been produced on the origins of the Son of Man concept, as well as on the ways in which this concept is employed in the New Testament. Many theories regarding the Son of Man passage in Daniel 7:13-14 have been produced, ranging from the claim that ideas of cosmic man in Persian, Mandaean, and Manichaean religion influenced this idea to the claim that Canaanite portrayals of the god Baal’s relationship to El are behind it.¹

If the subject from the standpoint of Old Testament studies were not already complicated enough, the New Testament basis for the use of this term is also fraught with difficulty. Is the Son of Man concept derived from Ezekiel, where the prophet is often referred to as son of man? Or does the term derive primarily from Daniel 7:13-14 (and the continuation of this tradition in later apocalyptic works such as I Enoch), where the Son of Man is described as one who comes on the clouds of heaven and receives an everlasting kingdom from one called the Ancient of Days? If it were clear that the writers of the New Testament were using the Daniel passage exclusively, then the interpretation of the idea in the New Testament would not be difficult. However, Jesus and the writers of the Gospels use this term not only to connote a heavenly figure which will come “in power and great glory,” but statements in the New Testament also point to the humility and suffering of the Son of Man.²

In this paper, I shall argue for the theory that the Son of Man idea from Daniel 7:13-14 is an elaboration of rituals and symbolic networks associated with the Hebrew Temple—and that this idea functions as one aspect of a greater paradigm in which biblical symbols, which on the surface may appear to the Western mind to be unrelated, are in fact linked. I shall then seek to show how certain elements of the idea in Daniel 7 were retained in early Christian theology at the same time that the idea was reconfigured in light of the theme of messianic suffering. Finally, I shall seek to draw implications of the Son of Man concept for a Christian transforming worldview.

¹ In his work God’s Conflict with the Dragon and the Sea: Echoes of a Canaanite Myth in the Old Testament (Cambridge University Press, 1985), John Day suggests that the enthronement of the Son of Man over the beasts by the Ancient of Days is Canaanite in origin. The myth he believes lies behind the Son of Man’s receiving of the everlasting kingdom from the Ancient of Days is that of Baal’s reception of the kingdom from El, the high god of the Ugaritic Pantheon.

Background of the Son of Man Idea in Daniel 7

Hans Gadamer has pointed out the failure of the exclusive use of the scientific method in hermeneutics, and a good example of this failure can be seen in the kind of speculation that has produced such multiple and wide-ranging theories concerning the Son of Man. The problem emerges from a direction in thinking that endlessly teases out threads of tradition in an effort to identify separate and often unrelated influences upon biblical ideas. In most cases, interpreters presuppose that writers of Scripture were as much concerned as they are with issues of particularity regarding sources. The “Son of Man” is but one example of a concept that has been atomized by biblical scholarship to the point that it has “died the death of a thousand qualifications.”

Many scholars also incorrectly assume false dichotomies when they propose to explain an idea in the light of one exclusive source, or suggest that a concept must be precise and have only one meaning. I do not claim that I have found the correct interpretation of the Son of Man concept; however, by shifting to a hermeneutical method that seeks to elucidate the concept in the light of a wider symbolic network whose whole transcends the sum of its parts, I believe I can provide some clarification.

I. The Wider Cultural Background: One theory suggested by an earlier generation of scholars is that the Son of Man idea in Daniel 7:13-14 had its basis in Urmenesch (primordial man) speculation found throughout the Ancient Near East. References are made to figures such as the Babylonian Adapa, the Persian Gayomart, the Gnostic Anthropos, and Philo of Alexandria’s Heavenly Man. In support of these conjectures is the research of the Myth and Ritual scholars who identified common themes in Babylonian and Hebrew understandings of kingship. Citing Psalm 2 as evidence of Babylonian influence on the Jerusalem kingship cultus, some scholars went so far as to suggest that there were direct connections between Babylonian and Hebrew kingship myths and rituals. However, the famous Egyptologist Henri Frankfort helped to put such “pan-Babylonian” speculations to rest by suggesting that ideas of kingship found in Babylonia, Canaan, Israel, and Egypt were unique and distinctive to these cultures.

Still, common themes of the struggle between chaos and cosmos that one finds reflected in the relationship between the Son of Man in Daniel 7 and the beasts that rise up out of the sea are echoed in myths and rituals ranging from Egypt to Babylon. In Egypt, the Pharaoh struggled with the serpent Apophis; in Babylon, Marduk defeated the dragon Ti’amat; and in Canaan, Baal vanquished the dragon Lotan (identical to the Leviathan of the Old Testament). Links between myths and kingship rituals of ancient Near-Eastern peoples must be acknowledged if a complete picture is to be presented. The fact that the king of Babylon, as the Son of Marduk, enacted the ritual of Marduk’s slaying of the dragon at the Babylonian Akitu festival establishes the link between the Babylonian king and the hero god. Also well known is the fact that the Pharaoh, as the virtual incarnation of all the gods of Egypt, linked the divine and human dimensions of

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reality through myths that were enacted in certain rituals. In Canaan, the cult of Baal and Asherah more than likely involved similar ritual reenactments of myth. Mircea Eliade has shown how essential such ritual reenactments were as the means of reestablishing a cosmic harmony that existed in illo tempore (once upon a time).\(^7\)

When one considers that the Old Testament contains references to the seven-headed dragon of Canaanite lore, Leviathan—and that the Hebrew word for the deep, tehom, is a cognate word for the Babylonian dragon of salt water, Ti'amat—one can understand why scholars have sought to isolate the influence of either Babylonian or Canaanite traditions upon Hebrew thought. What now is clear, however, is that the influence of one source does not in any way preclude the influence of multiple sources. In fact, a network of symbols having a common theme could be interwoven over time out of sources arising from disparate origins. Such symbols as the sea, the tehom, and Leviathan need not then be seen as essentially different and unrelated (as the scientific method with its Nominalist bias often suggests), but as interconnected symbols pointing to chaos as their common theme. The sea and other mythological creatures such as Rahab and Behemoth would then function as further symbolic expressions of this theme. Later, I shall try to show how such symbolic networks provide at least one basis for the contrast between the beasts that rise out of the sea in Daniel (which represent world empires) and the kingdom of the Son of Man.

Though I am suggesting that symbols of the struggle between chaos and cosmos were common stock in the Ancient Near East, it would be incorrect to assume that these symbols were employed by these cultures in anything like a uniform way. Henri Frankfort, for instance, makes this clear when he shows that kingship in Babylonian was connected with the development of a law code, while kingship in Egypt involved no such development.\(^8\) Each culture employed in unique ways the symbolism of the struggle between cosmos and chaos; Hebrew culture was no exception. Whatever utilization the Hebrews might have made of symbols coming from Babylonia, Egypt, or Canaan, those symbols would not be employed apart from a thoroughgoing transformation in the light of Hebrew monotheism. This point has often been lost on scholars who insist on using the history of religions approach with its inherent bias that imagines influences as moving in one direction only. One often gets the impression from this scholarship that the ancient Hebrew mind was something like John Locke’s tabula rasa—passive and malleable—yet this goes against the creativity and tenacity of the Hebrew spirit that, if anything, resisted capitulation to polytheism. This spirit is in fact more empirically evident from a reading of Scripture than the one imagined by the History of Religions School.

**II. Reconstructing the Unique Hebraic Symbolic Network:** If one is to make an effort to reconstruct the unique network of symbols that sheds light on the Son of Man concept in Daniel 7:13-15, then one must seek to show similarities and divergences from myth and ritual patterns in other Ancient Near-Eastern cultures. The most obvious starting place would be to investigate symbols and rituals that occur in connection 1) with Israelite kingship and 2) with the figure of the Hebrew High Priest.

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\(^7\) See Eliade, *Cosmos and History* (New York: Harper Torchbooks, 1959), 34-48, where the author discusses the myth of the eternal return.

\(^8\) Henri Frankfort, *Kingship and the Gods.*
A. Connections with Kingship: First, is there any evidence that “primordial man” symbolism united themes appearing in connection with the Hebrew king? I think that this symbolism is most obviously suggested by the figure of Adam. One mark of kingship that can be attributed to Adam is his ability to name the animals of the Garden of Eden, for kings in the ancient world were believed to possess this ability. One should remember that the naming of a reality in Ancient Near-Eastern culture assures one’s dominion over and control of that reality. Solomon is an example from the Old Testament. But the main emphasis in the story of Adam is not his continued dominance over the beasts of the Garden, but his loss of control over them. The principal beast over which he and his consort lose control is the serpent—a creature also associated thematically with the dragon. Such a parallel may be evident in the rabbinic idea that when God created the Garden of Eden he placed the head of Leviathan beneath it and covered over Leviathan’s foul stench with the Garden’s sweet fragrance. The appearance of the serpent in the Garden may in this light suggest a primordial eruption of that chaos which signals the demise of Adam and his loss of dominion over the earth. This loss of dominion is important for our understanding of the Son of Man in Daniel 7:13-14, for the restoration of dominion over “the beasts” is precisely what the Son of Man accomplishes.

There is, however, no concrete evidence that a kingship ritual of the Babylonian kind existed in Israel. In Babylonia, the king, as representative of the god Marduk, enacted the ritual of the slaying of the dragon, but in Hebrew religion, at least from the time of Samuel, resistance to the institution of human kingship would have precluded any participatory rituals in which the king would actually play the role of Yahweh in a cosmic drama. The fallibility of Hebrew kings is iterated repeatedly by the Deuteronomic historian. Consequently, the slaying of the dragon is accomplished by Yahweh alone, an idea that is in full accordance with the prominence given to

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9 See, e.g., 1 Kings 4:33, where it is said that Solomon “spoke of trees, from the cedar that is in Lebanon even to the hyssop that grows on the wall; he spoke also of animals and birds and creeping things and fish” (quote from NAS version).

10 Baba Bathra 75a.

11 Associations of the Garden of Eden with ideas of kingship and the loss of kingship occur in other places in the Hebrew Scriptures as well. Just as the story of Adam and Eve from start to finish portrays how sin and disobedience result in exile, so do the prophets describe the fall of various corrupt earthly kings from Eden or the mountain of God. In Ezekiel 31:18, the Pharaoh of Egypt is brought down with the trees of Eden. Ezekiel’s taunt against the King of Tyre (Ezek 28:12-19) portrays a similar theme. The Tyrean king is depicted as walking in Eden, the garden of God, and as clothed with every precious stone. Eden here is identified with God’s holy mountain, and the fact that this earthly king walks among the stones of fire may suggest that he (figuratively speaking) walks among the very stars of heaven. However, because this king has exalted himself above God, he has fallen under the curse of God’s judgment. God casts him down to the depths of the underworld (Sheol). A similar taunt against the king of Babylon occurs in the prophecy of Isaiah (14:4-21), where the king is described as the morning star (Lucifer) who falls from the summit of the mount of assembly located in the recesses of the north. Scholars now generally agree that in making his point against an upstart king, the prophet was using an ancient Canaanite myth. Cyrus H. Gordon, Ugaritic Literature Cyrus H. Gordon, Ugaritic Literature: A Comprehensive Translation of the Poetic and Prose Texts (Scripta Pontificii Instituti Biblici, 98; Rome: Pontificium Institutum Biblicum, 1949), 44. See description in Aubrey R. Johnson, “The Role of the King in the Jerusalem Cultus,” 83. The story is about the fall of one named Daystar from the cosmic mountain, Mount Zaphon. See article by J. Gray, s. v. “Day Star” in Interpreter’s Dictionary of the Bible (hereafter cited as IDB) 4 vols., ed. George A. Buttrick, et al. (New York and Nashville: Abingdon Press, 1962; suppl. vol., 1976), 1:785. “Poems about Baal and Anath” h. 1 AB. 50-65 describes how Asherah appoints Ashlar, a Tyrant, to be king, taking Baal’s place on Mount Zaphon. Ashlar ascends to the Fastness of the Mount, but because his feet do not reach down to the footstool nor his head to the top, he is cast down (James A. Pritchard, ed., Ancient Near-Eastern Texts Pertaining to the Old Testament [hereafter cited as ANET] [Princeton University Press, 1969], 140) after he tries unsuccessfully to sit on the throne of Baal.
the role of the Ark of the Covenant in the practice of Holy War. In Holy War, the Ark always preceded the Israelites in battle. This practice was in keeping with their belief that Yahweh fought on their behalf. The Ark is imagined in the context of Holy War to be the chariot of Yahweh, Lord of Hosts. The connection of the Ark with divine kingship is further evidenced by its location in the Holy of Holies of the Hebrew Temple. As such, it represents the throne where Yahweh has made His name to dwell.

The dominance of the divine kingship idea in Israel no doubt precluded the Hebrew king from taking upon himself the role of Yahweh in enacting rituals such as the slaying of the dragon. The distinction between Yahweh and the Hebrew king is as absolute as the distinction between the Creator and the creature. The recognition of this infinite qualitative distinction is reflected in the idea that the Son of Man himself does not do battle with the sea or the beasts that rise from it. This is Yahweh’s battle and His alone. The Son of Man merely receives the everlasting kingdom that is within Yahweh’s purview to give.

The extending of the battle motif to Yahweh’s conflict with the dragon and the sea is the theme of John Day’s excellent book on the subject. In the Old Testament, Yahweh is repeatedly viewed as subduing the sea or slaying sea monsters such as Leviathan (the seven-headed dragon of Canaanite mythology) or Rahab. However, lest one get the impression that the Hebrews wholly adopted the full-fledged dualism implied in the myth of the conflict between Baal and Lotan (or between Marduk and Ti’ammat), we should remember that God “formed Leviathan to sport with.” Dualism is here overridden by Hebrew monotheism.

Day shows abundant evidence that God’s conflict with the dragon was also historicized. Not only is Yahweh’s splitting of the Red Sea told in terms of Yahweh’s conflict with the dragon, but the dragon—and related symbols such as the sea—comes to be connected with various political enemies of Israel. These connections provide a basis for similar associations in Daniel 7 where the sea gives rise to beasts that in turn represent the political enemies of God and Israel.

B. Connections with the High Priest: The figure of Adam may also have connections with the figure of the High Priest, but in a manner different from that of the Hebrew King. In their attempt to make themselves into gods, Adam and Eve failed to secure the most important attribute that gods possess: namely, immortality. As a result of their transgression, their way was barred to the Tree of Life by the cherubim whose flaming sword pointed in every direction.

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12 E.g. Psalm 74:12-17; 89:9-14; 104:1-9; 65:6-7; 93; Job 41:1-34. The dragon Leviathan is undoubtedly the same as the seven-headed dragon of Canaanite mythology named Lotan. See “Poems about Baal and Anath,” in ANET, 108. See also the work of John Day, God’s Conflict with the Dragon and the Sea, 88-101.

13 Ps 104:6. This is also echoed in comments from Jewish Midrashim on God’s creation of the great sea monsters.

14 Isa 30:7; Ps 87:4; Isa 51:9-11; Ezek 29:3-5, 32:2-8; Ps 77:16-20; Isa 51:9-11; Exod 15:1-18 (in connection with Egypt); Isa 17:12-14; 8:5-8 (in connection with Assyria; Hab 3:8-10, 15; Jer 51:34 (in connection with Babylon); Isa 27:1 and Ps 44:18-20 (in connection with an uncertain political enemy); and Ps 46:2-3; 18:4-17; 144:5-7 (in connection with the nations in general).

15 That is, if the word Elohim is here taken to be plural rather than singular. However, if it is taken to be singular, then we would have to say that they were not trying to be like God as He really is; rather, they were attempting to be like God as they imagined Him to be, which is in fact a distorted image of God.

We should remember that the cherubim are also described in other places in the Hebrew Bible.\textsuperscript{17} As guardians of God's holiness, their figures appeared embroidered on the veil that separated the Holy Place in the Hebrew Temple from the Holy of Holies,\textsuperscript{18} and their shapes were fashioned to sit upon the mercy seat that covered the Ark of the Covenant.\textsuperscript{19} The rabbis were thus correct to recognize a symbolic connection between the Torah and the Tree of Life.\textsuperscript{20}

In his book \textit{Patterns in Comparative Religion}, Mircea Eliade recounts the fact that belief in the tree of life or the cosmic tree has been widespread, and that in the thinking of ancient peoples, the tree of life was not usually thought of as a merely literal reality. This tree always grows at the center of the world, functioning as a symbol of the very cosmos.\textsuperscript{21} With its branches ascending upward into the heavens and its roots reaching down into the underworld, the cosmic tree symbolizes the possibility of the communion between the spiritual forces of heaven and earth at the center of creation. Moreover, the cosmic tree served as the junction where the zones of heaven, earth, and the underworld intersected. As such, it was also the means by which one could move from one of these zones to another.\textsuperscript{22} Evidence of the notion of the cosmic tree in Israelite belief can be found in a Midrash of one of the Rabbis of antiquity who wrote that the tree of life in the Garden of Eden spread over all living things (that is, over the whole world). It “spanned a five-hundred years journey, and all the primeval waters branched out in streams under it.”\textsuperscript{23}

The association of Adam and the Garden of Eden with kingship motifs has already been noted, but the association of Adam and Tree of Life symbolism with the Holy of Holies of the Hebrew Temple could have no other connection than with the figure of the High Priest. Only the High Priest could go beyond the veil of the Temple into the Holy of Holies itself, and then only on the Day of Atonement (\textit{Yom Kippur})\textsuperscript{24} when he would sprinkle the blood, first of a bull and then of a goat, on the mercy seat above the Ark. This symbolic action was believed to reestablish the connection between God and His people for the ensuing year.

\textsuperscript{17} These connections persuade John H. Sailhamer, \textit{Genesis} (Grand Rapids: Zondervan, 1990), to say, “The description of the Garden of Eden appears to be deliberately cast to foreshadow the description of the tabernacle found later in the Pentateuch. The garden, like the tabernacle, was the place where man could enjoy the fellowship and presence of God” (Sailhamer, \textit{Genesis}, 2:41). Sailhamer observes that cherubim are not the only connecting symbol. There are also the references to gold and precious stones both in relation to the Garden of Eden and the Tabernacle (ibid., 2:43).

\textsuperscript{18} Exod 26:1, 31; 36:8, 35.

\textsuperscript{19} Exod 25:18-22; 37:7-9; 1 Kgs 6:23--35.

\textsuperscript{20} See \textit{Midr. Lev} 35. 6.


\textsuperscript{22} Ibid., 266-69.

\textsuperscript{23} \textit{Midr. Gen} 15:6. The quotation is from Rabbi Judah ben Rabbi Ila'i. \textit{Tg. Ps.-J.} Gen 2:9 speaks of the Tree of Life “whose height was a journey of five hundred years.” See also \textit{Midr. Cant} 6. 9, 2-3. “It was taught: The Tree of Life would take one five hundred years to go round, and all the waters of creation issue in various directions from beneath it. R. Judah b. R. Ila'i said: Its trunk is not all; even its foliage also extends a distance of five hundred years' journey.” The text goes on to say that the length of the world itself is a five-hundred years journey, and the whole world is to Gehinnom (hell) like the lid of a pot is to the pot. “The world is one-sixtieth of Eden, and Eden is immeasurable.” This could be no ordinary tree.

\textsuperscript{24} The ceremonies of the Day of Atonement are described in the Talmud in \textit{b. Yoma}. 
There can be little doubt that the regalia of the High Priest, along with the rituals of the Day of Atonement, connected him with the figure of Cosmic Man. The priest is arrayed with regalia symbolizing elements of the cosmos. Before entering into the Holy of Holies, he must divest himself of this regalia and don the pure white robes of humility. There is good reason to believe that his trek from the Outer Court of the Temple to the Holy of Holies symbolized his journey from earth through the visible heavens to the invisible heavens where the throne of God was situated.\textsuperscript{25} The Ark of the Covenant in the Holy of Holies would have functioned as the earthly reflection of the Divine Throne.\textsuperscript{26} Hence, while the theme of Genesis 3 centers on Adam’s loss of access to the Tree of Life, the rituals of the Day of Atonement signaled a reestablishment of access to the holy presence of God that Adam lost. The reestablishment of this access also signaled nothing less than the prospect of victory over chaos and cosmic restoration.

The theme of cosmic restoration is evidenced by the fact that the Day of Atonement preceded Tabernacles (\textit{Sukkoth}), the great eschatological feast that pointed to Yahweh’s future victory over every manifestation of chaos and the securing of God’s kingship over the entire earth. These ideas were closely correlated with the Hebrew belief that the Temple—and most notably the altar of burnt offering\textsuperscript{27}—rested over the \textit{tehom} (the deep) and served as the capstone over chaos.\textsuperscript{28} The place of the High Priest in the Temple rituals of sacrifice upon the burnt offering altar and his ascent from the Outer Court of the Temple to the Holy of Holies would have connected themes of a subduing of chaos and a reestablishing of cosmic harmony as well.

\textsuperscript{25}This symbolic connection is suggested by a Midrash on the Song of Songs (\textit{Midr. Cant} 3, 10, 4) where the celestial Holy of Holies is viewed as the counterpart of the lower holy of holies.

