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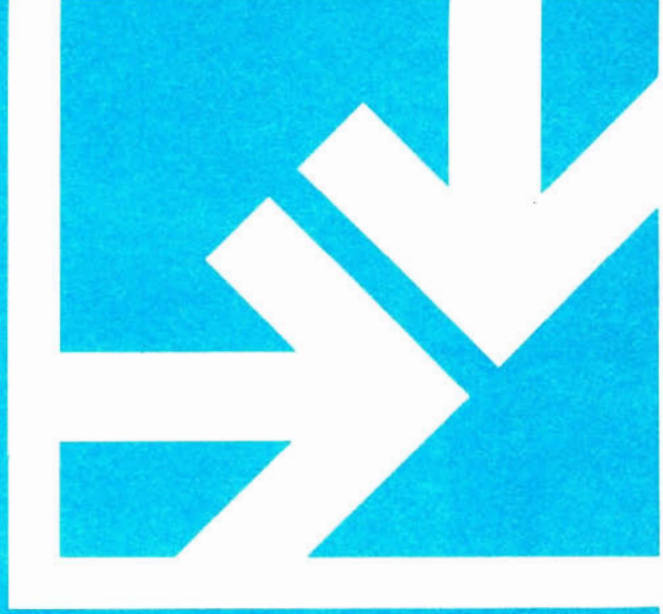

Evangelical Perspectives on Science and the Christian Faith

In this issue . . .

Astronomy

Instrumentalism

Bystander Apathy

Environment

Decline of the West

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

VOLUME 37, NUMBER 1 MARCH 1985

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Putting Things in Perspective

The major papers in this issue provide us with perspectives on astronomy, ecology, philosophy, and sociology. Each of these subject areas has profound inter-relations with evangelical Christianity and its biblical basis. These inter-relations, in turn, sometimes involve a diversity of views and conclusions among Christians because of varying details of our theological persuasions and the incomplete nature of human knowledge.

The lead paper, by Colin Humphreys and W. G. Waddington, is an exciting example of collaborative, interdisciplinary investigation. These two physicists have brought together the astronomical and the historical information regarding the date of the crucifixion. While not originally planned for the March issue this paper should be an encouraging preparation for the time when all of us will be reminded of the tremendous theological implications of the death and resurrection of our Lord.

John Byl gives us something to think about and perhaps may stimulate some future papers for the Journal as he recommends an instrumentalist approach to scientific theory, an approach that potentially helps us avoid some of the pitfalls of our usual realist approach. Another paper that might stimulate a discussion of differing perspectives is Fred Van Dyke's summary of the crisis in the environmental movement caused by unresolved value conflicts.

Sociologist Jerry Bergman discusses the disturbing subject of bystander apathy. His detailed discussion of how people respond to crisis situations considers our Christian responsibilities to love, and, therefore, help our neighbors. This paper left me a little uncomfortable in regard to my own limited willingness and ability to help as a Christian should. There is certainly more to the parable of the good Samaritan than just a romantic story.

Finally, I want to draw your attention to the paper by Paul Peachey on the Decline of the West. Shortly after becoming editor I concluded that I would like to see our Journal occasionally do what some other publications do—reprint significant papers from past issues. When I decided to elect the first reprint I immediately searched my back issues for the one paper that was most significant for me, the paper by Paul Peachey. When I saw that this paper was originally published in March of 1955 I decided March 1985 would be an ideal time for the reprint. Professor Peachey helped me considerably at a time when my own attitude had become decidedly cynical because of the very world events that he put in such realistic perspective. What helped me most was his confident suggestion that, even if the West continued to decline, our God could still raise up people to Himself in Asia or in Africa. And today, thirty years later we see our God doing just that! Anyone else with a candidate for a reprint?

—WLB

The Date of the Crucifixion

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The date of the crucifixion has been debated for many years yet there has been no agreement on the year nor the day on which Jesus died. In this review astronomical calculations are used to reconstruct the first century A.D. Jewish calendar and to date a lunar eclipse which Biblical and other references suggest followed the crucifixion. The evidence strongly points to Friday, 3 April, A.D. 33 as being the date when Christ died.

Chronology is the backbone of history. The key date in the chronology of the life of Jesus is the date of the crucifixion, since it is directly relevant to the length of his ministry, and to the date and nature of the Last Supper. We believe that the only way to establish the precise date of the crucifixion is by using science, history and theology in an interdisciplinary study. Previous attempts to date the crucifixion have used a process of elimination, showing that every year other than the one chosen is incompatible with the available evidence (see, for example, Hoehner,[1] Finegan[2]). In this article we consider the first positive dating of the crucifixion using lunar eclipse evidence.[3,4] We also reassess the 'elimination method' using a new technique for reconstructing the first century A.D. Jewish calendar, which should be more accurate than previous versions. Details of our work have already been published.[3,4] In this paper we bring together these details and add some further comments.

Biblical Background

There are three main pieces of evidence for dating the crucifixion:

(i) Jesus was crucified when Pontius Pilate was procurator of Judaea (all four Gospels; also Tacitus[5]), which is well documented to be A.D. 26–36.

(ii) All four Gospels agree that Jesus died a few hours before the commencement of the Jewish Sabbath, i.e. he died before nightfall on a Friday.

(iii) All four Gospels agree to within about a day (see below) that the crucifixion was at the time of Passover.

These three pieces of evidence compel us to reject many of the dates which have been suggested in the past for the crucifixion. For example, one of the earliest traditions, going back to Tertullian (A.D. 200), gives the date as A.D. 29, March 25. This date was not accepted everywhere throughout the early church and we now know from astronomical calculations that the time of the Passover moon in A.D. 29 was in April, not March.

In the official festival calendar of Judaea, as used by the priests of the temple, Passover time was specified precisely (see, for example, Reicke[6]). The slaughtering of the lambs for Passover occurred between 3pm and 5pm on the 14th day of the Jewish month Nisan (corresponding to March/April in our calendar). The

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Passover meal commenced at moonrise that evening, i.e., at the start of 15 Nisan (the Jewish day running from evening to evening) (Leviticus 23 v. 5; Numbers 28 v. 16). There is an apparent discrepancy of one day in the Gospel accounts of the crucifixion which has been the subject of considerable debate. In John's Gospel, it is stated that the day of Jesus' trial and execution was the day before Passover (John 18 v. 28 and 19 v. 14). Hence John places the crucifixion on 14 Nisan. The correct interpretation of the Synoptics is less clear and we consider briefly three of the many possible interpretations which have been proposed.

(a) A straightforward reading of the Synoptics would seem to indicate that the Last Supper was a Passover meal, eaten at Passover time (i.e. in the evening at the start of 15 Nisan) with the crucifixion occurring later that Jewish day, i.e on 15 Nisan (e.g. Mark 14 v. 12). This disagrees with John's date of 14 Nisan (see Jeremias[7]).

(b) Many scholars propose that the Last Supper described by the Synoptics was not a strict Passover meal. It is suggested that Jesus, knowing of his imminent arrest, held a Passover-like meal on the evening before Passover (see Luke 22 v. 15). Supporters of this interpretation note that the Synoptics make no mention of a Passover lamb being slain and roasted for the Last Supper. This interpretation is in broad agreement with the Johannine account in which the farewell meal is explicitly stated to have occurred before the feast of Passover (John 13 v. 1). The timing also agrees, so that on this theory all 4 gospels give 14 Nisan as the crucifixion date. A number of variations on this basic interpretation exist (e.g. references 6, 8, 9).

(c) Jaubert[10] has proposed that the Last Supper reported by the Synoptics was a strict Passover Meal but held at Passover time as calculated using the 'sectarian' calendar of the Qumran community and others. According to this theory the Last Supper was held on Tuesday evening, i.e. at the start of the Jewish Wednesday (the sectarian calendar Passover day, and recorded by the Synoptics) the crucifixion was on Friday (all 4 Gospels) and the official Passover was on Saturday (recorded by John). (For a discussion of calendars in use in the first century A.D. see for example, refs. 2 and 11). According to this theory all four Gospels again give 14 Nisan (official calendar) as the crucifixion date.

Thus some scholars believe that all 4 Gospels place the crucifixion on Friday, 14 Nisan, others believe that according to the Synoptics it occurred on Friday, 15 Nisan. For generality at this stage we assume that both dates may be possible. The problem that then has to be solved is that of determining in which of the years A.D. 26–36 the 14th and 15th Nisan fell on a Friday. As is well known, various authors (e.g. 7, 12, 13, 14, 15) have attempted to use astronomy to provide a solution to this problem. This is not entirely straightforward however, since, although astronomical calculations can accurately specify the times of new and full moons we do not know with what skill the Jews of the first century could detect the first faintly glowing lunar crescent following conjunction with the sun (the new moon itself being invisible, of course).

Thus there is an impressive unanimity from all sources that the crucifixion was on 14 Nisan and consequently the only two plausible years for the crucifixion are A.D. 30 and A.D. 33.

Reconstructing the First Century A.D. Jewish Calendar

In the past it appears to have been common practice to assume arbitrarily that the sickle of the new moon would be invisible to the unaided eye until a certain length of time (usually 30 hours) had elapsed since conjunction. Fotheringham[14] applied a more realistic criterion, based on the apparent position of the moon in the sky at sunset, to the problem of the visibility of small lunar crescents. Maunder[15] modified and improved Fotheringham's criterion. Even Maunder's limit of visibility is not rigorous as several thin crescents have been observed which would have been deemed impossible using his criterion.

In the present work we have computed the lunar crescent visibility as a function of time after sunset for the beginning of each lunar month in the period of interest. In order to do this, the lunar semi-diameter and the position of the moon in the sky at and after sunset are first evaluated from harmonic synthesis of the perturbed orbits of the earth and moon. The sky brightness for an observer at Jerusalem is then calculated as a function of the depression of the sun below the horizon, as is the moon's apparent surface brightness. Whether or not the moon is visible depends upon whether its contrast with the sky background exceeds the visual contrast threshold.[16] For the latitude of Jerusalem, our criteria for the first visibility of the lunar crescent corresponds to the lunal altitude at sunset being approximately 0.5° lower than that given by Maunder's criterion. This approach gives results which

Table 1
The Date of 14 Nisan in Jerusalem. A.D. 26–36

Year (A.D.)	*New Moon Time°*		*Deduced Date of 14 Nisan°°*	
26	April 6	6:40	Sunday	April 21
27	March 26	20:05	Thursday	April 10+
28	March 15	2:30	Tuesday	March 30
29	April 2	19:40	Monday	April 18++
30	March 22	19:55	Friday	April 7++
31	March 12	0:26	Tuesday	March 27
32	March 29	22:10	Sunday	April 13+
33	March 19	12:45	Friday	April 3
34	March 9	5:25	Wednesday	March 24
35	March 28	6:10	Tuesday	April 12
36	March 16	17:50	Saturday	March 31

°Calculated apparent (sundial) time of conjunction for Jerusalem (± 5 min).
°°This column gives the Julian day (from midnight to midnight), starting at 6th hour 14 Nisan and ending at 6th hour 15 Nisan.
+14 Nisan A.D. 27 and A.D. 32 could have been on the following day if the new moon was not detected due to poor atmospheric transparency.
++In each of these cases it is not impossible, but highly improbable, that 14 Nisan would have occurred on the preceding day.

are consistent with many recent observations of the first sickle of the new moon and we can therefore have considerable confidence in the calculations. Using this method, and assuming normal atmospheric transparency, we obtain Table 1, in which all cases close to the visibility limit are noted in the footnotes.

Although in the first century A.D. the beginning of the Jewish lunar month (in the official calendar) was fixed rigorously by astronomical observation, there remains an uncertain calendrical factor: that of intercalary (or leap) months. Twelve lunar months total approximately 11 days less than a solar year. For agricultural and religious festival reasons the Jews kept lunar months at approximately the same place in the solar year by the intercalation of a thirteenth month when necessary (one intercalary month being required approximately every three years).

Different methods of intercalation were used at different periods of Jewish history but in the first century A.D. intercalation was regulated annually by proclamation by the Sanhedrin according to certain criteria (7, 11, 12, 17). The most important of these was that Passover must fall after the vernal equinox. [It is clear from the Talmudic tract Sanhedrin 10b–13b that the Jews knew in advance when the equinox would be. We do not know the method they employed for this. There are various possibilities, for example use of the so-called 'gates of heaven' (Neugebauer[36]), or use of the time of the heliacal risings of particular groups of stars (e.g. the Egyptian decans) and the position of the new crescent relative to these asterisms (especially the Pleiades, as in Babylonia) to determine in advance when the equinox would be]. If it was noticed towards the end of a Jewish year that Passover would fall before the equinox the intercalation of an extra month before Nisan was decreed. Table 1 has been constructed on this basis and therefore includes intercalary months. However, a leap month could be decreed if the crops had been delayed by unusually bad weather (since the first fruits must be ripe for presentation on Nisan 16) and if the lambs were too young. Unfortunately we possess no historical reports as to the proclamation of leap-months in the years A.D. 26–36. It is therefore possible that in some years Nisan was one month later than given in Table 1, on account of unusually severe weather. Calculations show that in the period A.D. 26–36, if Nisan was one month later than given in Table 1, Nisan 14 would not fall on a Friday in any year and Nisan 15 would only fall on a Friday in A.D. 34 (April 23).

Possible Dates for the Crucifixion

Table 2 lists the possible dates of a Friday crucifixion, on 14 or 15 Nisan, obtained from Table 1 and including April 23, A.D. 34. These dates in Table 2 are the only

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Table 2
Calendrically Possible Dates for the Crucifixion

Jewish Day	*Source*	*Date (Julian Calendar)*
14 Nisan	John's Gospel and Synoptics (b, c)°	+Friday, 11 April A.D. 27 Friday, 7 April A.D. 30 Friday, 3 April A.D. 33
15 Nisan	Synoptics (a)°	+Friday, 11 April A.D. 27 ++Friday, 23 April A.D. 34

°Synoptics (a, b, c) refers to the 3 possible interpretations in the text.
+There is some uncertainty, depending upon the atmospheric conditions, as to whether this day was on 14 or 15 Nisan. We include all possibilities for completeness.
++Only in the case of a leap month being inserted because of exceptionally severe weather (see text).

ones that are astronomically and calendrically possible for the crucifixion. We now examine these dates in the light of other evidence.

A.D. 27 is almost certainly too early for the crucifixion. Luke 3:1–2 carefully states that John the Baptist commenced his ministry in the fifteenth year of Tiberius Caesar (Jesus was baptised by John subsequently). Depending on whether Hellenistic (Roman) civil or the Jewish ecclesiastical reckoning is used, the fifteenth year (=340 Seleucid Era) is autumn A.D. 28–29 or spring A.D. 29–30 (Edwards,[18] also private communication). In addition, most scholars believe that Pilate had been procurator for some time before the crucifixion (see Luke 13:1 and 23:12). These two points rule out the possibility of an A.D. 27 crucifixion.

A.D. 34 is almost certainly too late for the crucifixion since it would conflict with the probable date of Paul's conversion (A.D. 34, see ref. 19). In addition, A.D. 34 is only a possibility if the weather was exceptionally severe. There is no positive evidence in favour of A.D. 34 and we therefore rule it out. (The only eminent supporter of 23 April, A.D. 34 that we have come across was Sir Isaac Newton, and his main reason seems to have been that 23 April is St George's Day!).

Having eliminated A.D. 27 and A.D. 34 as possible years for the crucifixion, we note from Table 2 that the crucifixion must have occurred on 14 Nisan, and that the previously listed interpretation (a) of the Last Supper cannot be correct. It is perhaps also worth noting that science has been used to distinguish between different theological interpretations of the nature of the Last Supper, and has shown on calendrical grounds that the Last Supper cannot have been a Passover meal held at the official time. In addition, we have shown that the crucifixion occurred on 14 not 15 Nisan. Thus Jesus died at the same time as the Passover lambs were slain. This is consistent with many New Testament statements, for example, 'Christ our Passover is sacrificed for us' (1 Cor. 5:7). In addition, Paul refers to Christ as the first fruits of those who rise from the dead (1 Cor. 15:20), a clear analogy with the offering of the first fruits in the temple, which occurred on Nisan 16. Paul would surely not have used this analogy had the crucifixion been on Nisan 15 and the resurrection on Nisan 17. Thus in describing Christ symbolically as the Passover lamb and as the first fruits, the Pauline chronology of the crucifixion events is identical to that of John. Both are consistent with the Synoptic chronology, provided the Last Supper was not a Passover meal held at the official time. In addition, the Babylonian Talmud records that Jesus' death was on the eve of Passover, i.e. on 14 Nisan (Sanhedrin 43a). Thus there is an impressive unanimity from all sources that the crucifixion was on 14 Nisan and consequently the only two plausible years for the crucifixion are A.D. 30 and A.D. 33.

The earliest possible date for the commencement of the ministry of Jesus is autumn A.D. 28 (see Edwards[18]) and John's gospel records three different Passovers occurring in the ministry (including the one at the crucifixion). Hence, if this evidence is accepted, A.D. 30 cannot be the crucifixion year, leaving A.D. 33 as the

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only possibility. A.D. 33 is also consistent with the 'temple reference.' At the first Passover of Jesus' ministry John 2:20 records that the Jews said to Jesus 'It has taken 46 years to build this temple.' Assuming this refers to the inner temple (see Hoehner[1]), the 46 years leads to A.D. 30 or 31, depending upon how much preparation time was involved before building commenced. If the only Passovers of Jesus' ministry were the 3 explicitly mentioned in John's gospel, an A.D. 33 crucifixion implies a ministry of about 2½ years. Many scholars believe that John omitted to mention a further Passover, so that the ministry was for 3½ years.

We conclude that the words of Cyril and the Report of Pilate may be used as secondary evidence supporting our interpretation of the words of Peter that the moon appeared like blood on the evening of the crucifixion.

This date, 3 April A.D. 33, is supported by many scholars (e.g. Hoehner,[1] Reicke,[6] Ogg[17]). However, not all scholars accept that A.D. 33 is preferable to A.D. 30, and the date 7 April A.D. 30 is also strongly supported (e.g. Finegan,[2] Bruce,[8] Robinson[20]). Without further evidence it does not seem possible to decide conclusively between these two dates, although 3 April A.D. 33 is considered to be much the more probable for the reasons given above. A few scholars support dates other than A.D. 30 or A.D. 33 although these do not seem calendrically possible. We now consider the new evidence presented in our previous papers,[3,4] which provides the first positive dating of the crucifixion.

The Moon Turned to Blood

The new evidence concerns the meaning and significance of the moon being 'turned to blood,' referred to in the Bible and elsewhere. In Acts Chapter 2 v. 14–21 it is recorded that on the day of Pentecost the apostles were accused by a crowd of being drunk. Peter stood up and said 'No, this is what was spoken by the prophet Joel: In the last days, God says, I will pour out my spirit on all people . . . I will show wonders in the heavens above . . . The sun will be turned to darkness and the moon to blood before that great and glorious day of the Lord shall come. And everyone who calls on the name of the Lord shall be saved.'

Commentators are divided upon whether Peter was claiming that all the quoted prophecy from Joel had recently been fulfilled (e.g. Neil[21]) or whether the words refer to the future. We will investigate the former interpretation further, demonstrate that 'the moon turned to blood' probably refers to a lunar eclipse, and show that this interpretation is self-consistent and enables the crucifixion to be dated precisely.

Peter prefaces his quotation from Joel with the words 'Let me explain this to you . . . this is what was spoken by the prophet Joel.' Peter therefore appears to be arguing that recent events have fulfilled the prophecy he is about to quote. If this interpretation is correct 'the last days' (v. 17) began with Christ's first advent (for similar usage see 1 Peter 1:20; Hebrews 1:1–2) and the outpouring of the spirit (v. 17–18) commenced at Pentecost; 'that great and glorious day' (v. 20) refers to the resurrection, since which time 'everyone who calls on the name of the Lord will be saved' (v. 21). 'The sun will be turned to darkness' (v. 20) refers back to the 3 hours of darkness which occurred only 7 weeks previously, at the crucifixion (Matthew 27:45), and would be understood as such by Peter's audience. As is well known, the mechanism by which the sun was darkened may have been a khamsin dust storm (see refs. 22 and 23). Since the darkened sun occurred at the crucifixion it is reasonable to suppose that 'the moon turned to blood' occurred that same evening, 'before that great and glorious day,' the resurrection.

The interpretation of Acts 2:20 suggested above, that 'The sun will be turned to darkness and the moon to blood' refers back to the crucifixion, is supported by the New Testament scholar, F. F. Bruce,[24] who states in his commentary on the Acts 'Peter's hearers may have associated the phenomena in (Acts 2) vv. 19 f. with those which attended the preternatural darkness on Good Friday.'

There is some other evidence that on the day of the crucifixion the moon appeared like blood. The so-called Report of Pilate, a New Testament Apocryphal fragment (see James[25]), states 'Jesus was delivered to him by Herod, Archelaus, Philip, Annas, Caiphas, and all the people. At his crucifixion the sun was darkened; the stars appeared and in all the world people lighted lamps from the sixth hour till evening; the moon appeared like blood.'

Much of the New Testament Apocrypha consists of highly theatrical literature, which cannot be used as primary historical evidence. Tertullian records that Pilate wrote a Report of all the events surrounding the crucifixion and sent this to the Emperor Tiberias. The manuscript fragments that we possess of the Report of Pilate are all of later date but may be partly based on

this very early lost document (see James[25]). If this is the case the Report may provide independent evidence that 'the moon appeared like blood' following the crucifixion. On the other hand, the Report may have used the Acts as a source and not be independent from it. If this is the case, however, the event described by Peter 'the moon turned to blood' is clearly stated in the Report to have occurred at the crucifixion. A third possibility, which is the most likely, is that the so-called Report is a late Christian 'forgery.' If this is correct, there must have been a Christian tradition that at the crucifixion the moon appeared like blood.

There is strong evidence that when Peter and the Report of Pilate refer to the moon turning to blood on the evening of the crucifixion they are describing a lunar eclipse.

Further evidence is provided by Cyril of Alexandria, the Patriarch of Alexandria in A.D. 412. After stating that there was darkness at the crucifixion he adds 'something unusual occurred about the circular rotation of the moon so that it even seemed to be turned into blood.' He notes that the prophet Joel foretold this sign.[26] We conclude that the words of Cyril and the Report of Pilate may be used as secondary evidence supporting our interpretation of the words of Peter that the moon appeared like blood on the evening of the crucifixion.

A Lunar Eclipse Following the Crucifixion

'The moon turned to blood' is a graphic description of a lunar eclipse. The reason an eclipsed moon is blood red is well known and the effect has been well documented. Even though during an eclipse the moon is geometrically in the earth's shadow, some sunlight still reaches it by the refraction of light passing through the earth's atmosphere. This light is red since it has traversed a long path through the atmosphere and scattering by air molecules and very small particles preferentially removes the blue end of the spectrum. The combination of scattering and refraction produces the deep blood-red colour of a lunar eclipse.

'The moon turned to blood' has been used by writers and historians to describe lunar eclipses for many centuries, and the expression dates back to at least 300 B.C. Descriptions of some well documented ancient eclipses have been compiled by Ginzel[27] and matched with calculated eclipse dates. We quote three examples:

(i) The lunar eclipse of 20 September, 331 B.C. occurred two days after Alexander crossed the Tigris and the moon was described by Curtius (IV, 10 (39), 1) as 'suffused with the colour of blood.'
(ii) The lunar eclipse of 31 August A.D. 304 (probably) which occurred at the martyrdom of Bishop Felix, was described in Acta Sanctorem 'when he was about to be martyred the moon was turned to blood.'
(iii) The lunar eclipse of 2 March A.D. 462 was described in the Hydatius Lemicus Chronicon thus 'on March 2 with the crowing of cocks after the setting of the sun the full moon was turned to blood.'

In the mediaeval European annals compiled by Pertz[28] there are so many lunar eclipses described by 'the moon turned to blood' that the phrase appears to be used as a standard description. Stephenson[29] considers that the prophecy of Joel (2 v. 31) of the moon turning into blood (which Peter quoted at Pentecost) clearly alludes to a lunar eclipse.

There is therefore strong evidence that when Peter and the Report of Pilate refer to the moon turning to blood on the evening of the crucifixion they are describing a lunar eclipse. It is surprising that this deduction does not appear to have been made before, although Bruce[30] almost reaches this conclusion. He states, with reference to Peter's Pentecost speech, 'it was little more than seven weeks since the people in Jerusalem had indeed seen the sun turned to darkness, during the early afternoon of the day of our Lord's crucifixion. And on the same afternoon the paschal full moon may well have appeared blood-red in the sky in consequence of that preternatural gloom.' Presumably Bruce and other commentators have not been aware that a blood-red moon is a well-documented description of a lunar eclipse.

Lunar Eclipses Visible from Jerusalem A.D. 26–36

We have determined the eclipses relevant to our work using the most comprehensive data available[31] as corrected by Stephenson (private communication, see also refs. 32 and 33), who used ancient Babylonian eclipse records to refine the calculations to take into account more accurately long term changes in the earth's rate of rotation. These calculations agree very well with records of Babylonian and Chinese eclipse observations (the probable error in a calculated eclipse time 2000 years ago is typically 5 minutes). All lunar eclipses (total and partial) visible from Jerusalem between A.D. 26–36 are listed in Table 3.

Table 3
Lunar Eclipses Visible from Jerusalem A.D. 26–36

Date°	*Day*°°	*Magnitude*°°°	*Time Eclipse Started*
15 Aug A.D. 26	Friday	50%	23.16
31 Dec A.D. 27	Wednesday	70%	23.45
14 June A.D. 29	Tuesday	Total	20.45
9 Dec A.D. 29	Friday	45%	20.92
25 April A.D. 31	Wednesday	35%	21.58
19 Oct A.D. 31	Friday	25%	4.82
3 April A.D. 33	Friday	60%	Occurred at rising moon
27 Sept A.D. 33	Sunday	85%	4.88
11 Feb A.D. 35	Friday	55%	4.91
7 Aug A.D. 35	Sunday	60%	20.30
31 Jan A.D. 36	Tuesday	Total	Occurred at rising moon
26 July A.D. 36	Thursday	Total	22.23

°Julian calendar.
°°Julian day (from midnight to midnight as distinct from the Jewish day).
°°°Fraction of the area of the moon covered at the midpoint of the eclipse.

From Table 3, in the period A.D. 26–36 there was one, and only one, lunar eclipse at Passover time visible from Jerusalem, namely that of Friday, 3 April, A.D. 33. This date is the most probable date for the crucifixion deduced independently using other data. The interpretation of Peter's words in terms of a lunar eclipse is therefore not only astronomically and calendrically possible, but it also allows us with reasonable certainty to specify Friday, 3 April, A.D. 33 as being the date of the crucifixion. The random probability of a lunar eclipse occurring at moonrise (see below) on a particular date is, of course, small.

It is interesting to note that there have been a few references to this eclipse in the past, for example Hind[34] calculated that there was a lunar eclipse on 3 April A.D. 33, however his calculations showed that this eclipse was not visible from Jerusalem and presumably it was considered irrelevant to the date of the crucifixion. It is only recently that we have been able to take into account accurately the effects of long term changes in the earth's rate of rotation. Hence it is only in recent years that it has become possible to state with confidence that this lunar eclipse was visible from Jerusalem: that is its importance.

The Lunar Eclipse on Friday, 3 April, A.D. 33

Calculations show that this eclipse was visible from Jerusalem at moonrise. All times quoted below are local Jerusalem times as measured by a sundial. The start of the eclipse was invisible from Jerusalem, being below the horizon. The eclipse began at 3.40pm and reached a maximum at about 5.15pm, with 60% of the moon eclipsed. This was also below the horizon from Jerusalem. The moon rose above the horizon, and was first visible from Jerusalem, at about 6.20pm (the start of the Jewish Sabbath and also the start of Passover day in A.D. 33) with about 20% of its disc in the umbra of the earth's shadow and the remainder in the penumbra. The eclipse finished some 30 minutes later at 6.50pm.

Although at moonrise only 20% of the total area (πr^2) of the moon's disc was eclipsed (i.e. in the umbral shadow), calculations show that this 20% 'bite' was positioned close to the top (i.e. leading edge) of the moon. Fig. 1 shows the appearance of the moon at, and shortly after, moonrise on 3 April A.D. 33. As the umbral shadow (in which the sun is geometrically entirely hidden) was near the top of the moon, about two-thirds of the visible area of the rising moon would initially be seen as eclipsed (see bottom of Fig. 1), while the remainder would have been in the penumbral shadow.

There is great variability in exact colouration from eclipse to eclipse owing to atmospheric conditions. As explained previously, the umbral shadow is normally blood red. However, this colour is most noticeable during total lunar eclipses. For partial eclipses, particularly with the moon at high altitude, there is a large contrast difference between the obscured and unobscured part of the moon, so that the moon often appears almost white with a very dark 'bite' removed. However for some partial eclipses the red colour of the umbral shadow is clearly visible. For example, Davis[35] has recently depicted in colour an eclipse sequence as seen by the human eye with the moon low in the sky, and the colouration of the umbra in the partial eclipse phase is almost as vivid as when the eclipse is total.