\textsuperscript{26}As the \textit{Midr. Exod} 4:13 states, “The [position of the terrestrial] Sanctuary corresponds with that of the heavenly Sanctuary and the [position of the] ark with that of the heavenly Throne.” The development of the theme of the ascent to the throne or \textit{merkahab} in the Judaism of the Interbiblical Period and thereafter is of great interest. Gershom Sholem notes that descriptions of the \textit{merkahab} begin in the first chapter of Ezekiel, and from this point were developed in interbiblical writings such as the Slavonic Book of Enoch (\textit{2 Enoch}), a book which describes Enoch’s ascent through the nine heavens to the throne of God in the tenth heaven. Such descriptions also occur in the \textit{Martyrdom and Ascension of Isaiah}, the Talmud, the Midrash, and the Dead Sea Scrolls (Sholem, \textit{Kabbalah} [New York: Meridian, 1974], 14-19). Besides the description in Slavonic Enoch, some of the “Songs of the Sabbath Service” in the Dead Sea Scrolls, which describe the \textit{merkahab}, are of the greatest antiquity. See, e.g., 4Q303. 1. 33-45. In this Psalm, the number of ascent (seven) is mentioned no less than thirty-seven times. See also 4Q303 2. 1-37; 4Q405 14. 1-8; 4Q405. frags. 15 and 16. 19, 20, 21, 22, and 23. In many of these fragments, the number seven recurs in connection with the ascent to the Holy of Holies of the temple, which is also viewed as an ascent to the imperium where the throne of God is established.

\textsuperscript{27}See Eric Burrows’s discussion of the relation between the Babylonian \textit{apsu} and the Hebrew \textit{Tehom} (“Some Cosmological Patterns,” in \textit{The Labyrinth}, 55). Burrows quotes from the Tg. Ps.-J. Exod 28:30, where it is stated that the temple-rock closes “the mouth of the tehom.” This Targum speaks of “the great and holy Name through which the three hundred and ten worlds were created, and which was clearly inscribed on the foundation stone with which the Lord of the world sealed the mouth of the great deep from the beginning.” For other references, see Burrows, 55-59.

\textsuperscript{28}According to Babylonian Talmud tractate \textit{b Sukk}. 53a-b, King David discovered that the deep was threatening to erupt from the pits beneath the altar and submerge the world. His teacher, Ahitophel, thus instructed him to inscribe the Divine Name, the name of Yahweh, upon a piece of broken pot and cast it into the pits. After King David did this, the waters descended sixteen thousand cubits. The legend recounts how David afterward uttered the fifteen Psalms of Ascents (Pss 120-134) in order to make the deep rise fifteen thousand cubits so that it would be within one thousand cubits of the earth. Having risen to this level, the deep would then be able to water the earth. In Hebrew literature such as the Babylonian Talmud and the Book of Job, chapter thirty-eight, the idea of a cornerstone of creation holding back the waters of chaos is mentioned. In Job, chapter thirty-eight, God lays such a cornerstone, thus shutting up the sea behind doors “when it burst forth from the womb” (Job 38:8).
After the Babylonian exile, the prophet Zechariah would make explicit this connection between the Feast of Tabernacles and the Hebrew eschatological hope, for the fourteenth chapter of his prophecy contains repeated references to the Feast of Tabernacles.\(^{29}\) In that future time, God would accomplish his victory over the nations that had gone up to battle against Jerusalem,\(^{30}\) the alternation of daytime and nighttime would cease as God’s light would become the only light, and living waters would flow out from Jerusalem.\(^{31}\) In the Babylonian Talmud, images of the slaying of the dragon Leviathan are directly correlated with the construction of the Tabernacle of the New Jerusalem and the illumination of the city in the age to come. In that day, the canopy of Jerusalem would be fashioned from the skin of Leviathan (described as precious stones), whose splendor would shine from one end of the world to the other.\(^{32}\) This reflects similar themes in the Babylonian creation story where Marduk brings cosmic order out of the body of the slain dragon, Ti’amat.

**III. The Son of Man as Eschatological Adam:** While I have tried to show that the themes of subjugation of chaos and cosmic restoration have connections with Hebrew kingship and the high priesthood, I have suggested that the figure of Adam links kingship and the high priesthood by means of a comprehensive symbol. Now I want to suggest that the figure of the Son of Man in Daniel 7:13-14 should be viewed in the same way. The connection of the Ancient of Days with the Divine Throne is obvious, for the description of the stream of fire that proceeds from the Throne\(^{33}\) has connections with the Temple and the Divine-Throne motif in Hebrew thought. One rabbi describes the life-giving stream of Ezekiel 47 as originating from the Ark of the Covenant,\(^{34}\) which, as I have noted previously, was viewed as an earthly reflection of the Divine Throne.\(^{35}\) In Daniel, this stream is a stream of fire, but we should not forget that fire and water

\(^{29}\) Zech 14:16, 18, 19.

\(^{30}\) Zech 14:12-15.

\(^{31}\) Zech 14:8.

\(^{32}\) Baba Bathra 75a. For the association of serpents with precious stones, see Eliade, *Patterns in Comparative Religion*, 441-46.

\(^{33}\) Dan 7:10.

\(^{34}\) Rabbi Eliezer ben Jacob says in the Talmud that the river which will flow from the temple in the final age will be a place where men and women afflicted with gonorrhea, menstruating women, and women after childbirth could bathe. This is the same fountain spoken of in Zechariah 13:1, the fountain which would be opened up to the house of David and the inhabitants of Jerusalem for sin and impurity (*b. Yoma* 78a). The Tg. Zech. 13:1 states that the teaching of the law shall be revealed like a spring of water. See also Tg. Isa 12:3. Other rabbis would claim that the stream had its origin not at the place south of the altar, but at the very Ark of the Covenant where it began as a stream so small that it resembled the antennae of a locust. Rabbi Jeremia, in the Talmud, locates the origin of the river at the Holy of Holies (*b. Sanh.* 100a). Rabbi Phinehas, following the lead of Rabbi Huna of Sephoris, says that this river in the age to come begins at the holy of holies, where it resembles the antennae of locusts. As it continues to flow from that point, it becomes ever wider and deeper until at length it Swells into a rushing river (*b. Yoma* 77b-78a).

\(^{35}\) In Ezekiel’s prophecy (chapter 47) the life-giving stream has its origin from south of the altar of burnt offering, which was the exact location of the Bronze Sea. The Bronze Sea may well have functioned as a symbol of that chaos that Yahweh circumscribed within bounds when he created the world. See, e.g., Aubrey R. Johnson, “The Role of the King in the Jerusalem Cultus,” in *The Labyrinth*, 87. J. L. Mihelic notes that the “cosmic symbolism of the object has long been noted, and comparison has been made with the Babylonian *apsu*, a term used for the fresh-water ‘deep’ from which all life and fertility were derived” (Mihelic, s. v. “Sea, Molten,” in *IDB*, 4:253). W. F. Stinespring observes that Egyptian temples also had beside them a “sacred lake,” the purpose of which was
are often thematically related. One instance can be seen in the contrast between baptism in water and baptism with the Holy Spirit and with fire.

The figure that approaches the Ancient of Days is described as one like a Son of Man who comes on the clouds of heaven. John Day suggests that this description must have its basis in the Canaanite myth of Ba’al’s reception of the kingdom from El, for the fact that the figure comes on clouds can only reflect the idea of Baal as Rider of the Clouds. This interpretation seems inconceivable, however, if one remembers how Israelite kingship ideas were transformed in the light of Hebrew monotheism. A more likely interpretation would be that the Son of Man is an idealized, eschatological cosmic man—a king-priest—who will inherit from Yahweh the restored dominion over the beasts relinquished by Adam. Now, however, the beasts are not merely the beasts of Eden. Rather, they represent bestial spirits that animate certain kings, who in turn are representative of their successive world empires. The fact that these empires arise out of the sea reveals that their origin is the chaos. The fact that the Son of Man comes on the clouds does not have to suggest that he was originally conceived as a divine figure, but may be a way of referring to fact that the foundation and authorization of his kingdom is heavenly. The figure that Daniel might have had in mind may have been Judas Maccabaeus, the great liberator of the Jewish people from Seleucid rule.

Whatever interpretation one takes, however, there can be little doubt about the messianic significance of this symbolism. Neither can there be doubt as to why this symbolism survived after the time of the Maccabees, for the end of the Maccabean dynasty in 63 B.C. would have left the eschatological hope for the everlasting kingdom of the Son of Man an unfulfilled dream.

New Testament Transformations

1. The Son of Man as the “Ladder” to the Age to Come: Though Jesus used the designation “Son of Man” in senses other than that found in Daniel 7:13-14, his use of this designation in the sense found in Daniel does also occur. One example appears in the account of Jesus’ trial in Matthew 26:63-64. The High Priest charges Jesus under oath to the living God, “Tell us if you are the Christ, the Son of God.” Jesus responds, “Yes, it is as you say. . . But I say to all of you; In the future you will see the Son of Man sitting at the right hand of the Mighty One and coming on the clouds of heaven.” The High Priest, outraged, tears his robes at this reply and charges Jesus with blasphemy.

As Albert Schweitzer recognized, the apocalyptic significance of Jesus’ words here cannot be doubted. The reference is clearly to the Son of Man theme from Daniel 7. Many scholars, however, believe that the apocalyptic symbolism used in the Synoptics was obfuscated in the Gospel of John by what appears to be the spatial metaphor of Jesus as the ladder between

for ablutions. It was “filled with Nun, water from the subterranean Nile or ocean, with great cleansing and fructifying power” (Stinepring, s. v. “Temple, Jerusalem,” in IDB, 4:541). That the bronze sea rested on the backs of twelve bulls also suggests its connection with fertility, since bovines in Egypt, Canaan, and Mesopotamia were fertility symbols. For the symbolic connection between the bronze sea and the sea which compasses the world, see also Midr. Nun 13:14.

36 God’s Conflict with the Dragon and the Sea, 157-67.

37 Matt 26:63-64 (NIV).
heaven and earth. In John 1:45-51, the “Son of Man” is viewed in the light of Jacob’s vision of the ladder stretched between heaven and earth.

Philip found Nathanael and said to him, “We have found Him of whom Moses in the Law and also the Prophets wrote, Jesus of Nazareth, the son of Joseph.” And Nathanael said to him, “Can any good thing come out of Nazareth?” Philip said to him, “Come and see.” Jesus saw Nathanael coming to Him, and said of him, “Behold an Israelite indeed, in whom is no guile!” Nathanael said to Him, “How do You know me?” Jesus answered and said to him, “Before Philip called you, when you were under the fig tree, I saw you.” Nathanael answered Him, “Rabbi, You are the Son of God; You are the King of Israel.” Jesus answered and said to him, “Because I said to you that I saw you under the fig tree, do you believe? You shall see greater things than these.” And He said to him, “Truly, truly, I say to you, you shall see the heavens opened, and the angels of God ascending and descending on the Son of Man.”

The contrast between Nathaniel and Jacob becomes clear in verse forty-seven where Jesus says to Nathanael, “Behold an Israelite indeed, in whom is no guile.” The name Jacob, which means “beguiler,” “trickster,” or “deceiver,” was changed to “Israel” or “he strives with God” after he struggled with the angel at the ford of the River Jabbok. Nathanael is thus portrayed here as an “Israel” in whom there is no ‘Jacob.’

The words of Jesus that follow refer to the Old Testament account of Jacob’s ladder on which the angels of God ascended and descended. At first glance, it is difficult to see how the Son of Man idea from Daniel connects at all with the theme of Jacob’s ladder, for the ladder does indeed seem to suggest spatially oriented symbolism. However, a first century work entitled The Ladder of Jacob may point to the possibility that John’s symbolism is, in fact, temporal as well as spatial. In this work, the ladder which Jacob beholds in his vision is the ladder of this age, and its twelve steps the periods of this age. On each step of this ladder there are two faces—twenty-four in all—which are the faces of the kings of the ungodly nations who will interrogate the descendants of Jacob. The Ladder of Jacob also predicts the coming of a “heavenly man” who will join the things of heaven with the things of earth. This reference undoubtedly reflects the idea of the Son of Man found in Daniel.


40 NAS Translation.


42 See L. Hicks, s. v. “Jacob (Israel),” in IDB, 2:882-83; and A. Haldar, s. v. “Israel, Names and Associations of,” in IDB, 2:756.

43 Gen 28:12-14.

44 The Ladder of Jacob 5:1-5.
A rabbinc Midrash on Exodus contains a similar concept. The angels Jacob saw are described as the guardian angels of every empire. The ascent and descent of the angels is viewed as the rise and fall of the world’s kingdoms. God shows Jacob through this vision how the many peoples, governors, and rulers which would arise from each kingdom would also fall just as surely as they had risen. According to this Midrash, God urges Jacob to ascend the ladder just as the other nations had done, but Jacob, expressing his doubts, replies, “I fear lest I shall fall just as these have fallen.” God then says to Jacob, “Be thou not afraid, for just as I will never fall from My greatness, so neither thou nor thy children will ever descend from their greatness.”  

The Son of Man in John’s Gospel could be, in this respect, he who shall inherit of the Kingdoms of the World, and he who will make possible the people of God’s conquest and possession of spiritual territory hitherto occupied by those principalities and powers which have kept this present world in darkness.

The affirmation that Jesus was the Son of Man continued to be important to the writers of the New Testament. The temporal aspect alluded to in the above paragraph may be continued in the Book of Acts where the expansion of Christianity is linked to the martyrdom of Stephen, who saw the heavens opened and the Son of Man standing at the Father’s right hand. Read in the light of Joshua, the Book of Acts appears as the Christian version of earlier descriptions of political conquest, settlement, and expansion.

The author of the Book of Revelation also uses the Son of Man theme in such a way that its political significance cannot be doubted. Revelation 1:7 reads, "Look, he is coming with the clouds, and every eye will see him, even those who pierced him; and all the peoples of the earth will mourn because of him. So shall it be! Amen" (NIV version).

In the beginning chapters of the Revelation, imagery from the Jewish Feast of Dedication figures prominently in John’s vision of the Son of Man who walks among the seven candlesticks. In Daniel, the Son of Man comes before the Ancient of Days to receive all of the kingdoms of the world and to establish an everlasting dominion. The Book of Revelation expresses the same expectation that the kingdoms of this world will become the kingdom of our Lord and of his Christ, “and he shall reign forever and ever.” However, what is unique about the description of the Son of Man in Revelation is that symbolism once attributed to the Ancient of Days, along with descriptions of Yahweh in Ezekiel’s throne vision, are now attributed to the Son of Man as well. The pre-Christian distinction between the figures of the Son of Man and the Ancient of Days is abandoned as the two figures merge into a single, more comprehensive image. This cannot be understood as anything other than the highest affirmation that the Son of Man is more than an eschatological Adam; he is also the Ancient of Days himself. Similar symbolic mergers exist with regard to Divine Throne symbolism, where the slain Lamb is identified with the reality of the Divine Throne. The idea of Jesus as suffering messiah is thus interwoven into the rich tapestry of the greater symbolic network that would have been familiar to the Jewish mind of the first century.

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46 See Austin Farrar, A Rebirth of Images (Gloucester, Mass.: Peter Smith, 1970), 97.
47 Dan 7:13-14.
48 Rev 11:15.
II. Transformation of Son of Man Symbolism in the Light of Messianic Suffering: One problem that has confounded scholars concerning the use of Son of Man imagery in the New Testament is the appearance of Son of Man verses that affirm the humility of Jesus, an idea that seems on the surface to be out of sync with the Daniel 7:13-14 passage’s emphasis on the one who receives an everlasting kingdom. Norman Perrin has provided a useful insight that I believe overcomes this problem—namely, the idea that the early Christians practiced the Hebrew method of literary interpretation known as the *pesher*. Using this method, early Christian commentators on the Old Testament could interweave scriptures having differing theological emphases in order to accomplish a particular objective. One example of Christian *pesher* can be seen in Matthew 3:17, where the phrase “This is my beloved Son” (from Psalm 2:7) is combined with the phrase “in whom I am well pleased” (from Isaiah 42:1). The Psalm 2:7 refers to the theme of kingship, while Isaiah 42:1 refers to that of servanthood. By interweaving these verses, the kingship and servanthood of Jesus Christ are inseparably woven into an affirmation of the full reality of his personhood. There can be little doubt that the idea of the Son of Man underwent a similar redefinition in the light of the suffering and crucifixion of Jesus. This redefinition is not merely superficial but represents a thoroughgoing transformation of the earlier Jewish perspective on the Son of Man. This corresponds to the way that the Jewish understanding of the messiah as a political liberator was also transformed in the light of Jesus’ suffering, death, and resurrection.

There can be little doubt that the symbolic network associated with the figure of the Son of Man was important for the writer of the Book of Revelation. The sea, the dragon with seven heads and ten horns, the Beast that rises up out of the sea—all appear as connected symbols in the Book of Revelation. The theme of conquest is also dominant. God and his Messiah will vindicate the persecuted saints and bring retribution to their persecutors. But what is unmistakable is transformation of earlier ideas of holy war in the light of the suffering, death, and resurrection of Jesus.

Finally, the author of the Book of Revelation prophesies that with the coming of the New Heaven and the New Earth there will be “no more sea.” Since an end has come to the sea of chaos itself, there is no prospect that future beasts, which derive their existence from this sea, will arise. Instead, a river of the water of life flows from the throne of God and the Lamb. Accompanying the replacement of the sea of chaos with the life-giving stream are symbols derived from the Feast of Tabernacles and the Garden of Eden. Themes of cosmic restoration and regaining the dominion over the earth lost by Adam again appear.

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50 E. g., Matt 3:17.

51 See Rev 1:7, “And they shall look upon him whom they have pierced.”


53 Rev 21:3.

Implications of the Son of Man Symbol for a Christian Transforming Worldview

The Son of Man symbol is surely one of the most important for understanding the relationship between the Christian faith and ideas of political transformation. The context of Daniel 7 upholds the political significance of the Son of Man in that he who receives an everlasting dominion from the Ancient of Days is also the one whom all nations and peoples will serve. However, Jewish and Christian positions on the question of how this dominion is to be secured are not uniform. Jewish messianic expectation was by and large political, and is better understood within the traditional context of the practice of Holy War. This context is transformed in the New Testament. First, Christian martyrdom is viewed in the Book of Acts as the main means of establishing the authenticity of the claims that Jesus is the Son of Man.\textsuperscript{55} Martyrdom is not viewed as political failure but as a testimony to the assurance of Christian hope that success is inevitable and cannot be stopped even by death.

Second, political change and conquest begins primarily with the change and conquest of the human heart. This does not mean that the older understanding of political change through battle is completely abolished. Those who interfere with the coming reign of the Son of Man fall under divine judgment. This is in keeping with the prophecy of Jesus that the rejection of “the cornerstone” by the religious leaders of his day would result in divine judgment against them. The destruction of the temple in Jerusalem would be the tangible manifestation of this judgment upon the Jewish religious establishment for its rejection of the messiah. The conviction that God’s judgment will fall upon the kingdoms of this world is continued in the Book of Revelation. References to battles such as Armageddon and Gog and Magog suggest that the saints of the Most High will at times find themselves facing persecution and may have to face the reality of battle. It is difficult to conclude from the New Testament that the coming of grace in Jesus Christ somehow annuls the theme of judgment that is so prominent in Judaism. If anything, the coming of abundant grace raises the level of the severity of divine judgment. Divine judgment is, moreover, not only confined now to the political dimension but becomes focused on individuals and the church as well. The earlier dualism implied in the myth of the hero slaying the dragon allowed persons to distinguish between good and evil along sociological lines in which the “us” was identified with persons who are on God’s side, and the “them” with persons on the side of the dragon or beasts. Now the dualism is understood to exist within the human individual as well as in the world outside. One can no longer have confidence that one is entirely on the side of righteousness in the light of Paul’s statements—that “there is none righteous, no not one,”\textsuperscript{56} and that “all have sinned and come short of the glory of God.”\textsuperscript{57} The battle now rages on two fronts, and this is what makes the Christian position toward war so difficult. The one who struggles against evil can never forget the fact that he may well share the blame for the very evil he is called upon to fight against. The Christian attitude toward entrance into war can therefore never be one of trigger-happy jubilation but rather one of sorrow and regret that the human dilemma has forced the option of war upon one as a last resort. The good news of the kingdom of the Son of Man is that there is a superior way to face evil, and that is through bearing witness to the one who can secure victory over the beasts that rise from that sea of chaos which expresses itself through the human individual and collective unconscious. But

\textsuperscript{55} Rev 22:2-3.
\textsuperscript{56} Rom 3:10.
\textsuperscript{57} Rom 3:23.
this evil must be faced with courage, not with a reticence that is characteristic of non-interventionist approaches—some of which purport to be Christian—that teach a philosophy of “live and let live.” This philosophy may work in the best of all possible worlds, but the Christian conviction is that this is a world yet to come. Until the sea is no more, the struggle with the beasts, whether internal or external, must therefore continue. This struggle must not be rooted in human power and strategies, but in a strategy revealed by the content of the Christian revelation and in a power that is anchored in the sovereignty of God.
The Seventeenth Century: The Coming of Science

by James Huggins

[The following was formulated as an oral presentation for delivery to a faculty audience in the fall of 2002.]

The seventeenth century stands out as a time when God provided humanity with special ingredients that would result in the development of science and scientific thought—so much so that it has been called the century of genius. Many scientists were seemingly set into motion in numerous arenas: Giovanni Borelli, who worked with lenses and microscopes; Robert Boyle, who discovered that the pressure of a gas in a closed container is inversely proportional to the volume of the container, i.e., Boyle’s Law; Galileo Galilei, who defined mathematical laws that described the movement of bodies on the earth; Isaac Newton, who articulated the Law of Gravity; Johannes Kepler, who wrote on the Laws of Planetary Motion; John Ray, who was a founder of systematics; Antony von Leeuwenhoek, who was one of the first humans to see microorganisms through a magnifying lens; and Robert Hooke, who first reported to the world that life’s smallest living units were “little boxes” later known as cells. Marcella Malpighi and Jan Swammerdam were also classical microscopists of the first order who brought cognizance of our microscopic structure, and of the flora and fauna with which we coexist (Gardner, 1972). Through the efforts of these scientists, the advantages of inquiry through the scientific method—encompassing the progression from observation to data analysis to formulation of the hypothesis and the use of a control to generate new data and followed by the re-evaluation of the initial hypothesis to reach a conclusion—were realized and formalized. The seventeenth century emerged as a time when science and invention were wed, and the application of science advanced causes in agriculture, mining, navigation, and business. Was this simply a one-dimensional application of genius, or were there multidimensional aspects of the historical context that led to such a remarkable century in our journey as a species?

In retrospect, it is easy to see that science, along with the remarkable technologies that have sprung from it, is the single-most important factor that has demarcated the modern world from previous centuries. If we make the analogy of the development of society with the ontogeny of the human body, then the seventeenth century might represent the emergence of the final trimester of human society within the womb of time. For both the individual and for societal progression, if this comparison may be deemed appropriate, this period represents a spectacular time of growth. While this trimester, at first glance, might be lauded as the most “critical” of periods in the development of the individual, one must remember that the ability to achieve cellular proliferation at this point is dependent upon the remarkable cellular events preceding this stage. Nervous tissue will not migrate to necessary and final destinations unless primordial cells have laid the framework for predestined paths. In like fashion, science could not have been born without the “gastrulations” necessary for its final formation.

As academicians, we stand on the shoulders of those who have gone before us. The same is true for the seventeenth century scientists. Kepler, Galileo, Newton, and Descartes, widely regarded as the stars of the seventeenth century, are no exception. They were privy to the work of Copernicus from the sixteenth century, as Copernicus was privy to previous works such as the Pythagorean Theory and the truths and fallacies of thinkers such as Aristotle, Plato, Occam and
other great minds. Indeed, several of the works of the masterful minds of the seventeenth century were proofs of what Copernicus began, e.g., the Laws of Planetary Motion for Kepler and the Law of Inertia for Galileo (Russell, 1945). Newton did not merely take a hit from a gravitationally compromised apple, but instead stood on the pooled calculations and theories of Copernicus, Kepler, and Galileo. The discoveries, the ideas, the failures, and the successes of previous generations had reached critical mass; science was to become a force in the progress of humankind. I would suggest that no person within a single lifetime who expects to make a significant contribution to science can stand alone when he attempts to think with the thoughts of God behind him. Such was the case at this point also. The accumulated progressions of the human family had reached a contextual summit in which the thinkers of the seventeenth century could, so to speak, peer over the barriers that veiled both truth and future. Within sight were the answers to some of God’s riddles. These riddles had been hidden, and certainly not by intention, by His superior knowledge and were finally within the cooperative and cumulative grasp of humankind’s hand.

Let’s explore some factors that may have contributed to this coming of science. Recall if you will that the Thirty Years’ War ended with the Peace of Westphalia (1648) in the middle of the century. The dissolution of the Holy Roman Empire was effectively complete at this point, both in politics and international law. While there were many distractions to the development of science that resulted from this war during the first half of the seventeenth century, there arose during the latter half many new sovereign states (Palmer and Colton, 1995). Scientists consequently were effectively out from under the watchful eye of the Pope and freer to take up more controversial pursuits. Governance was relaxing its grip on the control of scientific investigation.

Human societal structures too had progressed to the point that elements within society did not need to be solely concerned with “hunting and gathering,” i.e., the compulsory work of scraping up enough food for daily subsistence. Segments of the population now found time for education and the arts; some possessed enough wealth to support academic efforts for themselves and others. There were even societies, or academies as they were known, that existed to offer financial and moral support to the aspiring scientist. Some examples of academies that flourished during the seventeenth century include the Academy of Experiments in Italy, the French Academy of Science, the Royal Society of London, and the Academy of the Lynx in Rome, whose motto was “sharp eyesight and keen observation” (Gardner, 1972). Correspondence and the sharing of information and ideas burst upon the scene. It became a matter of prestige for the aspiring scientist to be deemed worthy of correspondence with those who had already contributed to science. While universities had been established for some time, studies in medicine had included virtually no basic science or experimental procedures within the curriculum. However, with the advent of the seventeenth century and the blazing of a trail that led to discovery, these courses began to slowly work their way into the rigorous liberal arts curriculum previously deemed necessary for medical students.

Scientists of the seventeenth century were finally able to collect and analyze the works of others, then applying their own ingenuity to the problem. Certainly other humans on countless occasions throughout history have discovered things that advanced the well-being of the species. However, at the seventeenth century we had finally reached a point at which knowledge could be appreciated for and even beyond its application. Discovery for the sake of discovery could now be valued. Having finally been set free with resources and time within a rapidly forming framework of factual information, the work of these individuals resulted not only in pure
knowledge, but in methods that catapulted our world into one of proofs and logic. While this was not the first time aspects of the scientific method were used, it was a time when the method engrained itself into formal procedures that would come to be expected of all who sought to take science further. It should be noted that the application of these procedures has thoroughly permeated other academic disciplines. The linguist, the economist, the social scientist, and indeed most persons in academic disciplines use some form of the scientific method when they enjoin research for discovery. Perhaps of greater importance, the method called into question a multitude of time-honored assumptions. For scientists at this juncture in our history, it became the “how” and the “why” of what they believed rather than the “what” which distinguished them from others in the past and brought the world into a time of Enlightenment (Russell, 1945).

Therefore, I would contend that the stage was set and the time right for humans, gifted ones to be sure, to combine patience and clarity of mind with the skills of observation. Thoughtful progression through the acts of discovery allowed them adequately to form and test hypotheses, even those that may have seemed ridiculous to the accepted wisdom of the day. It seems to me that the scientists of the seventeenth century were distinguished not so much by being the first great modern thinkers, but rather as among the first thinkers existing at the confluence of forces that provided the climate necessary for real and deep discovery to materialize.

To be sure, problems existed for these architects of scientific thought who were working during this third trimester in the womb of societal gestation. Scientific findings often clashed with preconceived notions of the clergy who, along with physicians, represented the only previously educated segments of society. The findings of Copernicus concerning heliocentricity were “admonished” by both Luther and Calvin. These men concurred with assumptions that we on earth were the center of all God’s creation, and Calvin, when offering an opinion on Copernican findings, is said to have righteous exclaimed, “Who will venture to place the authority of Copernicus above that of the Holy Spirit?” Even though some scholars (McGrath, 1999) claim only Luther spoke caustically of the theory, religion’s propensity for correcting science was nevertheless the same. While God never said that the earth was the center of our universe, it had been surmised that even the most illiterate person of the day would be able to ascertain that because Joshua commanded the sun to be still and the shadow went backwards in the time of Hezekiah, the sun certainly and surely had to revolve around the earth. All this was held to be self-evident truth, despite the fact that none had tested the hypothesis. No one seemed to question that when Peter pronounced “Money have I none but such as I have I give to you in the name of Jesus. Arise and walk,” he had not the slightest idea how God accomplished the feat. However, God understood the needs surrounding the requests of Joshua and Hezekiah, just as He understood the plea set forth by Peter. The request was granted, but no explanation of the science was or has since been offered by our Creator.

Perhaps the greatest of the injustices afforded to a scientist of any century, and certainly to one of the seventeenth century, was dealt to Galileo. Galileo, whose clash with the Church is legendary, found that his confirmation of the existence of several as yet undiscovered heavenly bodies, which exceeded the currently sacred number of seven recognized at that time, and his adoption of Copernican heliocentrism would bring him great anguish. His proclamation of these truths wrought from scientific experimentation led to his condemnation by the Inquisition both in private and publicly in 1632 (Russell, 1945). He was later, under threat of excommunication and perhaps torture, forced to recant his aforesaid positions and made to promise he would never again espouse that the earth rotated around the sun. No small amount of damage, past and
present, has been done to and by the Church with this single misguided act. Unfortunately, once Galileo’s theories became accepted as fact and his work was recognized as taking our understanding of the universe and the laws of nature to a new plane, the Church and some of its interpretations came to be seen as fallible. By contrast, science, following the almost simultaneous discovery of the previously unimagined immensity and the unforeseen minuscule nature of the components of our universe, was propelled into a new and eminently prestigious position within society.

The advent of real hypothesis-testing science began to create within the populace a profound change in the perception of the place of our species and resulted in an unprecedented fear on the part of the governing powers of the day, i.e., those within the clergy and government who attempted to hold onto the orthodoxy spawned prior to this prelude to the Age of Enlightenment. Our medieval place at the center of the universe was in question, and indeed many did sincerely begin to doubt that “the Heavens had been created for the glory of God.” The religious doubts and fallacies that emerged from the science of the seventeenth century have persisted until the present and, according to scripture, can be expected to follow humankind until Christ returns. There seems, at least to me, great irony in the fact that while an altered view of the universe precipitated a great falling away from the faith, a similar adjustment to our understanding of science is touted as necessary, plausible and acceptable. Our scientific view of the universe, as enunciated through the works of Galileo and Newton, has in fact been altered considerably since its inception, i.e., the amalgamation of space and time into a space-time continuum. In like fashion, our understanding of scripture in light of science, predicated upon our ascension up the ladder of knowledge acquisition and the certainty of the proposed new information, should in no way dispossess us of our faith. Humans, being anything but omniscient, by necessity interpret our environment and scripture through the portal of our experience. As our knowledge level—and hence our collective experience—changes, so can our understanding of God’s revelation. Herein was the problem that surrounded the Church with the inception of heliocentrism. In time, the Church reacted properly, in that as the burden of proof came down on the side of science, so did our understanding of Scripture. This issue was not one that should have challenged our faith in the first place; it merely ousted long established tradition that never came directly from scripture. Experience should be tempered with reason, but it must be done within the context of faith. It should be noted that the Catholic Church officially apologized, in 1992, albeit a long time coming, for its seventeenth century treatment of Galileo (Los Angeles Times).

In Europe, the end of universal monarchy and the major blow dealt to the principle of *eius regio, eius religio* in 1648 at The Peace of Westphalia (Palmer and Colton, 1995) added to a euphoric sense of meaningful direction that seemed to affect much of the world. There was a greater freedom to worship as one would or would not. The spirit of the eighteenth century Enlightenment is held by some to be the direct result of the scientific revolution that took place in the seventeenth century. Accordingly, “modern” seventeenth century people ceased to fear both God and the devil, and a watchmaker mentality of God began to replace that of a loving Father. As might be expected, people of faith responded to this perceived slide from orthodoxy. Major revivals were held in the century by John Wesley in England and George Whitfield in America, and the Great Awakening was born in the 1740’s. Accompanying this evangelistic movement were the great spiritual hymns, oratorios and anthems of Isaac Watts, J.S. Bach, and the Messiah (Palmer and Colton, 1995). One person may have thought that good flowed from God while another held that this was the result of science, but both felt the future to be
exceptionally bright. Seemingly, at long last the principle of freedom of worship was practiced, if not always officially condoned. From this body of opinion, belief, judgment, doubt and attitude there did indeed seem to grow among the people a conviction that time would produce increasingly enlightened generations of people and improved world conditions with each generation. This indomitable spirit did much to usher in the Enlightenment of the eighteenth century.

If the seventeenth century represented the third trimester of a birthing process, then surely our infant burst from the womb during the eighteenth century into a bright new environment that could and would support the rapid growth of a world in infancy that was frantically striving to take its first steps toward adulthood. At this point I would like to delve into what I consider to be some lasting effects that were spawned from the magnificent seventeenth century and to examine some results of the interactions between the science which grew from the seventeenth century and human endeavor.

The cumulative increase in all forms of knowledge across both the seventeenth and the eighteenth centuries fed through technological advances the accumulation of wealth in Western societies. A positive feedback system developed between scientific and technical information acquisition and the accumulation of wealth, in that an increase in one supported an increase in the other. The partnership of basic science, in the form of discovery, with the science of application and the business world was born, and this mutual relationship has continued across the millennia. In fact, those states which have led the world in science and its application seem to have embarked, since the eighteenth century, upon a never-ending mission to advance “progress” as defined primarily by the accumulation of wealth and the acquisition of technology. It has been well documented that within the Western countries science fueled an agricultural revolution, which laid the foundations for the Industrial Revolution, which necessarily went before the post-industrial Information Age now predicated by the Biotech Century. While the economy may have fueled these “advancements,” it has been the engine of science that has pulled the cart. It seems the process of discovery and its resulting applications have been critical to every developmental stage of society since the seventeenth century.

History will record that, along our developmental path as a global community, science and technology have played a dominant role toward creating a divided planet: the techno haves and the techno have-nots. Riches and power have followed those cultures which nurtured and developed the art of science and invention. We must ask ourselves if it is sufficiently appropriate for the god of science to allow one culture or state to lord it over another equally valid but developmentally different culture. Jared Diamond (1999), trained as a bird evolutionist and an accomplished researcher within the field, has gained remarkable insight into the cultures and lives of hominids during his extensive research travels. Diamond holds there to be no greater genius residing in any one race over another. He adeptly explains that technology acquisition is a cultural icon that will allow or discourage its own use along various paths. The technology that is most useful for the individual culture is utilized while others, despite any intrinsic properties for future use, will likely be discarded.

Another of Diamond’s remarkable insights suggests that hunter-gatherer societies became communal ones complete with laws and governance only when physical space necessitated frequent interaction. Extrapolating from this principle, we may make the application that, courtesy of advanced technology, cultures are now also forced into frequent interaction. From this illustration, we should realize the direction that globalization is taking us—it is here to stay. We as individuals and as societies will have to deal with it, if for no other reason than our
backyards now join. Our territories or national boundaries join not because the world has physically gotten smaller but because of improved science and technology within the realms of communications, computers, and travel. From these advancements we have developed global economies, politics, health care concerns, and threatening environmental problems (Scholte, 2000). Six billion people now claim our earth as home and, at least currently, there is nowhere else to go. Like it or not, we are all members of a global society, and every nation is a member state in a global community.

As previously illustrated, the accumulated knowledge harvested from scientific procedure and utilized through the genius of application for the benefit of the individual or the species has contributed immeasurably to the current level of sophistication achieved by humankind. Unfortunately, science can be a double-edged sword capable of great good or great evil and may be used maliciously or with beneficence. The consequential cuts in both directions may be made under the guise of some other intention or even unknowingly. It should be evident that with each progressive step into new territory, there are and will continue to be new problems crying out for resolution. Consequently the ladder of success, progress, and advancement that is often attributed to science is strewn with the refuse of its application. Is it our nature, our lack of insight or our greed that precludes our fixing problems at the front end of a given technological process or procedure? For example, within the environmental realm even our vast knowledge base concerning ecological cycles that are absolutely critical to the proper functioning of our planet has not prevented us from exploiting our planet for individual or national advantage. Fueled by the fires of the almighty economy and a human desire for convenience, the technological subsidy of our species has created a formidable list of problems that have progressed rapidly, in the context of our history, to worldwide scale. Global warming, atmospheric accumulation of ozone, stratospheric depletion of ozone, desertification, acid rain, air and water pollution, and a loss of biodiversity that surpasses anything ever witnessed on earth represent tribulations that have followed human ascendency to the role of planet earth’s undisputed physical sovereign. Are we as a species, however, a despotic monarch? At the risk of becoming too anthropomorphic, I will nevertheless ask this question: have we so repressively subjugated our environment that it too will rebel, as humans have always risen against self-centered and egotistical tyrants? As a species, we must consider this question carefully.

What has brought us to this manmade precipice? We clearly can follow a trail across history that leads us to the seventeenth century where crystallization of the techniques of science provided the means to go after our needs and our wants with uncanny and surgical precision. Suddenly nothing seemed beyond the grasp of the one made in the image of the Creator. But is it science itself that brought us to this stage in our development? To go back to our earlier analogy, at what point in our development have we come to as a species? Are we still floundering in adolescence, or have we doomed ourselves through our great capacity for invention to an early senescence? Has this facility for invention outpaced our capability for discipline or our application of ethics and morality? Are we capable in our humanity of managing our planetary domicile?

There are as many opinions which answer these questions as there are experts. As explained so eloquently by Mary Clark in her book *Ariadne’s Thread* (1989), some have adopted the Cassandra approach, and just as the daughter of the King of Troy in ecstatic trance prophesied the doom of the city, so they proclaim our certain demise. Others, who have received the seventeenth century baton of an unfailing trust in science as the answer to all of our
problems, believe that science will rescue us from the horrors of our current dilemma. Theirs, per Clark’s use of Eleanor Porter’s novel character, is the ever wistful stance that Pollyanna took.

It seems ironic that the very thing discarded by so many with the rise of science could have proven to be the antidote for humanity’s misbehavior, i.e., the morality and ethics that are part and parcel of true religion. To quote a popular song of my youth written by Barry McGuire, “I don’t believe we are on the eve of destruction.” I believe humankind has the answer to the global problems we have created and has had it for ages; we are in hot pursuit of it within Christian higher education. As Christian academicians and educators, I trust we can make a difference in this world by educating young men and women who understand the grief it brings to those of other cultures when they learn the Western world has access to and control of the lion’s share of the world’s resources. We can make a difference when the drama, art or music of young people enters the portal of our hearts and touches our national souls to “do the right thing” or to escape the comfort of our utopia and come to grips with the realities of life beyond the Western world. We can make a difference when our scientists and economists bring us to grips with and offer viable solutions to the ecological nightmare looming on our horizon. We can make a difference when our medical missionaries bring physical and spiritual healing to a hurting and misguided world. We can make a difference by becoming a nation that is willing to curtail our fossil fuel emission, to work physically and financially to alleviate suffering and crimes against humanity, and to dedicate ourselves to finding solutions to the world problems that threaten global stability. Our approach to such a daunting task must be a well-rounded and interdisciplinary one. As educators, we must insist that our students be as familiar with the classics of literature as the computer, as competent in their theology as in mathematics, and as skilled at psychology as in communication. Our students must be able to articulate clearly, perhaps in multiple languages, the principles for which they stand and the good which can be accomplished through business, education, science and the arts. They must understand the historical and political context of the varied social, cultural and political structures that shape the fringes of their international backyard. Just as Roman roads opened up a means for the dissemination of the Gospel to those Christians who lived in the first century, globalization allows Christians of the twenty-first century the opportunity to fulfill finally and completely the Great Commission and make a lasting physical as well as spiritual difference in our world.

Back to our developmental analogy, it will be humanity—not God, luck or destiny—which defines the next stage in our ontogeny. I mean no disrespect to our Lord with this statement, but just as He has allowed choice in so many aspects of our life and faith, so He will allow us to shape this aspect of our destiny. On the one hand is early senescence and on the other is a vigorous and viable global community. Changes in our nation and in our world must occur if we are to coexist peacefully and avoid the cultural fragmentation so evident in today’s world. High ideas must be put in place. To accomplish these changes will require leaders willing to acknowledge, accept and strive toward the commandment Jesus said was the second greatest: “Love thy neighbor as thyself.” We must accept science for what it is: a great and marvelous tool, but just a tool. We must not allow it to take our faith, but rather to strengthen it; we must do all we can to reinstate our Lord to His rightful position within the hearts of humankind. Early in our societal ontogeny, many split science and faith. It is time to reunite them. I have spoken of the confluence of factors which shaped the “coming of science,” but the truth is that science is still “coming.” After five centuries, we have only begun to scratch the surface of the wonders of His creation. Despite our past record, science can still be applied across the various disciplines and, when united with faith, it can be used to reclaim our planet.
both physically and spiritually for the good of humankind and the greater glory of our God. It is to this effort that we as educators are called, and I pray it is to this destiny we send our own: our students, our champions.

References


The Project Approach: A Constructivist Teaching Option

by Carrie Whaley

Constructivism, a theory of how children learn or gain knowledge based upon the work of Jean Piaget, Lev Vygotsky, and John Dewey, is widely embraced by educators today. Constructivists believe that learning occurs when children encounter new experiences and seek to assimilate these experiences into their existing schemas (cognitive structures) or adjust their schemas to accommodate the new information. Knowledge cannot be imposed upon students; rather, children seek to develop a new understanding, or construct, for themselves. Constructivism should not be understood simply as a series of pedagogical strategies, but rather as a theory of learning. This understanding is crucial, because the implementation of practices perceived as constructivist, without an in-depth understanding of learning, will reduce constructivism to "little more than the acquisition of recipes for the teacher to use" (Blasi & Enge, 1998, p. 298).

The constructivist view of learning has implications for what role teachers can play in facilitating students' cognitive processing, with the emphasis on teachers and students sharing responsibility for initiating and guiding learning efforts. Learners should be provided with opportunities for making choices and with a wide repertoire of assessment strategies (Ray, 2002).

One example of constructivist practice that fulfills the aforementioned criteria is the Project Approach, begun in the mid 1980's by Lilian Katz and Sylvia Chard. The major tenet of the Project Approach is that "including project work in the curriculum promotes children's intellectual development by engaging their minds in observation and investigation of selected aspects of their experience and environment" (Katz & Chard, 2000, p. 2). Projects, although similar to themes and units, also have significant differences from them. Themes are broad concepts such as seasons; units are pre-planned lessons on a specific topic, such as fall. When planning the information for a unit, teachers usually have a plan for what they want students to learn. Projects, on the other hand, are a type of emergent curriculum, in which children become co-creators and co-players of the curriculum along with other members of the adult-child classroom community (Jones & Nimo, 1995). In one example of project work based on students' interests, Mrs. Scranton's preschool class undertook a study of fire trucks that lasted forty days and resulted in a wide array of student-created artifacts and learning experiences (Helm & Katz, 2001).