It is only recently that we have been able to take into account accurately the effects of long term changes in the earth's rate of rotation. Hence it is only in recent years that it has become possible to state with confidence that this lunar eclipse was visible from Jerusalem: that is its importance.

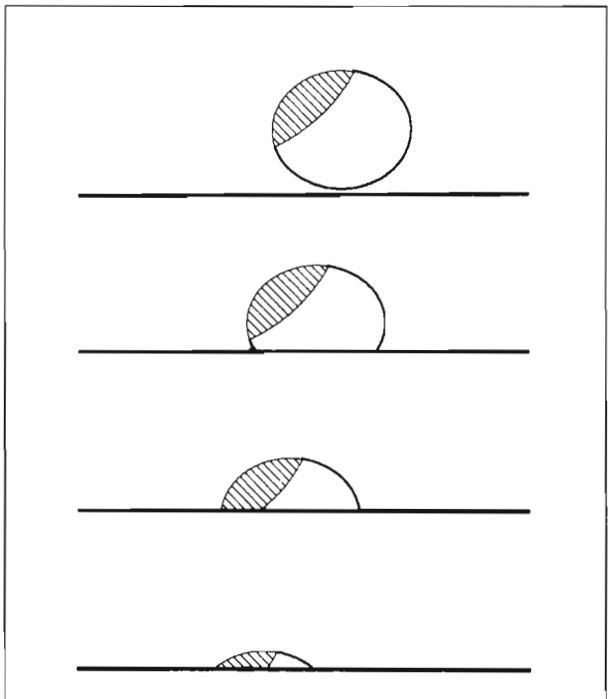

Figure 1. Moonrise on Friday, 3 April A.D. 33 as seen from Jerusalem. The effects of atmospheric refraction have been included and give rise to the distorted shape of the moon. The time interval between successive diagrams is 45 seconds. The most probable colours of the moon were: shaded area, red; unshaded area, yellow-orange.

For the case of the eclipse of 3 April A.D. 33 the moon was just above the horizon. The most probable colour of the rising moon would be red in the umbral shadow (shaded in Fig. 1) and yellow-orange elsewhere. At moonrise the initially small yellow-orange region would indicate that the moon had risen, but with most of its visible area 'turned to blood.' If in fact a massive dust storm was responsible for darkening the sun a few hours previously, dust still suspended in the atmosphere would tend to modify the above colours. The nature of this modification would depend upon the size distribution of the particles, but they would probably further darken and redden the moon.

The majority of lunar eclipses pass unnoticed, occurring when we are asleep or indoors. This eclipse however would probably have been seen by most of the population of Israel, since the Jews on Passover Day would be looking for both sunset and moonrise in order to commence their Passover meal. Instead of seeing the expected full Paschal moon rising they would have initially seen a moon with a red 'bite' removed (Fig. 1). The effect would be dramatic. The moon would grow to full in the next half-hour. The crowd on the day of Pentecost would undoubtably understand Peter's words, the moon turning to blood, as referring to this eclipse which they had seen.

A Crucifixion Solar Eclipse?

Finally, we must consider the well-known reference to a solar eclipse in some translations of Luke 23: 44–45. A typical translation is 'It was now about the sixth hour, and darkness came over the whole land until the ninth hour: the sun was eclipsed.' The three Greek words translated 'the sun was eclipsed' occur in only 5 early (but major) manuscripts of Luke. Other manuscripts do not contain these three words. Consequently some translations of Luke's gospel refer to this eclipse and others do not. A solar eclipse is of course astronomically impossible at Passover (full moon) time. In addition solar eclipses last for minutes not hours.

We consider there are two possible explanations for this apparent reference to a solar eclipse. One is that the original Luke text (which we do not possess) did not refer to a solar eclipse, but that a scribe copying this text, and knowing the oral tradition of an eclipse at the crucifixion, wrongly concluded this was a solar eclipse and amended the text accordingly. This could explain why these words are not present in all Luke manuscripts. We develop this argument further in ref. 4. The other possibility is that the Greek words translated 'the sun was eclipsed' were not intended to refer to an eclipse of the sun by the moon in the scientific sense, but simply refer to the sun not being visible. Strong support for this interpretation comes from a Messianic section of the Sibylline Oracles[23] which states 'And straightway dust is carried from heaven to earth and all the brightness of the sun fails at midday from the heavens.' The Greek word translated 'fails' by Charles[23] is identical to that in Luke 23:45 and usually translated 'eclipsed.' It is clear that the sun darkening mechanism referred to in the Oracles, this section of which was probably written before A.D. 160, is a dust storm and not an eclipse. We conclude that the apparent reference to a solar eclipse in some manuscripts of Luke's Gospel presents no problems.

Conclusions

Establishing the precise date of any ancient event is well-known to be extremely difficult. It is probably not an exaggeration to state that only when ancient chronology is based upon calculable astronomical phenomena can we have certainty and precision. In this review, astronomy has been applied in two different ways to date the crucifixion.

First, we have reconstructed the first century A.D. Jewish calendar using detailed astronomical calculations. The main textual evidence for the time of the crucifixion has been reviewed and we have concluded that only 2 dates, 7 April, A.D. 30 and 3 April, A.D. 33, fit the main pieces of evidence for when Christ died. Other textual evidence, more difficult to interpret

correctly, strongly favours Friday, 3 April, A.D. 33 as the date of the crucifixion.

Secondly, we have calculated that there was a lunar eclipse visible from Jerusalem at moonrise on the evening of Friday, 3 April A.D. 33. If this date was indeed the date of the crucifixion we would expect some textual reference to a lunar eclipse at the crucifixion. This paper presents three such textual references, from the Acts of the Apostles, the writings of Cyril of Alexandria and the Report of Pilate. There are therefore powerful convergent arguments pointing to 3 April A.D. 33 as being the date of the crucifixion.

The crowd on the day of Pentecost would undoubtably understand Peter's words, the moon turning to blood, as referring to this eclipse which they had seen.

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REFERENCES

[1]Hoehner, H.W., *Chronological Aspects of the Life of Christ*. Zondervan: Grand Rapids (1977).
[2]Finegan, J., *Handbook of Biblical Chronology*. Princeton University Press: Princeton (1964).
[3]Humphreys, C.J., and Waddington, W.G. *Nature*, 306, 743 (1983).
[4]Humphreys, C.J., and Waddington, W.G. in the *Finegan Festschrift* (ed. J. Vardaman, E.M. Yamauchi and B. Van Eldeven). (1984).
[5]Tacitus, *Annals*, XV, 44.
[6]Reicke, B., *The New Testament Era*. Translated from the German by D. E. Green. Black: London (1968).
[7]Jeremias, J., *The Eucharistic Words of Jesus*, translated by N. Perrin. SCM Press: London (1966).
[8]Bruce, F.F., *New Testament History*. Pickering and Inglis: London and Glasgow (1982).
[9]Whiteley, D.E.H., *Aufstieg und Niedergang der Romischen Welt*, 25, Part II, de Gruyter: East Berlin and New York, in Press (1983).
[10]Jaubert, A., *La Date de la Cene*. Gabalda: Paris (1957).
[11]Schurer, E., Vermes, G., and Millar, F., *The History of the Jewish People in the Age of Jesus Christ*, Vol. I. Edinburgh University Press: Edinburgh (1973).
[12]Fotheringham, J.K., *J. Theological Studies*, 35, 146 (1934).
[13]Goldstine, H.H., *New and Full Moons*, 1000 B.C. to A.D. 1651. Fortress Press: Philadelphia (1973).
[14]Fotheringham, J.K., *Mon. Not. R. Astr. Soc.* 70, 527 (1910).
[15]Maunder, E.W., *J. Brit. Astr. Assoc.* 21, 355 (1911).
[16]Kornfeld, G.H., and Lawson, W.R., *J. Opt. Soc. Am.* 61, 811 (1971).
[17]Ogg, G., *The Chronology of the Public Ministry of Jesus*. CUP: Cambridge (1940).
[18]Edwards, O., *Palestine Exploration Quarterly*, p. 29 (1982).
[19]Jewett, R., *Dating Paul's Life*. SCM Press: London (1979).
[20]Robinson, J.A.T., *Redating the New Testament*. SCM Press: London (1976).
[21]Neil, W., *The Acts of the Apostles*. Eerdmans: Grand Rapids, Michigan (1973).
[22]Driver, G.R., *J. Theological Studies* XVI, 327 (1965).
[23]Sibylline Oracles, III, 800. In Charles, R. H., *The Apocrypha and Pseudepigrapha of the Old Testament*. Oxford University Press (1913).
[24]Bruce, F.F., *The Acts of the Apostles*. Inter-Varsity Press: Leicester (1952).
[25]James, M.R., *The Apocryphal New Testament*. Clarendon Press: Oxford (1953), p. 154.
[26]Pusey, P.E., *Cyrilli archiop. Alex.* in *XII Prophetas*, i, p. 341, in Joel, ii, 30–31.
[27]Ginzel, F.K., *Spezieller Kanon der Sonnen- und Mondfinsternisse*. Mayer and Muller: Berlin (1899).
[28]Pertz, G.H., *Monumenta Germaniae Historica*, Scriptores, Hanover (1859). Reprinted Kraus Reprint Corporation: New York (1963), Vols 16–19.
[29]Stephenson, F.R., *Vetus Testamentum*, 19, 224 (1969).
[30]Bruce, F.F., *Commentary on the Book of the Acts*. Eerdmans: Grand Rapids, Michigan (1981).
[31]Oppolzer, T.R. von, *Kanon der Finsternisse* (1887). Translated by O. Gingerich. Dover: New York (1961).
[32]Stephenson, F.R., and Clark, D.H., *Applications of Early Astronomical Records*. OUP: Oxford (1978).
[33]Stephenson, F.R., *Scientific American* (1982), p. 154.
[34]Hind, J.R., *Nature*, 6, 251 (1872).
[35]Davis, D., *Sky and Telescope*, 64, 391 (1982).
[36]Neugebauer, O., *Orientalia*, 33, 49 (1964).

"The Book of Nature and the Word of God emanate from the same infallible Author, and therefore cannot be at variance. But man is a fallible interpreter, and by mistaking one or both of these Divine Records, he forces then too often into unnatural conflict."

"Science and Scripture Not at Variance," J. H. Pratt (1872)

Instrumentalism: A Third Option

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Most Christian scientists currently appear to favor a "realist" view of scientific theories. Apparent conflicts between science and Scripture are then generally resolved by modifying either our reading of Scripture or the offending scientific theories. In this paper we examine a third possibility: the adoption of an instrumentalist approach to scientific theories. This alternative enables one to make use of the practical results of scientific theories while at the same time withholding any commitment as to the validity of their epistemological content.

Most Christians accept—explicitly or implicitly—a "realist" view of scientific theories. They believe that scientific theories which purport to explain or extend observational data should conform as much as possible to reality. Thus they feel that we should strive to ensure that our theories are true. Or, at least, as close as possible to the truth.

Not only science, but also Scripture claims to tell us something about that reality which lies beyond our observations. Among other things, it informs us of events in the past, future, and spiritual worlds. Particularly in the last 150 years there have been serious clashes between the truth as found in the traditional interpretation of Scripture and that of secular science. (I use the term "secular" (i.e. non-religious) science to denote that approach to science that claims to be guided only by observation and reason, as opposed to other approaches (e.g. creation science) that accept special Divine revelation (e.g. Scripture) as a prime source of knowledge). How can this epistemological confrontation be resolved?

On the one hand, many Christians have accepted the essential correctness of modern secular science. They generally attempt to solve the crisis by modifying their reading of Scripture via either more elastic interpretations of problem texts or by suitably reducing the nature and extent of Biblical authority. The great difficulty with this procedure is that of finding valid and objective lines of demarcation: where is Scripture authoritative and where is it not? where is it infallible and where does it err? where must it be reinterpreted? If we sincerely wish to listen to Scripture as the Word of God, then it is clear that we may not arbitrarily limit or reinterpret it. Few Christians would be willing to go as far as Rudolph Bultmann who, in his zeal to accommodate modern science, denied the physical reality of spirits and miracles—even Christ's resurrection. But where, then, should they draw the line? And how should they resolve clashes between assertions of science and what they might still consider to be essential teachings of Scripture?

On the other hand, there are also many Christians who are still convinced of the substantial truthfulness of the traditional interpretation of Scripture and who

therefore reject the above course. Among them are those who attempt to construct a new scientific framework that is more congenial to Scripture. But this alternative also has its problems. Aside from the Herculean task of rewriting science so as to resolve conflicts with Scripture, we are again plagued by a lack of objective criteria. How, for example, can we show that one theory (e.g. creationism) is "better" than a competing theory (e.g. evolutionism)? How can we ever conclusively confirm or falsify any given theory? How can we choose between two competing theories, both of which claim to be in accord with Scripture? In short, how can we be sure that a "Scripturally true" science is any nearer to the truth than secular science when its assertions go beyond observation and Scripture?[1]

The instrumentalist considers theories primarily as "useful fictions" that are of great value in summarizing, manipulating, and predicting observations, and is more concerned with their ultimate utility *than in their* veracity.

The nature and status of scientific theories have in the last half century been the focal point of much discussion by philosophers of science. Such writers as Popper, Kuhn, Lakatos, Feyerabend and others have argued that theories cannot be logically derived from the observations but are primarily the product of a scientist's creative imagination; that scientific theories are equally unprovable, equally improbable and equally undisprovable; and that the acceptance and rejection of theories is heavily dependent on our prior philosophical presuppositions.

Given the subjective nature of scientific theorizing, and the inability of demonstrating conclusively the truthfulness or falsity of any particular theory, one may well wonder whether it is not more prudent to withhold assertions of truthfulness with respect to any scientific theory. Hence in this paper we would like to examine a third alternative to the resolution of the conflict between science and Scripture: the adoption of an instrumentalist approach to scientific theories. The instrumentalist distinguishes between observational data—the factual basis of science—and scientific theories which purport to "explain" or extend the data. He (the instrumentalist) considers theories primarily as "useful fictions" that are of great value in summarizing, manipulating, and predicting observations, and is more concerned with their ultimate *utility* than in their *veracity*.

Historical Background

The French physicist-philosopher Pierre Duhem (1861–1916) traces the instrumentalist position back to Plato's (427–347 B.C.) suggestion that astronomers should attempt to devise mathematical models that would "save the phenomena" of the planetary motions.[2] This program was carried out by the Greek astronomers and culminated in the geometric constructs of Claudius Ptolemy (A.D. 85–165). In his "Almagest" Ptolemy adopted the anti-realist view that his astronomical theories were merely useful fictions enabling him to predict planetary positions. His only criteria in choosing theories were accuracy in "saving the phenomena" and maximum simplicity.[3] (However, Ptolemy was not entirely consistent: in "Hypothese Planetarum" he defends a realist view of theories.)

The rival, "realist" interpretation of theories was advocated by Aristotle (384–322 B.C.). He believed that theories should not only save the phenomena, but should also be in accord with the actual nature of things. Thus his followers rejected Ptolemy's system because it was incompatible with the principles of Aristotle's physics (e.g. one of Ptolemy's devices was the "equant," which yielded non-uniform circular motions rather than the ideal uniform circular motion preferred by Aristotle). Moreover, in Aristotle's cosmology the planets were embedded in solid crystalline shells centered on the earth. This did not accord well with Ptolemy's system of epicycles (small circles rotating about a point on a larger circle) and eccentrics (circles not centered on the earth).

The interpretation of Ptolemy's epicyclic and eccentric spheres as being merely mathematical fictions was continued by Proclus (410–483 A.D.) in the fifth century. Similar views were held in the sixth century by Simplicius and John Philoponus. Later the non-realist position was supported by the famous Jewish philosopher Moses Maimonides (1135–1204) and Thomas Aquinas (1225?–74?), among many others. These writers all believed in the validity of Aristotle's physics and thus reconciled their acceptance of the Ptolemaic system by reverting to nonrealist interpretations of astronomical theories. It was held that earth-bound physics could discover the true nature and causes of the objects with which it dealt but that only God could comprehend the true movements of the heavenly bodies.[4]

A more thorough rejection of realist interpretations was favored by the later medieval nominalists.

Throughout the middle ages philosophers were much concerned with the relationship between reason and Revelation. Such figures as Augustine, Anselm, and Aquinas attempted to demonstrate the reasonableness of Christian beliefs. This led, for example, to rational "proofs" for the existence of God. The scholastics were inspired by the belief in the rational unity of philosophy and theology. They thought that true knowledge could be attained through human reasoning.[5]

The nominalists, most notably William of Ockham (1300?–1349?) and his followers, objected to such realism. In particular, they objected to the high role granted to human reason. As Dijksterhuis puts it:

> They criticized the too exalted position which the system-building doctors (e.g. Aquinas) had, in the opinion of their successors, assigned to human reason in their theology. Criticism was levelled first and foremost at the intellectualistic character of the Thomistic synthesis, in which human reason claimed to be able to conceive at least some of the truths of religion by its own efforts.[6]

Ockham insisted that we cannot acquire knowledge of any reality beyond the data of our experiences. He thus formulated the famous rule—Ockham's razor—that entities are not to be multiplied unnecessarily. He opposed the postulation of theoretical entities that had no observable consequences. Religious truths were held to be undemonstrable, the objects of faith alone. He believed that it was both impossible and unnecessary to prove these rationally.[7] Thus the possibility of a natural theology is denied. In reacting against the rationalism of the scholastics, the nominalists inspired Martin Luther, who hailed Ockham as his master.[8]

Nicolas of Cusa (1400–1464) extended the concept of nonrealist theories from astronomy to physics. He maintained that only God is capable of grasping the true essential nature of any part of the universe. Man can never know the true causes and essences of things. Thus he can deal only with fictitious conceptions and causes.[9]

The conflict between realist and nonrealist views of astronomical theories intensified after the publication of Copernicus' "De Revolutionibus" in 1543. Copernicus (1473–1543) himself was a realist but Andreas Osiander, in the preface to Copernicus' book, presented the theory merely as a useful calculating device:

> "... the author of this work has done nothing blameworthy. For it is the duty of an astronomer to compose the history of the celestial motions through careful and skilful observation. Then turning to the causes of these motions or hypotheses about them, he must conceive and devise, since he cannot in any way attain to the true causes, such hypotheses as, being assumed, enable the motions to be calculated correctly.... For these hypotheses need not be true or even probable; if they provide a calculus consistent with the observations, that alone is sufficient.... So far as hypotheses are concerned, let no one expect anything certain from astronomy, which cannot furnish it, lest he accept as the truth ideas conceived for another purpose, and depart from this study a greater fool than when he entered it."[10]

And indeed, Copernicus also had to resort to a large number (48) of epicycles to "save the appearances." He could hardly have considered these to be in any sense "real," although he undoubtedly did believe that the earth really moved.[11]

For the next forty years the majority of astronomers continued to adhere to a nonrealist view of astronomical theories.[12] Gradually, however, the realist view gained prominence. This led to the well-known conflict between those who rejected the Copernican system—primarily on the basis of Scripture—and those who accepted the truthfulness of it. A third approach, the instrumentalist position, was advocated by Cardinal Bellarmine as a means of resolving the clash between Galileo and the Church.[13] In a letter to Father Foscarini, who had written a book advocating the Copernican system, Bellarmine wrote:

> "... For to say that the assumption that the Earth moves and the Sun stands still saves all the celestial appearances better than do eccentrics and epicycles is to speak with excellent good sense and to run no risk whatever. Such a manner of speaking suffices for a mathematician. But to affirm that the Sun, in very truth, is

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> at the centre of the universe and only rotates on its axis without travelling from east to west, and that the Earth is situated in a third sphere and revolves very swiftly around the Sun is a very dangerous attitude and one calculated not only to arouse all Scholastic philosophers and theologians but also to injure our holy faith by contradicting the Scriptures. . . ."[14]

Marin Mersenne (1588–1648), an active propagator of the new science, was able to retain his religious beliefs without coming into conflict with natural science by adopting a positivistic approach to scientific knowledge. According to him, science is concerned with the quantitative organization of observed phenomena. Its aim is not to speculate on the essential nature of things, but to provide useful, practical knowledge. What lies beyond the observations is an object of faith subject to the authority of Scripture.[15]

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The futility of metaphysical speculation and the unreliability of rational theology were stressed also by Pierre Gassendi (1592–1652). He believed that religious truths were undemonstrable but truer than the results of science, which were always uncertain and had a pragmatic, rather than a truth value. Gassendi accepted as genuine only knowledge based on revelation or direct observation.[16]

The realist camp was greatly reinforced by the tremendous successes of Isaac Newton's (1641–1727) mechanics. George Berkeley (1685–1753) feared that the Newtonian system would lead to a decline in religious faith; for many people saw in its success a proof of the power of human reasoning, unaided by Scripture, to discover the reality of the world behind its appearances.[17] In his "Principles of Human Knowledge" (1710) Berkeley attempted to vindicate the tenets of Christianity without rejecting the practical results of science.[18] This was accomplished by denying the possibility of science to go beyond the observations. According to Berkeley, scientific concepts and theories were nothing but mathematical hypotheses that provided convenient instruments for calculating and predicting physical phenomena. He even went so far as to deny the real existence of matter, claiming that God was the direct cause of all our sensations. Thus God is essential not only for the creation of the universe, but also for its continuous existence. For Berkeley there existed only ideas and minds.

Conflicts between science and faith also led Pierre Duhem (1861–1916) to re-interpret the epistemological status of scientific theories. In his "Physics of a Believer" he defends the Catholic dogma against scientific assertions and metaphysical beliefs.[19] Duhem developed a "conventionalist" approach to science. Recognizing that theories are human creations which are impossible to prove or disprove, Duhem claimed that we regard certain scientific propositions as true, not for empirical reasons, but on pragmatic or aesthetic grounds: we accept certain theories by convention. Thus, "the validity of religious faith is contrasted with a science whose values are primarily utilitarian".[20]

More recently, a similar theme has been advanced by the Reformed philosopher Gordon Clark. Clark is concerned with countering the realistic view of scientific theories which has led many modern scientists and philosophers to use scientific assertions in an attack on religion.[21] He claims that "science then must not be regarded as cognitive, but rather as an attempt to utilize nature for our needs and wants"[22] and comes to the somewhat drastic conclusion that "science is always false, but often useful".[23]

Clark's case is built partly upon problems encountered in modern physics. Difficulties in the theory of quantum mechanics have induced many contemporary theorists of physics to advocate an instrumentalist philosophy of science. The prime difficulty stems from the fact that it appears to be necessary to attribute both wave and particle characteristics to electromagnetic radiation and material particles. Thus, for example, some phenomena involving light (e.g. interference and diffraction) are explicable only in terms of waves, while other experimental results can be explained only via a particle model. But the wave and particle descriptions are mutually incompatible and contradictory.[24]

In 1928 Niels Bohr introduced the principle of complementarity into quantum physics. This principle asserts that, although electromagnetic radiation exhibits both wave and particle properties, these aspects are *complementary* rather than contradictory: in any particular experiment we observe *either* the wave *or* the particle characteristic, but never both simultaneously.[25] Popper has described this as a renunciation of the attempt to interpret atomic theory as a description of anything:

> "Thus the instrumentalist philosophy was used here ad hoc in order to provide an escape for the theory from certain contradictions by which it was threatened."[26]

Werner Heisenberg, another founder of quantum mechanics, was also convinced that his quantum theory led of necessity to an instrumentalist position.[27]

To conclude our brief historical sketch, it is evident that nonrealist views of science have been advanced throughout the history of philosophical thought. Often they arose in reaction to attacks on religious truths by scientific and philosophical speculation. The instrumentalist position permitted the affirmation of the epistemological primacy of Divine revelation and stressed the limitations of unaided human reason while, at the same time, making use of the practical results of scientific inquiry.

The instrumentalist position permitted the affirmation of the epistemological primacy of Divine revelation and stressed the limitations of unaided human reason while, at the same time, making use of the practical results of scientific inquiry.

Objections to Instrumentalism

In recent years the instrumentalist position has not been well received by Christians. The great majority of Christians appear to be "realists" with regards to scientific theories. In fact, what is striking among current Christian writers is that instrumentalism is usually not even considered as a viable option. The Christian geologist D.A. Young, for example, concludes his study on the interpretation of the creation days:

> "Indeed, if it can be demonstrated beyond doubt that Scripture demands a 24 hour view of the days, then the Christian scientist must accept that and, in effect, give up geological science and turn to something else. If he is consistent in his faith in Scripture he must do this."[28]

Likewise, the theologian Langdon Gilkey writes:

> "anyone who uses the science of geology to find oil or coal has already implicitly abandoned the literalist view of Scripture."[29]

Both of these writers are "realists" insofar as they feel that one should not make use of those scientific theories that one considers to be false. The instrumentalist has no such qualms. Indeed, consistency in faith does not prohibit the usage of convenient, but false, theories—as long as they are clearly recognized as such. The utilization of *observational* relations (e.g. between geological formations and oil deposits) efficiently summarized and predicted by secular geology—or, for that matter, Flood geology—does not compel us to subscribe to their *theoretical explanations* involving alleged events in the distant past.

A major argument raised against instrumentalism is centered on the successfulness of certain theories. Surely, the realists exclaim, the great success of a theory in its empirical predictions confirms its essential truthfulness. How could science be so successful in its empirical predictions if its theoretical structures are potentially erroneous?

Such optimism is not, however, justified by history. To take a prime counterexample, consider the case of Newtonian mechanics. Never has there been a more useful and successful scientific theory. Many scientists in the 18th and 19th century were absolutely convinced of its essential correctness, with William Whewell (1794–1866), the English scientist and philosopher, going so far as to insist that Newton's laws of motion were to be considered as necessary truths.[30] Yet today, after the advent of relativity and quantum mechanics, it is generally acknowledged that Newtonian mechanics is, strictly speaking, false. Granted, its empirical successfulness—within a limited range of experience—still renders it immensely useful. But the nature of its basic theoretical concepts (e.g. time, space, mass, etc.) differs fundamentally from those of modern physics.

Or consider the fate of 19th century aether theories. Again, these were tremendously successful in their empirical predictions. So much so, in fact, that the great physicist J.C. Maxwell (1831–79) remarked that the aether was better confirmed than any other theoretical entity in natural philosophy.[31] Few contemporary physicists would still endorse this assessment.

History is replete with further such examples. For an account of more of these cases, along with a detailed rebuttal to this objection against instrumentalism, the reader is referred to Larry Laudan's article "A Confutation of Convergent Realism."[32] It is clear, then, that false theories can have true observational consequences and that therefore the successfulness of a theory is no guarantee of its truthfulness.

It has been argued that, since most scientists are realists, we must therefore take realism seriously. Historically, the quest for truth has provided a powerful incentive for scientific theorizing. The notion that a scientist's own particular theory is true, while those of his competitors are false, has inspired many a scientist.

In scientific theorizing the concept of truth is a prominent—many would say indispensable—psychological factor.

However, we must also take into account the fact that most scientists—with notable exceptions—are generally philosophically unreflective and, hence, not always fully aware of the subjectivity of their own (often tacit) assumptions and criteria. Furthermore, the concept of truth, while providing a powerful impetus, has proven to be a poor guide: as mentioned above, most theories once held as true have later been rejected as false.

Does one have to be a realist in order to be a good scientist? Would an instrumentalist philosophy of science hamper the progress of science, as is sometimes asserted by supporters of realism? Such fears appear to be unfounded. Instrumentalism has been advocated, in various forms, by many eminent scientists, including Ernst Mach, Pierre Duhem, Henri Poincare, Gustav Kirchhoff, Heinrich Hertz, Percy Bridgman, Werner Heisenberg, Arthur Eddington, as well as Niels Bohr and others who adhere to the Copenhagen interpretation of quantum physics.[33] This strongly suggests that serious scientific investigation can well be undertaken without adopting a realist view of scientific theory. To cite one example, the instrumentalist epicyclic approach of Ptolemy was much more successful in predicting planetary positions than was Aristotle's realist cosmology.

In a recent series of articles in the *Journal of the American Scientific Affiliation,*[34] Walter Thorson has voiced a number of further objections to instrumentalism. He feels that:

> "If we accept operationalism (a form of instrumentalism) as an adequate epistemology of science, then I see no reason why we must not accept it as an adequate epistemology of Christian faith and life."[35]

Thorson comes to this conclusion because he sees a fundamental similarity between Scriptural and scientific knowledge. In Scripture, as Thorson points out, we find no basis for the idea of an *abstract* knowledge of spiritual truths. Rather, knowledge requires obedience (i.e. functional application). Thus theology (or "theory") provides the basis for practical living. Dr. Thorson finds a parallel in science, particularly in Michael Polanyi's account of scientific knowledge. For Polanyi stresses that in science there is no abstract knowledge, but only *personal* knowledge that entails a personal commitment and functional application.[36]

However, even if there do exist some similarities between Scriptural and scientific knowledge, we must not overlook the great differences in their content and origin, as has been well pointed out by J.C. Keister.[37] In Scripture we are given extra-experiential knowledge in the form of propositional truths that are to be accepted as the infallible word of God the Creator, who knows all; in science fallible man strives to rise above his observational horizon by creatively inventing theories to account for his perceptions of nature.