The term project approach refers to children's investigations that can be incorporated into the curriculum in a variety of ways. There is no single or "right" way to incorporate project work into a curriculum; the significant thing is that time is allocated for children to make observations and inquiries into topics that interest them over a sustained period of time (Katz & Chard, 2000). The Project Approach website (www.project-approach.com) lists a variety of projects that preschoolers and elementary classes have completed, including the cafeteria, hospital, grocery store, insects, food, ecosystems, and butterflies, to mention only a few.

As with constructivism in general, the practices included in the project approach are not new to the field of education. They were advocated in the U.S. by John Dewey during the progressive movement of the early twentieth century, and they closely resemble the Bank Street curriculum model developed at the Bank Street College of Education. The Bank Street
Approach focuses on engaging children in meaningful learning activities rather than on achievement (Spodek & Brown, 1993). The schools in Reggio Emilia, Italy, employ a similar approach, including an emphasis on emerging curriculum which grows from the interests of the children. These schools use projects extensively and have been extremely successful in demonstrating the wealth of knowledge and skills gained in these projects through their use of aesthetically displayed documentation (Edwards, Gandini, & Forman, 1998).

Project work and systematic instruction can be seen as providing complementary learning opportunities. Project work is the part of the curriculum which is planned in negotiation with students and which supports and extends the more formal and teacher-directed instructional elements. In systematic instruction, students acquire skills, while in project work they apply those skills in meaningful contexts. Children need to learn to recognize for themselves the contexts in which skills might be used.

Because of the focus on inquiry in the Project Approach, it encourages students to design and investigate topics of interest to them. In classrooms today at all levels from preschool through college, students may be engaging in project work, while perhaps not even realizing it. At the preschool level, teachers follow the interests of the children as they plan topics of study. Through site visits and/or visiting experts, children explore firsthand a place or a thing and then "report" on their learning via pictures, videotapes, drawings, and dramatic play.

At the elementary level, students work together to explore questions and areas of interest which they have chosen in conjunction with the curriculum. Through interviews, experimentation, journaling, technology, and various forms of documentation, students immerse themselves in information and then serve as peer teachers as they present their findings to their classmates, parents, and/or others.

At the high school level, students have an opportunity to design their own investigations, decide on how to present these to the class, and even have input in how they will be assessed on the project. In one high school technology class, students designed a study on gender differences and used computers both for research and to create and display their results to the school community.

At the university level, students engage with their peers in on- and off-campus investigations. Students record reflective comments in journals, helping them to identify their personal beliefs and values with relation to classroom activities and field experiences. Assessment includes teacher, peer, and/or self-evaluations. Working together helps students understand that there is more than one answer to every question and more than one way to do almost everything. In the process, they learn a procedure for thinking through issues which allows them to become thinking individuals who will make informed decisions in their respective fields someday.

In 1994, President Bill Clinton signed into law the Goals 2000: Educate America Act, defining the nation's intent to revamp and revitalize the its educational system. The first goal, that "by the year 2000 all children in America will start school ready to learn" (Goals 2000, 1994), was also one of the most important, considering that more than nineteen million American children are under the age of five (Kids Count). In spite of the fact that nearly half these children receive care in nurseries and child care centers, kindergarten teachers report that one in three students is not equipped with the fundamental skills necessary for learning (Carnegie Corporation, 1994).

Because test scores for elementary and secondary students are equally dismal in too many schools, understanding both how students learn and how to motivate them to want to learn is
imperative for educators today. Classrooms should be places not just for relating facts, but for "listening, guiding, and helping individual children to make sense of the real world" (Hancock & Wingert, 1997, p. 36). The constructivist theory in general and the Project Approach in particular can help educators achieve these goals with students of all ages.

References


The Chaos of Human Emotion: A Unification of Biophysics and Metaphysics

by Glenn A. Marsch

Introduction

Human emotion is enigmatic and fascinating, having occupied theologians and philosophers for millennia. Until the twentieth century, studies of emotion were largely considered beyond the realm of science. But the advent of quantum mechanics and chaos theory has ushered in a wealth of speculation regarding the nature of reality and human behavior, and has precipitated a collapse of traditional deterministic models of the universe. Leaving behind the glories of celestial mechanics and gigalightyear cosmologies, we may consider the microcosm of the human mind. Neurobiologists, whose work many believe will one day unlock the biochemical basis of human behavior, are now elucidating the biochemical pathways that enable the brain to function. I propose that by studying the NPY-receptor \( Y_1 \) system and by pursuing interdisciplinary studies in theology, philosophy, and science, one can suggest consistent metaphysical and theological repercussions of the scientific findings.

John Polkinghorne, in *Faith of a Physicist* and other works, has cast a fresh look at ultimate questions by using the "bottom-up" approach critical to the scientific method. (By contrast, theologians tend to employ a "top-down" methodology to understand reality, applying general theological principles to all of life.) Experiments in contained vessels or miniscule, controlled systems can yield explanations that pertain to the entire universe. To scientists with a spiritual bent, this fact seems remarkable, a picture of a deeper reality.

Scientific truth is not all truth, and philosophers and theologians can ask metaphysical questions refractory to the scientific method. Yet with sufficient technological development, some ultimate issues once considered the bulwark of philosophy can be assailed by the scientific method. In the past, the inability to pinpoint a scientific basis for emotion (and consciousness) was due partly to the inability of scientists to construct a system with which they could perform fruitful, instructive experiments. We have now come to a milestone of inquiry where biologists and physicists can work alongside philosophers and theologians to study emotion.

In this new atmosphere, we can explore human emotion with the tools of science as well as the tools of theology, combining the "bottom-up" approach with the "top-down" one. To understand human emotion holistically, if not comprehensively, we must begin at the molecular level, studying the supple structures and interweaving interactions of macromolecules vital to human emotion. Can chaos theory describe such dynamic systems of biomolecules? And how do we understand these things in light of traditional Christian theology and the ancient scriptures and enduring creeds and confessions of the church?

Biological Chaos: A Model for Human Health

Chaos theory represents a startling new outlook on classical physics. Adumbrated by Henri Poincare's theoretical investigations of solar system instabilities, the theory flowered in the last third of the twentieth century with the work of Lorenz, Feigenbaum, and a host of other pioneers in the fields of mathematics and non-linear dynamics. Chaotic behavior, rigorously defined, is not confined to Newtonian mechanics and dynamics, but is observed in
thermodynamics, fluctuating electrical and magnetic phenomena, and even (or perhaps especially) biology.\textsuperscript{5}

Robert May urged scientists to manipulate the simple recursive population model $x_{n+1} = \lambda x_n (1 - x_n)$ to demonstrate biological chaos.\textsuperscript{6} In this expression, $x_n$ is the population of an organism in a given year, and $x_{n+1}$ is the population the next year. The quantity $\lambda$ represents the resources the organism has to expand its population. If $\lambda$ is very small, the organism will eventually die out; at a range of slightly larger values, the organism's population will reach a steady state. None of this was surprising; most population biologists surmised that a larger $\lambda$, representing a more fecund environment for the organism, enabled the organism's population to settle down at some steady-state value. What happened at very large values for $\lambda$ was shocking, however: at a certain point ($\lambda = 3$), the population begins settling to two populations, not one; and as $\lambda$ continues to rise, more of these bifurcations, so common in the transition to chaotic behavior, occur. If $\lambda$ is large enough, the organism's population changes erratically from year to year. This seeming randomness veils a beautiful fractal pattern characteristic of chaotic behavior. The population equation shows how simple systems can yield extremely complex chaotic dynamics.

Naturally, many researchers related chaos theory to other biological processes,\textsuperscript{7} at first suggesting that pathological conditions were chaotic. A heartbeat rhythm looks superficially like a periodic system, and researchers suggested that as a person approached death, his electrocardiogram rhythm would show nonlinear behavior and a transition to chaos. It is not so: the time interval between heartbeats is chaotic in healthy hearts.\textsuperscript{8} In fact, the ability to predict heartbeat intervals suggests to the clinician the signature of a diseased heart and impending heart failure.

Likewise, healthy brainwaves may exhibit chaotic behavior. Chaos has been difficult to demonstrate experimentally in electroencephalogram (EEG) signals because healthy brains are intensely noisy; the electrical impulses they generate appear almost random and aperiodic. But recently a theoretical model for electrocortical dynamics was developed which showed strong chaos and underlying fractal geometries.\textsuperscript{9} The authors hypothesize that "chaos plays a central role in the stability of sensory systems to respond in a rapid and unique fashion to different perceptual stimuli," in accord with Freeman's proposition.\textsuperscript{10}

Given that emotion is a subset of brain activity, and that chaotic dynamic systems in humans signify health, I suggest that healthy human emotion is governed by the chaotic dynamics of specific biomolecules. To validate this hypothesis, we can study the dynamics of an excellent "bottom-up" system implicated in mediating the emotion response: the neuropeptide Y (NPY) - receptor Y\textsubscript{1} complex. Will the imago Dei in man be brought into sharper relief by greater understanding of NPY activity?

**Neuropeptide Y Activity: A Model for the Biophysical Basis of Human Emotion**

The emotion response is mediated by neurotransmitters, molecules that can cross the synaptic junctions between neurons and which signal that certain biochemical reactions should be initiated. The concentration of neurotransmitters is very small, but they unleash reaction cascades that result in large-scale physiologic responses that we experience, at least partly, as the emotion. One of the most abundant neuropeptide transmitters in mammals is NPY, found in both the central and peripheral nervous systems (meaning the brain and everywhere else,
respectively). Accordingly, receptors for NPY occur in certain regions in the brain but transcend it, being found also in vascular and smooth muscle cells, in the kidney, and in the parasympathetic nerves.\textsuperscript{11} NPY is released at the synaptic junctions between neurons, where it binds to Y\textsubscript{1} and Y\textsubscript{2} receptor proteins and modulates many biochemical reactions contributing to the emotions we feel (Figure 1). NPY affects anxiety, sexual activity, food and fluid intake, and other emotion-associated physiological responses, like blood pressure.\textsuperscript{12} To ascertain how these physiological effects are produced, we must follow them down to the molecular level and then use biophysics techniques to describe molecular structure and function.

\begin{center}
\begin{tikzpicture}
\node at (0,0) [anchor=west] {\textbf{tyrosine, a fluorescence-emitting amino acid}};
\node at (0,-0.5) [anchor=east,rotate=90] {$Y = \text{Tyrosine, an fluorescent amino acid}$};
\node at (0,-1) [anchor=east,rotate=90] {$P = \text{Proline, an amino acid that disrupts } \alpha\text{-helices}$};
\end{tikzpicture}
\end{center}

\textbf{Figure 1}

\textit{Figure 1.} The amino acid sequence of human neuropeptide Y hormone. The tyrosines tend to facilitate $\alpha$-helix formation and the prolines tend to disrupt $\alpha$-helix formation.

NPY is not a small-molecule neurotransmitter like epinephrine or acetylcholine, but is much larger, a small protein chain consisting of thirty-six amino acids that, like most protein (peptide) chains, has a specific, higher-level three-dimensional structure. Variants of NPY have been isolated from many vertebrate species, but all are rich in the amino acids proline and tyrosine. (In biochemistry, the abbreviation for tyrosine is “Y”; hence the name neuropeptide Y.)

The structure of NPY is well known; the structures of its receptors are not. Nuclear magnetic resonance (NMR) techniques can determine the structures of molecules in solution and show that one end of the NPY molecule has modest higher-order structure, but the other side of NPY is a highly ordered structure called an $\alpha$-helix (Figure 2).\textsuperscript{13} Most investigators suggest that NPY under normal physiological conditions is bent in the middle, forming a hairpin shape, but an extended structure is possible (Figure 2). The structurally-disordered end of NPY is known to be mobile and flexible (Figure 2), undergoing rapid thermal fluctuations. This mobile domain of NPY is indispensable in NPY-receptor $Y_1$ binding, and I propose that it chaotically activates receptor $Y_1$ and the associated emotion response.
Figure 2. Left Panel, Figure 2A: On the left, cartoon schematics of NPY showing possible extended and folded structures for NPY. On the right, a ribbon model of the NPY molecule. The coordinates were downloaded as file IRON from the Brookhaven Protein Data Base and visualized using Rasmol. Right Panel, Figure 2B: The NPY molecule as observed from two different perspectives. These structures were refined from NMR experiments. Both terminal tyrosines (1 and 36) undergo rapid oscillations in aqueous solution. Adapted from Monks et al. (1996) J. Biomol. NMR 8, 379-390.

A Y₂-receptor protein also exists at the synaptic junction. But efficient NPY binding to this molecule requires only the rigid α-helical section of NPY, and thus may not be characterized by non-linear dynamics. Even so, NPY's mobile "tail" is required for Y₁-receptor activity, being necessary to initiate the cascade of chemical reactions that we experience as some emotions or, if one prefers, the physiological effects of emotions. The last proviso is given because our understanding of emotion should not necessarily be limited to scientific materialism.

The Imago Dei: A Model for the Metaphysical Basis of Human Emotion

Humans often seek deeper realities behind biological phenomena—like emotion—that we feel go beyond the physical world. We turn to religion: many gods of human history have shown emotion, evidencing man's instinct that emotion is something more elemental than brain function or the interplay of biomolecules involved in human emotion.

Christian theology is greatly concerned with the imago Dei in humanity, a proper understanding of which can perhaps enable us to understand emotion more clearly. While we must exercise care in anthropomorphizing God, as He is immutable and without the "passion" of fallen humanity, the Scriptures speak of God as being loving, angry, or pleased—depending on the context. As theologian John Frame asserts, God's "emotions" are His volitional and revealed responses to events, perfect in their appropriateness because God is holy perfection. Thus our emotions are an image of something analogous in God's nature.

In the theologians with whom I am most familiar (those with Reformed sympathies), the imago Dei in man is often defined as our ability to discern the truth, to do righteousness, and to be holy. We reflect God not only in our moral nature, but also in our creativity, our
relationships, and our emotions. The imago Dei in humanity should not be viewed as an atomistic litany: we are integrated creatures. Recent scientific research confirms that emotions are an indispenisible aspect of cognition or reasoning, as the brain centers which are responsible for emotion are "hard-wired" to the brain loci responsible for reasoning. For example, the prefrontal cortices are linked to the limbic system so that destruction of part of the limbic system results in a diminished capacity for making sound judgments.

How does this idea of our emotions reflecting God's image relate to modern philosophical notions about consciousness? I assume that emotion is related to human consciousness in some sense, that emotion is a subset of mentality. Thomas Nagel suggests that a correct theory of consciousness would entail a revolution in thinking induced by new concepts of physics and metaphysics. Neuroscience, advancing rapidly but still in the building-block stage, cannot exclude any of the mind-body philosophies promulgated at present. Here it is appropriate to define briefly the four metaphysical paradigms currently used to circumscribe our ideas about consciousness.

The materialist holds a monistic, reductionist philosophy that defines all aspects of mentality as originating from chemico-physical processes. Francis Crick reduces all phenomena in this manner; but a form of materialism, emergentism, describes higher mentality as a manifestation of irreducible complexity that is a natural by-product of simple molecules assembling to whole organs. The second philosophy, dualism, maintains a strict distinction between matter and consciousness and has long been a staple of Western philosophical thought held by, for example, Plato and Descartes. More recently, Eccles and Popper have applied a dualist-interactionist view to the mechanism of action of the human brain. The third philosophy of consciousness, functionalism, defines the mind as an organic-analog, massively-parallel computer, and is an idea maintained by those such as Daniel Dennett who champion a strong Artificial Intelligence (AI) point of view. Finally, Thomas Nagel and John Polkinghorne espouse a philosophy called dual-aspect monism, which admits to one substance in the universe with two poles: matter and mind. This notion of complementarity is natural both to quantum theorists and to theologians who understand the Trinity, and it is one I find agreeable. But no scientific program at present (nor perhaps ever) can definitively select among any of these mind-body philosophies.

The Chaos of NPY: A Model for the Unification of Biophysics and Metaphysics

Now I propose to fold together chaos theory, biophysics, and theology in a model for human emotion. First, as proposed above, I believe the macromolecules involved in human emotion will exhibit chaotic dynamics in a healthy individual. The biophysical model that follows is my hypothesis for chaos in emotion.

Many large protein molecules bind multiple small molecules (ligands) by cooperative binding, in which the binding of each small molecule to the protein macromolecule affects the binding of subsequent small molecules to the protein. The binding of ligands may alter the catalytic activity of a protein if it is an enzyme, or might initiate a cascade of secondary biochemical reactions if the protein is a receptor molecule. Such schemes are extremely common in biochemistry. While the binding of NPY to receptor Y₁ is not known to be a cooperative process, I propose a variation on the theme that may apply in this case.

I propose that there is one NPY binding site on the Y₁ receptor molecule, as previous research implies (Figure 3). Perhaps the α-helix of the NPY binds non-covalently in a fold of
$Y_1$-receptor. Then the mobile tail of NPY comes into contact with and activates a secondary $Y_1$-receptor "switch site." Activating the switch may induce a structural change of NPY-bound $Y_1$-receptor and the cascade of chemical reactions that we experience as emotion responses.

I hypothesize that this "switch" for the activation of the chemical reactions involved in the NPY emotion response exhibits chaotic behavior. There are a number of strategies one could employ to test this hypothesis. For example, NPY is an excellent fluorescence probe,24 and a low-resolution picture of the NPY-receptor $Y_1$ complex can be sketched by fluorescence spectroscopy techniques. This then shows the NPY molecule's environment, receptor $Y_1$ binding site structure (to low resolution), and distances between bound ligands on receptor $Y_1$.25 (Since receptor $Y_1$ is both membrane-bound and large, neither x-ray methods nor NMR techniques have been able to yield a high-resolution structure of the molecule.) This technique should identify the primary binding and switch sites, if they exist (Figure 3). When enough is known about the binding of NPY to receptor $Y_1$, experiments may be conducted expressly to detect nonlinear dynamics. Even if the putative "switching mechanism" is not chaotic, we should learn much that is now unknown about the NPY-receptor $Y_1$ system.

![Figure 3](image)

**Figure 3.** Proposed model for NPY chaotic switch.

To find whether the putative switch site is chaotic, one would need to perform time-resolved experiments to describe the temporal behavior of NPY. I propose a theoretical and an experimental way to do this, based on the groundbreaking work of Robert Shaw and the Dynamical Systems Collective once at UC-Santa Cruz.

Shaw conducted a clever and simple experiment that linked chaotic behavior to the loss of information or increase of entropy in a dynamic system, a dripping faucet.26 At a slow flow rate, drops first came out in perfect cadence, with identical time intervals between drops. Then at a slightly higher flow rate, he saw the characteristic bifurcation: the drops came out in pairs or in some predictable group. At a still higher flow rate, the time interval between drops transitioned into the chaotic regime. The beauty of this experiment is that no system of nonlinear equations is needed beforehand to show chaos. Rather, with any time sequence of data, Shaw's techniques should indicate whether the dynamic system is chaotic.27

With the knowledge previously gained about the receptor $Y_1$ - NPY complex, one can perform theoretical molecular dynamics calculations on the complex. During the calculation,
one can tabulate times between striking of the switch site by NPY and thus produce a time-resolved stream of data like that in Shaw's water-dripping experiment. If the calculation proceeds long enough, then the large data set can be plotted, and it may be determined whether that data is chaotic. The main drawback of the theoretical approach is that structures must be accurately known before the dynamics calculations can be attempted. Biomolecule structures may be elucidated first by NMR or x-ray methods, or else be theoretically determined by modeling protocols (e.g., homology modeling). Unfortunately, modeling the structures of proteins from the sequence is notoriously difficult.

Experimentally, one may be able to monitor the NPY activation of receptor Y₁ by measuring the flow of calcium ions in and out of the neuron (Figure 3). Such work is routinely done in biophysics and can be performed on single cells, even for single ion-channel protein molecules. Detecting the electrical current versus time of calcium ion flow is an indirect measure of NPY activity, since NPY initiates this activity rather than participating in it directly. Yet this simple system may show chaotic behavior by NPY, and there are excellent precedents for such behavior. The opening and closing of other cellular ion channels is chaotic and has been fit to dynamic models such as the two-well Duffing oscillator.²⁸

Another possible experimental approach should be briefly mentioned. A pulsed laser can be used to probe NPY switch kinetics, if one can distinguish NPY fluorescence of the bound state corresponding to "switch on" versus "switch off." If so, one can also generate a time-course of data corresponding to time intervals between "switch on" events, and then analyze according to Shaw's methodology.

The Role of Quantum Mechanics in NPY-Mediated Emotion

Quantum theory is subtle, and the theological repercussions of quantum indeterminacy in biomolecules are not clear. In biological applications, quantum theory is used to determine the structures of molecules, calculate various spectroscopic and thermodynamic parameters, and predict the mechanisms of biochemical reactions. As a biophysicist who uses quantum mechanics for practical matters like spectra interpretation and structure determination, I believe quantum theory shows why molecules are stable.

The biomolecules involved in human emotion are not sui generis. Thus, the quantum openness of molecules involved in human emotion should be similar to the quantum indeterminacy in any other biochemical system. The entire universe may be defined by such physical indeterminacy on all levels. Thus, if quantum openness governs emotion in a distinctive manner, then one might expect something "special" about the biochemistry of the brain. Clearly this aspect of human emotion requires more thought and research.

Application to Issues of Faith and Theology

One can address many ultimate issues on the heels of dependable data on the NPY-receptor Y₁ system. The first to consider involves whether this limited NPY-receptor Y₁ complex represents enough of the biochemical apparatus of human emotion that it models the holistic human emotion response. Since even primitive vertebrates possess NPY homologues, what beyond or about this system in humans distinguishes humanity from other animals? Can the NPY-receptor Y₁ system really constitute part of the imago Dei, since other vertebrates have the same system?
If the emotion response exhibits chaos, what can we say about the physical indeterminacy, or the non-deterministic behavior, of the system? The term "indeterminacy" is a descriptor best defined carefully. It is generally accepted that chaos theory describes phenomena that are epistemologically indeterminate. The sensitive dependence on initial conditions (SDIC) characteristic of chaos renders the future state of the non-linear system unknowable, although there is an underlying fractal geometry which can be revealed. Yet the equations that describe chaotic behavior are usually based on the same classical physics that for several centuries yielded (though perhaps not necessarily) a deterministic model of the universe. Thus, the indeterminacy of chaotic systems is usually interpreted as being what can be observed, but does not necessarily reflect deeper realities, a more profound (ontological) indeterminacy.

Disputes arise when indeterminacy in chaos is predicated on ontological considerations. Chaologists usually accept epistemological indeterminacy, but not ontological indeterminacy. Most practitioners of chaos theory are unwilling to assert that there is a deeper underlying rationale, or an ontology, for the non-determinism observed in chaotic behavior. In opposition to this model, John Polkinghorne concludes that in general, what we can observe and know (epistemology) accurately reflects the underlying reality, or what is (ontology). In accord with this model, he proposes that chaotic behavior reflects an ontological and an epistemological indeterminacy, as most argue for quantum theory.

Directly germane to the issue of physical indeterminacy is another classic faith-and-science dialogue involving Divine openness, or the issue of to what degree God "controls" His creation by divine providence. As a classically Reformed Protestant, I contend that God is sovereign, and I draw a distinction between the creature and the Creator. I have no problem maintaining epistemological and (perhaps even ontological) indeterminacy for quantum and chaotic phenomena. Rightly did Luther say of our knowledge of God that we see only God's hindquarters; we cannot take in all that He is. It is at this point that I differ from some of my faith-and-science colleagues. I believe that ontological indeterminacy is circumscribed by our creatureliness, and does not reflect shortcomings or limitations of God's knowledge of the natural world—not of His jurisdiction over it.

I propose then that chaos is a regulating principle of the human emotion biochemical apparatus, showing how we can understand emotion yet have limited power to predict our future emotional states from our past experiences. If human emotion were largely governed by chaos, then the distinction between the creature and the Creator would be preserved. At the same time, chaos is not lawlessness, not true randomness. Creatures in God's image can understand the principles that drive chaos and the implications and applications of chaos, even as we appreciate the power of quantum physics and its many applications.

Conclusion

Chaos is not merely a scientific God-of-the-gaps theory that reconciles us to some grim fact of knowledge-limiting indeterminacy. We can know real things, important things, about our emotions—both from scientific and from theological perspectives. Although we are only creatures, the trans-finite God loves us and reveals much of the physical world to us, even though He need not have done so. God is a God of love, and a holy God. Louis Berkhof, the Dutch Reformed theologian, bestowed to posterity this splendid definition of God's love: it is "that perfection of God by which He is moved to self-communication eternally."29 Even as He has
given us Scripture, He has given us the physical world to read. Is it any wonder we can understand the universe, and much that is in it, all the while knowing that we fallen and finite beings stand far off from God? Who can plumb His depths? In chaos theory is displayed both God's immanence and His transcendence, and through chaos theory we may one day, in a modest manner, unify the disciplines of neurobiology and theology.

Acknowledgements

I am deeply grateful to The Pew Charitable Trusts and Calvin College for providing the funding and venue for the 1998 Faculty Summer Seminar “Theology and the New Physics.” I thank the Calvin College staff for its superb hospitality and unflagging support that made my family welcome and created a stellar intellectual venue for this research. I am especially indebted to Rev. Dr. John Polkinghorne for his comments on this manuscript and for his mentoring and consistent insight into the real meaning of physics.

Endnotes

1 Erwin Schroedinger, What is Life? And Mind and Matter (London: Cambridge University, 1969); Roger Penrose, The Large, the Small, and the Human Brain (Oxford: Oxford University, 1997); John Polkinghorne, Beyond Science (Cambridge: Cambridge University, 1996). Many of the ideas here were germinated from the Calvin College-Pew Charitable Trust conference "Theology and the New Physics," moderated by Rev. Dr. Polkinghorne, Summer 1998.


7 Cramer, Chaos and Order.


14 Ps. 2:12, Is 47:6, Heb. 3:17, Mal. 1:2,3 and many other examples.

15 Professor John Frame, Reformed Theological Seminary, personal correspondence (1/13/99).


19 Rene Descartes, *Treatise of Man* (French text with 1972 translation and commentary by Thomas Steele Hall, Cambridge MA: Harvard University Press). Descartes understands soul and
body as constituting one creature, and *Treatise of Man* progresses under the assumption that knowledge of brain structure will afford a greater understanding of the soul.


22It may be facile to equate a physical theory to a Trinitarian theological position. Yet I suggest that fundamental attributes of the Creator should be reflected in the fabric of creation.


26Shaw, Robert *The Dripping Faucet as a Model Chaotic System*. (Aerial Press, University of California, Santa Cruz. 1984).

27NPY activation might be random and stochastic, or else on the opposite extreme, periodic.


CLIO Encounters Eschatology:
Recent Historiographical Interest in Christian Belief About the Future

by James A. Patterson

Introduction

In 1970, Hal Lindsey publicly inaugurated what proved to be a remarkable career as an evangelical prophecy guru with the initial release of The Late Great Planet Earth. This volume, which was not far removed from the literary genre of tabloid journalism, became a national best seller and precipitated a deluge of books, newsletters, films, and television shows devoted to frequently sensationalized depictions of prophetic themes. For his part, Lindsey essentially popularized the dispensational tradition of John Nelson Darby, C. I. Scofield, and Lewis Sperry Chafer; of course, he offered several new interpretive twists to fit the unfolding events of the late twentieth century into the classic system. Moreover, as Chris Hall has recently noted, Lindsey “unexpectedly uncovered a deep vein of eschatological and apocalyptic longing in the fundamentalist/evangelical subculture and in American culture at large.”

In the same year that The Late Great Planet Earth gazed expectantly toward the future for the impending fulfillment of biblical prophecies, the late church historian Ernest R. Sandeen published The Roots of Fundamentalism, a landmark monograph that looked to the past for perspective on, among other things, conservative Christian beliefs about the future. Lindsey and Sandeen probably were unaware of each other in 1970; in addition, they wrote for different reasons and disparate audiences. Nevertheless, Sandeen’s explorations in British and American millenarian sources yielded historical insights that subsequently would help to explain the Lindsey phenomenon. If American evangelicals and fundamentalists had devoured The Roots of Fundamentalism with as much gusto as they imbibed The Late Great Planet Earth, their grasp of Lindsey’s context and significance would have been much sharper. Furthermore, they might have been far less euphoric about the former tugboat captain’s prophetic speculations.

Sandeen, then a professor at Macalester College in Minnesota, was not the first scholar to address historical manifestations of prophecy belief. What set his endeavor apart from others was his focus on American fundamentalism as a theological tradition that could not be explained simply in cultural, psychological, or social terms. As an intellectual historian, Sandeen contended that premillennialism represented one of two major components at the very heart of the fundamentalist movement. He carefully traced the influence of nineteenth-century British millenarians like Edward Irving and John Nelson Darby, giving special attention to the latter’s ecclesiology and theory of a secret rapture. Through a number of visits to the United States, the Plymouth Brethren leader convinced many American Protestants to accept his dispensational theology, even if few were inclined to join his movement. As Sandeen demonstrated, dispensationalism was then Americanized through the efforts of men like C. I. Scofield, known especially for his Reference Bible.

In his thorough investigation of the origins of fundamentalist eschatological beliefs, Sandeen showed that he took them seriously. While his overall interpretation of fundamentalism has been justifiably challenged, Sandeen contributed significantly to the historiography of Christian beliefs about the future. His book provided a useful historical backdrop for what was happening among more apocalyptically-oriented evangelicals after 1970; at the same time, it
suggestively paved the way for further research into the historical development of Christian eschatology.

Timothy P. Weber, now the academic dean at Northern Baptist Theological Seminary near Chicago, pursued some of Sandeen's themes in his doctoral dissertation at the University of Chicago, eventually published as *Living in the Shadow of the Second Coming.* Weber shared Sandeen's interest in the theological world view of premillennialism, including its methods of biblical interpretation. But he also sought to incorporate the historical models of Robert F. Berkhofer Jr. and Martin E. Marty, his dissertation advisor. Hence, Weber aimed his analytical skills not only at doctrine, but also at the forms of behavior that were shaped and influenced by doctrine. He approached his study of premillennialism by asking whether a belief in the imminent return of Christ made any difference in how people actually lived, behaved, or conducted their lives.

After explaining the eschatology of premillennialism, Weber then examined the impact of belief in the imminent Second Coming on attitudes toward social reform, foreign missions, war, Zionism, and other issues with potential links to biblical prophecy. Like Sandeen, Weber presented premillennialism primarily as a *religious* movement: "Although it has had some social and political consequences, premillennialism's paramount appeal is to personal and religious sentiments." On the other hand, Weber's behavioral perspective allowed him to show more interest than Sandeen in the social and political implications of premillennial beliefs. In the final analysis, Weber went beyond Sandeen's basically theological treatment, resulting in a more realistic picture of premillennialism.

Led by historians like Sandeen and Weber, there was an explosion of scholarly writing about prophecy beliefs and apocalypticism in the 1970s and 1980s. These works ranged in scope well beyond American fundamentalism and evangelicalism to include several different historical eras and types of eschatological doctrines. Clearly, Christian eschatology had gained acceptance as a legitimate topic for historical research and writing. In fact, the 1990s would bring a further expansion of scholarly efforts to understand and explain the historical development of Christian beliefs about the end times, most notably in the works of Paul Boyer, Bernard McGinn, and Robert Fuller.

**Paul Boyer: Mining the Sources**

In 1992, Paul Boyer, the Merle Curti Professor of History at the University of Wisconsin-Madison, published *When Time Shall Be No More*, the most exhaustive study of modern American premillennialism yet written. Raised in the Brethren in Christ denomination, Boyer first became aware of prophecy issues during childhood through the sermons of his grandfather. Through previous works on the Salem witchcraft episode, urban history, and the nuclear age, Boyer achieved wide acclaim in the guild of professional historians.

In *When Time Shall Be No More*, Boyer's central concern is to account for the pervasiveness, persistence, and adaptability of prophecy belief in modern American culture. He steadfastly avoids condescending or reductionistic analyses, preferring to treat premillennial eschatology with respect as primarily a religious belief system. At the same time, Boyer alertly recognizes that doctrines concerning the end times contribute to a world view that offers psychological and ontological benefits: "Prophecy belief is a way of ordering experience. It gives a grand, overarching shape to history, and thus ultimate meaning to the lives of individuals caught up in history's stream. Here, I believe, is a key to its enduring appeal."
In a recent article that serves to update his book, Boyer elaborates further on this more functional side of prophecy belief:

So long as premillennial dispensationalism continues to meet the emotional and psychological needs of a great many Americans, and so long as the popularizers of Bible prophecy continue to weave our deepest collective anxieties into their end-time scenarios, this ancient belief system, with its infinite flexibility and its imaginative, drama-filled vision of history, will remain a significant shaping force in our politics and culture. Boyer’s sensitivity to these dimensions of eschatological belief, while not fully developed in *When Time Shall Be No More*, nonetheless helps to qualify the criticisms of reviewers who judge him as long on narrative and short on analysis and interpretation.

Like Sandeen, Boyer is most comfortable employing the tools of intellectual history; in particular, he depends primarily on the reading of texts for his information about the “hidden world” of prophecy belief. Indeed, the mere quantity of prophetic materials that Boyer read staggers the imagination. During a four-year period, he digested over three hundred prophecy books, as well as papers from prophecy conferences, prophecy newsletters, and religious periodicals devoted to prophecy themes. To supplement his scouring of written sources, Boyer also interviewed five prophecy writers, listened to prophecy sermons by visiting speakers at two churches in Madison, Wisconsin, and attended a prophecy seminar held under the auspices of the Seventh-day Adventist Church. Over one hundred pages of endnotes attest to the thoroughness of Boyer’s research.

In good historical fashion, Boyer sets the stage for the core of his book by establishing the background and context of premillennial eschatology. His first chapter concisely scans the early development of prophetic and apocalyptic thought in ancient Israel and the early church. He limits his discussion of biblical materials to Ezekiel, Daniel, Mark 13, and Revelation; here his comments indicate at least a modest acceptance of higher critical conclusions. For example, Boyer states that “the weight of scholarly opinion views the Book of Daniel as a pseudepigraphic apocalypse written around 167 B.C. and predated to enhance its credibility.” Even so, he recognizes the enormous influence of the Bible’s apocalyptic texts on later believers who viewed them as “vital source of doctrine, reassurance, and foreknowledge.”

His overview in chapter two of the “rhythms” of eschatological beliefs throughout church history covers key individuals and movements like Irenaeus, Augustine, Joachim of Flora, the Reformers, the Puritans, and Jonathan Edwards. The compressed character of this section is understandable in light of Boyer’s overall purpose; certainly it invited other scholars like McGinn to shape more substantive treatments of apocalyptic thinking in periods and contexts to which *When Time Shall Be No More* gives short shrift. Still, Boyer manages to glean some suggestive themes from his historical survey, including (1) the durability and adaptability of prophetic beliefs; (2) the danger of these doctrines becoming politicized; and (3) the reality that in the contemporary world, intellectual and theological leaders are no longer the chief expounders of the prophetic scriptures.

Boyer’s third introductory chapter, which covers some of the same ground as Sandeen’s *The Roots of Fundamentalism*, charts the history of premillennialism through 1945. The Wisconsin professor is especially adept at measuring the impact of the World War II era on premillennialist scenarios. In fact, the momentous wartime events, Boyer concludes, provided prophecy writers with “compelling empirical validation of their unfashionable but remarkably tenacious vision of human destiny.” Many of the themes that unfold more fully in later chapters are introduced in this section.
The heart of Boyer’s tome can be found in the five chapters that make up part II. Here he meticulously draws on his vast reading of prophecy literature to recount the story of dispensational premillennialism over the last half-century. Boyer focuses specifically on how the prophecy movement sought to interpret biblical texts in response to the advent of the atomic bomb, the regathering of Israel as a nation, the rise and fall of the Soviet Union, and the prominent role of the United States in world affairs. Chapter eight tactfully catalogs the host of Antichrist candidates that prophecy speculators have identified since 1945--Anwar el-Sadat, King Juan Carlos, Henry Kissinger, Mikhail Gorbachev, and Ronald Reagan, among others, received consideration for beastly status. In these chapters, Boyer copiously cites prophecy writers and preachers like Donald Grey Barnhouse, M. R. DeHaan, Dave Hunt, Salem Kirban, Tim LaHaye, Mary Stewart Relfe, Chuck Smith, Charles Taylor, Jack Van Impe, John Walvoord, and, of course, Hal Lindsey. The reader has to be struck not only by the apocalyptic nature of the times, but also by the boldness with which the prophecy experts put forth their applications of biblical texts to current events.

The final two chapters reveal Boyer at his interpretive best. For example, he offers the image of the theater as the most helpful metaphor for understanding the premillennial view of history as predestined. Premillennialism’s keen sense of harmony, symmetry, and meaning in history, in fact, partly explains its appeal: “With secular historians no longer speaking the language of progress or portraying the majestic unfolding of a divine plan in history, prophecy popularizers took up the slack and found a vast audience in the process.” Boyer is also effective in pointing out how the premillennial concept of history is linked to a pronounced utopianism with its emphasis on the coming Millennium as an “alternative future.”

Boyer’s most weighty achievement in this long volume is his consistent attention to the resiliency of prophecy belief. Even when the prophecy teachers and writers have been wrong on the significance of events or in their identifications of the Antichrist, they have not hesitated to reset their timetables or rework their interpretations of prophetic passages. Near the end of his book, Boyer comes close to commending the flexibility of contemporary premillennialists: “As the configuration of world power alignments and public concerns shifts at the end of the century, prophecy popularizers, like their predecessors over the centuries, are proving extremely resourceful at restructuring their scenario.” While this assessment might suggest that biblical prophecy becomes a ball of wax in the hands of some of its expounders, it also helps to explain why a distinguished historian like Paul Boyer regards prophecy belief as an enduring reality in modern American culture.

Bernard McGinn: Antichrist over Two Millennia

Bernard McGinn’s Antichrist represents only one of several works that this respected medieval historian has penned on the historical development of Christian eschatological beliefs, an area he has researched for over twenty years. Among other important volumes on prophetic doctrines, the Naomi Shenstone Donnelley Professor of Historical Theology and the History of Christianity at the University of Chicago Divinity School has authored Visions of the End and served as one of the editors for The Encyclopedia of Apocalypticism. Like Boyer, McGinn writes primarily as an intellectual historian, although his major area of expertise is Europe, not America.

The fact that McGinn is a Roman Catholic in the Augustinian tradition helps to explain his overall approach in Antichrist. From the outset, he disclaims a literal Antichrist, averring
instead that the paramount manifestation of evil has already come: “the most important message of the Antichrist legend in Western history is what it has to tell us about our past, and perhaps even about our present attitudes toward evil.”30 He then elaborates on this theme with the proposal that “the Antichrist legend can be seen as a projection, or perhaps better as a mirror, for conceptions and fears about ultimate human evil.”31 Thus an allegorical or symbolic understanding of the Antichrist functions as McGinn’s vehicle for taking Christian eschatology seriously.

McGinn’s aversion to a literal Antichrist is even more evident when he discusses the internal-external and dread-deception polarities that have characterized the various images of the Antichrist in Christian history. He unequivocally identifies with those Christian thinkers, such as Augustine of Hippo, who have located the central meaning of Antichrist in “the spirit that resists Christ present in the hearts of believers” or in the deceit of those “who confess Christ with their mouths but deny him by their deeds.”32 For McGinn, this spiritualized, even domesticated Antichrist is far more plausible than an external enemy who inspires dread like a persecutor or who practices outright deception from a seat of religious power.

These theological musings about the nature of the Antichrist form the backdrop for McGinn’s historical survey. He begins his account by delving into the apocalyptic traditions of Second Temple Judaism, which he regards as a complex interaction of myth, legend, and history. The angelic and human adversaries of God and His messiah that emerge in these writings, McGinn argues, “form a necessary part of the background to the Antichrist legend.”33 Among the important Jewish antecedents he discusses is the “Final Tyrant” found in the Book of Daniel, a writing that McGinn dates to the Maccabean period. By limiting the application of the “little horn” in Daniel 7-12 to Antiochus IV Epiphanes, McGinn adopts a posture toward the Old Testament prophetic book that is very similar to Boyer’s. In other words, the author of Daniel creatively utilized apocalyptic eschatology to interpret his own troubled times. Even as he ignores any predictive value in Daniel’s prophecies, McGinn frets over the apocalyptic writer’s externalization of good and evil “in terms of present historical conflicts.”34 Consequently, McGinn infers that the apocalypticism of Second Temple Judaism influenced Christian eschatology in deleterious ways.

McGinn’s comprehensive overview of Christian Antichrist images occupies eight chapters, each one devoted to a distinct historical period. In covering early Christianity, the Chicago historian combines a higher critical approach to the New Testament with a marked preference for patristic authorities like Origen, Jerome, Tyconius, and Augustine.35 All of these Fathers articulated non-millennial eschatologies, usually accompanied by inner moral interpretations of Antichrist. Four chapters on the Middle Ages, McGinn’s specialty, scrutinize topics like the monk Adso’s “Last Emperor” motif, Hildegard of Bingen’s innovative symbolism, Joachim of Flora’s apocalyptic speculations, and dissident Franciscans’ espousal of a papal Antichrist. In these sections, McGinn incorporates useful references to poetry, drama, and art, thus illustrating how apocalypticism played out in popular culture.36

For the Reformation and modern periods, McGinn employs the rubrics “Antichrist Divided” and “Antichrist in Decline.” First, he adeptly shows how polarization became inevitable as a result of Martin Luther’s “uncompromising denunciation of the papacy as true and final Antichrist present in the world.”37 This stridency set the tone for later debate; indeed, radical, Anabaptist, Puritan, and Catholic voices all responded in one way or another to the Lutheran Reformer’s identification of the papacy as the Final Enemy. Second, McGinn depicts
the marginalization of literal Antichrist beliefs after 1660, a development he appears to welcome. He offers this critical prognosis of modern trends:

Antichrist as a form of vague rhetoric to be used against any opponent helped weaken the content of a term that was already being undercut by the neglect of its more personal applications. . . . Antichrist’s reality became increasingly problematic as Enlightenment ideas spread, but Christianity itself had prepared the way for this collapse. Because of this, most eighteenth- and nineteenth-century views of Antichrist seem empty repetitions of once-vibrant symbols.58

In McGinn’s analysis, a divided Western Christendom lacked the resources to sustain a viable Antichrist tradition.