If modern man has now finally come to the realization that the human intellect has severe limitations in its ability to attain objective truth, then this should be cause for rejoicing rather than concern.

But is not nature also a Divine revelation? Certainly, and hence we can expect our observations of nature, God's general revelation, to be consistent with the contents of Scripture, His special revelation. Unfortunately, however, this Divine sanction can not be extended to scientific theories. To be sure, God has given us brains and has created the universe so that the laws of deductive logic are applicable. Yet our reasoning ability is not confined to the mere application of deductive logic, but includes also the capacity for abstract, speculative thought—the source of scientific theory. It is a tool that can be manipulated by our inner desires. As such it can easily be misguided—"For out of the heart come evil thoughts" (Matt.15:19)—and we are urged to "Take every thought captive to obey Christ" (II Cor. 10:15). Clearly, then, man is responsible for his thoughts, and hence also their products: scientific theories.

Thus Divine authorship may be bestowed on nature but not on scientific theories. This is made clear also by history: if God really were the author of our scientific theories then we would hardly expect to encounter false theories.

Dr. Thorson fears that the modern positivist attack on the concept of an objective reality will adversely effect Christian beliefs:

> "This entails not only the death of science but also the final erosion of *all* concepts of an objective authority to which meaningful commitments could, even in principle be made, i.e. Christianity would become, even more than at present, *incredible*. . . . Emphasis on "cool," non-verbal forms of communication, which can totally distort factual truth in favor of subjective

impressions, can make it almost impossible to present the word of God![38]

I heartily concur with Dr. Thorson that Christian beliefs take for granted the existence of an external objective reality: the Biblical events must surely be considered to be real, rather than mere existential symbols. But the acceptance of an instrumentalist view of science does not compel one to deny the existence of an objective reality, it merely questions the ability of scientific theorizing to acquire knowledge of that reality. The last 400 years has seen a steady inflation of man's assessment of the power of human reason—at the expense of Biblical authority. If modern man has now finally come to the realization that the human intellect has severe limitations in its ability to attain objective truth, then this should be cause for rejoicing rather than concern. A clear recognition of the smallness of man is the first step towards the acceptance of the Christ of Scripture as the only road to truth and salvation. The Christian must proclaim that in the word of God alone can we find a meaning to our lives, a guide for our conduct, and absolute truth regarding reality.

Is the instrumentalist position consistent with Scripture? Two motivations for doing science are often distilled from the Bible. The first of these is the cultural mandate found in Gen.1:28, where man is exhorted to subdue and have dominion over the earth. The emphasis is, however, on applications rather than on a quest for truth. Certainly, man must first investigate nature before he can develop and regulate it. Scientific research is essential if he is to acquire an intimate understanding of nature: man must make extensive observations, he must engage in experimentation, he must search for patterns and regularities, etc. And this will all involve theorizing. Yet the text implies that man's ultimate task in science is not to speculate on a reality beyond the observations, but to provide useful results.

A second motivation is often derived from those texts (e.g. Ps 19, Rom.1) stating that God reveals Himself through nature. But the purpose of this revelation is primarily redemptive (i.e. that we may recognize and acknowledge God as the Creator) and the knowledge thus revealed is limited to impressions of God's power, beauty and grandeur. Due to the corrosive effects of sin, even this limited revelation appears dim in the eyes of man and special revelation—in the form of Scripture and the inner working of the Holy Spirit—is needed for us to perceive it fully. Moreover, this revelation is made manifest via our direct *observations* of nature and not through our theoretical speculations. God does not reveal Himself through our scientific theories. On the contrary, Scripture emphasizes the limitations of human thought: Job 38–41 stresses man's ignorance regarding origins and deeper questions regarding nature; I Tim.6:20 warns us to avoid the oppositions of science—or knowledge—falsely so called, etc. Rather, it is Christ "in whom are hid all the treasures of wisdom and knowledge" (Col.2:3).

In summary, I can find nothing in Scripture that speaks against an instrumentalist view of science. Indeed, instrumentalism, with its more modest appraisal of the power of human reason, appears to be more Biblical than scientific realism. God is certainly not glorified if our faith in scientific theories causes us to distort His Word, which is the great danger with realism.

Of course, the instrumentalist approach is applicable only as long as our prime goal is that of utility. Some fields of study (e.g. sociology and psychology) are concerned not only with observing and predicting human behavior, but also with transforming it to preconceived standards. Here theories can have significant ethical consequences. The Christian must therefore insist on the authority of Biblical norms and insights on the nature of man. Other disciplines (e.g. history and philosophy) have truth as their main goal. There we have no choice but to be realists: reject those theories that contradict Scripture and seek Christian alternatives.

Conclusion

In conclusion, I feel that the advantages of the instrumentalist approach to scientific theories have not been sufficiently appreciated by the Christian community. Instrumentalism appears to avoid the shortcomings of the other two major proposals for reconciling science and Scripture: subjective, ad hoc modifications of either Scripture or science. Instrumentalism, on the other hand, enables us to retain the epistemological supremacy of Scripture—thus leaving us with a solid basis with regards to the essentials of the Christian faith—while still making use of the practical results of secular science.

REFERENCES

1. These difficulties are discussed in more detail in my paper "Science and Christian Knowledge," *Reformed Perspective*, Vol. 2 No. 6 (April 1983), pp. 4–9.
2. Pierre Duhem, *To Save the Phenomena*, translated by E. Doland & C. Maschler (Chicago: University of Chicago Press, 1969), p. 5.
3. Ibid., p. 17.
4. cf. E.H. Madden (ed.), *Theories of Scientific Method* (Seattle: University of Washington Press, 1966), pp. 23–25.
5. Meyrick H. Carre, *Realists and Nominalists* (London: Oxford University Press, 1946), pp. 120–122.
6. E.J. Dijksterhuis, *The Mechanization of the World Picture* (London: Oxford University Press, 1961), p. 165.
7. Leszak Kolakowski, *Positivist Philosophy* (Harmondsworth: Penguin, 1972), p. 23.
8. As cited by Carre, op. cit., p. 122.
9. cf. Madden, op. cit., p. 25.
10. As quoted by Arthur Koestler, *The Sleepwalkers* (Harmondsworth: Penguin, 1968), pp. 573–574.

11. Ibid., p. 454.
12. Ibid., p. 170.
13. Ibid., p. 29.
14. as quoted by Madden, op. cit., pp. 44–45.
15. cf. Kolakowski, op. cit., p. 30.
16. Pierre Gassendi, "Exercises Against the Aristotelians," Book II, Exercise VI, as found in Craig B. Brush (ed.), *The Selected Works of Pierre Gassendi* (New York: Johnson Reprint Corporation, 1972), pp. 85–86.
17. cf. Karl R. Popper, *Conjectures & Refutations* (London: Routledge, 1963), p. 98.
18. cf. W.T. Jones, *Hobbes to Hume* (New York: Harcourt, Brace & World, 1969), p. 281.
19. Pierre Duhem "Physics of a Believer," included as an appendix in his book *The Aim and Structure of Physical Theory* (Princeton: Princeton University Press, 1954), pp. 273–311.
20. Kolakowski, op. cit., p. 178.
21. Gordon H. Clark, *The Philosophy of Science and Belief in God* (Nutley, New Jersey: The Craig Press, 1964), p. 7.
22. Ibid., p. 93.
23. Clark in *Horizons of Science*, Carl F.H. Henry (ed.), (New York: Harper & Row, 1978), p. 271.
24. cf. R.T. Weidner & R.L. Sells, *Elementary Modern Physics* (Boston: Allyn & Bacon, 1968), pp. 180–183.
25. Ibid.
26. Popper, op. cit., p. 82.
27. Werner Heisenberg, Dialectica 2, p. 333 ff.
28. D.A. Young, *Creation and the Flood* (Grand Rapids: Baker Book House, 1977), p. 144.
29. Langdon Gilkey in *Science and Religion*, I.G. Barbour (ed.), (New York: Harper & Row, 1968), p. 167.
30. William Whewell, *Philosophy of the Inductive Sciences* (London: John W. Parker, 1847), vol. I, pp. 245 ff.
31. cf. Larry Laudan, "A Confutation of Convergent Realism" in *Philosophy of Science, 48* (1981), p. 27.
32. Ibid., pp. 19–49.
33. cf. Popper, op. cit., p. 99.
34. Walter R. Thorson, *JASA* (1981: March, pp. 3–11; June, pp. 65–73; September, pp. 129–138.
35. Ibid., p. 134.
36. Ibid., p. 133.
37. J.C. Keister, *JASA* (1981), September, pp. 138–141.
38. Thorson, op. cit., p. 9.

"PROGRESSIVENESS"

January 31, 1829

To: President Jackson

The canal system of this country is being threatened by the spread of a new form of transportation known as 'railroads.' The federal government must preserve the canals for the following reasons:

One. If canal boats are supplanted by 'railroads,' serious unemployment will result. Captains, cooks, drivers, hostlers, repairmen and lock tenders will be left without means of livelihood, not to mention the numerous farmers now employed in growing hay for horses.

Two. Boat builders would suffer and towline, whip and harness makers would be left destitute.

Three. Canal boats are absolutely essential to the defense of the United States. In the event of the expected trouble with England, the Erie Canal would be the only means by which we could ever move the supplies so vital to waging modern war.

As you may well know, Mr. President, 'railroad' carriages are pulled at the enormous speed of 15 miles per hour by 'engines' which, in addition to endangering life and limb of passengers, roar and snort their way through the countryside, setting fire to crops, scaring the livestock and frightening women and children. The Almighty certainly never intended that people should travel at such breakneck speed.

Martin Van Buren
Governor of New York

"No Growth," *The American Spectator*, January 1984, p. 31.

Toward an Understanding of the Decline of the West

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The European slant of the paper is explained by the fact that the author was working and studying in Europe at the time the paper was prepared.

The western world was ushered into the present century by the optimistic philosophy of the evolutionary progress of the processes of history. Science and technology had overcome so many of the incongruities of human existence that it seemed to be only a matter of time until the paradise of which men in all ages had dreamed would become reality on earth. What philosophers proclaimed seemed confirmed on every hand by the solid achievements of the human genius. The ascent from the lower to the higher which in the philosophy of medieval scholasticism had required at every transitional stage a transcendent creative intervention was now seemingly being achieved by the pulsations of immanent energy.

Today, at mid-century, that same western world grovels uneasily beneath the ruins of its utopia, trembling with fear of even worse things to come. In Europe this fear seems to have produced among many a general apathy toward life and the future, while in America one sees symptoms of panic and malaise. The difference in reaction, however, is only that Europe has already progressed further along the road of disillusionment. For the confidence of Europe was shaken already by World War I—indeed she had premonitions before that time of terrible things to come—while only with World War II and the Korean conflict did the terrible truth come home to America. Furthermore, Europe has experienced the catastrophe in her own flesh and blood while America knows it only theoretically in terms of the terror she herself produced at Dresden and Hiroshima. Some European observers detected the first tremors of fear in America between 1945 and 1950 when her conscience showed the first signs of uneasiness because of the bomb she had unleashed and the realization dawned that the achievement of world order lay beyond her powers, a realization that the stalemate of Korea, America's first unwon war, can only deepen.

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The spirit of despair found its European prophet already during the interwar period in Oswald Spengler, the despondent German philosopher who published his dirge for western civilization under the title, *Der Untergang des Abendlandes*—The Decline of the West. His theories gave expression to the despondent feelings of many intellectuals who believed that the culture (civilization) of the West had run its course. World War II has increased the speculation as to the significance of the crisis, particularly in Germany, who out of her own experience knows perhaps better than any other western nation its dimensions. In widely different circles today's conditions have come to be regarded as the end stage of secularization and dechristianization. By contrast the Middle Ages now appear as the age of faith. People yearn for the security of cultural unity and harmony which medieval times offered, as can be seen in the resurgence of the Catholic Church in many areas and in the pilgrimage into her fold of certain people, particularly European poets and prose writers. Parallel to this is the swing toward orthodoxy, the rise of a strong liturgical trend, and the self-contradictory reawakening of confessional consciousness in many quarters within the Protestant world. Indeed one can note striking similarities to the restorative and romantic period which followed the French Revolution and the Napoleonic Wars.

The interpretation of this crisis in western civilization varies greatly according to the viewpoint of the observer. Catholicism as the exponent of cultural unity under the tutelage of the church naturally regards it as the consequence and the final stage of man's revolt against God, against His church, and against Christ's vicar on earth. Where they are not engulfed in the humanist stream, the reaction of the official Protestant bodies often do not differ greatly from the Catholic, since they too pose as the spiritual guardians of society. The secular humanist° viewpoint arrives at opposite conclusions, for it denies that the Middle Ages were ever as thoroughly Christian as the proponents of Christian culture would have it, and would at any rate never assign religion as important a role in the affairs of men as it is accorded by the religious traditions themselves. A third viewpoint is that of "evangelical" Christians, who find themselves divided, however, between the approach of the Catholics and that of the humanists. Some would agree with the former that the process of secularization is responsible for the crisis, but would view the whole in the perspective of an intense eschatological schematization, while others would agree strongly enough with the humanists that medieval society never had been thoroughly Christianized and consequently would feel that today's crisis in a stricter sense is not immediately the secularization of world culture.

It is a common characteristic of all schools of thought, however, to hold that evil forces threaten to reduce to ashes at a single blow the accumulated cultural heritage of painfully progressing centuries. All seem to agree that an old epoch in human history has passed but that a stable foundation for a new one has not yet been laid. Nevertheless the majority of men cling tenaciously to the remnants of the old order,

The governance of unredeemed men requires measures and means that are fundamentallly at variance with the essence of the Gospel

determined to preserve its privileges and unable to face the sacrificial demands of a new unformed era. Indeed no one, whatever his persuasion, can contemplate with complacency the outbreak of new wars or revolutions. Alone the communist votaries of revolution relish the thought of catastrophe, and in western countries few of them realize what they worship.

It is the purpose of this paper to examine briefly this belief that the West is in a state of decline and to suggest elements essential to a Christian attitude toward the problem. To analyze western history and civilization in this light is a stupendous task, as the widely differing conclusions of men who have spent their lifetime studying it amply testify. I make no pretense of having begun to master the mass of material that needs to be studied, to say nothing of the inscrutability of the ways of God in history. Indeed, preoccupation with questions as these whose larger dimensions lie beyond human comprehension can lead to futile speculation which will deflect the Christian from his main responsibility to live and proclaim the Gospel within history, content to leave the larger meanings to God. It can tempt men to seek for human remedies and to rely on man-made devices, forgetting that human destiny ultimately lies in the hand of God. Furthermore, all historical writing and all cultural analysis is of necessity selective, interpretative, and insofar subjective, so that salient facts may completely escape notice. Finally, one

°The term "humanist" is used in this paper to refer broadly to the various modern streams of secular thought, beginning with the Renaissance. These streams of thought manifest in varying degrees the following characteristics: they repudiate special relevation and/or subordinate its authority to reason and empiricism, and seek to explain man and the universe in terms of immanent energy and processes. Thus in the name of "immanence" they stand in opposition to transcendental or supernaturally revealed truth and are actually "man-centered" or "humanistic."

must note the errors which historical consciousness has brought into western thought and even into the church, such as philosophies of history which have defied the process of history itself. But bearing in mind all these and other dangers, we cannot escape the problems which our time thrusts upon us. Without understanding, in some fashion at least, the age in which we live we cannot hope either to survive as vital Christian churches nor yet to fulfill the task of Christian witnessing. This paper, however, is not based on any exhaustive or systematic study; it simply constitutes reflections made along the way, and is offered as a contribution to a discussion which I hope will be continuous and will help to give us the orientation which we need to fulfill the responsibilities of our own generation.

Western History and Civilization

The term, "decline of the West" presupposes a previous level of attainment now in the process of disintegration. The "West" which is here meant is European civilization primarily (Europeans would here prefer the term "culture") but including also its American extension, which civilization is the creation of medieval Catholicism and of Fifteenth-to Twentieth-century humanism. While now one, now the other, is given the major credit for the total structure, depending on the viewpoint of the observer, in either case it seems clear that not only the civilization itself but also the presuppositions upon which it rested are threatened. An examination of these two great cultural forces will therefore be necessary.

a. Medieval society as the "corpus christianum"

Historians have traditionally divided western history into three periods: ancient, medieval, and modern. While the roots of Europe go deep into the ancient past, and consequently have fed on various traditions, particularly the Greek and the Latin, Europe as we know it today is seen as the creation of medieval times. After the ancient empires one after the other were broken up, the Romans emerged shortly before the birth of Christ to achieve the imperial political unity of the Mediterranean world. Local religions and cultures had failed and a great process of eclecticism and synthesization had set in. The failure of the Greek gods to protect the great civilization of Greece had discredited them and led to a decline in the importance of religion as a factor in the affairs of men. Thus Christ brought His message to the world at a time when an optimum of transnational stability had been reached, while the resistance of competing religions was remarkably low.

In the mind of Christian historians, this coincidence of the coming of Christ with a maximum of political stability and a minimum of cultural resistance constitutes in part "the fullness of the time" of which the prophets predicting the coming of Christ had spoken. Nevertheless the tide was soon to turn inasmuch as the religious indifference lasted only several centuries, for not only did the Roman emperors now seek to unify the empire by means of an imperial religion such as Mithraism, but the third and fourth centuries of our era were marked by what Professor Marrou of Paris has called a new religiosity. New credibility was attached to the intervention of the gods in the affairs of men, after several centuries marked by skepticism. But now, once Christianity had gained a real entree among the Mediterranean peoples, demanding as it did the ultimate loyalty of its adherents, a conflict with the absolute demands of the empire and its gods was inevitable. This led to persecutions till Constantine with political astuteness recognized in Christianity the greatest spiritual force in his empire and reversing the policy of suppression, enlisted its support in the imperial achievement.

Constantine is usually regarded as a turning point in the history of the church and of the West, but the actual compromise of which he is the symbol was a process that far superseded his span of life, a process in which the church and the empire as universal concepts became coterminous. Nevertheless, when the barbaric storms descended on Rome, Christianity was still a vital

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force, sufficiently autonomous that when the empire fell, it survived, despite the accusation of pagan Romans to the contrary that it had caused the downfall of the eternal city. As Augustine, who became the leading theologian for the post-Constantine centuries, fended off the pagan accusations he set forth the transcendent *civitas dei*, and by a slight misinterpretation the Roman church as an institution identified herself with the *civitas*, with the millennium of Christ, and for a thousand years medieval Europe lived under the illusion that the millennium could be realized within history.

Until the fall of Rome (A.D. 476) the chief cultural forces at work in the empire had been the Greek, i.e., Hellenist, and Latin traditions, now in interaction with Christianity. The entrance of the Germanic peoples into the Latin world brought the fourth great component of European civilization into the picture. In a remarkable fusion of cultures these uncivilized peoples coming from the north were to inherit the political tradition and responsibility of the empire while at the same time yielding to the cultural superiority of the Mediterranean peoples. It was as the Mediterranean culture, particularly the "Christianized" Latin, was carried northward across the Alps and assimilated by the Germanic tribes that modern Europe was born. The original heirs of the Roman tradition were the Franks who occupied finally the area between the Loire and the Rhine rivers. But on into the heart of modern Germany in thousands of small clearings in the dark Teutonic forests courageous missionary monks planted sanctuaries and slowly chiseled away at the raw blocks of savagery to create eventually the modern European spirit.

The classic theologian of this Europe was Thomas Aquinas. On the skeleton of Aristotelian philosophy he erected a magnificent structure of thought, founded upon the unified authority of natural and revealed theology, embracing the totality of human experience, and able to absorb within itself all the incongruous and contradictory in the world of men. In this great system the lower was only a preliminary stage to the higher. Every line strove forever upward as did architectural lines of the Gothic cathedral which this great culture produced. No state was so lowly, no function so menial, that it had no place in the providence of God, to enhance His eternal glory. On all the disharmonious, the imperfect, the suffering, the church as the extension of the incarnation radiated by way of the sacraments the Eternal Presence. Even kings and emperors were thought to have been brought under the reign of Christ and the tension between church and world had disappeared. Day and night monastic voices and the incense of worship ascended in anticipation and imitation of the multitudes that shall assemble around the throne of God to sing His praises eternally. At the head of this great divine-human society stood the vicar of Christ, representing and safeguarding His seamless robe. The *corpus christianum* was indeed the most magnificent dream ever dreamed by man.

The actual accomplishments of this great system were impressive, both religiously and culturally, and remain so to this day. In the first place, the cults of paganism were successfully eradicated, despite remnants which remain to this day, and monotheism was everywhere established. "Christian" theism became the world view of the West, and the religious consciousness affected profoundly the political concepts of the time. Christian theology, literature, symbols, and liturgy were introduced, and once the Holy Scriptures were in Europe a recurrent eruption of Gospel freshness was assured. In the second place, Christianity brought not only a new religion but a new ethic. However imperfectly its ideals may have been realized in practice, no one in Europe could escape its influence. The religious unrest of the late Middle Ages and the flourishing of mysticism, both of which were the soil from which the Reformation sprang, testify to the success of medieval Catholicism in educating the Germanic conscience. In the third place, the impulse of Christianity as it fused with the undifferentiated genius of northern Europe produced a new culture in some respects superior to any culture previously known. Indeed it was the spirit of Christianity that eventually pulled Europe from the "Dark Ages" which succeeded the collapse of the ancient Roman empire.

The difference was that where the corpus christianum *looked to the transcendent, the supernatural, for fulfillment, the humanist structure relied on the immanent, the natural.*

Nevertheless the medieval vision, the *corpus christianum*, was doomed from the outset. In the first place, the Christianity which penetrated north of the Alps was no longer pure. Already the mere fact that it was carried by monks who, despite the Christian heroism that characterized their work, were an aberration of the Gospel ideal, could only mean that a distorted social ethic reached the pagan tribesman. In the very process of evangelism itself important concessions were made to the pagan spirit. So Pope Gregory the Great (590–604) instructed the great Benedictine missionary

Augustine, who was sent to the Angles, to simply sanctify by means of holy water the heathen sanctuaries already in existence so as to win the pagans more readily. Even their festivals were to be transformed into Christian feasts; "For if a few outer pleasures are left to them they will be more quickly attracted by the inner joys. For to cut off everything from these hard hearts at one blow is without doubt impossible. He who wishes to scale a high mountain can do so only with slow steps, not by leaps." We cannot here discuss the question of missionary technique with illiterate pagan peoples. It is important only to note the discolored Christian message which reached the Teutonic world. More disastrous than all else, however, was the debasement of Christianity which stemmed from the Constantinian compromise, for not only had state and church become united, not only was Christianity now falsely captivated by and identified with the culture of the occident, but it had become a mere means of mundane ends. Throughout all human history natural religion has always been the highest cohesive and integrative force in any society and culture, as the numerous studies of "primitive" peoples made in our century have shown. This is precisely what Christianity is not. As Jacob Burckhardt, the great Swiss historian, points out, the Christian religion, in contrast to the polytheistic cults of classical paganism, "was and is not a cult consecrating a national culture but a transcendent faith in a future redemption. It was hostile to the pagan gods of nature and culture, as it must be hostile to the idols of modern civilization." But empirical Christianity was now no longer primarily the redemptive intervention of God, but a new means to cultural and political ends, subservient to the caprice of the ruling caste.

In the second place, the basic presuppositions of the *corpus christianum* were false. The Gospel speaks to men who are morally free to reject its claims. Everywhere it recognizes that some will accept while others will reject its message. And while the universality of its intent and of the final triumph of Christ is nonetheless upheld, the Gospel nowhere visualizes a permanent peace between "church" and "world," nowhere predicts the final harmonization of all that is incongruous in human experience except eschatologically, and nowhere promises the redemption of this aeon in toto. Thus Jesus had to declare Himself: "I am not come to send peace but a sword." To set up an ecclesiastical and political regime that presupposed that the totality of mankind had been embraced within the Christian community could therefore never correspond with reality.

In the third place, the *corpus christianum* even as an ideal was possible only as long as the theistic world view was universally acknowledged. Men might not necessarily accept the claims of Christianity existentially—indeed the recognition of supernatural reality is not a uniquely Christian insight—but as long as the mythological world view of medieval man, which was in part a continuation of pre-Christian theologies, persisted, there was no escape from the external demands of the church-dominated society. Once, however, modern discoveries disenchanted or demythologized the world and man began to feel himself autonomous, and free from dependence on deity, the whole structure was undermined. The only recourse open to the *Corpus* at this point was to suppress coercively every dissent and cultural heterogeneity. But this was a basic contradiction of the essence of the Christian faith which is at heart voluntaristic. Furthermore this confusion of a sort of natural or instinctive theism with the revealed Christian faith could only obscure the distinction between the providential and redemptive activities of God.

Not only was the humanist giant far more indebted to Christianity than he ever realized, but he misunderstood the basic human limitations and moral weakness even worse than medieval Catholicism had ever done.

In the fourth place, the attempt of the church in medieval times to direct the whole of society necessarily plunged her into ethical compromise. The governance of unredeemed men requires measures and means that are fundamentally at variance with the essence of the Gospel. In the position of ethical compromise the Christian "salt" lost its "savour," the church her prophetic otherness, that would have enabled her to rebuke and transform the abuses of society. All too soon she became so imbedded in the *status quo* that those who wished to rise higher came into conflict with her totalitarian claims and were mercilessly dealt with as heretics.

Finally, Christianity in Europe has never been too much more than a veneer, for the true Christians have always been in the minority. Many of the tribes were originally converted (read baptized) en masse. Beneath the new Christian traditions the old pagan stream continued to flow, ever ready to reappear under favorable circumstances. The men of the Third Reich could still establish contact with the old Germanic religions, ridiculous as it may seem. It is remarkable how frequently one finds the religious comprehension of the

common people who have been "churched" for centuries limited to a vague, almost naturalistic, theism, which knows God primarily as Providence. Superstition is still widely prevalent, and many smaller traces of paganism still remain, such as certain festivals or practices as runic symbols on farm buildings or local traditions as in Westphalia the "Heidenweck" (heathen bread rolls) used on Mardi Gras. That elements of the pre-Christian past should persist is neither surprising nor of itself disastrous. Indeed this demonstrates unmistakably the great task which the Gospel must undertake to transform us poor pagans into true sons of God. The error arose, however, in the assumption that the entire culture could be or had been Christianized, for Christianity now ceased to be prophetic.

b. *The modern humanist world view*

Despite the great achievements of his society the lot of late medieval man was not a very happy one. Furthermore, by the late Middle Ages the creative force of the *corpus christianum* had been largely spent and new ideals began to stir his imagination. Whether or not the re-emergence of pagan impulses in the spirit of western man as heralded by the Renaissance is to be attributed to the failure of the medieval church is not easy to determine and must at any rate remain an open question in the present discussion. In an article published several years ago in the German weekly, "Sonntagsblatt," published by Bishop Lilje, Nicholas Berdyaev asked: "Why did not the superior religious insights of the Middle Ages, and superior they were to both the ancient and the barbaric traditions, produce a Christian renaissance?" In his answer to his own question he pointed out that Christianity had introduced two principles into the experience of man: (1) the eschatological-messianic principle in which Christ has entered history, thereby ending the concept that history repeats itself in endlessly reproduced cycles, and revealing the purposeful movement of history toward a final goal, and, (2) the principle of freedom in history as over against the older idea of determinism. Indeed it is this freedom that makes for movement in history as such. And it was the assertion of this freedom that made the Renaissance possible. Why then did Christianity not achieve a renaissance? Because, according to Berdyaev, Christianity had also introduced a conflict between these two principles, for the Middle Ages tried to realize the kingdom of God by coercion, thus denying to man that very freedom which the Gospel would effect.