In his final chapter, “Antichrist Our Contemporary,” McGinn assesses various twentieth-century versions. After a brief discussion of Roman Catholic perspectives, he evaluates dispensational premillennialism’s chronic search for the Antichrist, covering much of the same ground as Sandeen, Weber, and Boyer—although failing to cite the latter. McGinn seems somewhat hopeful about the Antichrists of literature, noting writers of modern fiction like Frank Kermode, Czeslaw Milosz, Robert Hugh Benson, and Charles Williams, all of whom wrestle with the motivation behind ultimate human evil. McGinn also points to Carl Jung’s notion of Antichrist as “an inexorable psychological law,” not because he views it as plausible but rather as another possible way of emphasizing the “inner meaning of Antichrist.”59

McGinn’s quest for the contemporary relevance of Antichrist stems largely from his concern that the traditional “legend” serves mainly to foster “hatred and oppression of groups, such as Jews and Muslims, seen as collective manifestations of Antichrist’s power.”40 His salvage operation on Antichrist belief finally arrives where it began, stressing the symbolic nature of the Antichrist within: “At the end of this millennium we can still reflect on deception both within and without each of us in our world at large as the most insidious malice—that which is most contrary to what Christians believe was and still is the meaning of Christ.”41 As some of McGinn’s critics have suggested, it remains to be seen whether this Antichrist image is adequate to account for either the biblical texts or contemporary manifestations of evil in our world.42 Nevertheless, McGinn has written the best one-volume historical account of the Antichrist tradition, one that is still influencing our journalistic culture today.43

Robert Fuller: An American Obsession?

Following Paul Boyer’s magisterial study of prophecy belief in America and Bernard McGinn’s thorough examination of the Antichrist tradition in Christian history, Robert Fuller’s Naming the Antichrist is something of a disappointment. First, Fuller is much briefer than McGinn on the overall history of Antichrist belief and not nearly as comprehensive as Boyer when dealing with the American scene. Second, Fuller writes with an obvious agenda. He is appalled by the persistence of literal interpretations of biblical prophecy in fundamentalism. Rather than appraise these beliefs at face value, Fuller attempts, with limited success, to explain them primarily with psychological and social categories. In fact, he claims that one of the essential tasks of intellectual history is to be alert to “the sociology of knowledge”:

The whole point of humanistic inquiry, particularly historical inquiry, is to explicate meanings that are not overtly present in a text, a historical event, or a person’s self-awareness. A judicious use of social, economic, and psychological perspectives that
make such an explication possible is thus an indispensable part of the interpretive process. While this is a laudable goal, Fuller seems more bent on discrediting the fundamentalist world view than on offering a plausible and convincing account of it.

Fuller, Professor of Religious Studies at Bradley University, contends in his introduction that Christians through history have used the Antichrist symbol to shape their self-understanding and to demonize their enemies. For Americans, in particular, naming the Antichrist aids in the establishment of “the symbolic boundaries that separate all that is holy and good from the powers of chaos that continually threaten to engulf them.” Apocalyptic thought then, according to Fuller, functions as a protective device for those plagued by doubts and uncertainties about life.

The initial chapter of *Naming the Antichrist* traces the origins of Antichrist doctrine from the New Testament era through the colonial period in America, a span of almost eighteen hundred years. Fuller’s psychosocial approach to eschatology is clearly evident when he interprets the beast of the sea, or Antichrist, in John’s Apocalypse as “a mythic device” that has allowed readers “to label and interpret their fears and frustrations.” The remainder of Fuller’s historical survey through the Reformation correlates apocalypticism not so much with theological speculation as with social, economic, and political disruption.

Fuller’s treatment of the Puritans in chapter two leaves much to be desired. In terms of historical matters, he wrongly implies that Puritans were Separatists, and fails to distinguish carefully between Puritans and Pilgrims. On the interpretive side, he organizes his analysis around the idea that apocalyptic thought in New England provided a mechanism for the Puritans to demonize their enemies, whether they be native Americans, dissenters, or witches. Fuller, however, does not supply sufficient evidence to demonstrate that the Puritans identified all their “enemies” with Antichrist, or that they viewed all their social and political conflicts in apocalyptic proportions. He also delivers some low blows; for example, he suggests that “Cotton Mather’s lifelong obsession with the devil was an inherited trait.” Except for his generally balanced presentation of Jonathan Edwards’s eschatology, Fuller’s overview of Puritanism is condescending and much too driven by social and psychological explanations.

Following a chapter on developments in American apocalyptic thought during the nineteenth century, Fuller devotes most of the remaining parts of his book to fundamentalist eschatology. Overall, his explication of fundamentalism in many ways parallels his treatment of Puritanism. He sees both movements as representative of the darker side of apocalyptic belief; both used Antichrist doctrine to project their fears and anxieties upon demonic enemies, thus serving as typical exemplars of the American “obsession.” Hence, Fuller writes about both with a decidedly polemical edge.

Fuller’s portrait of fundamentalism draws on the scholarship of Boyer, Marsden, Sandeen, and Weber, among others. The major difference is that they are more nuanced and less tendentious than Fuller. For example, far more than any previous author, Fuller wants to identify premillennialism as the sine qua non of fundamentalism, ignoring the fact that not all fundamentalists have been premillennialists. He also jumps from a discussion of early fundamentalism in chapter four to “Crusades of Hate” in chapter five, assuming significant historical continuity between those who stood for the fundamentals of the faith in the 1920s and those more extreme fundamentalists who later launched virulent anti-Semitic, anti-Catholic, and anti-New Deal campaigns. Indeed, it is not entirely obvious who falls under this judgment of Fuller: “[t]he story of twentieth-century Antichrist is thus in large part the story of naming,
dramatizing, and mythologizing the enemies of ultraconservative Protestantism." At times, Fuller appears to classify anyone who believes in biblical inerrancy, premillennialism, evangelism, and social and moral separatism with the "apostles of discord" and "paranoid" types described in chapter five. Fuller's assessment of fundamentalism as basically ill, empty, and even evil has provoked one critic to remark that Naming the Antichrist "is an invitation not to understand but to deride and dismiss."51

Although Fuller drops many interpretive hints throughout his book, he waits until the epilogue to reveal his full agenda. After reviewing several earlier theories concerning apocalypticism, he opts for a perspective that combines philosophical pragmatism and functionalism:

A functionalist interpretation of specific religious beliefs, such as belief in the Antichrist, focuses on the functions of these beliefs in guiding individual and group interaction with the surrounding world. Philosophical pragmatism comes into play as we begin seeking some means of comparing or evaluating competing ideas or beliefs. Pragmatism shifts our attention away from philosophy's traditional interest in judging the truth of an idea, in favor of the task of assessing an idea's functional value.52

What especially irks Fuller about apocalyptic fundamentalism is that its eschatological beliefs promote nativism, territorialism, and "tribalistic boundary posturing," which he apparently judges to be "absolutely" wrong, even though his philosophical allegiance is to a system that denies absolutes.53

In the final analysis, Fuller regards naming the Antichrist as a functionally counterproductive activity. It not only prevents people from becoming fully participating contributors in a pluralistic society, but it also represents an attempt to project one's own faults and shortcomings onto an enemy, which is psychologically dysfunctional. Yet Fuller seems not entirely satisfied with his functionalist perspective when he borrows social gospel rhetoric for his last sentence: "[t]his relentless obsession with the Antichrist appears to have done more to forestall than to signal the realization of the Kingdom of God on earth."54 Perhaps even a pragmatic functionalist like Robert Fuller is entitled to entertain an eschatological hope.

Conclusion

In his recent book Apocalypses, retired UCLA professor Eugen Weber sets forth a compelling rationale for the historical investigation of prophecy belief:

If scores of eschatologists have proved mistaken, the answer is not that one of them will prove right one day, but that too many of them have proved too influential—destructive, constructive, inspiring, consoling—and that it is foolish for historians to dismiss or, worse, to ignore them.55

The point of Weber's statement reverberates through the scholarly contributions considered in this essay. Because several researchers chose not to neglect an important and legitimate sphere of historical inquiry, we have a fuller and much richer portrait of the development of eschatological doctrines in Christian history. Their work not only demonstrates the significant impact that beliefs about the future have exerted at various times in the past; it also illuminates the cultural, historical, and religious contexts that have helped to shape those beliefs.

The studies of Boyer, McGinn, Fuller, and others hold special relevance for Christian readers. As Weber observes, several "eschatologists" have made serious miscalculations about prophetic timetables or patently erroneous conjectures regarding the fulfillment of biblical
prophecies. The existence of contrived, sensationalized, or highly speculative apocalyptic scenarios in the past should alert evangelical Christians against such follies in the present. If the history of prophecy belief teaches anything, it calls its practitioners to exercise caution and humility when attempting to chart the future plans and actions of God.

Finally, while the historical labors reviewed here yield many benefits, they also suggest some interpretive limitations. McGinn, Fuller, and—to a lesser degree—Boyer at times adopt an adversarial posture toward their subjects. As a result, some of their analyses tend toward reductionism, especially when they employ political, psychological, and social explanations for the vitality and persistence of prophecy belief. While such perspectives certainly have validity, they also threaten to obscure the importance of religious aspirations and theological convictions in the lives of those energized by eschatology. To enlarge on Weber’s warning, patronizing the eschatologists can be as problematic as dismissing or ignoring them.

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4For example, see the earlier path-breaking work by Norman Cohn, *The Pursuit of the Millennium: Revolutionary Millenarians and Mystical Anarchists of the Middle Ages* (London: Secker and Warburg, 1957). Ironically, the third edition of Cohn’s book was published in 1970 by Oxford University Press.

5Sandeen saw the Princeton Theology of the nineteenth and early twentieth centuries as the other vital component. See *The Roots of Fundamentalism*, esp. chap. 5.

6Ibid., esp. chap. 3.

7Ibid., 222-24.

8The most successful challenge to Sandeen’s two-source thesis was George M. Marsden, *Fundamentalism and American Culture: The Shaping of Twentieth-Century Evangelicalism, 1870-1925* (New York: Oxford University Press, 1980).


12 Ibid., 229.


17 Boyer, When Time Shall Be No More, xi.
18 Boyer, “Bible Prophecy Belief in Contemporary American Culture,” Anglican and Episcopal History 67 (December 1998): 466. It is not clear whether “this ancient belief system” is a reference to biblical prophecy in general or to premillennial dispensationalism in particular.


20 On his sources, see Boyer, When Time Shall Be No More, xiii-xiv. For the endnotes, see ibid., 341-444.

21 Ibid., 31.

22 Ibid., 45.

23 Ibid., 77-79.

24 Ibid., 112.

25 Ibid., 317-18.

26 Ibid., 318-24.

27 Ibid., 338-39.


30 McGinn, Antichrist, xii.

31 Ibid., 2.

32 Ibid., 4-5.

33 Ibid., 9.
34Ibid., 32.

35Ibid., esp. chaps. 2 and 3.

36Ibid., chaps. 4-7.

37Ibid., 208.

38Ibid., 249.

39Ibid., 274-75.

40Ibid., 273.

41Ibid., 280.


43For example, look for the impact of McGinn on Kenneth L. Woodward, “The Way the World Ends,” Newsweek, 1 November 1999, 67-74. At the end of his article, Woodward asks, “And who’s to say that John’s mythic battle between Christ and Antichrist is not a valid insight into what the history of humankind is ultimately all about?”


46Ibid., 30.

47For example, see ibid., 34-37.

48Ibid., 42-44.

49Ibid., 62.

50Ibid., 136.


52Fuller, Naming the Antichrist, 194-95.

53Ibid., 195-96.
54 Ibid., 200.

55 Weber, Apocalypses, 239.
Tennessee: Raveling the Edges of Who I am

by Jenny Brooks White

When I was there, I was a cotton farmer's daughter with wild hair and bare feet and I let no one tie my days to order. I climbed the highest trees, fingered scars in the rough bark, and felt my hands turned raw and sweaty. When I looked over the cotton fields, I saw deer flash their white tails and run when they caught my scent. I've run, too, through the roughest fields with grass whipping my bare legs and the ground rising up to meet my fast steps. I was a sister and fought my brothers with the wrath of a young woman. I pounded my fists into their adolescent chests and I even bloodied their noses. And I bloodied my knees and elbows, fell from swings and bicycles, cut my feet on the gravel drive. I was a granddaughter and I walked my grandfather's garden rows, found bits of coal and glass, reached through the scratchy squash and picked fruit swollen with time. And now time reaches up for me and takes me back to Tennessee, a place far away, a place once visited, once lived, and it shakes out its memory in my mind the way my grandfather shook fruit trees—bringing the ripest, most delicate to the ground. I look back at that cotton farmer's daughter and see her ragged pants and tangled hair and I say to myself: this is who I am.
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honorific, which became widely popular in the Middle Ages. Honorius Augustodunensis writes that Mary Magdalene merited her singular Christophany ("angelum videre meruit Dominusque resurgens primo omnium ei publice apparuit"), and that Christ sent her as an apostle to his Apostles ("eamque apostolam apostolis suis misit"); Honorius sees Mary as a second Eve bearing the message of eternal life instead of subjecting humankind to mortality ("et sicut prima femina mortem viro traderet, ita nunc femina perhennem vitam viris nunciaret"; PL 172.981). In Joseph Szövérffy's survey of medieval Magdalene hymns, Apostola is one of four principal titles that she is repeatedly given (92). Vernacular authors such as Osbern Bokenham (139) and Nicholas Love (206) also observe this distinction in their praise of the Magdalene, and Joseph Harris has argued that the ballad "Maiden in the Mor Lay" draws upon similar Magdalene traditions (79). Possibly the most dramatic illustration of her apostolic role can be found in an English twelfth-century psalter probably prepared for Christina of Markyate. Here the Magdalene, with hand raised, extends her finger in a gesture of address, recounting the news of the Resurrection to eleven wide-eyed Apostles who hang on her every word. This iconography is not common, but it can be found in multiple manuscript illustrations, carvings, and stained glass beginning in the eleventh century (Haskins 220, 452).

Conscience's suggestion that the Magdalene noised her news indiscriminately abroad undermines her quasi-evangelical authority. Even his summarizing statement, "Thus cam it out hat crist overcoom, recouerede and lyued," implies a random relaying of information. The language of the Vulgate, confirmed by patristic, hagiographic, dramatic, and lyric traditions, stresses Mary Magdalene's role as an appointed envoy to the Apostles, not the indiscriminate speaker we find in Conscience's account.

III

Conscience's portrayal of a garrulous Magdalene offers an ideal opportunity to employ the proverb "What a woman knows may not well remain secret." The garrulity of women was a proverbial commonplace, and its appearance in one of the most encyclopedic poems of the English Middle Ages may therefore be unsurprising. Examination of the contexts in which this proverb occurs elsewhere, however, reveals more specific, and more specifically ideological, agendas which condition its use and which motivate Conscience's apparently gratuitous denigration of the Magdalene.

The "counseille" proverb's first English attestation comes from the widely popular Proverbs of Alfred, in which we are told that King Alfred was "pe wysuste mon þat wes englelon on" (lines 23-24). For the author or compiler of the Proverbs, part of the king's wisdom involved a facility with misogynistic traditions. At "Siford," before a gathering of bishops and earls, knights and clerks, Alfred counsels his men: "Be never so insane nor so drunk with wine that you ever tell your wife all your plans, because she will reveal all in front of all your enemies . . . for woman is word-crazy and has a tongue too swift, and even though she

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Le Culte de Marie Madeleine en Occident, des origines à la fin du moyen âge.

6 I translate from the J text (Jesus College Oxford MS. 29). The "counseille" proverb is item W534 in the Whitings' proverb dictionary; compare items F426 and W485, and Tilley's item W649.
might want to, she cannot withhold anything.” In the Proverbs of Alfred we first witness what will become a recurrent narrative context for this proverb: the secrets which a “word-wod” woman divulges will be hazardous to men.

No text more strongly emphasizes the danger of confiding in wives than Jean de Meun’s portion of the Roman de la Rose, in which the female personification Nature “confesses” to a male Genius for creating that most reprehensible of all creatures, Man. What ensues is a broad parody of Catholic confession in which a priestly Genius uses his authority not only to counsel Nature, but also to embark on a diatribe against the seductive menace and verbal infidelity of women, employing the same sententious advice found a century earlier in the Proverbs of Alfred:

No man born of woman, unless he is drunk or demented, should reveal anything to a woman that should be kept hidden, if he doesn’t want to hear it from someone else . . . for if, just one single time he ever dares grouch at her or scold her or get angry, he puts his life in danger—if he deserved death for his deed—that she will have him hanged by the neck, if the judges catch him, or secretly murdered by friends. (276)

As in the Proverbs of Alfred, we see the details of the insanity or drunkenness that must afflict a foolish man who speaks his mind to his wife, as well as the disastrous consequence which would befall him. A few lines later, Genius dramatizes the proverb by portraying a sexually seductive wife who weasels her husband’s secret out of him, saying:

I see all these other women who are sufficiently mistresses of their houses so that their husbands confide in them enough to tell them all their secrets. They all take counsel with their wives when they lie awake together in their beds, and they confess themselves privately so that there is nothing left to them to tell. Truth to tell, they even do so more often than they do to the priest. I know it well from them themselves, for many times I have heard them; they have revealed to me everything, whatever they have heard and seen and even all that they think. In this way they purge and empty themselves. However, I am not the same sort. (278)

Jean de Meun’s mention of priests in this passage transforms these loose-lipped wives into metaphorical confessors—a metaphor further explored below.

Chaucer would make liberal use of the “counseil” proverb, employing some form of it in The Wife of Bath’s Tale (the digression on Midas and his ass’s ears, line 980), The Monk’s Tale (2015-30; 2090-94), and The Tale of Melibee (1060). Chaucer’s Monk, for example, does not ascribe Samson’s downfall to fortune, but to his error of confiding in women:

Of Sampson now wol I namoore sayn.  
Beth war by this ensample oold and playn  
That no men telle hir conseil til hir wyves  
Of swich thyng as they wolde han secrec fayn,  
If that it touche hir lymes or hir lyves.  

(MkT 2090-94)
The Wife of Bath is especially fond of quoting proverbs, even to the disparagement of her own gender. In her tale, when she discusses the suggestion that a woman most desires her husband’s confidence, she embarks on a long digression employing, and radically altering, the familiar myth of King Midas and his ass’s ears—a digression in which Midas’s wife, not his barber, betrays his embarrassing secret. She further affirms the truth of the proverb in a confessional passage concerning the secrets of Jankin:

My fifthe housbonde--God his soule blesse!--
Which that I took for love, and no richesse,
He som tyme was a clerk of Oxenforde,
And hadde left sceole, and went at hom to bord
With my gossib, dwellynge inoure toun;
She knew myn herte, and eek myn privetee,
Bet than our parisses preest, so moot I thee!
To hire biwreyed I my conseil al.
For hadde my housbonde pissed on a wal,
Or doon a thyng that sholde han cost his lyf,
To hire, and to another worthy wyf,
And to my nece, which that I loved weel,
I wolde han toold his conseil every deel.
And so I did ful often, God it woot,
That made his face often reed and hoot
For verray shame, and blamed hymself for he
Had toold to me so greet a pryettee.

(*Prol. WBT 531-42*)

Thus Jankin joins husbands from the *Proverbs of Alfred*, the *Roman de la Rose*, and the Wife’s own tale as men whose lives are ruined or jeopardized by their loose-lipped wives.7

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7 One might also observe that the verbal promiscuity of these women frequently possesses a sexual correlative. The wife of Genius’s *Roman de la Rose* diatribe partially undresses as she solicits her husband’s secret, while Delilah and the Wife of Bath are both portrayed as sexually powerful and potentially dangerous. The “counself” proverb also features prominently in Thomas Hoccleve’s *Tale of Jonathas*, in which the prying woman is the prostitute Felicula. This correlation between verbal and sexual promiscuity might have prompted Langland’s audience to recall the Magdalene’s traditional status as a reformed prostitute, thereby associating her with the Venerien Wife of Bath, the prostitute Felicula, the temptress Delilah, and the seductive wife of Genius’s diatribe in a sorority of sexually and verbally dangerous women. Langland alludes to the Magdalene’s sexuality in passus 5, lines 496-498 and passus 10, line 428, presenting the Magdalene as one of salvation history’s greatest sinners whose redemption illustrates God’s abundant grace. No one, according to the Dreamer, could have led a worse life in the world than her. Conscience, however, does not make the Magdalene’s presumed sexual past an issue in passus 19.
This selective but representative narrative history of the proverb reveals that loose-lipped and prying women jeopardize men’s crucial secrets, and sometimes their very lives. And in two instances the usually domestic “counseille” proverb carries with it implicit ecclesiastical associations. Genius’s diatribe in the Roman de la Rose, with its portrayal of women as irresponsible secular confessors, reinforces the exclusively male role of confessor by pointing out a woman’s inability to hold an office so dependent upon the ability to “keep counseille.” Chaucer was to repeat these ecclesiastical associations in the Wife of Bath’s Prologue, in which Alisoun asserts that her gossip “knew myn herte, and eek my privete, / Bet than oure parishe preest . . . .” If this is how women keep counsel, so the argument would run, they surely would make disastrous priests. In the Roman de la Rose and the Wife of Bath’s Prologue, the proverbial garrulity of women is expanded from a domestic sphere to reflect a religious one.

However, the author who provides the clearest connection between the “counseille” proverb and anxieties over women’s religious authority is Langland himself. In passus 5, Wrath, a former friar, slanders all women while confessing to Repentance:

I haue an Aunte to Nonne and an Abbesse bope;  
Hir were leure swowe or swelte þan suffre any peyne.  
I haue be cook in hir kichene and þe Couent serued  
Manye Monþes wiþ hem, and wiþ Monkes bope.  
I was þe Prioresse potager and opere pouere ladies,  
And maad hem ioutes of langlyng þat dame Iohane was a bastard,  
And dame Clarice a knyþtes douȝter ac a cokewold was hir sire,  
And dame Pernele a preestes fyle; Prioresse worþ she neuer  
For she hadde child in chirietyme; al oure Chapitre it wiste.  
Of wikkedede wordes I, wræþe, hire wortes made  
Til “þow lixt!” and “þow lixt!” lopen out at ones  
And eþer hitte oþer vnder þe cheke.  
Hadde þei had knyues, by crist! hir eþer hadde kild oþer.  
Seint Gregory was a good pope, and hadde a good forwit:  
That no Prioresse were preest, for þat he purweiede;  
They hadde þanne ben Infamis, þei kan so yuele hele counseil.  

(5.153-68)

For Wrath, the “counseille” proverb involves no mere metaphor but stands as the principal argument against women priests. Wrath dismisses the prioresses’ assumptions of authority with the same reproach that Conscience levels at the Magdalene, using the same proverb; they cannot restrain their “janglyng” mouths.

IV

Up to now my focus has been on literary traditions that may help make sense of Langland’s problematical Magdalene, but it is in a social context that Conscience’s proverbial denigration of the Magdalene can be better understood, and gendered controversies of the late fourteenth and early fifteenth centuries recommend such an approach. In the first half of the
thirteenth century, it appears that some prioresses were testing the limits of their religious authority despite the oft-repeated injunctions of 1 Timothy 2:11-12, encroaching upon the priestly duty of hearing nuns’ confessions. Their presumption led to a sharp rebuke by Pope Gregory IX, who forbade prioresses to assume such duties. It is this decretal to which Wrath alludes in passus 5, and Wrath’s use of the “couseille” proverb implies an association on some level in Langland’s mind between the Magdalene and these prioresses who had overstepped their bounds.

Perhaps Langland was concerned with these gendered tensions because his age was uniquely marked by an increasingly public feminine religiosity that became associated with everything subversive and dangerous. The explosion of lay piety, affective devotion, and vernacular translation of Scripture threatened to circumvent the already-besieged clerical community in England. Mystics such as Julian of Norwich were recording their spiritual experiences while Langland was writing his poem, and those who received visions from God authorizing non-traditional actions would prove most difficult to contain. Jean de Gerson, the staunch defender of orthodoxy best known for his vigorous persecution of Wyclif’s continental counterpart, Jan Hus, felt compelled to remind Langland’s generation that “the female sex is forbidden on apostolic authority to teach in public, that is either by word or by writing . . . . All women’s teaching, particularly formal teaching by word and by writing, is to be held suspect unless it has been diligently examined, and much more fully than men’s” (Colledge and Walsh 151). Here we may be reminded of a Canterbury monk’s reaction to Margery Kempe: “I wold how wer closyd in an hows of ston pat per schuld no man speke wyth pe” (27).

If contemporary accounts can be trusted, there were not enough houses of stone in all of England to contain the women who were supposedly assuming important roles in heretical movements of Langland’s day. Lollardy especially offered opportunities for women that orthodox Catholicism would never have allowed, as women assumed important but hazardous roles as readers and interpreters of Scripture. Yet the extent to which women were actually involved in Lollardy is the subject of considerable debate. Claire Cross has suggested that through being central to the family unit by which Lollardy thrived, women were spiritual leaders in the heresy. According to Cross, women were active teachers mainly through Conventicle recitation of memorized Scripture (360, 370-71). Margaret Aston continued Cross’s line of inquiry, additionally addressing rumors that Lollard women were actually functioning as priests. However, Shannon McSheffrey has cautioned against exaggerating women’s roles, reminding us that most of these women were illiterate and ancillary to a definite male leadership structure. McSheffrey writes, “Even most influential female Lollards confined their endeavors to informal situations rather than public teaching roles” (21).

Although the extent of women’s actual involvement in Lollardy is debatable, one thing is certain: women were perceived to be usurping traditionally male roles in heretical movements, including preaching and expounding Scripture, and this usurpation was to be a source of great anxiety. Margery Kempe’s public religiosity repeatedly earned her the accusation of “fals loller,” suggesting an association among her contemporaries between the heresy and preaching

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8 See Friedberg, Decretal Gregor. IX Lib. V. Tit. XXXVIII. cap. x (cols. 886-7).
women. It may be no coincidence that the two great persecutors of Wycliffite and Hussite belief, Thomas Arundel and Jean de Gerson, also made a point of condemning women preachers. Margaret Aston adduces considerable evidence from chronicle and sermon literature, poetry, and polemical tracts to reveal widespread concern over women’s roles among the champions of orthodoxy. By the 1390s rumors were circulating throughout London that women were celebrating masses, and Hoeckleve’s oft-quoted verbal assault on Oldcastle shows how women were already established as vigorous heretical interpreters of Scripture in the minds of the orthodox by this time:

Some wommen eke, thogh hir wit be thynne,
Wole argumentes make in holy writ!
Lewe calates! sittith doun and spynne,
And kakele of sumwhat elles, for your wit
Is al to feeble to despute of it!
To Clerkes grete apparteneth pat aart
The knowleche of pat, god hath fro yow shite;
Styte and leue of for right scendre is your paart. (13)

Hoeckleve responds to the threat of Lollard women scholars in what is by now a predictable pattern: by impugning their authority through misogynistic portrayals of small minds and big mouths. The imagined “kakeling” of Hoeckleve’s women is a revealing correlative to Langland’s depiction of “janglyng” prioreses and an indiscriminate Magdalene. The charge of garrulity seems to have been a multi-purpose putdown for any group of presumptuous women.

Aston discusses the most compelling evidence for a late fourteenth-century debate over women’s religious authority in the case of Walter Brut (or Brit), arrested in 1391 on heresy charges. Brought before the Bishop of Hereford, John Trefnant, Brut contended that women did indeed have priestly powers denied them by orthodoxy, expressing such powers in explicitly Petrine terms (e.g., they have the power “to bind and to loose”). Prominent theologians were convened to counter Brut’s claims, and his case evolved into a kind of referendum on whether women could attain religious privileges formerly reserved to men. In the debate between Brut and his opponents, the Magdalene was introduced as proof of the defensibility of women preachers: “multe mulieres constanter predicaverunt verbum quando sacerdotes et alii non audebant verbum loqui et patet de Magdalena et Martha” (“Many women steadfastly preached the Word when priests and others did not dare speak the Word, as evinced by the Magdalene and Martha” (Aston 52; my translation). Brut’s case demonstrates that the symbolic power of the Magdalene’s voice could be and was appropriated by proponents of expanded female religious liberties.¹⁰

⁹ William White was also alleged to have used these Petrine terms in the early fifteenth century; see Aston 52, 59.

¹⁰ Here one might also be mindful of allegations made toward Waldensian women. In his Summa adversus Catharos et Valdenses (ca. 1241), the Dominican Moneta of Cremona asserts that “the Waldensians appealed to the example of Mary Magdalene to justify preaching
Brut’s defense benefitted from hagiographical traditions that made Mary and Martha outstanding women evangelists. In the *Legenda Aurea*, St. Peter entrusts Mary Magdalene to the care of Maximin fourteen years after the Resurrection. When the disciples disperse to spread the gospel, Maximin, Mary, Martha, Lazarus, and others are cast out to sea in a rudderless ship by unbelievers. Miraculously arriving safely at Marseilles, the Magdalene immediately sets to work converting heathens through the power of her speech. The composer of the *vita* invests the Magdalene’s lips with both erotic and rhetorical power:

When blessed Mary Magdalene saw the people gathering at the shrine to offer sacrifice to the idols, she came forward, her manner calm and her face serene, and with well-chosen words called them away from the cult of idols and preached Christ fervidly to them. All who heard her were in admiration at her beauty, her eloquence, and the sweetness of her message... and no wonder, that the mouth which had pressed such pious and beautiful kisses on the Savior’s feet should breathe forth the perfume of the word of God more profusely than others could. (376-77)

It is no wonder then, given Mary Magdalene’s status as an emblem of the value—even the privilege—of women’s speech, that she could be perceived as a dangerous role model by later clerics. A figure outside the male apostolic circle of Christ but who was still clearly favored by him, the Magdalene would serve as an inspiration for a growing body of late medieval women who similarly sought an affective bond with Christ independent of a male clerical “inner circle.” Prominent women such as Christina of Markyate and possibly even Richard II’s Queen Isabella owned Psalters depicting the Magdalene proclaiming the Resurrection to the other Apostles. Osbern Bokenham tells us that Lady Bourchier, Countess of Eu, commissioned the English translation of her *vita*, with pointed emphasis on her apostolic role:

“I have,” quod she, “of pure affecceyoun
Ful longe tym had a synguler deuocyoun
To þat holy wumman, wych, as I gesse,
Is clepyd of apostyls þe apostyllesse;
Blyssyd Mary mawdelyn y mene,
Whom cryste from syn made pure & clene,
As þe clerks seyn, ful mercyfully,
Whos lyf in englysshe I desyre sothly
To han maad, & for my sake
If ye lykyd þe labour for to take,
& for reuerence of hyr, I wold you preye.”
(5065-75)

And when Margery Kempe portrays herself repeatedly answering the question, “Why wepist þu so, woman?” surely she is engaging in more than a little self-fashioning. Conscience’s proverbial

by women” (Kienzle 105). Of course, since this *Summa* was intended to point out the errors of the heresy, its allegations may be distortions of actual Waldensian practice.
denigration of the Magdalene, then, reflects contemporary tension between a male clerical orthodoxy struggling to maintain ecclesiastical control in opposition to a growing number of women who, like the Magdalene, refused to be silent, who believed in the validity of their spiritual experience, and who sought a greater public authority in matters of the soul.

V

We are finally confronted with an issue raised at the outset of this study: if Conscience is such a courteous character in passus 19, why attribute this proverbial misogyny to him? Any discussion of Conscience’s role must begin with a definition of his function in faculty psychology, and Mary Carruthers offers a useful summary of scholarly readings. According to Carruthers, scholastics held that Conscience represented basic “moral sense,” a blend of synderesis and conscience. Quoting Aquinas, Carruthers defines synderesis as a “habit, a natural disposition of the practical intellect, ‘the first practical principles bestowed on us by nature,’ by means of which the practical intellect is inclined to the good and is able ‘to discover, and to judge of what [it has] discovered’” (Schroeder 15). Conscience, then, is a catch-all term for several “intellectual habits” derived from synderesis, and is a faculty devoted to making distinctions and applying knowledge. Carruthers further comments, “The role of conscience was able to include not only the function of moral judge but also that of intellectual judge distinguishing between truth and falsehood” (16). Given this definition, it appears strange that Conscience would depart from Scripture and portray an indiscriminate Magdalene by means of an antifeminist proverb in his account of the Resurrection. Perhaps Carruthers’ discussion of Conscience’s collective role explains the portrayal. Citing the work of Morton Bloomfield, Carruthers observes that Conscience’s role as knight “may indeed reflect an aspect of the monastic conception of conscience—not only as the guide and protector of the individual soul but as a collective conscience defending the collective soul of the Church” (17-18).

I would suggest that Conscience’s account of the Resurrection results from his collective role as defender of Holy Church, and his use of proverbial misogyny constitutes an attempt to unify and defend an increasingly fractured Catholic orthodoxy. This is a role he will play in greater detail as the final two passus unfold—building and defending the Barn of Unity. Immediately after employing the “counseille” proverb, Conscience tells us that “Peter parceyued al pis and pursued after, / Bope James and Johan, Iesu to seke, / Thaddee and ten mo wip Thomas of Inde.” Conscience emphasizes Peter’s intellectual understanding of Mary Magdalene’s words, for these words prompt him and other Apostles to await Christ’s appearance before the Eleven. The sense of 19:157-69 is that Mary Magdalene indiscriminately broadcasts the news of the Resurrection, but it is Peter who first fully understands its ramifications and, with the other Apostles, takes action. Here Langland may have been influenced by an interpretation best developed by Aquinas, who argued that the Magdalene’s Christophany was flawed, that she was unfit to preach and needed the male Apostles to translate her information into action (Børresen 245-46).

Perhaps Conscience, in devaluing Mary Magdalene’s authority and affirming Peter’s, is making clear just who exactly has the power to bind and loose. Given the historical rivalry that
obtains between the two figures, it may be no coincidence that the divestment of Mary’s authority and the investment of Peter’s occurs in the space of a mere thirty-four lines, culminating with the papal privilege given to St. Peter:

And whan þis dede was doon do best he þouȝte,  
And yaf Piers pardon, and power he graunteðe hym,  
Myght men to asoille of alle manere synnes,  
To alle maner men mercy and forȝifnesse  
In couenaunt þat þei come and kneveliche to paie  
To Piers pardon þe Plowman redde quod debes.  
Thus hap Piers power, be his pardon paied,  
To bynde and vnbynde boþe here and ellis,  
And asoille men of alle synnes saue of dette one. (19.182-90)

Here Conscience replaces Christ’s post-Resurrection commission to all of the Apostles (John

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11 Christ’s command to Mary Magdalene to bear the news of the Resurrection specifically to Peter entwines these two figures forever in the narrative of the greatest authority-conferring experience in church history, and calls attention to Peter’s dependence upon Mary Magdalene for the news. The Magdalene’s Christophany granted her a privilege unattained even by Peter, the foremost of the Apostles and the “rock” upon which the church is founded. The respective designations of Mary Magdalene and Peter even betray a kind of hierarchical rivalry, as apostola apostolorum and princeps apostolorum both make special claims for themselves. This rivalry was much more than a nominal one. Gnostic gospels reveal a well-documented and strongly gendered tension between Mary Magdalene and Peter in nascent Christianity. (On the Magdalene in Gnostic writings, generally see Malvern 42-56; Pagels 12-14, 22, 64-66; and Haskins 42. For other early texts that depict a gendered tension among the Apostles, see Schüssler-Fiorenza 304-9, 332-33.) Perhaps Gnostic and medieval writers were elaborating on the same tensions suggested in New Testament accounts in which Peter seems to doubt the Magdalene’s words (e.g., Luke 24:12). Most importantly, Mary’s unequivocal privilege of seeing Christ first was undermined by Paul’s mention of Peter and omission of Mary in the Resurrection account of 1 Corinthians 15:5, thus making them competitors for the distinction and fostering a debate that would prove to be of the highest importance in establishing papal power and the roles of women in the church. In the figure of Peter, medieval dramatists would depict an Apostle angrily dismissive of the Magdalene in terms that emphasized her gender. The Towneley Thomas Indie, for example, begins with Mary Magdalene bringing the news to the Apostles; Peter shouts her down with an impassioned “Do way, woman, thou carpys wast!” (line 7). The exchange continues at length, with the Magdalene accusing Peter of heresy and Peter vigorously maintaining that the Magdalene’s lying is shameful. For other medieval texts which depict Peter’s skepticism of the Magdalene, see the Coventry (“Corpus Christi”) Appearance to Mary Magdalene (Davies 343-46), and the Ms. e Museo 160 Christ’s Resurrection (726-29; Baker 191). This rivalry would provide Langland with an inviting narrative context in which to insert a misogynistic proverb so dependent upon gendered tension and mistrust.
20:19-23) with Peter’s singular commission (Matt. 16:18-19). Conscience also undermines the communal sense of John 20 by referring to the gathering as “Peter and . . . his Apostles”--a foregrounding of Peter not found in Scripture. Peter’s special commission is similar to the communal commission, but it occurs well before the Resurrection, even before Christ’s transfiguration. Perhaps Conscience makes these changes in the belief that a resurrected Christ would have greater divine authority to bestow on Peter; the sequence of events is shifted accordingly.

Given Langland’s skepticism regarding the ecclesiastical abuses of the post-apostolic church, perhaps Conscience’s portrayal of the Magdalene is meant to demonstrate how earthly power can corrupt this essential faculty. (Conscience’s unwise decision to allow the friars, particularly Frere Flaterere, entrance into the Barn of Unity will later demonstrate his debilitated powers of discernment.) In Conscience we see a figure enhancing the authority of Peter (and, by extension, papal authority) at all costs, even at the expense of a beloved saint. And of course the Great Schism forms the contemporary backdrop for Langland’s narrative—a backdrop of divisiveness in which church authority was fragmented among two and three popes between 1378-1417, and to which Langland alludes in 19.417-27. Conscience’s efforts in the name of unity illustrate the impulses that yield such a state of affairs; his attempts to consolidate Peter’s authority necessarily detract from Mary Magdalene’s. For a church to have one earthly leader, there can be no division of power.

Although it is true that Langland was in many ways a social conservative who probably would have opposed women’s pursuit of greater ecclesiastical authority, Conscience seems too deeply flawed for his views to be considered authorial. Langland might have supported the end of his arguments, but not the means, characterized as they are by a mocking application of proverbial misogyny. Conscience’s prejudices involving Mary Magdalene cannot be attributed merely to a confusion of traditions; Langland manifests a strong familiarity with relevant Scripture and Magdalene hagiography elsewhere. There are six references to Mary Magdalene in Piers Plowman. In 5.497 Repentance says that Christ appeared to the Magdalene first to show that he died for sinners. In 10.428 Will refers to her sinful nature to justify a self-indulgent predestinarianism since even some of the most iniquitous are saved: “Than Marie Maudeleyne who myȝte do worse?” In the speech attributed to Trajan in 11.250-58, Langland employs the interpretation of Luke 10:40-42 that casts Mary Magdalene as a representation of the contemplative life in order to praise poverty. In 13.194 Conscience praises poverty as well, noting that Mary Magdalene gained more from her box of ointment than Zacchaeus did from half his riches. Anima also associates the Magdalene with virtuous poverty in 15.294, observing the extra-biblical tradition that she lived on roots and dew and her devotion to God in her later life. The Resurrection account of 19.157-62 marks the final appearance of Mary Magdalene in Piers Plowman. It seems, then, that for Langland’s characters, as well as for principal actors in church history, Mary Magdalene could be whatever each figure needed her to be—saint, sinner, whore, apostle, gossip—and Conscience is no different. His interest in affirming male ecclesiastical authority leads him to apply the proverb “þat womman witeþ may noȝt wel be counseille,” with all of its unflattering narrative associations, in depicting a “word-wod” Magdalene unworthy of the momentous news she bears, incapable of using it to establish Holy Church. For Langland, Conscience is the revisionist historian of a church lamentably estranged from a once unified, divine origin.
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The Status of Pollution in Tennessee

by H. W. Wofford

What places come to mind when you think about polluted sites in the United States? Perhaps you think about Love Canal in Niagara Falls, New York, where the Hooker Chemicals and Plastics Co. buried 22,000 tons of chemical waste in a half-dug canal and where a housing development was built on top of it (1). Or maybe Lake Erie comes to mind. It was so heavily contaminated by industrial wastes and sewage that it was closed for fishing and swimming, and many species of lake fish were on the verge of extinction. In 1965, almost one-fourth of the lake was so polluted that its oxygen supply was virtually depleted (2). What about Los Angeles, California? Los Angeles is located in a geological bowl which traps air pollution, and during the sixties smog sometimes got so bad that industries and motor vehicle traffic had to be shut down for several days a year. You may not be as familiar with Boston harbor. At one time it was so polluted that there were reports of rats walking across the harbor on the floating debris!

When people are asked to name polluted states, New Jersey is often mentioned. This is probably because of areas on the coast such as Newark, with its sprawling railroad yards and chemical refineries. Much of Newark is an eyesore, prompting a friend of mine from New Jersey to describe it as the "armpit of the universe." However, this is probably not a fair way to characterize New Jersey as a whole. When you get away from the industrial areas, the countryside in New Jersey is among the most beautiful and undisturbed in the United States. Sometimes Texas and Louisiana will be added to the list because of the expansive petrochemical industries on the Gulf Coast of these states.

But what about our state? Where would you rank Tennessee as a polluted state? I don’t think most people in Tennessee would consider our state to be very polluted. After all, we have traditionally been known for our agricultural economy, rather than for our industrial output. I must confess that, until I returned to Tennessee after having spent fifteen years training as an ecotoxicologist, I did not think of Tennessee as polluted. It is interesting how differently you look at the place where you grew up after having been away for some time. You can back off and look at it a little more objectively. Coming back as a trained environmental toxicologist, I looked at Tennessee through new eyes. Over the last twelve years, I have been accumulating information about the state of pollution in Tennessee from newspaper clippings, state and federal publications, and web sites. My goal for this paper is to pass on to you a summary of what I have gleaned from all this information. What you read may surprise you.

I can’t possibly write about every environmental problem in Tennessee in a paper of this length. In order to make the task a bit more manageable, I will begin with some overall statistics concerning the status of pollution in Tennessee, and then focus on our immediate environment, Madison and surrounding counties.
Tennessee’s Environmental Scorecard

There are many ways in which the environmental health of an area can be assessed. These include determination of the amount of air pollution, the amount of water pollution, the amount of waste emptied into the sewer system, the rate of deforestation, the public health status, and the status of environmental education. I have summarized some of them in Table 1. As you can see, Tennessee consistently comes in as one of the ten worst polluted states in the nation.

It is informative to go to the Agricultural Museum in Milan, Tennessee. In this museum, there is an exhibit about soil erosion and conservation efforts made by Tennessee to prevent it. There is a picture in this exhibit of a man standing in a ditch caused by soil erosion. He cannot see out of the ditch! Great strides have been made in recent years to control soil erosion, with no-till farming being the most recent such control measure.