The analysis of Berdyaev seems valid, for the doom of nations is always related to the self-betrayal of the people of God. At the same time, proceeding as we are from a voluntaristic concept of Christianity, we can hardly consider the church entirely responsible for the rise or fall of a civilization nor can we assume *a priori* that the church could have retained the spiritual leadership of the modern scientific movement. To the extent, however, that the church employed non-Christian means in the suppression of dissent and presumed to dictate coercively the conduct of men who had rejected the central presuppositions of Christianity or of her claims, she herself drove men to revolt, once they discovered the hoax. In any event, the rediscovery of the ancients, the expansion of the geographic horizon of the late medieval world, the discovery of scientific experimentation and of certain elementary principles governing the functioning of the universe, which were not known before, introduced a spirit of doubt and inquiry into the western mind that was to grow steadily till the twentieth century, and to destroy the theistic world view to which western civilization originally owed its existence. The full-blown humanist world view, however, in certain respects differed little from the Thomist concept which preceded it. For modern humanism, whatever its particular philosophical expression, likewise visualized the attainment of paradise within history. As larger and larger areas of life were brought under rational control, as the old frontiers of human self-determination receded rapidly, and as humanity (presumably) evolved steadily upward it seemed only reasonable to believe that in time everything incongruous in human experience would be resolved and all the discordant would be harmonized. The difference was that where the *corpus christianum* looked to the transcendent, the supernatural, for fulfillment, the humanist structure relied on the immanent, the natural. For Darwin and Thomas both there was a gradual ascent from the lower forms of life to the higher. But where Thomas held that every transition required a supernatural, creative act, Darwin held that transition from the lower to the higher forms would be realized through immanent or innate energy. And if Thomism was far preferable to Darwinism because of its deference to the transcendent, i.e., to God, it shared

The American reaction to the (Russian) Communist challenge is the reaction (e.g., "McCarthyism") of a people uncertain of its own faith. It is the reaction of a culture which can return neither to the theism which gave it birth, nor yet to the humanism which nursed it to maturity.

in part with the latter its fatal misunderstanding of the provisional and contingent nature of the present aeon.

By the early sixteenth century people already dared to appeal to non-Christian authorities in their criticisms of existing conditions, religious as well as secular. Since then the world has become disenchanted. Where medieval man saw demons at work, modern man has discovered bacteria. Where medieval man saw the justice of God striking down the wicked, modern man sees the consequences of the violation of the laws of "nature." Where medieval man wrote off the unknown as lying enshrouded by the supernatural, modern man sees only unexplored vistas of the natural and the physical. Whatever inspiration the modern ideals of human dignity and freedom have drawn from Christian sources, modern man somehow feels that he owes the conveniences and comforts of modern life more to the empiricism of the doubting humanist than to the faith of the believing Christian. The pioneers of the physical sciences as Copernicus, Kepler, and Galileo were neither impelled by unbelief in their research nor led to it by their discoveries. The opposition of the church, however, both Catholic and Protestant, identified her with the forces of reaction, and more and more men found the Christian faith incompatible with the facts of science. The telling blows to medieval bigotry and religious intolerance were not dealt even by the Reformation to say nothing of Catholicism, but by the secular Enlightenment. It was Voltaire who took up the cause of the persecuted Huguenots and nourished the spirit of toleration that went into the French declaration of "The Rights of Man and the Citizen." Even if in this particular case the Catholics were persecuting Protestants, the latter were no better. In 1541 the Protestant government of Bern sent the nobleman Naegli to Paris to protest against the French government's suppression of the Huguenots at the same time that her own prisons were overflowing with Anabaptists. The reasons for persecution were identical.

Throughout the eighteenth and nineteenth centuries and on into the twentieth the humanist stream continued to swell. As emancipated moderns reveled in their new freedom and power Philosophers were busily hewing out new gods in place of the old One who had been left behind. First came the apotheosis of reason, then of evolution and progress, and finally, of science and the machine. And the church, accustomed for a millennium to identify herself with the social regime in power, with the *status quo*, strove to maintain her privileges, either by political power as in Catholic countries or by adaptation in Protestant countries.

The grandeur of the humanist dream is not to be denied. That modern autonomous man, ostensibly in his own strength, "subdued the earth" to a degree never approached by a culture exclusively devoted to the supernatural gives him an unassailable dignity. And yet when all the accounts are rendered the picture changes profoundly, for not only was the humanist giant far more indebted to Christianity than he ever realized, but he misunderstood the basic human limitations and moral weakness even worse than medieval Catholicism had ever done.

(1) Humanism's indebtedness to Christianity

The modern humanist tradition has often been sternly critical of social injustice to which even Christians had all too often quietly acquiesced. We have already noted that religious tolerance in Europe was more or less a product of the Enlightenment. One might also point to Karl Marx and his associates who, proceeding from a militantly materialistic world view, drew the attention of the world to the abuses of British industry during the first half of the nineteenth century. And yet a closer examination of the great crusades for social justice reveals, particularly in England, that whatever secular idealists may have had to say about social injustice, the men who actually accomplished the slow and painful tasks of reform drew their inspiration largely from Christian sources. The men who finally killed the English slave trade and who drove the exploitation of woman and child labor from English factories had roots deep in the Methodist revival, many of them being lay preachers or sons of ministers. After World War II American labor unions joined the coordinating council of American relief agencies which worked in Germany, unions which actually represented millions of workers, but it was the churches who did the main job. In a different way, the same thing might be said of the eighteenth- and nineteenth-century Continental prophets of human autonomy, whatever their specific philosophic persuasion. It was very often their orthodox or Pietist upbringing that prevented their drawing practical conclusions from their intellectual revolt. Immanuel Kant's ethical sternness is not primarily an organic part of his philosophy. It is much more a philosophic adaptation of a stern Scotch Presbyterian and German Pietist upbringing that had formed his early life.

(2) The misunderstanding of humanism

The basic error of humanism, whatever its philosophic or scientific garb, has been the supposition that the unlocking of the mysteries of the universe, the gradual rationalization of life, and the supposed evolutionary ascent of the race would enable man himself to overcome the incongruities of human existence. It failed to see that technological and scientific or even philosophic progress, even though seemingly unlimited in potential development, could never alter a single

strand of man's moral fiber, that, to the contrary, such progress increased the potential for evil as much as the potential for good, that the fact of evil (and not only finitude) lies at the heart of the human enigma, and that consequently civilized man no more possesses the key to Paradise by the mere virtue of his knowledge than did his tribal forefathers.

It took the catastrophic wars of the twentieth century and the revolt of the oppressed to unmask the folly of the humanist dream. Not only did the wars in their external effects destroy the belief that by inherent forces man moved steadily upward, but the monstrosities of the totalitarian states revealed fully the autonomous man who was no longer inhibited as some of his forerunners had been by an inbred piety. The men of Dachau demonstrated in unmistakable terms how the fully autonomous human animal beneath a godless sky conducts himself. And when the nation which ostensibly was the real citadel of Christian virtue, something of a modern counterpart of the *corpus christianum*, unleashed on a defenseless city of women and children the first atomic bomb the disillusionment of modern man was well-nigh complete. Meanwhile the theoretical basis of scientism was equally shaken. The series of discoveries initiated by Albert Einstein's first formulation of the theory of Relativity in 1905 has gradually shattered the scientist's "absolute" laws of causality or determinancy, of the space-time categories, and the concept of the "closed universe" objectively measurable. We have thus witnessed in our generation the default of the humanist dream, a crisis perhaps equal in profundity to the failure of the medieval religious world view at the dawn of the modern era.

Meanwhile the new Christian communities of the Orient have developed a genius of their own and are exercising an increasing influence in the world church.

The Protestant Reformation

Our discussion to this point has dealt with two world views as having created and informed western man: the medieval Christian and the modern humanist. What has been the contribution of Protestantism? For the average Protestant the Reformation is an event in Christian history second in significance only to the inception of Christianity itself. In terms of potential Christian achievement, of the break-through of the evangelical experience in Europe, of the shattering of Catholicism's false authority, and of the repostulation of the authority of the Word of God and the community of the believers, this viewpoint seems well justifiable. To the Catholic, however, the Reformation appears as an episode in the process of the secularization of modern culture. A good illustration of this viewpoint is Alois Beck's introduction to his *Messerklärung* (Molding bei Wien, 1949), a German handbook to the Latin mass for the general public (Beck is the initiator of the contemporary Catholic Bible-reading campaign in German-speaking Europe), where he describes the secularization of the West as follows: "For about 500 years the Church has been defending herself against a world which has been becoming increasingly ungodly; the development began with the Nominalism of William of Occam; in the time of the *Reformation* a part of the Christians said *'No' to the Church* and separated itself from the pope; in the time of the *Enlightenment* there followed a *'No' to Christ*, while outwardly men still held to a 'world architect' (Deism, Free Masonry), who was, however, no longer concerned about anything; *during approximately the last century* this apostasy developed its logical last step: to a *'No' to God*, in whose place now some creature was deified: Technology and Progress, Blood and Soil, Power and Gold. Further from God it is not possible to go; we are thus standing at *a spiritual turning point;* the modern age with its rational darkness is dying."

In the realm of culture and social ethics I am increasingly inclined to concur with the Catholic view of the Reformation, though I draw far different conclusions of the case. The Reformation as such is difficult to isolate sufficiently from parallel movements and impulses in secular areas of life to permit an adequate analysis. As we have seen, Beck suggests that its roots lay in the rise of Nominalism, a view shared by many others. It will be remembered that Luther's early theological development lay under the nominalist influence of William of Occam through the latter's disciple, Gabriel Biel of Tubingen. Others have seen the roots of the Reformation primarily in the Renaissance, which was largely true in the case of Zwingli, and quite generally so inasmuch as the humanists introduced the study of Scripture in the original tongues and on the basis of Scripture dared to criticize existing religious conditons even counter to the authoritarian claims of the church. Again one might emphasize the importance of mysticism in late medieval society or the geographic and scientific discoveries which served to weaken the authority of the medieval church.

Whatever we decide about the origin of the Reform, we can regard it as a new and genuine answer to the Gospel by the Germanic conscience no longer able to

accept the Catholic evangel. German Protestant scholars tend to regard the Reformation as the "acute Germanization of Christianity," as the release of a new genius within the Christian tradition. And certainly any Protestant would agree that Luther's rediscovery of justification by faith was indeed a triumph of unending significance over centuries of accumulated distortion.

When Christians cease to be Christian and to fulfill their role on the plane of redemption, that other minister of God on the plane of preservation, the state, most readily oversteps his bounds.

The same could be said of the other two cardinal principles of the Reformation—the supreme authority of Scripture and the universal priesthood of believers. The Reform indeed brought a new day for the Christian Church.

Why then is the Protestant claim of the significance of the Reformation not justifiable? To me the simple answer seems to be that it mistakenly identifies the actual development of the Reformation with the personal experience and the ideals of the isolated Luthers. The unique thing about the Reformation was not that Luther's experience was so revolutionarily new—there had been religious awakenings before—but that it coincided with other latent forces, particularly nationalism which needed only the detonator that Luther's message provided in order to be set in motion. Already at the Council of Constance, a century earlier, the seamless robe of Christ had been rent by the new national gods. Now in the sixteenth century that part of the Protestant message which caught the imagination of rulers and people alike was the proclamation of freedom, these from the Roman hegemony, those from the burdens of peasantry. Hence the Reformation can hardly be called a popular revival. On the local level it meant little actual change. Governments had to legislate on matters of simple morality, sometimes to take the wind out of the sails of the Anabaptists, the "left wing" of the Reformation, which demanded a more radical "break" with Catholics, since on the popular level a quickening of the conscience did not result. Luther's later years were enveloped in gloom because the reform had failed to produce the piety and morality among the masses for which he had hoped.

The new spiritual impulses which the Reform actually generated were choked out by the old concept of cultural homogeneity, by the social order of the *corpus christianum* which persisted and was accepted by the leading reformers. Thus the Reformation failed to sense and to challenge the central error of Catholicism with regard to the essence of the church and her relationship to society. Despite new formulations which were designed to remedy some of the evils of the system, the basic presupposition of medieval times—that the borders of the church were coextensive with the entire society, while membership was effected, not by personal decision and commitment but by external coercion and clerically administered sacrament—was too deeply imbedded in the subconscious stream of European thought to be seriously challenged and thus became the basis for the modern Protestant social ethic. In the religious struggles and wars which followed in the century after the Reformation it was not the persecution of believers by the "world," but the rivalry of two systems both laying claim to inclusive totality. Wilhelm Dilthey, a German philosopher of the turn of the century, in his analysis of the world view of the Renaissance and the Reformation, concludes that the Reformation was not a restoration of primitive Christianity but rather a further development of the medieval universal ideal. It would be erroneous, of course, to lay the blame for this entire development on the reformers alone, particularly since at points they sensed the problem and were prevented by factors beyond their control from taking appropriate action.

It must be recognized, however, that despite the failure of the Reform to free the church from cultural assimilation, it was by its very nature far more adaptable to the modern world than Catholicism could ever be. Indeed its basic flaws dare not close our eyes to its tremendous service to modern man. It has been the spiritual home of countless millions in many generations who could never have accepted the claims of Catholicism, and has been marked by a spontaneous and genuine piety rarely achieved by the latter. But its real vitality owes largely to subsequent developments such as Pietism and the English revivalist and free church movement, made possible, however, because the control of Catholicism was broken in the sixteenth century. Nevertheless Protestantism's confused and ambiguous social philosophy and social ethic, its divorce of objective justification from subjective transformation, and the absence of a central authority which alone can maintain a (Catholic-like) system of inclusive totality, make it particularly vulnerable to the ravages of humanism. Protestant professors and clergymen were often in the front ranks of the prophets of humanism, sawing off the very limb on which the Reformation rested, while Catholicism at least maintained a state of tension with "modernism" and "liberalism," particularly since the publication of the papal "Syllabus" of modern errors in 1864. But precisely this

adaptability to the total society was another form of the erroneous attitude of the *corpus christianum* and has become the Nemesis of Protestantism. Since its attitude toward the world was assimilative rather than prophetic, "responsible" rather than catalytic, it too became imbedded in all the incongruities of the *status quo*. If we inquire then as to the spiritual blessings of Protestantism we can say they were tremendous, but if we inquire, as in this paper, as to its degree of basic Christian restitution, we are driven to the dismal conclusion that it simply failed, at least in its original form, to sense the fatal social error of Catholicism and to effect an essentially renewed approach. In this analysis we are therefore justified in subsuming it under the contribution of medieval Christianity in as far as it remained "orthodox" and under that of humanism in as far as it was secularized.

The Twentieth Century "Decline"

The crisis of the mid-twentieth century, if this analysis is correct, is then to be sought ultimately in the realm of metaphysics. The theistic world view which from the Constantinian period forward had provided the subsoil of western culture was challenged by the fifteenth-century Renaissance and received its first shattering blow in the French Revolution. From this blow it has never fully recovered but has had to give way increasingly to essentially immanentistic world views of humanism, which held out the hope of human fulfillment through the impulsion of innate energy. Today the triumphant humanist dream has in turn likewise defaulted, and has demonstrated unmistakably that it has rested on false premises. This failure or rejection of both the spiritual premises of western civilization constitutes the crisis of our time. To be sure, powerful remnants of both views remain and will be influential in time to come. Indeed it would be most difficult to reduce all western thought into one category or the other in any clear-cut fashion. This essay is merely an attempt to find something of a dominant characteristic in the subconscious presupposition of our time and is not directly concerned with the formal philosophies themselves.

Is the West, then, in a state of decline? If we accept the ideal either of medieval Christianity or of humanism, it seems that our answer must be a gloomy yes. Even if we accept neither, we are driven to the conclusion that the collapse of both the transcendentalist and the immanentistic value systems threatens to pull down the whole civilization with them. The West has lost the cohesive which holds the parts together to construct a meaningful whole. She is like a monster from whom the soul has departed but whose body continues to flail about in madness. The American reaction to the (Russian) Communist challenge is the reaction (e.g., "McCarthyism") of a people uncertain of its own faith. It is the reaction of a culture which can return neither to the theism which gave it birth, nor yet to the humanism which nursed it to maturity. Consequently modern man is not in the dilemma of two undesirable possibilities but simply at a dead end. There is of course a political dilemma between East and West, but the struggle between the communist and the western systems is mostly an echo, an Indian summer, of the two world views we have just described, the West of the transcendentistic medieval (in as far as she claims to be Christian), and the East (in so far as it is Marxist) of the immanentistic modern. But the masses, even when forced to choose one or the other of these two ideologies, sense instinctively the hollowness of both claims. In any event, western culture today needs a new metaphysics which it has not yet found. How and whether a new foundation for our present civilization will be found would be hazardous to predict. Humanly speaking, greater violence than what we have yet experienced seems inevitable, particularly because of similar upheavals of even greater proportions in the Orient. The prospect of a life and death struggle between closed cultural systems as the present alignment of East and West seems to predict is ample cause for men's hearts to fear.

To characterize our time only in terms of "decline" would be to commit anew the errors of the *corpus christianum* and of humanism. More than this, it would be the sin of unbelieving pessimism, of the faithless steward who buried his talent in a napkin, for the crisis of our day demonstrates once more that the justice of God is tempered with mercy, that out of the marred clay He fashions new vessels. For the collapse of these two great systems of semitruths will enable men to shift their point of departure from within the inclusive natural community to within the (gathered) religious community, to see more clearly than perhaps at any time since the Constantinian compromise that God works redemptively among men by way of the leaven, by the gathering of those who respond to His regenerative overtures, and that the incongruities of human existence and of the social order can reach final solution only as the regenerative process comes to maturity eschatologically. The impossibility of identifying the Christian community with any natural community or culture is being sensed increasingly, and scholars as G. J. Heering and Herbert Butterfield from various viewpoints are beginning to interpret the facts of Christian history accordingly. (See e.g., Herbert Butterfield, *Christianity and History*, London, 1950)

It will be helpful to examine a bit more closely the "decline" of the West in this light. In the first place, it has shattered the myths of inherent progress. While it would be premature to speak of a popular revival, to

reckon with transcendent reality is no longer the mark of naivety or bigotry. In the second place, the "decline" of the West and the emergence of the Orient has broken the monopoly which the West has exercised over Christianity for centuries. The failure of the church to domesticate the whole of western culture has forced even the "Volkskirche," the mass or established churches, to become at least to a degree, gathered communities. Hence the West is no longer synonymous with Christianity. Meanwhile the new Christian communities of the Orient have developed a genius of their own and are exercising an increasing influence in the world church. This was brought home to the West with great forcefulness by the presence and voice of the large numbers of Orientals at the ecumenical conferences at Oslo (youth) in 1947 at Amsterdam in 1948, and at Evanston in 1954. Bishop Stephen C. Neill, reported, after a trip to Africa, that it is entirely within the realm of the possible that native African Christians may yet share in a re-evangelization of the West. In short, these developments emphasize in a new way the universality of the church of Christ and her transcendence over particularist cultures and social groupings. In the third place, this cultural disentanglement of the church is ethically salutary. Humanly speaking, a widespread turn to pacifism is hardly in the offing, but nevertheless the incompatibility of war with the Christian ethic is being felt increasingly. The same might be said with regard to divisions in the church. In the fourth place, there are encouraging trends even culturally. In philosophy there is some revival of realism, despite the ascendancy of existentialism, which still belongs to the nominalist tradition. The failure of the scientific structure built on nominalist assumptions is bound to renew and increase the interest in realism. The upper reaches of scientific thought have likewise been profoundly shaken. The discovery that the absolute laws of the physical universe are after all only relative has led scientists to interpret "indeterminancy" as actually meaning "creativity." It was this discovery, a Greek chemistry professor told me recently, that enabled him to accept the doctrine of grace as a new intervention of God outside the "laws" of nature. More familiar to us is the development of neo-orthodoxy in theology, though not a full return to evangelical faith. Its most important feature in this context is its rediscovery of the transcendence of God and of the corresponding inadequacy and dependence of man. While none of these developments alone are likely to turn the tide of the West, they might well become major contributory sources for a genuine renascence.

Excessive preoccupation with attempts to read the signs of the times regarding future events cannot but dim our understanding of the here and now.

A Christian Course of Action

This general analysis leads to several concrete suggestions as to the Christian course of action in the time ahead.

1. Viewing the "decline" from within the gathered Christian community rather than within the natural community of the *corpus christianum* or of humanism leads to the conclusion that the crisis of the West is to be sought in the dilution of Christianity itself rather than in the secularization of culture in general. The latter is only a consequence of the former. Jesus called the Christian the salt of the earth. The non-Christian can know God only within the limits of natural theism. Greater insights come indirectly through his observation of those who know God supremely through revelation, in our own age, through the Christians. It is when God in Christ becomes discredited by the unworthiness of those who confess His name that the God in Nature no longer seems inexorable. When Christians cease to be Christian and to fulfill their role on the plane of redemption, that other minister of God on the plane of preservation, the state, most readily oversteps his bounds. When those who know Him no longer reveal an awareness that "it is a terrible thing to fall into the hands of the living God," those who don't know Him need not worry about getting acquainted with Him. Preaching in the "new era" must be pre-eminently Christological and Christocentric. Hand in hand with a rediscovery of the church as a gathered community must go a rediscovery of the distinction between God's work in the realm of providence and His work in the realm of redemption so that the church may be truly the church. Christians dare not confuse pious sentiments arising from experiences of natural theism with a vital faith in Christ. Obviously it is not the Christian task to denounce or judge such experiences but only to promote the truth.

Furthermore, viewing the "decline" of the West from within the New Testament concept of the gathered community, one is led to the conclusion, as we have already noted, that since Constantine the time may never have been more opportune for the church to disentangle herself from worldly alliances. Under the totalitarian powers, earnest Christians have been driven to the catacombs. In the West the forces of secularism have become so powerful and the number of people outside the pale of the church so great that the church

can no longer presume to speak for the whole in the sense of the Constantinian compromise. World events will thus drive many Christians and Christian groups to rediscover their true relationship to the world. Admittedly, the opposite seems true in America for the moment, where many see the world struggle developing between the two supposedly opposite forces of Christianity and Communism. This indeed is the great temptation of American and other western Christians. Yet even this situation will not change the minority position of Christianity in the culture of the West and is at any rate offset by the emergence of vital Christian minorities in other world cultures.

2. Next to evangelism, the most urgent task within the Christian Church—even more urgent than the much more publicized effort for ecumenicity—is the re-articulation of the Christian social ethic, of the relationship of the Christian and the church to the social order. Indeed one might well ask whether that is not essentially the evangelistic task of the day, the proclamation of a Gospel which reunites in the true New Testament sense, faith and works. The Catholic Church has retained her mistaken medieval vision in that respect, except as tactical modifications have become necessary and as we have seen, Protestantism has not developed an adequate and unique social ethic of its own. In theory the "free churches" should be uniquely fitted for such a task of witnessing. But they, too, have often shared in the general decline of Christianity, sometimes in adherence to dead traditions, sometimes in the confusion of religious individualism with political individualism, sometimes in the relegation of religious experience to the realm of private piety. Such an approach of course presupposes a readiness to undergo the pre-Constantinian church-world tension and conflict.

3. Apologetics should seek to employ the discoveries and developments of science to which we have referred rather than to refight the battles of an earlier liberalism that is on the wane. Evangelical Christianity, based as it is upon God's self-revealing and redemptive acts in history because of man's fallen state, has done too little to relate its message to God's original creative charge to man to "subdue the earth." Too often its defense against the onslaught of militant secularisms or atheisms is conducted from a pre-Copernican platform. The church seldom succeeds in combining her conservatism vis-a-vis the attacks of worldliness with a forward look in the things of time which must change. Too often her fight for the faith degenerates into a reactionary fight for the privileges of the social *status quo*. The major task of Christian apologetics today is thus the proclamation of the special revelation of God in Christ in all its radical finality, but in terms which recognize empiricism within the realm of nature as being implicit in the divine charge to man to "subdue the earth." But in such an attempt to fight an advance guard battle in the proper understanding of empirical science, we will need to be on guard constantly lest we fall into a new form of the old error of making science the touchstone of revelation or the still older one of supposing that a mass revival could somehow redeem the entire social order of the present aeon.

4. It appears that particularly in Europe, and to some extent in America, the creative days of the Christian clerical caste and the institutional church are over. Even the real effectiveness of modern mass media of communication in the evangelistic effort seems to be diminishing. The Church of Christ is essentially a pneumatic fellowship that expresses itself concretely in the Christian brotherhood, there where the "two or three are gathered." This fellowship is a fellowship of persons and is thus by its very nature what sociologists call a "primary group." The church can never assume the "secondary" character of the depersonalized urban society. It therefore seems clear that evangelism will make real progress among the industrial masses, as well as among other dechristianized groups in our society, only if the church will regain the personal mobile lay character which has characterized all her truly creative periods, above all, the first centuries of the Christian era. The emphasis must be shifted from the salaried professional and the huge Gothic sanctuary to the man to man evangel of the simple self-supporting believer who shares the struggle of the common man.

5. There needs to be a recovery of eschatological comprehension, not speculatively but "existentially." We need to understand anew the ways of God in history. True, men have failed, but even in the midst of that failure the kingdom of God is moving toward fulfillment. Excessive preoccupation with attempts to read the signs of the times regarding future events cannot but dim our understanding of the here and now. Unhealthy speculation about the eschatological calendar can even be a way to bury the talent He has given. On the other hand, we need desperately a recovery of genuine eschatological expectancy, of the secret of the true saints of all ages who have awaited the aeon to come because they were already in it and whose future was illuminated as much by their present possession as was their present experience by their hope of future glory. Only such a faith will fit us to walk among the prophets of a new day that shall dawn, if God will, after the night that is descending upon the West, or to walk among those whose raiment is washed white if the "decline" of the West should be a feature in the final act of the drama of history. Only thus can we say: "Whether we live therefore, or die, we are the Lord's" and "Amen. Come, Lord Jesus!"

The Sociology of Bystander Apathy

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Bowling Green, Ohio

The recent New Bedford Tavern Rape has again drawn attention to the bystander apathy phenomenon. A review of the literature finds that there are numerous sociological and psychological factors that operate to inhibit helping behavior. Among these are the tendency that the larger the number of bystanders, the more defused the responsibility; being suddenly faced with a crime causes problems in interpreting what is happening, and with knowing just how to respond. Helping one's neighbor in a crisis situation is obviously an important part of the Christian ethic. Love of neighbor is the second most important commandment, the first being love of God. In that it is incumbent upon a Christian to help those in need, especially one in the clutches of a victim role, there are various ways to facilitate bystander emergency helping behavior. These include training in the skills of helping, anticipatory socialization, and an inculcation of the helping ethic as part of one's religious training. Training has been shown to be effective to facilitate helping behavior. The churches can play a central role in dealing with this important aspect of Christian social ethics.

The hesitancy of bystanders to render aid to crime or accident victims is baffling to many persons. The New Bedford, Massachusetts "tavern rape," which *Newsweek* (1983) called "beyond exaggeration," has again illustrated the well-known *Bystander Apathy* phenomenon. A horrible crime takes place, but the "bystanders" who are in a position to help are reticent to intervene. Why do they often totally avoid giving aid?

The "Big Dan's Tavern" case is unusual only in its extent—the 21-year-old woman was assaulted and repeatedly raped for more than an hour-and-a-half in front of about a dozen male customers. The victim was both raped and forced to perform oral sex on the barroom floor and a pool table. As the news media often asked: "Didn't [the bystanders] . . . at least owe her a phone call to the police?" (Press, 1983:79)

In most states, bystanders are not legally obligated to help crime victims. Criminal behaviors are acts of *commission*, not omission. Incidents as the above, however, have motivated lawmakers to consider bystander laws, some already receiving support. So far, only Minnesota and Rhode Island have enacted "duty-to-rescue" laws in response to the New Bedford Case. Up to this time only Vermont had a law which attempted to deal with the problem—merely a fine of $100 for failing to assist someone "gravely endangered." So far no one has been prosecuted under this law (Cunningham, 1984).

The case which motivated the classic studies by Latane and Darley (1970) occurred in 1962. An estimated 38 New Yorkers observed a 45-minute ordeal which resulted in the murder of Kitty Genovese. Of the

three dozen people that came to their windows and saw her cry out in terror, not a single one came to her assistance. The case, although it caused massive public outcry, did not produce any significant legislation (Cunningham, 1984).

Similar cases abound. At least 30 people watched a man beaten and stabbed to death by a stranger in New York's Central Park (*Daily Sentinel-Tribune*, Bowling Green, OH, August 25, 1980, p. 17). Although repeatedly stabbed in the face, neck, and back with a 28-inch piece of wood, of the 40 observers only a few who saw the attack tried to locate the police, and then only after some time elapsed. The officers rushed to the scene to find the murderer, Jimmy Jones, still beating his victim. The altercation was no family disagreement. Blood was "everywhere," and the murderer was obviously trying—and came close—to decapitating the recipient of his wrath.

Another case, Andrew More Mille, was stabbed in the stomach in front of 11 other riders as he rode the train home from work. The 17-year-old boy bled to death; those who observed the homicide simply went on their way, seemingly nonchalant about the event (of course, what they were thinking one cannot know).

When the writer worked in Jackson State Prison, several inmates commented that they had little fear of bystanders who may have observed them in the process of carrying out their criminal activities—they learned from experience that most will not interfere. Criminals obviously prefer to conduct their illegal activities with as few observers as possible but, especially for street crimes, bystanders do not necessarily dissuade them from criminal behavior. Only if they were relatively inexperienced in crime did they possess a high level of fear of bystanders. Further, several inmates felt the larger the crowd, the less the need for concern. They became aware of this generalization through personal experiences or their criminal subculture information network (or even possibly by reading sociology books).

Is bystander apathy a gauge of a sick society, as some claim? Although usually less than a whole chapter is devoted to the phenomenon in social psychology textbooks, most now discuss it. It is clearly a phenomenon which, at the least, contributes to major contemporary social problems, especially crime (Pomazal and Jaccard, 1976). It also has clear implications for Christianity.

Christianity and the Brother's Keeper Ethic

An important aspect of Christianity has *always* been helping others in need. A specific illustration of the many examples of this principle is the Good Samaritan parable. The account is about a man who was attacked while going from Jerusalem to Jericho. Stripped of his clothes, he was beaten to the extent that he was left for dead. This excellent example of the bystander effect shows that the dying man, ignored by all except a certain Samaritan who, "moved with pity," bound up the wounds of the injured man and poured oil and wine (as an antiseptic) on them, a costly procedure. The Samaritan then took the injured man to an inn and took care of him, giving two denarii to the innkeeper, instructing him to "take care of this man and whatever you spend besides this, I will repay you when I come back here." After relating this parable, Jesus commanded his listeners to "do the same yourself," clearly teaching the imperative to help others in distress.

Helping of all types is a central tenet of Christianity, and many argue it is the central doctrine of the Christian faith.

Helping of all types is a central tenet of Christianity, and many argue it is the central doctrine of the Christian faith. The greatest commandment is to "love God with one's whole heart and soul," the second greatest is to "love one's brothers and sisters with one's whole heart and soul." Even agape love precludes doing nothing while one's neighbor is caught in the clutches of the victim role (James 2:8, Rom. 13:9; 15:21, Gal. 5:14). How to facilitate helping behavior is the subject of this paper.

How Common Is Bystander Apathy?

It is difficult to judge from newspaper accounts the extent of this phenomenon. Situations where many persons observe a brutal murder are more likely to receive press coverage than those in which a person attempting a homicide was forcefully stopped by a bystander. In the latter situation, homicide did not occur and, at best, the event may be defined as an altercation, an unnewsworthy event that is often not even reported to the police. Even if court adjudication resulted, it would most likely be "assault with attempt to do great bodily harm." Obviously, sometimes people help and sometimes they don't—they may even help in life threatening situations more often than not. And not helping may more often make headlines. The only way to gather accurate data is random interviews.

The research that has been completed indicates that

the problem is widespread. Harold Takooshian staged mock crimes to explore the reasons for public "indifference" to other's difficulties (Gergen and Gergen, 1981). In one example, a man carried a seemingly unconscious woman from an apartment building, threw her into the trunk of a car, closed it, and drove off. In 20 replications, virtually no witnesses stopped the man or even bothered to record the car's license number or call the police. In another experiment, it was arranged for a policeman armed with a gun, nightstick, and handcuffs, to be in an area where a confederate, faking a theft, jimmied a door open and walked off with obviously valuable coats and cameras. Although not a single witness in this experiment spoke to the policeman, five witnesses warned the "thief" to watch out for the cop! Interviews of observers of such mock crimes have caused researchers to conclude that *bystander apathy* clearly encourages crime. The major concern though must be *what determines when help will be given*—and why help was not given in blatant extreme cases, such as those discussed above.

The Psychology of Helping, A Complex Problem

Although the phenomenon is labeled "apathy," Latane and Darley conclude that indifference is only part of the reason for not helping. In the Kitty Genovese murder, they note, many observers did not merely look once and then ignore what they saw, but stared out of their windows. Were they caught, fascinated, distressed or even frozen in terror at what was happening? Many were not only unwilling to act, but also unwilling to turn away. Some have suggested that the reason they did nothing was that they were *immobilized by terror and fright*, unable to believe that what was taking place before them was, in fact, real. The scene in front of them was, after all, a rare reality which was in total contrast to their everyday experience. The shock of the events, some suggest, not apathy, may have immobilized them. The same behavior has been observed when attempted suicides, drownings and similar tragedies occur. Thus, helping behavior is complex.

Most theories of behavior are based on considerations of rewards and punishments, assuming essentially selfish behavior is a primary motivator. Unless one grants that anticipated ego rewards (thanks from the victim and the victim's family, the psychic satisfaction of helping someone, etc.) are the *main rewards* (the most common explanation) it is not necessarily simple to explain how people overcome the normal resistance to helping others (Pomazal and Jaccard, 1976).

Assuming that it is painful to watch someone suffer, the bystander can avoid this pain by one of the following courses:

1. Avoid the situation by leaving the area, or
2. By continuing with business as usual; or
3. Become involved by trying to help the person and thereby alleviating personal anguish (the most rational, humane approach).

With this last approach, when the victim's attacker is subdued, the victim is no longer being stabbed, the horrible scene stopped, and the observer no longer has to suffer watching it. Thus, a common explanation as to why most of us behave altruistically is that society rewards this behavior (Begley, 1984). Every school child has read about altruistic heroes. We are socialized to believe that to save or even help another life is a wonderful thing (Nash, 1983). This view is conveyed through tales of unselfish heroes that are commonly portrayed in storybooks and folk tales. A good recent example is the case of the Washington, D.C., plane crash at which a middle-aged businessman risked (and lost) his life helping others out of the icy water. His actions were praised repeatedly in the mass media and even by Congress.

Helping Behavior Depends on the Situation

Research on helping in non-emergency situations has found that when something small is asked for, such as the time of day, a high of about 85% freely respond (Latane and Darley, 1970). The actual rate may be higher for the reason that some of those not giving the

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time decline for valid reasons; they may not own a watch, may not hear the request or understand English. When asked for directions, a New York study completed in 1968 (n = 1,520), found that 84% complied, a request for change for "a quarter" 73%, to give their names 39% (a strange request), and when asked to give the requester "a dime," only 34% did so. Again, some may not have helped because they could not (did not have a dime, did not hear the request, etc.). When something small is asked for, whether the request is answered also depends upon the *reason* given for the request (Latane and Darley, 1970). If the experimenter added that the dime was needed to make a telephone call, the percent helping went from 34% to 64%. Thus, if help is given depends on how the potential helper perceives the situation.

The Influence of Sex

The sex of the asker affects most situations—in the above study female requesters were helped 58% of the time, males only 46% (significant at the .02 level). Latane and Darley (1970:14) also found that in many situations, "females were almost twice as likely to receive help as males when alone and three times as likely when in same-sex pairs." This study also found that females were more likely to *receive* help and males were much more likely to *give* help. In a study of persons offered candy on the street corners of New York (they were told it was a free sample) 46% accepted when given by a female, but only 19% accepted when offered by a male.

The effect of the audience responses seems to have a crucial effect on helping behavior. In an innovative study (quoted by Latane and Darley, 1970) two girls, playing with a frisbee in the waiting room at Grand Central Station, "accidentally" threw it to another person, a confederate who either threw it back and joined in, or returned it and condemned the girls for being childish and acting dangerously. When a confederate joined in, 86% of the bystanders participated. When the confederate refused to play and disapproved of the activity (the second condition), no other bystander joined in.

The individual's response, in other words, is heavily dependent upon how the audience's reaction was defined—in this case it was evaluated mostly from the behavior of the third person, the confederate. Someone else joining lends credence to the position that the "group" (the audience) feels that the game is appropriate or acceptable, a phenomenon called *group think* (Janis, 1967). One person with firmly held opinions, though, can shatter *group think*. In formal situations, such as board meetings, a holdout can cause prolonged committee indecision. Further research on the "frisbee study" has found that by varying the behavior and words of the third person, what the confederate *did* was less important than what the confederate *said*. If she simply allowed the frisbee to bounce off her and be retrieved by one of the two others girls in the study, the bystanders participated at a higher rate than when the confederate utilized inhibitory behavior by condemning playing with the frisbee. When the "condemner" left, though, the level of participation increased almost to the rate obtained when the confederate approved of the frisbee behavior. This indicates that condemners inhibit others from joining the activity when present, but far less so when absent. The "audience" evidently did not cause internalization of the condemnation.

If one or two take the initiative, the inhibitions of each individual bystander will be reduced, increasing the likelihood that they will help. Each person in the crowd tends to wait for someone else to take the initiative.

The Stages that Lead to a Helping Decision

The process of helping involves the following two steps:

1. *Interpretation of the situation.* Is the person acting or is it only a "friendly" fight occurring? The events may seem real, but may be so "shocking" that they are interpreted as unreal. It may seem difficult to misinterpret a rape or homicide, nonetheless, a bystander can rationalize it as "only fighting among spouses," "acting for a movie," even if a knife was obviously plunged into the victim and drew blood (movies do look real). Training can alert one to quickly assess a situation and react appropriately.

2. *An evaluation of a decision to help.* Conclusions about what is occurring, i.e., the man killing a woman is deranged, imply conclusions as to helping. But if one should help is not always a simple or easy decision. Training could help one assess one's options.

Clark and Word (1974) note that inhibiting effects of groups typically is more apt to occur if the emergency is *ambiguous*. If a victim is clearly hurt, group inhibi-

tion is often less. As they note (1974:280), "bystanders who were exposed to a nonambiguous emergency did not misinterpret the event," and consequently their behavior was less affected by the presence of others.

If one or two take the initiative, the inhibitions of each individual bystander will be reduced, increasing the likelihood that they will help (Gergen and Gergen, 1981). Each person in the crowd tends to wait for someone else to take the initiative. A similar situation is a traffic light which changes to green. The line-up tends to wait until someone takes the initiative and pulls forward. After this occurs, the other cars readily follow.

People are also more likely to help when many victims are involved compared to one or a few. In a disaster more help is typically forthcoming than if one person faints on the street. It is clear to the observer in these situations that something tragic has happened. In disasters it is also likely that someone who is related to a bystander or a friend is hurt, a situation which almost guarantees aid (Clark and Ward, 1966). This helping bystander will likely by his/her behavior encourage others to help.

Latane and Darley (1970) found that pairs of adults acquainted with each other were more likely to help a third person in distress than pairs who were strangers. When in the company of friends, persons are more likely to discuss helping, the first step in giving aid, and therefore are more likely to overcome inhibitions in aiding victims.

Helping in Obvious Emergencies

Even in a clear emergency, hesitancy exists for the following reasons, all of which, as will be shown, can be reduced by training.

1. Because they are unusual and rare events, the observer often finds it difficult to comprehend what has happened and it takes time in order for the tragic reality to become vivid.

2. Intervening in an emergency situation may not be rewarding—the person may not be able to successfully help and may very well be punished as a result of trying to help. "If I involve myself, he may well try to kill me also." These conclusions obviously lead to various courses of action ("there's no point in both of us getting hurt"). This implies that training in helping is needed to reduce both this fear and possibility. Failure is, at the least, embarrassing or more likely painful. In trying to save a person from drowning, a would-be rescuer may himself drown. After the emergency situation, the non-helper may be totally baffled by his or her inhibited behavior—"Why didn't I help that person? I just stood there, stunned. I can't understand it." We may freeze because we do not know what to do and because the emergency not uncommonly develops unexpectedly. We have little time to think through possible courses of action. The emergency is upon us and we react as one who is thrown a ball and told to "think quick"—we often do nothing.

   Thus, *increased experience* with disaster phenomena, and the known ability to help with a perceived low risk to oneself (as in the situation of lifeguards trained to, and experienced in, helping drowning swimmers, or a man saving a baby drowning in shallow water) would reduce helping inhibitions.

3. The process of helping also requires a decision as to what form of assistance should be given—an easy question to answer in the case of a child drowning in four feet of water, but more difficult if a man in front of us clutches his chest and slumps on the sidewalk as if he is having a heart attack. In interpreting whether a situation is truly an emergency, a person becomes keenly aware of the reactions of others. If no one else is taking action, observers are inclined to interpret the event as a non-emergency.

4. We generally derive a great deal of information about new situations, even familiar ones, by evaluating the behavior of those around us. Others panicking influences us to panic. Others behaving calmly influences our behavior in that direction. When at a formal dinner party, one is acutely aware of the behavior of others. And until one knows the mores, the situation is evaluated carefully before behaving. Of course, someone has to take the initiative, and often it is the person who has "rehearsed the situation" (has experience) and therefore knows how to behave. If the bystanders define the act as a non-emergency by their inactivity, *each individual* is more likely to condone not responding. This is likely the case in group rapes. The behavior is acceptable because everyone is watching it happen and seemingly condoning it even though the woman may be screaming. The group then causes a redefinition of the situation. "It is not rape and, although putting up a fuss, she is obviously enjoying it" (Starr, 1984). The March 1984 convictions in the "tavern rape" case may affect this belief (see *Time*, 1984; Starr, 1984; and Press, 1983). A major finding of bystander inactivity research is that, as the number of other people increases, the impulse to help is inhibited. The more bystanders, the *greater* the diffusion of responsibility for helping, and the *less* likely each individual person will believe that he or she is responsible to help.

5. Other factors also impede intervention. Few persons want to make a fool of themselves in front of a crowd. Crying fire when there is no fire, but only an air conditioner backed up, is embarrassing. Most persons have never rehearsed helping in emergency situations, and they certainly do not want to look foolish in front of an audience on the first dry run.

6. The pressure of the situation also affects helping effectiveness. In a study by Berkun (1962) and his colleagues, soldiers assigned to a small shack overlooking a canyon were asked to set up a remote control circuit for the group of men wiring explosives in the canyon below. While working, an explosion was heard and a voice stated that there was an accident and someone was hurt. The voice then asked the listeners to call for help. The phone, as part of the experiment, would not work. It was found that soldiers working under this stressful situation were much *more* clumsy and inept, as one would expect, than those in a similar but far less stressful situation (the control group whose phone worked).

7. Latane and Darley (1970) concluded that people sometimes do not help a victim *out of concern* for him or her. Helping, some feel, may in certain circumstances impinge the victim's ability to cope himself, or possibly may embarrass him, implying an inability to cope. Aid may also put him in the difficult position of receiving help which obligates reciprocation later. It seems, though, that most people would appreciate both the help and concern that motivated it, and that this reason given by non-helpers is of limited validity. Even if the victim of an accident is fully able to help him or herself, concern from others about his emergency is usually appreciated, especially after the event passes.

Helping in Crime Situations

In an experimental situation in which money was "stolen," 52% of the subjects who were by themselves (the alone condition) claimed not to have noticed the theft compared to 25% in the paired condition in which both persons were naive to the experiment's purpose. Actually, very few of the pairs—3 out of the 32—on their own reported the money stolen compared to 24% in the alone condition (Latane and Darley, 1970). And in the paired condition, 19% reported the theft. When asked later about the incident, the observers gave elaborate, but often implausible, explanations, such as "it looked like he was only making change," "I thought he took the money by accident." It is likely that most actually saw the staged theft but, again, a large percent denied awareness of what was an obvious infraction of the law which occurred in front of them. Of course, not seeing a theft (or claiming not to) is viewed as a valid justification for not doing anything about it. The subjects were likely not socialized to be vigilant relative to the appropriate responses in these situations and thus responded the way they did.

An even more daring experiment along the same lines was a staged robbery (Latane and Darley, 1969). The robber would (1) enter the store, (2) ask the cashier a question, (3) the cashier would leave for a minute, (4) the person, ostensibly a customer, would pick up a case of beer and remark "They'll never miss it," (5) then walk out of the store without paying for it. On 48 occasions the robber worked alone, and on 48 were paired. Not one person tried to prevent the theft, and only 20% reported it spontaneously, although 51% reported it after encouragement. Little difference existed between the single and the paired robbers. The number of bystanders had an effect on the reporting—again, the more bystanders, the less likely anyone was to report the incident. As Latane and Darley (1970:77) conclude, "regardless of what is absolutely right, reporting [an] . . . emergency meant putting another person in trouble. It meant squealing . . . many subjects may have chosen to side with the villain rather than with his victim." Without counter-conditioning (moral education designed to socialize a person to report crime), this may be the "natural" way to respond.

The Validity of the Verbal Reasons for Not Helping

When questioned as to why they did not intervene to prevent an actual homicide, an amazing variety of responses were given—they thought it was fake, a tape recording, a movie was being filmed, that "she enjoyed getting stabbed," or deserved it and, probably the most honest, "I don't know why I didn't do anything, I guess I was just horrified" (Jones and Aronson, 1973). One claimed that he was paralyzed with fear, another "the lady was really getting stabbed in front of me, and I had never seen that. I just didn't know what to do," and "I guess I'm mad at myself that I didn't do something, but I didn't. I just stared, me and everybody else." Yet in most assault cases, it would have been a simple task for four or five persons to subdue what is often a lone attacker. A broom or stick could be used to disarm him and several persons could subdue him. Reasons given for not helping, therefore, are of questionable validity as a full explanation.

Individual Responsibility

The fact is, in spite of the factors previously discussed which clearly do inhibit responding in emergency situations, in the end it is a conscious decision of the person not to act. These inhibitions can be overcome,

and it seems they are more likely to be overcome if a person is trained to respond to emergency situations, either via formal training, role playing, and instruction/discussion in the home, school or church (Teger, 1967; Nash, 1983). All of the factors listed above *do not negate individual responsibility,* but only help us realize steps to overcome in socializing persons into helping behavior and the need for us to assume our part. The larger the audience, the greater the diffusion of personal responsibility ("It is not my fault she was killed, somebody else could have intervened") can be dealt with by training in individual responsibility, a major part of the Christian ethic (Begley, 1984). If only one bystander is present in an emergency, this person carries all of the responsibilities—if there is help to be given, only he or she can give it if no one else is present. And, if others are around, one can learn not to assume that the other person is already taking some action to solve the crisis such as by calling the police, doctor, or doing something else. Most studies also find that if a person is going to help, he or she will do so within a few minutes after they are aware of the victim's plight, or not at all. Research is needed to fully understand what differentiates those who do help from those who do not, but training is clearly part of the difference (Wallach and Wallach, 1983).

Thus increased experience *with disaster phenomenon, and the known ability to help with a perceived low risk to oneself . . . would reduce helping inhibitions.*

The most common responses as to why the person did not help, that he did not know what to do, is a realistic response which illustrates the need for both training in helping techniques and anticipatory socialization as part of our basic secular and sacred education. In our culture, it is assumed that males are more apt to respond to emergencies (Cunningham, 1984). This was not confirmed by some research. In several studies, if both males and females were present, males were *not* significantly more likely to respond. This may be partly because most of the experiments involved low cost intervention (simply going somewhere else to ask for help, or report an incident to someone else). A situation requiring direct intervention, such as saving a drowning victim, may not produce these results. Thus, Latane and Darley (1970) concluded that male–female norms, although possibly relevant to *some* high cost situations, made little difference in the reportorial intervention needed in the experiments they utilized. Others have hypothesized that the maternal instincts, and especially the child care training of a woman, would make her *more* likely to intervene. Women in the past were *trained to fill caretaking roles,* and also probably have more experience responding to emergencies than males. The typical mother has dealt with far more family "emergencies" than the father. They respond more often because they have better training and more anticipatory socialization for emergencies, indicating the usefulness of this education.

Summary, Conclusions, and Recommendations

The prevailing explanation for the seemingly inhuman callousness of the bystander effect is the "group effect" which suggests that the more potential helpers present, the less likely any one person will step out of the crowd to aid victims (Latane, 1970). The crowd's inactivity implies that the norm is "stand by and watch only," and anyone who helps violates what has become the prevailing group norm. Each member of the crowd will, instead, try to rationalize or "reinterpret" what seems obvious.

This and most other behaviors identified in this paper which inhibit or reduce the likelihood of bystander aid can be overcome *if* a person was sufficiently socialized in the importance of "good samaritanism" and the need for the skills to help. Many writers argue that the bystander effect reflects a decline in morality, specifically a decline in the Christian helping ethic. An increase of "selfishism" and egoism is probably partly responsible for the "not helping behavior" (Wallach and Wallach, 1983). To the extent that this is part of the bystander phenomenon, people can learn to overcome these inhibitory factors.

In support of this, Clark and Ward (1974) found that several characteristics of the emergency situation were important determinants of bystander behavior. Subjects who were more confident were not only more likely to help the victim but, if they did so, worked with less risk to themselves. This indicates that training in emergency situations (including role playing and anticipatory socialization, both of which increase confidence) can be very helpful. We would not expect a swimming lifeguard to do nothing to save a person drowning in front of him or her. Presumably, those who are trained to help, and internalize the norm of helping, are far more likely to help in any situation. In a study that indirectly tests this hypothesis, Pomazal and Jaccard (1976) found that the *intention* to donate blood was highly related to whether or not the person actually later did. Of those who stated they intended to donate, 53 subjects later did and 102 did not. Of those who had

no intention of donating, 2 later donated and 99 did not. The authors concluded (1976:231) that "a positive intention is a necessary but not sufficient decision for the performance of [helping] behavior." In the case of helping in emergency situations, a positive intention may not be a sufficient condition, but to the degree that this study is generalizable such intention will likely facilitate helping behavior.

Also, Morgan (1983) found that religiousness is positively related to helping others. Church attendance is likewise positively correlated with helping (Tittle and Welch, 1983). Presumably, most American religious denominations teach, at least indirectly, the importance of helping others; altruism is a central trait of Christianity (see Matthew 5:38–48 and Luke 10:29–37).

Neal (1983) notes that one cause of the bystander apathy phenomenon is the fact that the *bystander role* in modern society is played far more often than the *involvement role*. Most persons present at sports events, involved in watching movies, television, etc., concerts and even in most social events, are bystanders. As a society we are thus involved primarily in a watching role, standing on the sidelines and observing. Observing takes less effort, involves less threat, and eliminates the possibility of embarrassment, mistakes, or errors of judgment. Thus, lack of training and experience in the helping role is widespread and one reason for not helping.

Another variable was whether the subject knew the confederate. If so, he was significantly *faster* in responding than strangers. Thus, we would expect help to be rendered far more often in a small town, where people know each other, than in the city. In a situation with friends, the subject knows that he or she is accountable—how could one explain to friends one's failure to help another friend? Several studies have also found that meeting the victim briefly had a major effect on both the likelihood and the speed with which the subjects responded to the crisis. In a crisis situation, one is far more likely to help someone who is known. The person is then a human being, not a nameless, personless stranger in need of help. Religious training clearly can aid personalizing strangers and nurturing the "I am my brother's keeper" syndrome. Scripturally every living human is one's neighbor even one's enemies (Luke 10:29–37) and concern is to be shown to all (Matt. 25:35–46).

It was also found that the size of the community in which the subject grew up was related to helping (the smaller the community, the more likely the person helped in an emergency). Presumably, in small towns people are trained to help and have more experience in helping others compared to those in large cities. The father's occupation was also related—middle class persons were more likely to help, possibly because of being raised in a social environment where helping is more important and more apt to be directly taught. Studies of helping in airports in contrast to subways found that twice as many in subways helped, 83% compared to 41% in airports. Although it is difficult to specify why this difference resulted, some hypothesize that the major reason was because one is more likely to find middle class people in subways and more upper class people in airports (Schwartz and Clausen, 1970).

The most common responses as to why the person did not help, that he did not know what to do, is a realistic response which illustrates the need for both training in helping techniques and anticipatory socialization as part of our basic secular and sacred education.

In endeavoring to determine the difference between responsive and unresponsive bystanders, a number of studies have correlated the result of various personality scales, such as those measuring authoritarianism and anomie. This research has found that, for the most part, the scores on these personality scales have non-significant relationships with helping. People who scored low on authoritarianism were as likely to help as those who scored high, for example. This also conforms to the position that helping behavior is learned, and the solution to bystander apathy is training and socialization.

Implications for Christianity

In spite of the clear sociological and psychological factors which inhibit helping behavior, it is apparent that the churches' function to train its members in the Christian value of helping others can be highly functional in responding to this concern. With training, role playing, and anticipatory socialization, persons can become aware of the inhibiting factors and, to a large degree, overcome them, as many Biblical examples illustrate (Cunningham, 1984). One is not totally immobilized by the inhibitory effects of an audience, but is still free to act (and a person can most often overcome the normal inhibitions). That these programs

can be effective is demonstrated in studies of life-guard training and instruction to help in emergency situations. And this training is imperative, for as Christ taught that those not helping strangers in their time of need, "shall go away into everlasting punishment" (Matt. 25:35–46). The importance of the helping ethic could hardly be put more forcefully.

REFERENCES

Begley, Sharon. "Raising Children Who Care," *Newsweek*, March 12, 1984, p. 76.

Berkowitz, Leonard. "Decreased Helpfulness with Increased Group Size through Lessening the Effects of the Needy Individual's Dependency," *Journal of Personality*, Vol. 46, June 1978, pp. 299–310.

Berkun, M.M., Bialek, H.M., Kern, R.P., and Yagi, K. "Experimental Studies of Psychological Stress in Man," *Psychological Monographs*, 1962, 76, 1–39 (Whole No. 534).

Charney, Israel. *How Can We Think the Unthinkable? Genocide: The Human Cancer*. Boulder, Colorado: Westview Press, 1982.

Clark, Russell and Larry Ward. "Where Is the Apathetic Bystander? Situational Characteristics of the Emergency," *Journal of Personality and Social Psychology*, 1974, 29, 279–287.

Cunningham, Susan. "Genovese: 20 Years Later, Few Heed a Stranger's Cries," *APA Monitor*, May 1984, p. 30.

Darley, J.M. "Fear and Social Comparison as Determinants of Conformity Behavior," *Journal of Personality and Social Psychology*, 1966, 4, 73–78.

———, and Latane, B. "Bystander Intervention in Emergencies: Diffusion of Responsibility," *Journal of Personality and Social Psychology*, 1968, 8, 377–383.

Foy, E., and Harlow, A.F. *Clawing Through Life*. E.P. Dutton, 1928.

Gergen, Kenneth, and Mary Gergen. *Social Psychology*. New York: Harcourt Brace Jovanovich, Inc., 1981.

Goldstein, Jeffrey. *Social Psychology*. New York: Academic Press, 1980.

Janis, Irving. *Victims of Group Think*. Boston: Houghton Mifflin Co., 1967.

Jones, C., and E. Aronson. "Attribution of Fault to a Rape Victim as a Function of Respectability of the Victim," *Journal of Personality and Social Psychology*, Vol. 26, 1973, pp. 415–419.

Latane, Bibb. "Field Studies of Altruistic Compliance," *Representative Research in Social Psychology*, 1970, 1, 49–61.

———, and John Darley. "Group Inhibition of Bystander Intervention," *Journal of Personality and Social Psychology*, 1968, 10, 215–221.

———. "Bystander Apathy," *American Scientist*, 1969, 57, 244–268.

———. *The Unresponsive Bystander: Why Doesn't He Help?* New York: Appleton-Century Crofts, 1970.

Latane, Bibb, and Judith Rodin. "A lady in distress: Inhibiting effects of friends and strangers on bystander intervention," *Journal of Experimental Social Psychology*, 1969, 5, 189–202.

Morgan, S. Philip. "A Research Note on Religion and Morality: Are Religious People Nice People?" *Social Forces*, Vol. 61, No. 3, March 1983, pp. 683–692.

Mynatt, Clifford, and Steven J. Sherman. "Responsibility Attribution in Groups and Individuals: A direct test of the diffusion of responsibility hypothesis," *Journal of Personality and Social Psychology*, Vol. 32, Dec. 1975, pp. 1111–1118.

Nash, Ronald. *Social Justice and the Christian Church*. Milford, Mich.: Mott Media, 1983.

Neal, Arthur. *Social Psychology: A Sociological Perspective*. Reading, Mass.: Addison-Wesley, 1983.

Pomazal, Richard, and James Jaccard. "An Informational Approach to Altruistic Behavior," *Journal of Personality and Social Psychology*, Vol. 33, 1976, pp. 317–326.

Press, Aric, et al. "The Duties of a Bystander," *Newsweek*, March 28, 1983, p. 79.

Rosenthal, A.M. *Thirty-Eight Witnesses*. New York: McGraw-Hill, 1964.

Schwartz, Shalom, and Geraldine Tate Clausen. "Responsibility, Norms, and Helping in an Emergency," *Journal of Personality and Social Psychology*, Vol. 16, No. 2, 1970, pp. 299–310.

Starr, Mark. "Gang Rape: The Legal Attack," *Newsweek*, March 12, 1984, p. 38.

Teger, A., and D. Pruitt. "Components of Group Risk Taking," *Journal of Experimental Social Psychology*, Vol. 3, 1967, pp. 189–205.

"The Crime that Tarnished a Town," *Time*, March 5, 1984, p. 19.

"The Tavern Rape," *Newsweek*, March 21, 1983.

Tittle, Charles, and Michael R. Welch. "Religiosity and Deviance: Toward a Contingency Theory of Constraining Effects," *Social Forces*, Vol. 61, No. 3, March 1983, pp. 653–682.