Air pollution is also a big problem in Tennessee. It is probably contributing to the destruction of hundreds of thousands of acres of trees in the Great Smoky Mountains Park. Air pollution, mainly sulfur and nitrogen oxides, from industry and the cars of the millions of tourists who visit this park weakens the trees, making them susceptible to infections by fungi, bacteria and insects (5). I had the opportunity to talk to a technician at the Agricultural Experimental Station here in Jackson. He has been measuring the pH of the rainwater falling on the station for several years. Though it isn’t part of his job, he does it out of interest. On several occasions, the precipitation falling on Jackson was acidic enough to be classified as acid rain. Interestingly, this always happens when the wind is coming from the southwest. This shouldn’t be too surprising, since Memphis, the largest center of industry in West Tennessee, is southwest of us. On one or two occasions he recorded alkaline rain. I have never seen this discussed in the environmental literature. What are we putting into the air in West Tennessee that is making our air more alkaline (basic)?

Tennessee Rivers and Lakes

Another way to assess the environmental health of a state is to examine the health of its rivers and lakes. 60,000 stream miles and 540,000 lake acres can be found within Tennessee (27). One way of determining the health of these waterways is to look at whether or not these waterways have been posted. In other words, have some intended uses of these waterways been restricted? This usually means that either body contact, recreation, or fishing has been restricted or banned. In 1996, twenty-six per cent of stream miles and twenty-two per cent of lake acres in Tennessee were classified as not fully supporting their intended use (27). These waterways have been posted for such diverse causes as presence of fecal coliforms, lead, mercury, PCBs, chlordane, and dioxins.

Two Tennessee rivers, the Forked Deer River and the Obion River (which pass through parts of Madison or Gibson Counties), are classified as completely failing to support their intended use (Table 2). The Mississippi River, which is notorious for its pollution, has been added to the table for purposes of comparison. As you can see from the table, our local river systems are not considered safe for the usages we commonly make of waterways and are considered less safe than the “mighty Mississippi.” Having contracted either Giardia or amebic
dysentery from swimming in the Forked Deer River in the days of my youth, I heartily recommend that you heed the warnings!

**Madison and Gibson Counties’ Environmental Scorecards**

The Environmental Defense Fund maintains a web site that allows individuals to rank almost any site in the country according to its rate of release of toxic chemicals and the health effects of these chemicals (28). In terms of release of Toxics Release Inventory (TRI) chemicals, an inventory of chemicals maintained and monitored by the EPA, Madison County ranks forty-seventh in the state in release of these chemicals, while Gibson County ranks sixteenth. This surprised me. I expected that Madison County would release more chemicals than Gibson County. However, Gibson County has four facilities in the top one hundred for most chemicals released, while Madison County has none. It is important to note that these numbers do not take into consideration non-TRI chemicals, including many agricultural chemicals. I shudder to think of what I was exposed to while “growing up on the farm.”

However, these rankings should not give residents of Madison County too much peace of mind. Although Madison County fares well in comparison to other Tennessee counties, it must be compared to the nation as a whole (28). Madison County ranks in the top twenty per cent of all counties in the U.S. in terms of:

- Release of non-cancer hazards
- Water releases of recognized developmental toxicants
- Water releases of suspected immunotoxicants
- Release of chemicals with ozone-depleting potential.

Gibson County fares even worse. It ranks in the top twenty per cent of all counties in the U.S. in terms of:

- Release of cancer hazards
- Air releases of recognized carcinogens
- Air releases of recognized developmental toxicants
- Air releases of suspected cardiovascular or blood toxicants
- Air releases of suspected reproductive toxicants.

**Problem sites in the Madison County Area - Superfund Sites**

Another criterion that can be used as a yardstick of the environmental health of a region is whether or not that region contains any Superfund sites. Residents of Jackson have the dubious distinction of living within thirty miles of four EPA Superfund sites (Table 3). Two of these are located within the city limits of Jackson and are within two miles of ten of Jackson’s water wells. EPA Superfund sites are sites that are deemed to be so contaminated and pose such a health risk that they are assigned the highest priority for cleanup. The problem with Superfund sites is that when the funding was set up for this program, the cost of the cleanup was grossly
underestimated. As a result, many sites have been identified, but have not been cleaned up. Regarding the four sites in the vicinity of Jackson, only partial cleanup has been undertaken, and cleanup efforts are still underway.

The state of Tennessee also has a Superfund program. Table 3 contains a listing of the Tennessee Superfund sites in Madison and Gibson Counties. As you can see, Tennessee has added an additional seven sites in our area to the Superfund list. Of these sites, only the Owens-Corning site has been declared clean. Table 3 also includes some sites in this area that have not been declared Superfund sites, but have been in the news lately because of environmental problems.

In order to give you a better appreciation of the magnitude of these environmental problems in our area, I have given some of the history and the possible health consequences of some of these sites in the following sections.

American Creosote Works

The American Creosote Works was declared an EPA Superfund site in 1987 and is considered to be one of the worst creosote-contaminated sites in the country (21). The plant operated from the early 1930’s until 1981. It was located on fifty-five acres in southwest Jackson just off of State Street, between the Forked Deer River and the 45 Bypass.

Creosote is used as a wood preservative. It is most often seen in old telephone poles and railroad ties. After the wood was treated by placing it in baths of hot creosote, it was stacked on racks outside to dry. The excess creosote dripped onto the ground and has been working its way into the water table. Creosote contains a large number of chemicals called polyaromatic hydrocarbons and related compounds, many of which are potentially carcinogenic (cancer-causing). One PAH, benzo[a]pyrene (BAP), was found in high concentrations in the soil. BAP is one of the five most carcinogenic chemicals that we have currently identified.

In 1991, the EPA started the cleanup of the site. All of the remaining creosote (approximately 200,000 gallons) was removed, and all structures were torn down to the ground. However, funding problems halted the cleanup of the soil at the site (22). The state and federal governments planned to spend $5 to $12 million to clean up this site (21). However, the total projected costs have increased to as much as $50 million. About 8.4 acres of land will be scraped two to five feet deep, removing 35,000 to 88,000 tons of soil. The work was scheduled to begin in 1996 or 1997, but I have not seen evidence of cleanup operations. At one point it was seriously suggested that the site be used as a jail! I can’t imagine how many lawsuits that would have generated. Does being used for bioremediation constitute cruel and unusual punishment?!

Iselin Railroad Yard

The Environmental Protection Agency wants to put Jackson’s old Iselin Railroad Yard on its Superfund list of the most serious hazardous waste sites (12). This eighty-acre site is just south of Iselin Street in Southeast Jackson, directly across from Washington-Douglass Elementary School. It is also near ten of JUD’s city water wells. This site was used for the maintenance and repair of railroad engines for many years by the Mobile & Ohio and Illinois
Central railroads (13). The degreasers used to clean the engines and their parts were often allowed to run onto the ground and into a creek that fed into the Forked Deer River. Often, the water in the creek ran black.

Among the chemicals found at the Iselin site are chromium, lead, vinyl chloride, chloroethane, benzene, copper, tetrachloroethane, dichloroethane, ethylbenzene, and xyylene. These chemicals carry such possible health risks as cancer, birth defects, liver toxicity, kidney toxicity and neurotoxicity. JUD is currently monitoring the city water for these chemicals and has plans in place for treating the water if necessary.

Cleanup of the Iselin site was predicted to start in 1996, but to the best of my knowledge this process has not started yet (14).

**Milan Army Ammunition Plant**

The Milan Army Ammunition Plant has been in operation since 1942, manufacturing ordnance for the military. From 1942 to 1978, wastewater from the O-line production area was discharged into eleven unlined settling ponds. In 1991, it was discovered that RDX and other potential carcinogens such as TNT, 2,4-dinitrotoluene, nitrobenzene, and HMX used in the manufacture of explosives, had seeped out of these ponds and had gotten into the groundwater that provides the drinking water for Milan (19). In 1992, the U.S. Army started a $9 million study to assess the degree of contamination of the water, eventually drilling four hundred test wells (16, 20). The results of this testing indicated that the city’s drinking water was below the danger point of 2.0 ppb.

In light of concerns that the levels of these chemicals could increase in the future, the Army agreed to spend $9 to build a water treatment facility at the plant and to drill three new water wells for Milan farther away from the arsenal. In May 1995, the levels of the chemicals in the city water had not increased significantly (17). By 1997, the Army had spent $58 million on the cleanup operation. This involved the design and construction of cleanup systems using a combination of high-tech filtration and UV systems, and a low-tech artificial wetlands where native plants and microorganisms break down the chemicals, a process called bioremediation (18). The O-line ponds were also capped with clay to prevent further leaching of the chemicals into the water table. A recent report indicates that the cleanup of the contaminated ground water is on schedule and should be complete by 2009 (29). Unfortunately, parts of the city park will be unavailable for the next six to eight months as wells are being dug which will be used to filter the groundwater.

**Lead Exposure in Jackson**

Jackson is the only city in West Tennessee to be cited by the Environmental Protection Agency (EPA) for having high lead levels in the drinking water. According to EPA guidelines, lead levels in drinking water must not exceed fifteen ppb. Unsafe levels of lead were found in a small number of homes with lead materials in their plumbing and are not due to lead in the JUD water supply. Although a report in 1994 showed that about twenty-two per cent of the children
in Madison County have elevated levels of lead in their blood, it is believed that most of this lead did not come from the water, but from lead-based paint and leaded gasoline.

More recently, residents of East Jackson in the neighborhood of the former H. O. Forgy recycling plant have been tested for lead levels (15). This plant that turned scrap metals into materials for industry allowed lead to seep into the soil for thirty-seven years, from 1946 to 1983. When evaluated for its risk, this site received a score of 85.26. In order for a site to be placed on the EPA Superfund List, it must have a score of 28.5. The score for the H. O. Forgy site is one of the highest ever seen.

Velsicol Corporation Dump Site

The Velsicol Corporation is a Memphis-based company involved in the manufacture of insecticides. Several hundred thousand drums (seven million gallons) of waste created from the production of these insecticides were buried on thirty-seven acres between 1964 and 1974 in Hardeman County near Toone, which is just south of Jackson (23). Over time the drums rusted and leaked, allowing the chemicals to leach into the water table. It is estimated that over one thousand acres of groundwater are contaminated because of this leakage (24).

Removing and properly disposing of all these drums could cost in excess of $1 billion. At this point, a ground water treatment plant has been constructed, and the area has been capped with clay to prevent further leaching into the water table. This is all the cleanup that is currently planned. Velsicol has spent $12 million on capping and stabilizing the site to this point (25). However, the clay cap over the site has been found to be only ninety-eight per cent effective (26). It is now being capped with plastic, which will be “one hundred per cent effective.” The workers who went into this site to stabilize it were either very brave or very foolish. This is by far the worst contaminated site that I have ever encountered, and it’s only a thirty-minute drive away!

Conclusions

I have presented a large number of facts and figures about the state of pollution in Tennessee. What conclusions can we draw from all of this? The obvious conclusion is that Tennessee is a relatively contaminated state. It is very likely that health problems are and will continue to be a result of this contamination. Many of these sites are areas where chemicals are entering our water table. Adequate quality drinking water may very well be the next great environmental crisis for the whole world, including the United States. West Tennessee is blessed with one of the best aquifers in the world. However, there are many sites in which chemicals are slowly working their way into this aquifer. These chemicals will not stay localized. Hydrologists tell us that the aquifer in West Tennessee flows. As it does, it will carry chemicals to areas that are many miles away from the sites of contamination.

It should be noted that as bad as the status of pollution in Tennessee may seem, it is getting better. Almost every statistic I have mentioned in this paper has shown improvement in the last twenty years. For example, in 1996, twenty-six per cent of stream miles and twenty-two per cent of lake acres in Tennessee were classified as not fully supporting their intended use (27). In
1984, forty-six per cent of stream miles and thirty-four per cent of lake acres were not fully supporting. This constitutes a significant improvement.

How did we get this way? I suspect it has much to do with our state historically having a predominantly rural economy. Thus, some of the problems resulting from urbanization and industrialization have come to us later than for other states, and we are dealing with them much later as a result. Also, I feel there is almost a vacuum of environmental awareness and consciousness in West Tennessee. I was impressed by this when I came back to Tennessee after having spent fifteen years in other parts of the country. Many people think nothing of littering in this area, and they tend to pour out chemicals such as used oil and antifreeze on the ground. This same attitude has carried over into industry. For most of this century, industrial wastes have just been dumped into a ditch. Jackson has only very recently put a tree ordinance in place. In New England, you must get permission from all of your neighbors before you can cut one tree in your yard. Union, as a Christian university, must set an example of environmental stewardship for the community.

I suspect that the contamination of our area also has to do with the loss of contact between our citizens and the environment. As people moved away from the farms, seeking jobs in the cities, they lost their contact with the soil. I grew up on a farm. I spent most of my waking hours prowling around, turning over logs, watching birds fly, and catching insects and tadpoles; in the process, I developed a deep appreciation and love for the environment. The students in my classes have learned this, as I frequently get on my “soap box” about environmental issues. Children who grow up in cities don’t have these opportunities. Studies have shown that inner city children have no idea where their food comes from, other than the store. These children don’t have a connection to the land, and it is less likely that they will show concern about environmental issues. I have been impressed on many occasions by individuals who will get outraged about the fate of whales, which they have never seen, and not be concerned about the destruction of the environment going on behind their own house.

Ultimately, the contamination of Tennessee is about our population. As the population and economy of Tennessee has grown, so has the demand for food and goods. With this increase, there has to be an increase in the utilization of chemicals and subsequent problems of dealing with the byproducts of the manufacture of these chemicals. My dad understands this very well. He is a retired farmer. During his career as a farmer, he has released thousands of pounds of agricultural chemicals into the environment. He despises these chemicals, but he can’t see any way around the use of them. Without the use of pesticides and herbicides, we wouldn’t be able to feed everyone in the U.S., much less export excess food to starving people in other parts of the world.

What can we do about it? We can’t avoid the use of water. There are some things that we can do at a personal level to help protect ourselves. For example, we could drink bottled water. But recent studies have shown that bottled water, despite its cost, is not necessarily any safer than our tap water. It would be a good choice if you live in an area with a known contamination problem.

Filtration of the water might be an option. However, this also has its problems. The type of filtration employed must match the contamination problem. A different approach is necessary to remove bacteria from water than to remove heavy metals or organics. Another problem is
knowing when to change out the filters. In many cases, there is no obvious way to tell when a filter is saturated other than having the water tested. After a filter becomes saturated, it may start to release its absorbed chemicals back into the water and, in some cases, the concentration of the pollutants in the water may be higher than without a filter.

You can have your water tested. This is especially advised if you have reason to believe that it is contaminated. However, unless you can convince the Health Department that there is a problem, you may have to pay for the testing yourself. Depending on the contaminant you are concerned about, this can range from fifteen dollars up to several hundred dollars per test. If you have city water, it should be tested for a wide range of chemicals on a regular basis, and you should be able to get a report from the city.

The best way to get good quality drinking water is to have uncontaminated water in the first place. This requires us to develop a sound environmental ethic about the proper handling of waste products. Here, education is probably the most important factor. Be informed. I suspect that often chemicals have been released into the environment more out of ignorance than out of greed. Get involved. Attend community meetings on environmental issues. There have been many in this area, some very recently. Write your legislators. Remember that in even the worst cases that I have described, the companies involved were not breaking any laws at the time.

After reading this article, has your opinion about the amount of pollution in Tennessee changed? If so, let me know.
### Table 1 - Tennessee’s Environmental Scorecard

#### Quantity of release

<table>
<thead>
<tr>
<th>Description</th>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 1 in the nation for soil erosion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2\textsuperscript{nd} worst air-polluting state</td>
<td>1990</td>
<td>(8)</td>
</tr>
<tr>
<td>139 million lbs of toxic chemicals into the air in 1990</td>
<td>1995</td>
<td>(3)</td>
</tr>
<tr>
<td>139 million lbs of toxic chemicals into the air in 1997</td>
<td>1997</td>
<td>(6)</td>
</tr>
<tr>
<td>12\textsuperscript{th} worst water-polluting state</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8\textsuperscript{th} worst state for toxins dumped into sewers</td>
<td>1994</td>
<td>(4)</td>
</tr>
<tr>
<td>21 million lbs of toxic wastes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10\textsuperscript{th} worst state for toxins dumped into sewers</td>
<td>1990</td>
<td>(1)</td>
</tr>
<tr>
<td>15.7 million lbs of toxic wastes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6\textsuperscript{th} worst toxin-emitting facility in the country</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Johnsonville power plant</td>
<td>1992</td>
<td>(9)</td>
</tr>
<tr>
<td>3\textsuperscript{rd} worst state in the nation overall</td>
<td>1995</td>
<td>(6)</td>
</tr>
<tr>
<td>5\textsuperscript{th} worst state in the nation overall</td>
<td>1997</td>
<td>(6)</td>
</tr>
</tbody>
</table>

#### Health Implications of the release

<table>
<thead>
<tr>
<th>Description</th>
<th>Year</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>2\textsuperscript{nd} worst in the nation for protecting the environment</td>
<td>1989</td>
<td>(7)</td>
</tr>
<tr>
<td>Criteria: Drinking water, Food safety, solid-waste recycling,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>forest management, and impact of growth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9\textsuperscript{th} worst in the nation in release of chemicals which</td>
<td>1995</td>
<td>(10)</td>
</tr>
<tr>
<td>cause birth defects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11\textsuperscript{th} worst in the nation in release of chemicals which</td>
<td>1995</td>
<td>(10)</td>
</tr>
<tr>
<td>cause cancer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three cities in top 25% with premature heart- and lung-related deaths</td>
<td>1996</td>
<td>(5)</td>
</tr>
<tr>
<td>linked to particulate air pollution: Nashville, Memphis, Chattanooga</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Table 2 - The Health of Local Rivers in Tennessee (27)

<table>
<thead>
<tr>
<th>River</th>
<th>Miles in Tennessee</th>
<th>Fully Supporting</th>
<th>Partially Supporting</th>
<th>Not Supporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forked Deer</td>
<td>20.7</td>
<td>0 %</td>
<td>0 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Obion</td>
<td>71.1</td>
<td>0 %</td>
<td>0 %</td>
<td>100 %</td>
</tr>
<tr>
<td>Mississippi</td>
<td>175.3</td>
<td>0 %</td>
<td>14 %</td>
<td>86 %</td>
</tr>
</tbody>
</table>

**Supporting** - Can be used for body contact, recreation and fishing
Table 3 - Problem Sites in the Madison / Gibson County Areas

<table>
<thead>
<tr>
<th>Site</th>
<th>County</th>
<th>City</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA Superfund Sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Creosote Works</td>
<td>Madison</td>
<td>Jackson</td>
</tr>
<tr>
<td>Iselin Railroad Yard (Proposed)</td>
<td>Madison</td>
<td>Jackson</td>
</tr>
<tr>
<td>Milan Army Ammunition Plant</td>
<td>Gibson</td>
<td>Milan</td>
</tr>
<tr>
<td>Velsicol Corp. Dump Site</td>
<td>Hardeman</td>
<td>Toone</td>
</tr>
<tr>
<td>Tennessee Superfund Sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. O. Forgy and Son</td>
<td>Madison</td>
<td>Jackson</td>
</tr>
<tr>
<td>Boone Dry Cleaners</td>
<td>Madison</td>
<td>Jackson</td>
</tr>
<tr>
<td>Porter-Cable Corporation</td>
<td>Madison</td>
<td></td>
</tr>
<tr>
<td>Noma-ITT</td>
<td>Madison</td>
<td>Jackson</td>
</tr>
<tr>
<td>Owens-Corning (Now declared clean)</td>
<td>Madison</td>
<td></td>
</tr>
<tr>
<td>B &amp; H Transformer</td>
<td>Gibson</td>
<td></td>
</tr>
<tr>
<td>Michie Dump</td>
<td>McNairy</td>
<td>Michie</td>
</tr>
<tr>
<td>Other Problem Sites</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITT Milan (Jones Companies Ltd.)</td>
<td>Gibson</td>
<td>Milan</td>
</tr>
<tr>
<td>Yorkville Elementary School</td>
<td>Gibson</td>
<td>Yorkville</td>
</tr>
</tbody>
</table>
References


Juff Contributors

John Jaeger further explores his interest in philosophical issues here, on the heels of his 1998 JUFF piece on Kierkegaard. He is assistant professor of library sciences and holds a master of divinity degree as well.

Randy Johnston is Department Chair and associate professor of chemistry. This is his third article to appear in JUFF since his 1994 arrival at Union.

Barbara McMillin has just been named Dean of the College of Arts and Sciences after serving six years as chair of English. The article here is a reworking of a paper presentation last February at the Tennessee Philological Association meeting in Jackson.

Melissa Moore has contributed multiple articles to JUFF in the area of literary criticism. Currently on maternity leave, she holds the title of associate professor of library services.

Gavin Richardson begins his second year at Union with his JUFF debut. Assistant professor of English, his article is being revised for cross-publication.

Roger Stanley has edited or co-edited JUFF since 1995. He holds the title of assistant professor of English.

Jan Wilms assumes the presidency of the Faculty Forum after serving as its vice-president for 1998-99. He is associate professor of computer science and Chair of mathematics and computer science.

H. W. Wofford is a former president of Union’s Faculty Forum and well known regionally for his acumen on environmental issues. He serves as Director of the Center for Scientific Research and is an associate professor of biology.

Janice Wood enters her second year as co-editor of JUFF and has been a past contributor. She is assistant professor of communication arts.