Wallach, Michael and Lise. *Psychology's Sanction for Selfishness*. San Francisco: W.H. Freeman and Co., 1983.

"Harvey [i.e. William Harvey, early seventeenth century English scientist who, among other accomplishments, gave the first accurate description of the circulation of the blood] was a great man not only because he made a great discovery but also because he knew his own limitations. He solved one problem once and for all, and he had the courage to leave other problems unsolved. He explained only what he could demonstrate experimentally and was not afraid to admit that he had no answer for other questions. This makes him a true scientist."

Civilization and Disease, Henry Sigerist (1943)

Beyond Sand County: A Biblical Perspective on Environmental Ethics

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The present environmental movement is moving toward a crisis of unresolvable value conflicts because of the inadequate foundation of secular environmental ethics. The Judeo-Christian ethic is the only system adequate to deal with the complexities of environmental controversies because it: 1) is a uniquely theocentric ethic in which the worth of created things is imputed by God's value judgments of them, rather than humanity's usefulness for them, 2) is based upon a covenantal relationship between God and all created things, 3) specifically provides for the care of the land on a regular basis, 4) provides a model, Jesus Christ, to illustrate God's concepts of ruling and subduing, and 5) states that God will redeem nature with humanity. Secular systems of environmental ethics are fundamentally inconsistent. They attempt to portray humans as simply one biotic component of an ecosystem and, then, presume that humans should manage such systems. The Judeo-Christian ethic demands that humans manage the ecosystem, but dignifies (rather than disguises) such a role as that of stewards to their Creator-God. The practical implications of a biblical ethic in managing nature are explored.

The 1970's have been described as the decade of the environment. The decade began with the passage of the National Environmental Policy Act (NEPA 1970, 42 U.S.C. 4321 et seq.) and the Clean Air Act (1970, 42, U.S.C. 7401 et seq.), and was continued in such landmark legislation as the Endangered Species Act (Public Law 93-205, 1973) and the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.). Empowered by these statutes, as well as other federal and state legislation, major improvements in environmental activity followed. However, as the seventies aged, rising unemployment, economic downturn and rising resentment against government interference in land use policies (e.g., the Sagebrush Rebellion) combined to stimulate growing opposition to environmentalists. Trends in the present federal administration have consistently demonstrated that, in conflicts between economic interest and environmental interest, it is the environment which must be made to yield.

The management of any environment belongs to the realm of science, specifically ecology. But values neces-

sary to make management decisions and to set management priorities belong to the realm of ethics, specifically ecological ethics. The main thrust of the environmental movement was ethical, rather than scientific or technological. Therefore, to understand the ecological movement, one must explore the movement's ethical base.

Secular Systems of Environmental Ethics

Nash (1967) argues that the very idea of an environmental ethic is a relatively recent phenomenon, appearing in the early 19th century in Thoreau, and continuing in the late 19th and early 20th centuries in the writings of John Muir and others. Perhaps the most eloquent of all would not appear until the mid-20th century in Aldo Leopold. Leopold was trained professionally as a forester but is considered the father of the science of wildlife ecology. Though an eminent scientist, he is most remembered, not for his scientific writings (mainly on wildlife management), but for his writings on environmental ethics, specifically for a "land ethic." His *magnum opus* is considered to be *A Sand County Almanac*, published posthumously in 1948. The book is a collection of Leopold's essays, and more recent editions combine the *Almanac* with eight essays from Leopold's *Round River* essays.

Leopold defined an ethic as a differentiation between social and antisocial behavior (Leopold 1974:238) and, in the ecological sphere, as a limitation on freedom of action in the struggle for existence (p. 238). Leopold claimed that all ethics rested upon a single premise: "that the individual is a member of a community of interdependent parts" (Leopold 1974: 239). "The land ethic simply enlarges the boundaries of the community to include . . . collectively, the land" (Leopold 1974:239). Leopold subscribed to the still popular, if naive, view that ethics has "evolved." He considered the "Mosaic Decalogue" (Leopold's term; he never referred to them as "The Ten Commandments") to be an early example of a simple ethic dealing with relations between individuals, and the Golden Rule as an ethic trying to integrate the individual to society. He considered democracy a more advanced ethic trying to integrate social organization to the individual. The final step would be the land ethic which would change "the role of *Homo sapiens* from conqueror of the land community to plain member and citizen of it. It implies respect for his fellow members, and also respect for the community as such" (Leopold 1974:240).

In the western world, Judaism and Christianity have together been the most important source of ethical systems for the last 4,000 years. Leopold, whether explicitly or implicitly, seemed to perceive their contributions and, not unnaturally, saw their repudiation as a necessary step to clearing the decks for his new, advanced ethic. A former graduate student of Leopold has told me that he was the kindest and most compassionate of men (R.A. McCabe 1977, pers. comm.), yet Leopold was capable of bitter sarcasm in attacking both Judeo-Christian ethics and its adherents. "Abraham knew exactly what the land was for: it was to drip milk and honey into Abraham's mouth. At the present moment, the assurance with which we regard this assumption is inverse to the degree of our education" (Leopold 1974:240). In his call for a new ethic toward the biotic community, Leopold portrayed Judeo-Christian ethics as a primitive, deficient system which could not speak to environmental dilemmas. Therefore, at least in humanity's treatment of the land, Judeo-Christian premises were to be explicitly rejected.

The premise that Judeo-Christian ethics were deficient was a theme which did not end with Leopold, but rather intensified in the writings of later environmental ethicists. Perhaps best known of these is Lynn White, Jr., who in his essay "*The Historical Roots of Our Ecologic Crisis*" (White 1967) sees Judeo-Christian ethics as not merely deficient and apathetic toward the environment, but as the root cause of all ecological problems. "Christianity . . . not only established a dualism of man and nature but also insisted that it is God's

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will that man exploit nature for his proper ends" (p. 1205). "By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects" (p. 1205). White, too, opts for a "new religion." "More science and more technology are not going to get us out of the present ecologic crisis until we find a new religion, or rethink our old one" (p. 1206). White ends by proposing Francis of Assisi as the patron saint of ecologists. His understanding of Francis' theology is that "Francis tried to depose man from his monarchy over creation and set up a democracy of all God's creatures" (p. 1206). "His view of nature and of man rested on a unique sort of pan-psychism of all things animate and inanimate, designed for the glorification of their transcendent Creator" (p. 1207).

It is the way of things that the original ideas of great writers will be paraphrased and mass-produced by the less-than-original authors of undergraduate textbooks. So it is in ecology that the present consensus identifying Judeo-Christian ethics as the ultimate source of all ecological problems has trickled down to such textbooks as Colinvaux's (1973) *Introduction to Ecology*, Kreb's (1972) *Ecology: The Experimental Analysis of Distribution and Abundance* and Hinckley's (1976) *Applied Ecology: A Nontechnical Approach*, to name but a few. Christians continue to find themselves identified as the villains of the environmental drama.

A Biblical Environmental Ethic

All genuine Christianity rests upon biblical revelation. It provides, for the Christian, the only acceptable court for the hearing of such cases. The Judeo-Christian perspective is one of the few ethical systems, perhaps the only one, that is genuinely non-anthropocentric. "In the beginning *God* created . . ." (Gen. 1:1, NASB). The Bible begins with an outlook as radical to the typical modern materialist as it was to the typical pagan primitive. A transcendent God, a God truly independent and above nature, calls the natural world into being, into order, complexity and harmony out of a formless void. Human beings are not even mentioned, much less consulted, about nature's design. First the inanimate (light and dark, sun and moon, water and land) and then the animate (fish, fowl, cattle and crawling creatures and beasts of the earth) are called into being. And this transcendent God, from first to last intimately involved in what He has made, pronounced His own value judgments. Five times in the first 25 verses we read the phrase, "God saw that it was good." Five times the divine value judgment is made, and made completely independent of human kind. The value of "good" placed upon them by their Creator is theocentric, not anthropocentric. Man's evaluation of what God had made, or the use he will find for it, is nowhere considered. Before people are created, God blesses all the creatures He had made with these words, "Be fruitful and multiply, and fill the water of the seas, and let birds multiply on the earth" (Gen. 1:22, NASB).

Only after such judgments are made, and such blessings given, does God turn His attention to human beings. To them He repeats the blessing He has already pronounced upon the animals. "Be fruitful, and multiply and fill the earth. . . ." To them He also gives the added responsibility to subdue the earth, and "rule over the fish of the sea and over the birds of the sky, and over every living thing that moves on the earth" (Gen. 1:28, NASB). Here we come to grips with the verse which has been the greatest problem for those who see the Judeo-Christian worldview as the reason for humanity's rape of nature.

Leopold defined an ethic as a differentiation between social and antisocial behavior and, in the ecological sphere, as a limitation on freedom of action in the struggle for existence.

Pollution and mass extinctions of other lifeforms are seen as fulfillments of the mandate to rule and subdue. Or, to use C.S. Lewis' phrase, the "man has nature whacked" mentality. Francis Schaffer has observed, correctly, that every word carries both a definition and a connotation, and the two may not be the same. The connotation represents the meaning a word acquires as it travels through the world. Since, in Genesis, it is God who uses the words "rule" and "subdue," it would be only fair to examine God's definition of such words, rather than man's, and to attempt to find substantive instances of how God behaves as a "ruler" and as a "subduer." It also would be helpful to examine the situational context in which the commandment is given.

Take the case of "subduing" first. We can begin by intelligently examining what God probably *did not* mean when He used the term. First, it is unlikely that He could have had in mind that human beings kill animals and eat them, for regarding food, God instructs them, "Behold, I have given you every plant yielding seed that is on the surface of all the earth, and any tree

which has fruit yielding seed; it shall be food for you" (Gen. 1:29, NASB). He could not have meant for Adam to kill the animals to make coverings, for the Bible states that "the man and his wife were both naked and were not ashamed" (Gen. 2:25). It cannot mean that He intended people to begin an exploitation of the earth's inorganic material, because the usual uses of technology, to control the immediate environment and to increase food production, would have no use in this world. It cannot even mean that God wanted humanity to begin high-intensity agriculture, since "God caused to grow every tree that is pleasing to the sight and good for food" (Gen. 2:9, NASB). These alternatives cover the typical spectrum of exploitative acts which most people imagine when they hear the words "subdue the earth." In this biblical setting, every one of them is inappropriate. So what can "subdue" possibly refer to? Apparently to "subdue" in this context can only mean, "Bring that which I have created into conformity with my ways." In a world without sin, we are not unkind to Adam if we remark that this probably would not have been a particularly unpleasant or difficult job. Certainly the first act of "subduing" (and, tragically, the only one which Adam apparently completed) was to name the animals. Here we see Adam cooperating with God in continuing to order that which God had made. God brought order out of chaos, but now, not out of need but out of love, He involves human beings in the continued work of ordering the creation.

Ruling Over Creation

Many persons find the ideas of "ruling over" even more difficult to accept. The tragic history of our race is a story of millions of wicked people trying to "rule over" (i.e. exploit and subjugate) each other. The names of the more successful ones, Ghengis Khan, Hitler, Stalin, Julius Caesar, Nebuchadnezzar, cast a grim shadow on the mind, and drench the pages of history in the blood of the innocent. Personally, I do not doubt that this is precisely the phrase that Leopold had in mind when he said that his ethic would transform man "from conqueror of the land-community to plain member and citizen of it." Before assuming that "ruler" and "conqueror" are synonymous in the mind of God it would be helpful to examine God's own ideas of "rulership" and His examples of how to go about the business of "ruling."

The first characteristic that marks God's rule is freedom for His subjects. I do not mean here freedom in the modern sense of personal liberty to commit irresponsible acts, but in the scriptural sense of freedom from sin, freedom from the worst part of yourself to follow the best part of yourself, the part that leads to a healthy relationship with God, your "ruler." The words on the liberty bell, "Proclaim liberty throughout the land," are taken from the 25th chapter of Leviticus, the book of the law. God promised that one day a ruler would come out of Israel. He describes this through Isaiah who says:

> For a child will be born to us, a son will be given to us; and the government will rest on His shoulders; and His name will be called Wonderful Counselor, Mighty God, Eternal Father, Prince of Peace. There will be no end to the increase of His government or of peace, on the throne of David and over His kingdom. (Is. 9:6,7, NASB)

The prophecy here of course refers to Jesus Christ, the Son of God. Jesus' ideas on ruling are the most logical

The tragic history of our race is a story of millions of wicked people trying to "rule over" (i.e. exploit and subjugate) each other.

basis for evaluating what God meant when He told Adam to "rule" over the earth. By word and deed, Jesus' example of ruling presents a very different picture than what the world would paint into Genesis 1. Jesus said:

> You know that the rulers of the Gentiles lord it over them, and their great men exercise authority over them. *It is not to be so among you,* but whoever wishes to become great among you must be your servant and whoever wishes to be first among you shall be your slave; just as the Son of Man did not come to be served, but to serve, and to give His life as a ransom for many. (Matt. 20:25–28, NASB, emphasis mine)

The words were not empty rhetoric and were repeated with a powerful object lesson on the eve of Jesus' death.

> Jesus, knowing that the Father had given all things into His hands, and that He had come forth from God, and was going back to God, rose from supper, and laid aside His garments; and taking a towel, He girded Himself about. Then He poured water into the basin and began to wash the disciples' feet, and to wipe them with the towel with which He was girded . . . And so when He had washed their feet . . . He said to them, 'Do you know what I have done to you? You call me Teacher and Lord; and you are right, for so I am. If I then, the Lord and the Teacher, washed your feet, you ought also to wash one another's feet. For I gave you an example that you should do also as I did to you.
> (John 13:3–5, 12–15, NASB)

Given both the example and words of Jesus as God's representative, God's command to "rule over" the created order cannot mean "exercise despotic authority over nature." It clearly means, rather, that human beings, whom God has made great, must be nature's

servants. Humans are, by this example, instructed to put the welfare of the natural world above their own, to seek its good first, and to "rule" it as God would rule it, in the form of obedient servants.

Covenant, Law, and Redemption

These examples have been taken from the context of a sinless world (the Garden of Eden) and a sinless life (Jesus Christ). But in neither sin nor judgment did God forget His creation. With the termination of the flood, God made a covenant with Noah that He would never again destroy the world that way. What is often overlooked is that in this covenant, creation is Noah's co-signer.

> Now, behold, I myself do establish My covenant with you and with your descendants after you; and with every living creature that is with you, the birds, the cattle, and every beast of the earth with you . . . all flesh shall never again be cut off by the water of the flood. (Gen. 9:9–11, NASB)

The covenant made, and ratified in the sign of the rainbow, was not a covenant between *humanity and God*, but between *nature and God*. Just as God is a covenant partner with humanity, so God is a covenant partner with nature.

The contention by Leopold that Mosaic law reflects concern only about interpersonal relationships would have been dispelled by a firsthand reading of it. Mosaic law is unprecedented in its concern for "land ethics." God says through Moses to Israel:

> When you come into the land which I shall give to you, then the land shall have a sabbath to the Lord. Six years you shall sow your field, and six years you shall prune your vineyard and gather its crop; but during the seventh year the land shall have a sabbath to the Lord, you shall not sow your field nor prune your vineyard. Your harvest's aftergrowth you shall not reap, and your grapes of untrimmed vines you shall not gather; the land shall have a sabbatical year. (Lev. 25:2–5, NASB)

In each 50th year, the year of Jubilee, all property acquired in the previous 50 years was to be returned to the original owners. There could be no ever-expanding grasp for wealth and property, characteristics so prevalent in modern materialism. While each family was assured of its inheritance, the land would not be treated as a commodity to be indiscriminantly bought and sold.

The Israelites failed to observe these laws, even as they failed to observe so many others. But God's laws cannot be indefinitely ignored. II Chronicles 36 closes the book on the kingdom of Judah with these words:

> And those who had escaped from the sword he carried away to Babylon; and they were servants to him and to his sons until the rule of the kingdom of Persia, to fulfill the word of the Lord by the mouth of Jeremiah, until the land had enjoyed its sabbaths. All the days of its desolation it kept sabbath until seventy years were complete. (II Chr. 36:20,21, NASB)

The Christian must continue to act as a servant-redeemer toward nature until the return of Jesus Christ. There is no substance to White's accusation of "dualism" toward nature in Christian ethics, for God has inseparably linked the redemption of nature to the redemption of humanity. Paul writes to the church at Rome:

> For the anxious longing of the creation waits eagerly for the revealing of the sons of God. For the creation was subjected to futility, not of its own will, but because of Him who subjected it, in hope that the creation itself also will be set free from its slavery to corruption into the freedom of the glory of the children of God. For we know that the whole creation groans and suffers the pains of childbirth until now." (Rom. 8:19–22, NASB)

Isaiah is even more explicit:

> And the wolf will dwell with the lamb, and the leopard will lie down with the kid, and the calf and the young lion and the fatling together. And a little boy will lead them . . . They will not hurt or destroy in all my holy mountain, for the earth will be full of the knowledge of the Lord as the waters cover the sea. (Is. 11:6,9, NASB)

Christians are not only to be involved in redeeming other people, but also in redeeming nature through intelligent stewardship and management. The priorities and goals of such management are set, not by the economic value of the particulars of the ecosystem, but by the knowledge that God has pronounced each component of the system "good" (without reference to any of its uses or values to human beings) and that such a value judgment cannot be overridden. Human beings humbly, but enthusiastically, embrace a managerial role toward nature. *Enthusiastically,* because they have been given the assignment by their Creator-God. *Humbly,* because they know that they will be held accountable to God for the way in which systems are managed.

Inconsistencies of Secular Ethics

The present lack of courage displayed by government officials charged to protect the environment stems from their own inadequate and inconsistent ethical base. To begin with the Leopoldian land ethic, human kind can no more be transformed into a "plain member and citizen" of a biotic community than Albert Einstein could be turned into a "plain member" of the scientific community. Every action human beings take affects their environment. They cannot drive a car, eat a meal, or flush a toilet without environmental impact on a grand scale, and their overall activities are much more pervasive than these trivial examples. The question is not "Will humans rule nature?," for we do rule nature. The question is rather

"How will we rule?" Resource management necessitates rule over nature, and Leopold, of all people, should have recognized this. Management of any biotic resource necessitates *man's* manipulation of natural populations toward *man's* predetermined end. Leopold, who helped found the wildlife society, who helped to establish the Journal of Wildlife *Management* (emphasis mine), who taught the first courses in wildlife management at the University of Wisconsin-Madison in the 1930's, who trained hundreds to become wildlife managers and indirectly influenced thousands more to do likewise, should have been more honest with himself and his readers than to even suggest that a human being can be a "plain member" of natural communities. The Leopoldian ethic demeans management at the same time that it demands management. The Judeo-Christian ethic also demands management, but gives dignity and conviction to the role of the manager as a steward of God.

Humans are instructed to put the welfare of the natural world above their own, to seek its good first, and to "rule" it as God would rule it, in the form of obedient servants.

As for White, his criticisms draw their power mainly from the attachment of materialistic, rather than biblical, connotations to words like "rule" and "subdue." White's own alternatives offer little hope. For the same reason that the Leopoldian ethic fails, White's call for a Franciscan sense of "spiritual autonomy of all parts of nature" (p. 1207) also provides no direction. Human beings cannot constructively manage nature, nor deal with ecological problems, by viewing themselves as an "autonomous part" of an ecosystem. White's description of Francis is itself questionable. The man who wrote, "All creatures of our God and *King*. . ." (emphasis mine) clearly did not have in mind a "democracy of all God's creatures" (White 1967:1206).

Christians have been lazy, ignorant and apathetic about environmental concerns. But only Christians possess an ethical system strong enough to bring conviction, courage, correction and direction to the environmental dilemma. This is not the time to be led astray by mindless environmental slogans, but to embrace our role as servants and stewards of nature, managing it with a view, not to our own uses, but to the inherent value which God gave it, all the while holding in awe the responsibility before us, charged by God and accountable to God.

Biblical Principles in Resource Management

We now come to the most crucial test of these ideas. If these biblical perspectives govern our thinking, how will they also govern our action? It is most helpful to consider implications in three specific areas before we construct an overall biblical picture. These three areas are: 1) the implications of creation's value; 2) the implications of humanity's role in creation; and 3) the implications of linkage between humanity and creation.

We must address the question of value first, for all other implications proceed from it. Every notable writer who has struggled with the question of environmental ethics has struggled with the question of value. Lynn White Jr. begins the question of value as the root cause of our ecologic crisis. "Man named all the animals, thus establishing his dominance over them. God planned all of this explicitly for man's benefit and rule: nothing in the physical creation has any purpose save to serve man's purposes." (White 1967:1205). I have already demonstrated the fallacies of White's exegesis, but he shows, nevertheless, a clear perception of the key issue: the source and measure of creation's value determines humanity's attitudes toward it and exploitation of it. In his essay, White rightly condemns both anthropocentrism and utilitarianism. He is not the first to do so. However, the problem of secular environmental ethics is that, while they have unanimously condemned such attitudes, they have never successfully replaced them. Leopold (1974:246) condemns economic utilitarianism:

> One basic weakness in a conservation system based wholly on economic motives is that most members of the land community have no economic value. Of the 22,000 higher plants and animals native to Wisconsin, it is doubtful whether more than five percent can be sold, fed, eaten or otherwise put to economic use.

However, Leopold never ultimately escapes anthropocentrism. In defending wilderness preservation, he states that the motive of preserving wilderness is "for the edification of those who may one day wish to see, feel, or study the origins of the cultural inheritance." (Leopold, 1974:265). If Leopold failed to escape the trap of anthropocentrism, his predecessor, Thoreau, fared no better. Thoreau supported wilderness preservation in order to maintain human civilizations. We are all probably familiar with his statement, "In the wilderness is the preservation of the world," but let me allow a great man to speak for himself, rather than be quoted out of context.

> The story of Romulus and Remus being suckled by a wolf is not

> a meaningless fable. The founders of every state which has risen to eminence have drawn their nourishment and vigor from a similar wild source. It was because the children of the empire were not suckled by a wolf that they were conquered and displaced by the children of the northern forests who were. (Thoreau 1851; in Nash 1968:12)

Both Leopold and Thoreau also attempt to combine this disguised anthropocentrism with the concept of the "rights" of non-human organisms. Thoreau begins an essay, "I wish to speak a word for nature, for absolute freedom and wildness, . . . to regard man as an inhabitant, or a part and parcel of nature, . . ." (Thoreau 1851; in Nash 1968:10). Leopold is more explicit, stating, ". . . these (nonhuman) creatures are members of the biotic community and if (as I believe) its stability depends on its integrity, they are entitled to its continuance." (Leopold 1974:246,147). Notice the line of logic followed here:

> Premise 1: Living creatures are part of the biotic community.
> Premise 2: "Community (ecological) stability depends on integrity (i.e. persistence of component parts)"
> Conclusion: "All species which are members of any biotic community ought to be preserved."

Clearly, Leopold's conclusion is not logically valid. We cannot draw an imperative conclusion (species ought to be preserved) from a subjunctive premise (species exist). Yet in this and similar statements we find the seeds of the future animal rights movement as well as Nash's more recent "rights of rocks" philosophy. Norton (1982a 1982b) has demonstrated conclusively that: 1) environmental ethics cannot be derived from rights or interests of nonhumans, and 2) environmental ethics cannot be derived from rights or interests of future generations. Environmental ethics fail in the first category because: 1) no general theory of nonhuman rights exist and 2) no appeals to the rights of nonhumans simultaneously fulfill the minimal conditions of rights holding and still provide a coherent rationale for environmental preservation (Norton 1982a). The second category fails to provide an adequate environmental ethic because "one cannot recognize a future individual as the holder of a right or interest until the individual as such can be identified. Unfortunately, these individuals can be identified only after many environmental decisions, especially those governing population policy, have been made" (Norton 1982b:320).

Christians have been lazy, ignorant and apathetic about environmental concerns. But only Christians possess an ethical system strong enough to bring convication, courage, correction and direction to the environmental dilemma.

Technology, then, cannot be constrained by imputing rights to nonhuman organisms or by the prospect of bettering future generations. Christian environmental ethics constrain technology on the question of values in three ways: 1). they identify the value source as originating in God, not human beings (Gen. 1), 2). they identify this God as continuing in covenantal relationships with His creatures (Gen. 9), and 3). they identify specific divine commands (Lev. 25, 26) which are given solely for the benefit of non-human creation.

This ethical system preserves us from logical contradiction of the "nature's rights" and "future generations' rights" ethics, as well as from the selfishness of anthropocentrism. Because of this, the Christian sees appropriate uses of technology in the following principles:

1) When technology assists any component of creation, including, but not exclusively, human beings, to "be fruitful and multiply" (Gen. 1).

2) When technology assists in preventing the destruction of any component of creation (Gen. 9).

3) When technology permits any component of creation the opportunity for recuperation and rest (Lev. 25,26).

These principles, however, are incomplete in themselves. Considered alone, they would give the impression that technology is available to all creation. It is not, but only to humans. Whatever may be said about the intelligence levels of dolphins, chimpanzees, and whales, they do not possess significant technologies for altering the physical environment. We have already explored the conflicts of secular, (including Leopoldian) land ethics which attempt, on the one hand, to treat man as merely a biotic component of an ecosystem and then presume that men should manage or preserve the same systems. If White accused Christianity of arrogance toward nature, at least he recognized it did not indulge in these sorts of double-thinking hypocrisies. Seen in this light, biblical passages describing human dominion over nature can be understood. They are not statements of primitive arrogance, but descriptions of life as it is. As I have stated earlier, the question is not *whether* humans will rule nature, (we might as well ask whether a living human will continue breathing), but *how* they will rule. The secular mentality is utterly unable to conceive of a genuinely beneficent

ruler. Were it not for Jesus Christ, none of us could imagine the idea at all. Yet in Christ, we find the inconceivable, the unimaginable combination, the ruler of unlimited power, the servant of utmost humility. Recall again the words of John 13, "Jesus, knowing that the Father had given all things into His hands, and that He had come forth from God, and was going back to God . . . began to wash the disciples feet."

If Leopold failed to escape the trap of anthropocentrism, his predecessor, Thoreau, fared no better. Thoreau supported wilderness preservation in order to maintain human civilizations.

Jesus does not don the servant's apparel in weakness, fear, or insecurity, but in "power and love and discipline." (II Tim. 1:7, NASB). He knew that He was greater than the disciples (John 13:13) and shamelessly accepted their worship (Matt. 28:17, NASB). He knew he had something to give them which they were incapable of giving themselves, and He freely gave it, even to the cost of His own life.

In a monarchy, abdication results in anarchy. So in creation, humanity's abdication of rightful responsibilities is as harmful, and as sinful, as their abuses. The technological power within the hands of the human race is not-so-mute testimony to the truth of God's word,

> Thou dost *make him* to rule over the works of Thy hands; Thou hast put *all things* under his feet, All sheep and oxen, and also the beasts of the field, The birds of the heavens, and the fish of the sea, Whatever passes through the paths of the seas. O Lord, our Lord, How majestic is Thy name in all the earth. (Ps. 8:6–9, NASB, emphasis mine)

Biblical Principles for The Servant-Ruler

Man's rulership, expressed, in part, by his use of technology toward nature, is governed not only by the value of creation, but by an acceptance of his own role in creation. To the principles in applying technology toward nature we have already established, we may add the following criteria. As a servant ruler:

1) Humans do not abdicate their responsibility to manage creation, including the use of technology in management.

2) Humans manage from a perspective of intimacy of knowledge and relationship toward the creation. They are not estranged from their subjects (Deut. 17).

3) Humanity's primary goal in management is to meet the physical needs of the creation, enabling it to better fulfill its own "great commission." (Gen. 1) A secondary goal is to meet the needs of humanity itself.

Finally, the question of linkage between humanity and nature focuses on the shared history, experience and destiny of all creation. Humanity and nature share in the consequences of the Fall (Gen. 3) and the consequences of judgment (Gen. 6). Likewise, they also share both the need and hope of a redeemer (Rom. 8:19ff) and the promise of restoration in the kingdom of God (Is. 11).

These linkages point the way to a clear understanding of nature's current state and future destiny, though, for many, they are difficult to accept. The shared curse and judgment of creation should warn us against the transcendentalists' error of equating nature with perfection. In the most pristine ecosystems, the animal components may engage in pansexuality and homosexuality, rape, infanticide, fratricide, matricide, and patricide. Predators may fail to control their prey, with resultant adverse changes in vegetation. When opportunity affords, the competitively superior may ruthlessly eliminate their respective inferiors. "Natural" extinctions take place. Parasitism, disease, and catastrophe strike randomly, leaving death in their wake. The quiet, unobtrusive, "natural" succession of vegetation inexorably proceeds. With it comes the disappearance of some species and their replacement and dominance by others. For those who know nature, be they Christian or not, preservation is seen for what it is: the mythology of ignorant sentimentalism. The Christian, however, must consider more than the practical impossibility of mere preservationism. He must recognize the biblical perspective that that which is is not that which will always be. "And I saw a new heaven and a new earth; for the first heaven and the first earth passed away, and there is no longer any sea." (Rev. 21:1, NASB).

> And the wolf will dwell with the lamb and the leopard will lie down with the kid, and the calf and the young lion and the fatling together; And a little boy will lead them . . . They will not hurt or destroy in all my holy mountain, For the earth will be full of the knowledge of the Lord as the waters cover the sea. (Is. 11:6,9, NASB).

The Christian steward, then, is committed to use technology for the purpose of redemptive management, not mere preservation. Recall Jesus' parable of the unrighteous steward.

> . . . the one who had received the one talent came up and said, "Master, I knew you to be a hard man, reaping where you did not sow, and gathering where you scattered no seed. And I was afraid, and went away and hid your talent in the ground; see, you have what is yours."
>
> But his master answered and said to him, "You wicked, lazy slave, you knew that I reap where I did not sow, and gather where I scattered no seed. . . . Take away the talent from him and give it to the one who has ten talents. And cast out the worthless slave into the outer darkness, in that place there shall be weeping and gnashing of teeth." (Matt. 25:24–26,28,30, NASB).

Only God can redeem creation, just as only God can ultimately redeem humanity. But we cooperate with God to the extent that we recognize His purposes and work according to His established ends. This frees us from captivity to the secular agenda and propels us toward distinctively Christian witness in the acts of stewardship. Indeed, Christians *must* assume leadership in the care of the environment. Regardless of the contributions of the Sierra Club, the Nature Conservancy, the Environmental Defense Fund, or any other secular organization, the Bible makes it brutally clear that there will be no *redeemed creation* if there is no *redeemed humanity.*

In a monarchy, abdication results in anarchy. So in creation, humanity's abdication of rightful responsibilities is as harmful, and as sinful, as their abuses.

"For the anxious longing of the creation waits eagerly for the revealing of the sons of God." (Rom. 8:19, NASB).

These facts do not denigrate the contributions of non-Christians toward proper stewardship of natural resources. Indeed, it is to the shame and disgrace of Christ's Church that the sons of this age have been wiser than the sons of the kingdom in the care of creation. Nevertheless, without the knowledge of God, human efforts must fall short of ultimate truth or eternal agendas. As the Church involves herself in the care of creation, she is not piggy-backing on a secular environmentalist agenda. Instead, as Christ's ambassador to the world, she brings to the environmental conflict a perspective distinct from all competing ethical paradigms. Despite her many weaknesses and imperfections, the Church is the only institution on earth with the authority to offer a genuine environmental ethic and the power to bring significant healing to the planet. She rejoices wherever, whenever, and however the work of God is accomplished, but she alone is charged by God with the redemption of creation. Lasting healing can come from no other source. It is time for the Church to say "yes" to God's commands for the care of creation, and begin a long overdue task.

Where, then, have the scriptures led us in the application of technology in stewardship? I think we may confidently stand on the following: 1) Christians are called to embrace the role of ruling creation, humbly as well as joyfully, but not to shun, ignore, or be ashamed of what God has called us to be. 2) Christians are called to manage creation according to the eternal value of God, not the temporal values of human beings. 3) Christians are called to enable the creation to be fruitful and multiply, placing its needs above their own, following the example of our saviour, the servant-ruler, Jesus Christ. 4) Christians are called to redemptive management, not mere preservation, working toward the anticipation of creation's future redemption, and ours.

REFERENCES

Colinvaux, P.A. 1973. *Introduction to Ecology.* John Wiley and Sons, Inc. New York. 621 pp.

Hinckley, Alden D. 1976. *Applied Ecology: A Nontechnical Approach.* MacMillan. New York. 342 pp.

Krebs, C.J. 1972. *Ecology: The Experimental Analysis of Distribution and Abundance.* Harper and Row. New York. 694 pp.

Leopold, Aldo. 1974. *A Sand County Almanac.* Sierra Club/Ballantine. New York. 295 pp.

Nash, Roderick. 1967. *Wilderness and the American Mind.* Yale University Press. New Haven, Connecticut. 218 pp.

Norton, Bryan G. 1982a. Environmental ethics and nonhuman rights. *J. Envir. Ethics* 4:17–36.

———. 1982b. Environmental ethics and the rights of future generations. *J. Envir. Ethics* 4:319–337.

Thoreau, Henry D. 1968. *The Transcendental View.* Pages 9–13 *In* Roderick Nash, ed. *The American Environment: Readings in the History of Conservation.* Second Edition. Addison-Wesley. Reading, Massachusetts. 364 pp.

White, Lynn. 1967. The historical roots of our ecologic crisis. *Science* 155:1203–1207.

Communications

Some Thoughts on a Possible Physical Basis of the Human Mind Engaged in Exploratory Activity

Elsewhere[1] I have argued that all knowledge, including scientific knowledge, is personal knowledge arising from the human mind's active exploration of external reality which one always encounters as a whole person. In this exploratory activity the human mind[2] is much more than a lens that must be focused on the truth. For it has the ability to construct models of reality, to test theories, to see parts in relation to the whole, and, finally, to exercise disciplined creativity. Such a view of the human mind is embedded in the existence of genuine human freedom with respect to one's external environment; understanding, of course, that such human freedom is not a freedom from all external restraints but the freedom to respond to, to take a stand toward the constraints that impinge upon any finite person. How does such limited but genuine freedom, without which the concept of mind or human consciousness is meaningless, arise in the context of the complex physio-chemical activity of the human brain and nervous system? It is suggestive, at this point, to note that:

> The Bible does not view the person as someone who *has* a body and a mind but rather as someone who *is* mind and body. Frederick Buecher reflects a biblical view of persons when he writes, 'the body and soul which make up a man are as inextricably part and parcel of each other as the leaves and flames that make up the bonfire.'
>
> The 'immortal soul' concept is Greek. In contrast the Bible reflects the unity of the person and presents the doctrine of the resurrection of the body. God prizes our bodies so much that Jesus became flesh and dwelt among us. He will bring us back to live not as some disembodied echo of a human being but as a complete person. The body and soul will be united in resurrection splendor. In the biblical view we don't *have* minds, we *are* minds. Medical science, both ancient and modern, with its emphasis on psychosomatic medicine recognizes the essential unity of the person. A sick mind makes for a sick body. A lengthy illness can cause depression.[3]

Thus we see that not only current neurophysiological studies of cognitive processes but also the biblical perspective affirms the notion that human consciousness is rooted in man's biological being. Figure 1 is an over simplified but suggestive attempt to capture this key insight by schematically representing the essence of the awesome complexity of the information flows in the human nervous system that are associated with all mental thinking processes, conscious and unconscious.[4] The ensuing discussion is based upon Figure 1.

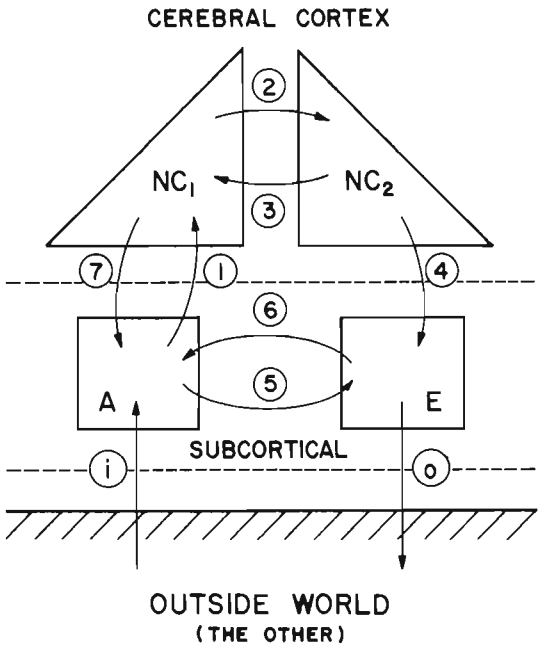

Figure 1. *The human nervous system highlighting possible information flows out of which the human mind arises.*

NOMENCLATURE;

A - The *afferent system*, the one that gathers and brings in information ("The Way In")

E - The *efferent system*, the one that goes out, controls, and alters the external environment ("The Way Out").

NC_1 - Sensory areas of the neocortex where all sensory information (including the somatosensory cortex where most sensory information on the body is collected) is collected and organized.

NC_2 - Motor areas of the neocortex. Develops commands that are carried out by the efferent system.

INFORMATION FLOWS

ⓘ - Input to the nervous system.

ⓞ - Output from the nervous system.

①, ①, ②, ④, ⓪ represent the simplest up-down model of information nervous system; ⑤ represents *reflexes*. These are pathways that allow certain stimuli to activate muscle action directly, that is, without intervention from the high brain centers.

⑦ represents a pathway by which information is *fed back* to the afferent system that is gathering information in. Now (in the sensory system) raw data is mixed with analyzed data to become new sense data. Thus we have a possible physical basis for the cognitive psychologist's assertion that what we perceive really depends upon our viewpoint with respect to what we are observing. Or in other words, we perceive through a filter of presuppositions, theories, and models of reality as indicated by not only cognitive psychologists; but theologians, philosophers and those scientists who reflect upon how they actually do science. Finally the introduction of this feedback loop ① – ⑦, has vastly increased the complexity of the neural activity as compared to what it would be with pathway ① alone, in doing so it has also introduced the problem of *self-reference* as man interacts with external reality (the outside world).

⑥ represents the completion of a *feedback loop* in which information about body movements is fed back to the afferent system.

③ completes a *feedback loop* between the command (or policy developing) and the information collecting subsystems of the neocortex.

How is it possible to attribute to the brain, a physical system, the ability to hold beliefs, formulate theories, and create models of the world outside oneself (The Other)? The answer, I believe, lies in the closed feedback loops ① – ⑦, ② – ③, and ⑤ – ⑥. Recall that sensory information from the various receptors is relayed to the cortex, but the message also contains its own echoes, elaborated by the cortex. Thus the cortex is seen to be not so much a pinnacle as a hub of intersecting loops. Such a structure has enormous dynamic complexity; furthermore, the chains of influences of the loops that make it up are not open-ended but closed upon themselves making the dynamics all the more unpredictable. Consider a minute fluctuation of neural activity that corresponds to a belief, theory, model, or decision made to act upon in order to test our beliefs, theories and models. Once injected into one of these loops, the activity may be either amplified or squelched. "If the decision is an important one, it may involve the creation, feedback, sampling, and filtering of a multitude of images, and the schemata of simulated actions. The power of determining one's own behavior is not the power of one entity (the mind) over another (the body) but the influence the brain has on itself, the power of self-reference. The outcome may involve elements of chance, but, more important, it will be a reflection of the unique configurations of my brain. In that sense my action is free."[5] The complex feedback activities that the cerebral cortex serves as a hub for has created a dynamic structure of awesome complexity and unpredictability. From this physically based information structure arises man's ability to not only be conditioned by his environment but to take actions to probe and alter it and to formulate models, theories, and finally ultimate beliefs that will help him to further understand, explore, and modify his surroundings. Of such is, with high probability, the physical origin of the mind, i.e. human consciousness, with its sense of freedom as it encounters and responds to external reality. If this indeed is a valid physical explanation of mental activity we have another example of the remarkable "unity in variety" that seems characteristic of all truly creative exploratory activity[6]; for feedback loops seem to play a major role in all biological systems from the complex interactions of the global ecosystem, the physiological control processes inherent to all animal behavior (conscious and unconscious), and, as we have documented, even the complex physical activity of the human brain that results in the deepest thoughts of the scientist, the artist, and the truly religious person responding to the complexity and richness of all human experience.

Let me end with a theologically speculative but hopefully not unbiblical thought. It is worth noting that this "unity in variety" manifested in the universality of feedback processes may be one very fitting way for the living God of Biblical revelation to implant his unique character upon His created Universe. For the concept of feedback is central to good communication processes at all levels of reality and good communication is, in turn, a necessary condition for meaningful personal relationships to take place. As the Biblical character of God is most fully revealed in the unity of the triune Godhead consisting of three distinct persons of Father, Son and Holy Spirit in intimate and loving personal relationship with one another is it not strikingly suggestive of His guiding creative activity that the Universe, truly a cosmos, at many different levels is best understood in terms of a concept central to maintaining personal relationships—communication through feedback of structured information. Indeed the "unity in variety" that feedback represents, as it manifests itself in created reality, affirms by analogy the central Biblical theme that God's Creative Word is the source of all meaning and our responses (feedback, if you like) are important to God:

> "The word of Yahweh is integrity itself, all he does is done faithfully . . .
> By the words of Yahweh the heavens were made,
> their whole array by the breath of his mouth . . .
> Shout for joy to Yahweh, all virtuous men,
> praise comes well from upright hearts . . .
> Let the whole world fear Yahweh, all who
> live on earth revere him!
> He spoke, and it was created;
> he commanded, and there it stood."
> (Psalm 33; versus 4, 6, 1, 8–9; *New Jerusalem Bible.*)

References

[1a]Neidhart, W. Jim, "*The Participatory Nature of Modern Science and Theism*, *Journal of the American Scientific Affiliation*, Vol. 36, No. 2, pp. 98–104, June 1984.

[b]Neidhardt, W. Jim, "Realistic Faith Seeking Understanding—A Structural Model of Human Knowing," *Journal of the American Scientific Affiliation*, Vol. 36, No. 1, pp. 42–45, March 1984.

[c]Neidhardt, W. Jim, "A Communication Model of Human Exploration and Discovery," *Journal of the American Scientific Affiliation*, Vol. 35, No. 3, pp. 181–184, Sept. 1983.

[d]Neidhardt, W. Jim, "The Human Explorer—A Tri-level Communications Model," *Journal of the American Scientific Affiliation*, Vol. 33, No. 3, pp. 183–185, Sept. 1981.

[e]Neidhardt, W. Jim, "Schematic Portrayals of the Personal Component in Scientific Discovery," *Journal of the American Scientific Affiliation*, Vol. 32, No. 1, pp. 61–63, March 1980.

[f]Neidhardt, W. Jim, "Personal Knowledge: An Epistemology of Discovery," *Journal of the American Scientific Affiliation*, Vol. 29, No. 3, pp. 118–123, Sept. 1977.

[g]Neidhardt, W. Jim, "Faith, the Unrecognized Partner of Science and Religion," *Journal of the American Scientific Affiliation*, Vol. 26, No. 3, pp. 89–96, Sept. 1974.

[h]Neidhardt, W. Jim, "Faith and Human Understanding," *Journal of the American Scientific Affiliation*, Vol. 21, No. 1, pp. 9–15, March 1969.

[2]For an excellent overview of the whole field of cognitive psychology see *The Universe Within* by Morton Hunt, Simon and Schuster, New York, 1982, 415 pp.

[3]Johnson, Cedric B., *The Psychology of Biblical Interpretation*, Zondervan Publishing House, Grand Rapids, 1983, pp. 22–23.

[4]Figure 1 and the ensuing discussion are substantially based upon the very excellent discussion of the physical basis of consciousness contained in *Windows of the Mind* by Erich Harth, William Morrow and Company, Inc., New York, 1982, 285 pp. Figure 1, in particular, a modification of his figure 5.11 (p. 171). Let me stress that Figure 1 does not represent an exhaustive description of all possible feedback loops present in the central nervous system.

[5]Harth, *Ibid.*, pp. 184–185.

[6]Bronowski, J., *Science and Human Values*, Harper & Row Publishers, New York, 1965, pp. 9–24.

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A Response to Davis Young's Critique of Origin Science

1. In response to my article on origin science (JASA 9-84) Young argued that the "scientific community rigorously excludes from the definition of natural science all reference to supernatural causes." But this is an arbitrary definition of "scientific community." For this definition includes only those scientists who reject creation science. But this begs the question, since there are hundreds of creation scientists who would not accept this definition, including many of the founders of modern science.

2. Young asks, "How can we predict when God will perform a miracle or create a universe"? By this he implies a supernatural creation is not subject to scientific analysis because it cannot be predicted. However, origin science as such does not involve *predictions* (forward) but only *retrodictions* (backward). Of course no predictions can be made from a singularity such as a miracle. For no pattern or trend can be properly extrapolated from a single instance. However, the inability to validly *predict* the future from one event does not mean that one cannot validly posit a proper cause for a *past* event based on uniform observations in the present. If it did then even evolution would not be science, since the great evolutionary transitions were unique and unrepeatable events.

3. Young argues that "natural science is said to be explanatory of the empirical world in terms of natural law only. . . ." However, this is true of operation science, but not of origin science. Operation science deals with recurring patterns of events in nature which are the basis for natural law. For no law is validly based on a single instance. But an event of origin is by nature a singularity. So there is no known recurring pattern of events associated with an event of origin against which one can test a theory about it. Hence, it is a mistake to extend the method of operation science, which describes natural regularities, into the realm of origin science which does not. To do so places origin science in an untenable position because it limits origins to natural (operational) causes which by its very nature it need not have.

4. Young argues that "All the science of geology [or any natural science] can do is enable us to explain the *origin* and history of a rock in terms of the laws of nature *operating* under certain natural conditions" (emphasis added). This statement also confuses *origin* science and *operation* science. Origins deal with past *singularities*, but the operational laws of the universe describe present *regularities*. So events of origin cannot be treated like an operational law of nature. Origin events are singularities, but it is not scientific to posit an unusual cause for an event. Scientific laws are not *based on* singularities. They are based on regularly observed conjunctions. This does not mean that scientific analysis cannot be made *about* singularities. The origin of the universe, the generation of first life, and the emergence of new life forms are all singular events *about* which science is concerned. But scientific conclusions *about* these events are *based on* the regular connections which uniform observations in the present offer. And these regularly observed connections establish intelligence as the cause of living things. This legitimizes creation as valid origin science.

5. Young claims that "natural science neither affirms nor denies that God could have miraculously created a rock or the Earth instantaneously." He would also apply this same logic to living things. But denying the relevance of supernatural intervention makes sense only when applied to operation science. For here it does not matter whether there was a Creator of the natural laws, but only whether the natural law(s) can account for the effect. In this sense there is really no difference between an evolutionist and a theistic evolutionist. Both believe that the origin of living things can be explained by natural laws apart from any supernatural intervention.

While the existence of a Creator is irrelevant to *operation* science as such, it is very much relevant to *origin* science because the origin of the universe and of life either had a natural cause or a non-natural (i.e., supernatural) cause. There are no other alternatives. But to rule out the possibility of a supernatural cause of *origins* (such as the Arkansas judge did) is arbitrary, unscientific, and even unconstitutional. In fact, in the case of the origin of the whole natural universe any cause would by definition be a supernatural cause. To call an intelligent power beyond the natural scientific world another kind of "Nature" would be question-begging semantics.

6. Young's rejection of "any hard-and-fast distinction between two such kinds of science" (as origin science and operation science) is inadequate. He affirms that "recurring patterns of events which natural science seeks to observe are condition-dependent." That is, science is limited to "events that are connected to (caused by) repeated material conditions." But this is not an argument; it is merely an affirmation of a method which insists on only natural causes for origins. For Young insists that *all* events (origins included) must for the scientists have a "material" cause. But if this is so, then as a scientist Young would have to deny the Christian belief in *ex nihilo* creation.

Young's reply that "science simply has nothing to say at this point" is inadequate. For we cannot insist that the scientific mind stops asking the causal question simply because it cannot find a *material* (natural) cause. Scientists do not stop thinking scientifically (causally) simply because they are speaking about origin events. Indeed, if they do not posit a supernatural case of origin, they will posit a natural one. Why then arbitrarily limit science to only natural causes of origin?

In contrast to Young's stipulative definition of origin science, there is a nature-based distinction between operation and origin science. *Operation science always involves some recurring pattern of events in nature against which a theory can be tested.* But Origin science involves no known recurring patterns of natural events against which the theory can be tested. Rather, origin science, like forensic science, is based on the principles of causality and uniformity. These principles posit a cause of an unobserved past singularity which is similar to causes observed in the present. Such a principle, as we have shown, calls for an intelligent cause (Creator) of the first living thing. This is creation (or origin) science.

7. Young further implies that the distinction between operation and origin science is invalid because even some operation events cannot be "observed directly." But origin science readily admits that not all operational events are observed directly. However, there is an important difference between *indirect* observation of operational laws and no *direct* observation of an origin event. *Origin* events are unobserved because there were no observers there to observe them and because they are not being repeated now for our observation. Like a forensic event, such as a murder, the origin event happened only once and it cannot be repeated now for observation by the scientific jury.

By contrast with origin events, *operation* events (like subatomic patterns of events) are "unobserved" directly in an entirely different sense. They are not unobserved because they are unrepeated. These patterns are in fact repeated. However, the origin events are unobserved directly because there is no known regular pattern of observed events associated with them. But there is a recurring pattern (phenomena) associated with subatomic events. In this sense subatomic events are totally unlike origin events. The difference is that, unlike origin science, operation science always has a known recurring pattern of observable phenomena associated with the unobserved events. Hence, the distinction between origin science and operation science is based on an objective difference in the real world of nature.

8. Young insists that "creation science has nothing to do with Jastrow." But this overlooks an important point. Robert Jastrow has presented a powerful scientific case that the whole material universe had a *beginning*. And this is very relevant to origin science. For scientific thinking is predicated on the principle that every event has an adequate cause. Hence, using Jastrow's evidence for a beginning, creationists have a right to conclude there was a cause (Creator) of the beginning of the universe.

9. Young also claims that the thought of a universe several billions of years old "is anathema to creation-science." But this is not so. Even proponents of the young earth view admit their basic arguments for creation stand apart from the age of the earth. Further, the two-model law in Arkansas *demanded* that the evidence for the old earth view be presented if any evidence was presented for a young earth view. What is wrong with presenting evidence for both sides of an issue?

10. Young provides a clue as to why he rejects origin science. He believes "the power of God displayed in the created order (Rom. 1:20) is clearly seen through the eyes of faith of the regenerated Christian and is not discoverable by scientific investigation." However, Romans 1 says that God's wrath is revealed, not against Christians, "against *all* [ungodly] . . . *men* who suppress the truth in unrighteousness" (v. 18). And it goes on to say that these ungodly, unregenerate men have "clearly seen" and "understood" the truth about God "from the creation of the world" (v. 20). Indeed, it is "evident to them" (v. 19). Furthermore, these unbelievers to whom God has revealed Himself through creation are "without excuse" (v. 20), and therefore they are justly condemned for not responding correctly to what God has revealed to them (2:5, 12; 3:19). Certainly a just God did not condemn them for rejecting truth they did not know. The unregenerate do *perceive* the truth revealed in nature, they simply do not *receive* it. Instead, they repress it. But it is there nonetheless for the scientific mind to ponder.

In summation, Young does not reckon with the distinction between *operation* science, which always involves a recurring pattern of events in nature against which a theory can be tested, and origin science which does not. Failing to acknowledge this distinction, he (wrongly) assumes that all science should be defined the way operation science is defined, namely, naturalistically. Taking this naturalistic definition of science and applying it to origins, Young employs a form of *methodological naturalism* which would seem to be contrary to his Christian beliefs about the origin of the universe.

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Millikan, Spiritual Altruist

The physicist Robert Andrews Millikan (1868–1952) was one of six children of a midwest clergyman of Scottish descent. His daily work on the farm and summer factory experience set a pattern for his industrious life.

At seventeen he graduated from high school, where he found the teaching of physics poor—as it was throughout the nation. After a year at Oberlin Prep he entered the college there, where physics turned out to be a complete disaster. His interest in this subject became aroused only in his third year when he was asked to teach it at the Prep; he found problem-solving a fascinating introduction. With an M.A. at twenty-five he received a fellowship in physics at Columbia University; here he studied optics with Michael Pupin. He spent the summer at the University of Chicago with Albert Michelson. Even though his appointment had not been renewed, he returned to Columbia where he completed his Ph.D. research on the optical properties of metals. On borrowed funds he spent the scientifically exciting year 1895–6 in Europe, particularly at Berlin and Göttingen.

At twenty-eight he was offered an assistantship by Michelson, who gave him charge of the weekly seminar. Four years later he was made responsible for all student research under Michelson. He encouraged both colleagues and students to carry out their own fundamental investigations; frequently he himself engaged in cooperative research with them. Within two years he was made Assistant Professor, and then Associate Professor five years later. Meanwhile, he had married a former fellow student of Greek. By forty-two he had been made Professor.

In 1912 he isolated the electron and measured this elementary electric charge *e* (off slightly because of the poor value used for the viscosity of air). Millikan regarded the electron theory of matter as "one of the grandest, because simplest, of all physical generalizations." He was made a member of the National Academy of Science at forty-six. The following year he made his most remarkable experiment, the verification of Einstein's photoelectric equation, with an accurate determination of Planck's constant *h*. In 1923 he received the Physics Nobel Prize for his work on *e* and *h*. Meanwhile, in 1917 he published some of this work (revised in 1924) and amplified later in The Cornell Messenger Lectures, which resulted in "Electrons (+ and −), Protons, Photons, Neutrons, Mesotrons, and Cosmic Rays" (rev. 1947).

Meanwhile, science was being mobilized for WWI. In 1916 Millikan took leave of absence from the University to devote full time to being Chairman and Research Director of the newly formed National Research Council's Physics Divison (which later included astronomy, geoscience, and mathematics); he had the rank of Lt. Col. in the Signal Corps. Later he was also made Vice-chairman and Executive Officer of the Council—until the end of 1918, when he returned to the University.

He spent a couple of winter quarters in Pasadena with A.A. Noyes and G.E. Hale at the Throop Polytechnic Institute, which became the California Institute of Technology in 1920. The following year Millikan became Director of the new Norman Bridge Laboratory for Physics. He was an active innovator at the new institution, which emphasized the relationship of science and engineering; viz, entrance exams for everyone, rotating chairmanships in lieu of departmental heads, and an Executive Council (some faculty and Trustees) in lieu of a president. He arranged for distinguished visiting professors from abroad. Within a few years the CIT Associates were formed to raise funds for outstanding projects and buildings; e.g., high voltage, aeronautics, seismology, the Mt. Palomar 200″ telescope, et al. Despite his heavy administrative load Millikan continued to do research of his own—particularly on cosmic rays. When this man of affairs died at 85, he left an imperishable monument—CIT!

His altruistic spirit was not confined to the encouragement and strengthening of research. He himself was wont to thrill audiences and to transmit enthusiasm. His very first concern had been teaching. My own college teacher had been one of Millikan's early collaborators on photoelectric research. Accordingly, our textbook was the first that Millikan had written, viz., "Mechanics, Molecular Physics, and Heat" (1903), as well as the sequel, "Electricity, Sound, and Light" (with J. Mills, 1908). Of course, in high school, like everyone else, I had had "A First Course in Physics" (with H. Gale, 1906). The aim of the last, as the authors claimed, was "a better acquaintance of the social significance of science." Millikan believed, "Physics is the most basic of all sciences and the one upon which they all depend." He did admit later, "We have learned not to take ourselves as seriously as the 19th-century physicists took themselves."

Millikan's altruism spread beyond academia and his country. He became increasingly concerned about the road to international peace. He favored the League of Nations, which President Taft had called a "League to enforce peace." The isolationism of the U.S., which wrecked the League, he regarded as "one of the great tragedies." As an individual, he remained a member of the Committee on Intellectual Cooperation. Recognizing always the need for collective security against individual madmen, he favored the highway indicated "by most of the great souls who have developed the world's greatest religions—men who like Buddha and Jesus have depended almost exclusively upon the development and use of the great spiritual forces ... suggested by the words brotherhood, love, pity, kindness, altruism, duty, conscience, morality, words which ... unquestionably stand for just as fundamental realities in the experience of all human beings as words like matter, motion, space, energy, weight, table, rock, etc." (He admitted, "It is today as difficult to find a satisfactory definition of 'matter' as of 'spirit.' ")

"The combination of science [what] and religion [ought]," he believed, "provides the sole basis for rational and intelligent living." Science is credited with having revealed a God who works through law, thus indicating the orderliness of the universe and man's duty to live in harmony with it. "The God of science is the 'Spirit of rational order and of orderly development'—hence progress." He was convinced that "there is actually no conflict whatever between science and religion when each is correctly understood." "There has been no conflict between the two as interpreted by the best minds the world has produced."

The last chapter of his "Autobiography" dealt with "The Two Supreme Elements in Human Progress," i.e., the spirit of religion and the spirit of science. He regarded science and religion as the two great sister forces which have pulled and are still pulling the world onward and upward."

"The most important thing in the world is the belief in the reality of moral and spiritual values." "An attitude of altruistic idealism" is common in all religions, e.g., that "found simply in the life and teachings of Jesus"—"the essence of His message." "Never man spake like this man!" He was impressed with the Golden Rule, which, he insisted, says that "*you* are the sole judge of what you ought to do." (cf. A.N. Whitehead's definition of religion as "world loyalty"). Millikan believed that such action would have to be based on some kind of "faith in the ultimate good." He noted that "Einstein calls it the Intelligence manifest in Nature." "If there is a better definition of God than that I, at least, do not know what it is."

Mindful of Job's personal dilemma, "Can man with searching find God"?, Millikan concluded his "Autobiography" with another quotation from the cosmotheist Einstein, " 'It is enough for me to contemplate the mystery of conscious life perpetuating itself throughout all eternity, to reflect upon the marvelous structure of the universe which we dimly perceive and to try humbly to comprehend even an infinitesimal part of the intelligence manifested in nature.' I myself need no better definition of God than that, and some such idea is in all religion as a basis for the idea of deity."

Millikan noted that "the Christian Church is the greatest social institution in the country." There was never any

mention of his own affiliation or activities, but he probably was a member of the Congregational Church. His expressed opinions, however, were more in the spirit of unitarianism than of basic Christianity. He was wont to stress the second great commandment with its altruistic object. The God of the first commandment remained aloof, impersonal, a nebulous being, unknown and unloving—quite different from Jesus' Father whom He came to share.

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This is the ninth in a series on religious scientists.

Compton, Christian Humanist

As Arthur Holly Compton (1892–1962) grew older, his outlook became broader, but always from a fixed Christian viewpoint. His father, a Presbyterian minister, was professor of philosophy at Wooster College; his mother, born a Mennonite, was Foreign Secretary for the Missionary Society of the Presbyterian Church. His sister Mary was a missionary in India and Pakistan; his brother Karl, a physicist, became President of MIT; his younger brother Wilson was an economist.

Although a three-letter athlete (baseball, basketball, football) at Wooster, at eighteen he decided to become a physicist. A year later (having already shown some manual dexterity) he used the College X-ray machine. As a graduate student at Princeton University he was inspired by Owen W. Richardson's investigations of photoelectrons and thermoelectrons. Dean Andrew West impressed him with classical maxims such as that of Pythagoras: "Search to find what and how the world is made, in order that you may find a better way of life." He himself was not content merely to love knowledge, but rather sought to add to it—to seek for truth itself. Having received his Ph.D. at twenty-four, three years later he was awarded a National Research Council Fellowship. He spent a year at the Cambridge Cavendish Laboratory where he became acquainted with W. and W.L. Bragg, C.G. Darwin, A.S. Eddington, E. Rutherford, J.J. and G.P. Thomson, C.T.R. Wilson, et al. At twenty-eight he was appointed head of the Washington University Physics Dept., where he discovered the total reflection of X-rays and the so-called Compton Effect, i.e., the recoil of a high-energy photon with longer wavelength from a free electron (like an elastic collision). In 1926 he published a book, "X-rays and Electrons." His confirmation of Einstein's particle theory of radiation resulted in Compton being awarded the 1927 Physics Nobel Prize (together with C.T.R. Wilson). In the 1930's he made intensive studies of the controversial cosmic rays, particularly their variation with latitude and altitude—evidence of their extraterrestrial origin. In 1934 he was George Eastman Visiting Professor at Oxford. While Chairman of the University of Chicago Physics Dept. (1940–5), he became Director of the Metallurgical Laboratory, in charge of the WWII Plutonium Project, where the first self-sustaining nuclear reaction took place Dec. 2, 1942—ostensibly to develop an atomic bomb before the Nazis might do so.

Compton served science in many administrative and consultative capacities. He was President of the American Physical Society and of the American Association for the Advancement of Science, as well as a member of the National Academy of Science, the American Philosophical Society, and the American Academy of Arts and Sciences,—he was an honorary member (or associate) of twenty-four foreign academies. He attended many international conferences and received a number of science awards (French Academy, Franklin, Freedom Foundation, Hughes, Humanities, Jewish Education, Mateucci, Radiology Society, Rumford).

At the close of WWII he decided to invest his talent in the future: he considered "sound educational guidance" to be the greatest national need. Previously he had felt "my highest function in society was in learning the truths of nature and in interpreting these truths for man's welfare." From 1945–53, therefore, he accepted appointment as Chancellor of Washington University (including some voluntary teaching), which he regarded as "a truly unique opportunity for strengthening the nation." He was given twenty-one honorary degrees and received invitations to deliver many prestigious lectures such as the James Arthur, De Golyer, Elliott, Forbes-Hawke, Guthrie, Hill Foundation, Lowell, MacNair, Montgomery, Schwab, and Terry. He published two books on these: "The Freedom of Man" (1935) and "The Human Meaning of Science" (1940). He died at seventy.

Throughout his life Compton was active in church affairs, from teaching a Sunday School class in Princeton to being an elder in the Second Presbyterian Church in St. Louis, to being a member of the national Presbyterian Board of Education. He was ecumenical in his relations, e.g., General Chairman of Laymen's Missionary Movement, Protestant Co-Chairman of National Conference of Christians and Jews, General Chairman World Brotherhood, Interchurch Relation of Presbyterian Church, et al. He lectured at the Jewish Theological Seminary, from which he received an Honorary Litt. D.

Although always a strong advocate of national defense, Compton had to face a personal problem, as a Christian, toward actual war. Science and technology, he believed, are morally neutral, but is war itself ever just? Yes, if it is required to insure a lasting peace! He was willing to risk his own life—and the lives of others—for the survival of human values. With E. Fermi, E.O. Lawrence, and J.R. Oppenheimer (he was always pro-Oppenheimer) he served on an advisory panel to the military on the potential use of the first atomic bomb. Afterwards upon being questioned in Japan about the USA decision, he remarked later, "I could not say I was sorry." Unfortunately the heart of the war problem is

still the heart of man! He himself realized that organized religion would be required to "inspire man to cast envy and hate aside and work for each other's welfare. It is we who must shape our new world."

Compton believed that one of mankind's basic problems is an inspiring meaning for life, but that ultimate values of life are beyond science. Consequently, he was concerned about the relation of science and religion, a problem with which his father had wrestled. In particular, he was pleased with the freedom evident in the uncertainty principle of modern physics, which can be interpreted as experimentally statistical—even though the system is theoretically causal. He concludes, "The great significance of science to man is that it encourages his growth as a free man."

For Compton the heavens (an ordered cosmos) still "declare the glory of God and the firmament showeth His handiwork"—"a sentiment that has been of even greater meaning to the increased number of men and women, and especially of youth who have caught the spirit of science." (As a ball of light expands in the dark, its contact with the dark unknown increases—so, too, the mystery of the universe deepens as the knowledge of it spreads.) "It is only in so far as we have a vision of excellence for men's lives that science has a human meaning." "The hope of civilization lies in the advancement of science." "In their essence there can be no conflict between science and religion. Science is a reliable method of finding the truth. Religion is a search for a satisfying basis of life." "Only our religious leaders have seriously attempted to tell us where to go." Compton noted that St. Paul had characterized a religious man as being "alive to all true values." "By enabling men to see more clearly what those values are and to work for them more effectively, science has become an ally of religion."

For Compton "the supernatural is as real as the natural world of science." God, he believed, is "the creative and controlling force at work in the world for all who want to find Him." "It is only in unusual phenomena, such as miracles, that God is [directly] concerned. The familiar phenomena of nature require no deistic explanation—they are self-evident." Not only is God the Father the ruler of the universe, but Jesus is God the Hero Son to be admired and emulated. "That Jesus' spirit lives so vitally in man today makes me hope that by following in His footsteps in my small way I also may live forever." There is abroad, moreover, a spirit of the highest good, God the Spirit (an interpretation of the Christian doctrine of the Trinity).

"The Christian God is the God of love." "Faith, hope, love endure, these three, but the greatest of these is love." "This is not science, or nature. It is the true supernatural." "A surprisingly large share for carrying through the program of God for the universe rests on our [educated] shoulders.

Compton summarized his creed in the conclusion of his MacNair lectures: "If indeed the creation of intelligent persons is a major objective of the Creator of the Universe, and if, as we have reason to surmise, mankind is now His highest development in this direction, the opportunity and responsibility of working as God's partners in His great task are almost overwhelming. What nobler ambition can one have than to cooperate with his Maker in bringing about a better world in which to live? 'My father worketh hitherto, and I work.' "

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This is the tenth in a series on religious scientists.

"Modern science is committed to the absolutely unrestricted pursuit of scientific knowledge, and the pursuit of knowledge is in reality the pursuit of power. Since we took the first bite of the apple, man has longed to know as God knows, to control as God controls—indeed to be a god. This longing for omniscience, omnipotence, and—yes—even immortality is inherent within the human species. Modern man, through science and technology, has taken the increasing responsibility not only for controlling his present but for shaping his future. He has really come to believe his own illusion that he is in charge, that he can, through his own rational efforts, become godlike."

The Mustard Seed Conspiracy, Thomas Sine (1981)

Guest Editorial

BOOK REVIEWS: A STIMULATING AND PROFITABLE ENDEAVOR

Twelve years ago I reviewed my first book for the *Journal of the American Scientific Affiliation.* Since that time I have reviewed over 30 books, gaining knowledge, insight and inspiration in the process. As I look forward to reviewing books in the future, I take this opportunity to thank the *Journal* for its Book Review section.

The assets of reviewing books are many: you receive free books, read regularly in your academic field, see your reviews appear in print, and provide a useful service for readers.

There are a few liabilities: sometimes it is hard to find time to squeeze book reviewing into a busy schedule, sometimes the books are duds, sometimes you may bruise the ego of the author whose book you are reviewing, and sometimes you may present the truth as you see it and have no one agree with you.

But in balance, since I enjoy reading, appreciate authors, and like expressing my opinions, I find reviewing books a stimulating and profitable endeavor. I read the Book Review section regularly and appreciate the *Journal* for devoting so much space to it.

Since I have been reviewing books, I have come to some conclusions. When I first started, I tended to think the main task of a book reviewer was to search out the flaws in a book and expose them to the public eye. While I still think that is part of a reviewer's task, I think it is a secondary part. The main part is to provide information which will allow the reader to have an idea of what the book is about and whether he should invest money in buying a copy. If a reviewer considers his role to be mainly that of a critic, he may find himself majoring on the minor and thereby giving a distorted view of the book. In such a case, the reader will go away with a false sense of the book's worth. In other words, I think that it's important to keep a book's flaws in proper perspective and not allow them to become the main part of a review, unless the book has few redeeming qualities.

When I first started reviewing books, I had a firm conviction that it required a lot more skill and effort to write a book than to review one. I still do. This may be one reason why I continue to write book reviews and not books.

Samuel Johnson thought that the role of critic is one to be disdained since it feeds on another person's creativity. Literacy criticism was Johnson's least favorite writing form because by it "men grow important and formidable at very small expense." It's much easier to point out the shortcomings of someone else's book than to come up with a spotless creation of one's own.

My sympathies are squarely with authors. Misspellings, incorrect grammar, nonsequitors, incompleteness, illogic—unless these are the salient features of a book—should receive second billing. Someday, I may write a book and that's the kind of treatment I'd desire. It's the golden rule.

It's always possible to fault a book for saying too little or too much, being too pedantic or too popularized, being too annotated or too skimpy. But I think the main way to evaluate a book is to ask: does this book have something important (relevant, significant) to say and does it succeed, for the most part, in saying it. If the answer to that question is yes, then I think the book should receive the reviewer's endorsement and recommendation. This is the guideline I use.

There are many excellent books being written. Thanks to the *Journal* for providing its subscribers with so much useful information about a lot of the best.

Richard Ruble

Trustee Professor
John Brown University
Siloam Springs, Arkansas

Book Reviews

HARPER'S WORLD OF THE NEW TESTAMENT

by Edwin Yamauchi. San Francisco, CA: Harper and Row, 1981. 128 pp. $9.95

Christianity was born in a world which was the product of the blending of three cultures—Near Eastern, Greek and Roman. *Harper's World of the New Testament* is motivated by the widely accepted presupposition that "the rise of Christianity cannot be understood without reference to its historical and cultural background." It is this background that the book seeks to sketch. The focus of the volume is not the retelling of the story of early Christianity itself. Rather, it attempts to inform the reader concerning the setting in which that story was unfolded. In so doing a reminder is given that the events of the New Testament "took place in a real world, at an actual time in history, and in places that can still be seen, photographed and appreciated today."

The scholar entrusted with the task of producing this book was Edwin Yamauchi. As a committed evangelical Christian, historian at the University of Miami (Ohio) and officer of the Near East Archaeological Society, he was well qualified for this endeavor.

Harper's World of the New Testament is divided into four major sections. The first focuses on the Jewish religious and historical background, the second on Greek and Near Eastern intellectual culture and the final two on the Roman Empire. Each of the first three sections follows basically a chronological approach to the subject matter. The Jewish outline begins with the Maccabeans, whereas the Greek section includes the early philosophers.

The volume is written in a popular style. Numerous photographs, maps and sketches illustrate the text. The main narrative is augmented by short discussions of related topics placed in gray inserts. These features combine to make a useful and interesting reference work for the lay reader.

The drawbacks of the book are few. The topical arrangement is helpful. Yet, one wonders why the Greek and Near Eastern materials were placed together. Likewise, the division by cultural background, rather than by aspects of human life, does not bring together in one chapter the religious milieu of the first century, which for many readers may be the most important topic. The book also suffers from the lack of a concluding chapter, which could have tied the various strands together. A subject index would have been useful as well.

Harper's World of the New Testament is designed to illumine the lay reader to the world which saw the rise of Christianity. It fulfills this purpose well.

Reviewed by Dr. Stanley J. Grenz, North American Baptist Seminary, Sioux Falls, South Dakota, 57105.

BIBLICAL INSPIRATION,

by I. Howard Marshall, Wm. B. Eerdmans, 1983, pb. 119 pp., $4.95, ISBN 0-8028-1959-1.

The title of this book disguises the length of the journey that the reader takes with the author. The same size, at 115 pages of text, as the recently reviewed (Volume 35, Number 3) *The Divine Inspiration of Holy Scripture* by W.J. Abraham (Oxford, 1981), it covers a lot more ground, necessarily at a quicker pace.

The author's first stop is an examination of what little can be taken from the Bible itself on the subject of inspiration. This is enough to indicate that inspiration does not always mean the same thing. What inspiration *does* mean is therefore examined as the second stop and seven views are presented succinctly and sympathetically, but with a brief criticism. Marshall then offers his own way of understanding how "the Bible can be regarded as both the words of men and the Word of God"; he uses an analogy to the complementarity between scientific explanation in terms of cause and theological explanation in terms of creation, "divine causation." This view does, as the author claims, make God ultimately responsible for both process and product, while wisely avoiding attempting to explain means. It copes with the variety in the product and the human "factors" in the process. But it says rather little.

If one were looking for an extensive discussion of biblical inspiration, what has been outlined above would be disappointing. But it is only the first third of the book. Despite its title, this book is not meant to be such a discussion, and even specific references are given for only three of the seven canvassed views, one of them W.J. Abraham's, of what inspiration *is*. That question is fundamental but preliminary to the main portion of the text.

On the basis of the first two chapters outlined above, the author goes on to answer four questions. What are the results of inspiration? How are we to study the Bible? How are we to interpret the Bible and what are we to do with the Bible? As in the first part of the book, Marshall tries both to bring home to the reader that simple-minded answers to questions are inadequate and we need to base our answers on the Bible. He discusses as his third stop what one might mean by inerrancy in keeping with what the Bible says about itself. The result of inspiration is that the Bible is entirely trustworthy as self-revealing of God.

Chapter Four is on biblical criticism, what it has done, what it has not done, and how to use it. Like any criticism, one should take it for what it is worth. But we must read the Bible

critically if we are going to understand it at all. Interpretation follows naturally if not easily. In keeping with his apparent goal of stimulating the seeking of less easy but more adequate answers to questions, the author attempts to indicate the complex relation between how we can apply what we read and what the writer said to the original readers; how the words of men can be for us the Word of God. He examines several unacceptable ways of veiwing that relation. Then turning to the Bible, he looks at its commands, its doctrine, apparent contradictions, and its different world view. As helps to interpretation he suggests both solving problems "in the light of the Bible as a whole" and "seeking a canon within the canon," suggestions which seem strangely contradictory. He also emphasizes help from other Christians, both contemporary and those in the past that offer us a constantly increasing "heritage of understanding." The last eight pages of the book are devoted to what we are to do with the Bible. The answer that the author expands is "submit to what it says."

I have thought it necessary to indicate in some detail what *Biblical Inspiration* is about, because so little of it is about biblical inspiration. It is more a guidebook for a journey into thinking *about* the Bible for the first time, and for this purpose it seems suitable, especially as it is well written, based on the Bible itself, and scrupulously fairminded. The least suitable feature for this purpose is its air of saying all that needs to be said, with no indication of the further reading that one might want and surely needs on each of the topics discussed if one wishes to consider it seriously. For its apparently intended audience the book can be recommended.

Reviewed by Robert Thomas, Applied Mathematics, University of Manitoba, Winnipeg, Manitoba, Canada R3T 2N2.

FROM MAGIC TO METAPHOR: A VALIDATION OF THE CHRISTIAN SACRAMENTS by George S. Worgul, Jr., Paulist Press, New York, 1980, 232 pp., $8.95.

Metaphor is currently demanding the attention of scholars in linguistics, psychology, sociology, artificial intelligence, computer science, and electrical engineering in addition to the traditionally interested disciplines, philosophy, theology, and literature. Reflecting this pervasive interest, Worgul draws from a wide range of sources, but the breadth of the enterprise is perhaps its downfall.

Part I, titled "Introducing the Question," includes discussion of the "Sacramental Crisis" (p. 3), establishment of methodology, and definition of terms. In Chapter 1, Worgul describes the decline of participation in the Eucharist within the Roman Catholic Church, concluding that if "the sacramental economy was to survive, a change was in order. A repetition of the old order simply was not enough. A 'new' way had to be found. The pastoral rush to bandage the sacramental wounds of the Church records the final element of the Church's internal contribution to its own sacramental crisis" (p. 16). However, he makes no mention of the biblical institution of the Eucharist, thus leaving the reader with no foundation on which to base a resolution to the crisis.

Chapters 2 and 3 are a collection of investigative methods and definitions, with very little attempt at unification for the author's purposes. Chapter 3 defines only a small part of the subsequent jargon.

Part II, titled "The Anthropological Dimensions of Sacraments" includes chapters on psychology, sociology, and philosophy, while Part III includes five chapters on "The Theological Dimension of Sacraments."

Finally, Part IV on "Sacramental Models" contains chapter 12 "Celebration: Toward a Revised Sacramental Model" and 13 "The Challenge of the Crisis."

The impression one gets from the foreword all the way to the last page is carelessness. The book is littered with typographical errors. The sheer quantity of references requires a bibliography (chapter 5 has 123 end notes), and an index would appear necessary because of the number of technical terms and scholars referred to.

The quantity of terms includes a confusing array of jargon. For example, the reference on p. 66 to the "individual human person" is the roccoco extension of the baroque "human person" used throughout. The jargon is drawn from diverse quarters and its lack of unity is symptomatic of the lack of any unification of definitions or methodology. Father Fransen, who wrote the foreword, tries to excuse this as erudition and attempts to avert inevitable criticism with: ". . . some readers, less aware of the laws of human argumentation and thought, may regret that the author's (sic) psychological, sociological, and anthropological expositions were not fully integrated into his theological exposé (sic). This kind of mixture, however, would have been totally impalatable (sic) and even quite confusing. . . . This is a question of intellectual honesty" (p. xii). If the divergencies of methodology and definition were carefully drawn, this position would be proper. The lack of this delineation is only further proof of the careless haste of the project.

The most telling shortcoming, however, was the choice of models for the Christian sacraments. From "myth" to "metaphor" naively implies a movement from the primitive and unknown to the more modern, literate and comprehensible. Even a cursory look at the metaphor literature belies such a position. Max Black's *Models and Metaphors* is the only reference from the main body of metaphor literature cited by Worgul.

For those of us committed to the validity of the Christian sacraments based on the nature of their institution and the Christ instituting them, the project is ill-conceived from the outset. Given the importance of the project, it certainly warrants more care than this study affords.

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SCIENCE AND CREATIONISM edited by Ashley Montagu. Oxford University Press, 1984. xvii + 415 pp. (no price given).

The 125th anniversary of the appearance of Darwin's *Origin of the Species* has passed, but the furor which it originally ignited continues to burn. Although the right to teach evolution in American public schools was established by the celebrated 1925 "Scopes monkey trial," the volatility of the issue caused most biology texts to utilize the term sparingly, that is, until the launching of *Sputnik I* in 1957 catapulted the teaching of science to the center of our public education system. The new biology texts assigned a major role to evolution, which set in motion the anti-Darwinism forces once again.

The contemporary controversy, however, is somewhat different from that of the 1920's. Evolution is now opposed by Christians educated in the sciences but nevertheless committed to a literalistic interpretation of Genesis. Their program calls for "two-model" scientific education legislation which would require their understanding of supernatural creation presented alongside of evolution as a scientific model in America's public schools. A law to this end was enacted in Arkansas in 1981 but was successfully challenged in 1982 in United States District Court. *Science and Creationism* arises out of these recent developments.

The book is edited by Ashley Montagu, anthropologist, author of various works and lecturer at Princeton University. He also sounds the major themes of the book in his introduction. Nineteen scholars join in the discussion in separate essays. Many of the articles were written expressly for inclusion here, whereas others appeared in various journals previously. Also included is Judge William R. Overton's court decision which struck down the Arkansas legislation.

Taken as a whole the volume is highly beneficial. The arguments of the Institute for Creation Science are summarized and answered point by point. Likewise, the positive case for evolution is presented. The various considerations found in the book must be pondered by anyone who would question the validity of current scientific thinking on the question of origins. Of special interest is the repeated thesis that creation-science advocates misunderstand and misuse the criticisms of evolution which have recently been voiced by certain leading scientists.

Science and Creationism is unfortunately plagued by certain faults common to collections of essays. The twenty offerings are of varying value to the volume as a whole and are uneven in length, rigor and style. Some, such as the article by Sidney W. Fox, are quite detailed and scholarly. Others seem to be merely a venting of personal frustration and emotion. Similarly, extensive footnotes and bibliography are offered by a few, but not all authors. Certain themes and reasoning patterns find repeated emphasis in the various articles, which makes for unfortunate redundancy.

The reader would have been assisted in his journey through the long volume by certain helps which were unfortunately not provided. No attempt is made by the editor to introduce the reader to the content and author of each article. The back cover suggests that the book's essays "reflect diverse fields of expertise and explore the creationism issue in all its aspects: scientific, historical, theological, legal and educational." Neither the table of contents nor the order of the articles gives indication of this. As for the promised theological exploration, no essay from a leading American theologian is to be found! In fact, the authors included comprise an interesting theological mix. George M. Marsden, an evangelical from Calvin College, is perhaps the most conservative. His excellent article seems out of place, however, when one later reads L. Beverly Halstead's comment, "I do not see how the concept of evolution can be made consistent with that of creation by a personal god, or indeed any sort of god" (p. 240).

These numerous problems do not negate the significance of *Science and Creationism*. Christians, whether members of the ICR or theistic evolutionists, all affirm "in the beginning God created. . . ." This declaration concerning the origin of the world necessitates honest and open dialogue with science. Although the book fosters an unrealistic separation of science and religion, it is a valuable window on the contemporary scientific understanding.

Reviewed by Stanley J. Grenz, North American Baptist Seminary, Sioux Falls, South Dakota 57105.

REVELATION DES ORIGINES: LE DEBUT DE LA GENESE by Henri Blocher, (Presses Bibliques Universitaires, Lausanne, 1979). ISBN 2-8285-0037-3, 50 FF, 242 pages.

This is not a book on Genesis that definitively answers all the questions. It is far better: a careful attempt to establish the meaning of the early chapters of Genesis. It is written by a French evangelical scholar who seems to have read everything on the subject and whose skills in theology, Biblical studies, and critical thinking enable him to discuss intelligently the strengths and weaknesses of the various answers that have been proposed.

The book begins with a discussion of methodology. Blocher insists that the text be interpreted according to the highest hermeneutical principles because it is in fact the Word of God and carries His authority. Rather than naively trying to divest ourselves of all presuppositions as we approach the text, or to read the text in the light of modern science (the science-Bible dialogue properly comes only *after* the text's meaning has been established), we ought to seek the frame of reference of the whole of Scripture. The "analogy of faith," that Scripture interprets Scripture, is thus a fundamental tool. But for Blocher, such a high view of Scripture implies a need to also take seriously the human element of the text. Since God has spoken *through men* in various ways (Heb. 1:1), "one 'follows' God himself by paying attention, in the most methodical and best-informed manner possible, to the humanity of His Word, in all the forms it can take." Thus a careful understanding of the genre of the biblical narratives, based on biblical and extra-biblical source material, is essential.

Blocher next discusses at length the genre of the "two tablets" of the creation story. It is a gross simplification to demand a choice between prose and poetry; he argues that Scripture abounds in examples of mixed genre. The presence of figurative elements does not necessarily imply that a narrative is merely symbolic, nor does an underlying historicity demand that literalistic language always be used (the book of Revelation, which describes "things that will soon take place," is a good example). The extreme care with which the Genesis 1 narrative has been arranged, both in its language and theological content, indicates that it ought to be interpreted as a "hymn in prose" of composite genre, rather than according to literalistic, concordist, or "gap theory" schemes. While many have advocated this sort of position in the past, I found it helpful and refreshing to see a discussion of the compellingness of this approach based on *textual*, rather than scientific or logical, considerations.

In successive chapters the book discusses: "being, order, and life" as a framework for the first creation narrative; the "image of God"; "male and female"; the "Edenic covenant" of Genesis 2 and the breach of that covenant (he prefers this notion to that of a "fall"); the wages of sin (with a helpful discussion of death); and finally, in treating Genesis 4–11, the further consequences of sin, its judgement, and the indications of God's grace—culminating in the call of Abraham. He finishes with two appendices, one discussing the reasons why he rejects a documentary hypothesis approach to the Pentateuch (Mosaic authorship seems to him as compelling as any alternative), the other relating Genesis, especially its first chapter, and modern science. Considering this question last is deliberate. While ultimately the two approaches must be integrated in some sense ("God's universal lordship prohibits a compartmentalization"), science must not be allowed to intrude prematurely in determining what the Biblical passages say ("Moses was unaware of [modern scientific hypotheses . . . so] we should 'forget' them"). After reviewing briefly various scientific findings, he sees no *a priori* problem, biblically speaking, with theistic evolutionary hypotheses. At the same time he argues forcefully, on both textual and theological grounds, for an historical basis to the events of Genesis 2 and 3 (though this does not exclude the possibility of the use of figurative language to describe the events). Where exactly to place Adam with reference to the paleontological record is somewhat unclear—none of the possible solutions is without problems—but Blocher closes with a discussion of the various options, suggesting that this somewhat "embarrassing" (quotation marks his) problem illustrates well the proper approach of faith: "so sure of the Word of God that it can calmly make known its hesitations and wait patiently for the resolution of any unclear points."

If I found the book at all disappointing it was only because having whetted my appetite by his thorough scholarship and clear thinking, Blocher stops where he said he would—after an exegesis of the text—leaving largely unanswered the related issues of integrating this teaching (especially with regard to sin, death, and the "fall") with 20th century scientific perspectives. Still, if this book stimulates other Christians to works similar in scholarship, orthodoxy and non-polemic approach, it will have served a good purpose. Perhaps this review will help encourage some publisher to get the book translated into English, so it will be available to a wider audience. *(**Editor's Note:** recently released in English under the title* In the Beginning: The Opening Chapters of Genesis, *D.G. Preston, trans., Inter-Varsity Press, 1984.)*

Reviewed by Kurt Wood, chez Hiestand, 23 Ave. Charles Flahault, 34100 Montpellier, France.

TEILHARD AND THE UNITY OF KNOWLEDGE

by Thomas M. King and James F. Salmon, eds. Ramsey, N.J., Paulist Press, 1983, 172 pages, $6.95.

Teilhard and the Unity of Knowledge represents the proceedings of the Georgetown University Centennial Symposium convened in honor of the late French theologian-scientist, Pierre Teilhard de Chardin. The book includes essays by Frederick Copleston, Ilya Prigogine, Richard Leakey, Kenneth Boulding, Paolo Soleri and Raimundo Panikkar, a sermon by the senior editor and an appendix on Teilhard's involvement in the Piltdown hoax, also by the senior editor.

Prigogine's essay, *Time and the Unity of Knowledge*, provides an excellent review and integration of the concept of bifurcation leading to non-equilibrium systems in such diverse fields as physics, chemistry and biology. Panikkar provides a scholarly and radical view of human history in the essay, *The End of History: The Threefold Structure of Human Time-Consciousness*. Kenneth Boulding's *The Concept of Evolution in the Interaction Between Science and Religion*, contains a harvest of valuable historical insight. Thomas King's appendix on Teilhard's involvment in the Piltdown hoax is meticulously documented and well worth reading. Despite these strengths, the overall outcome of the symposium is disappointing. Teilhardians will discover that, despite the title, Teilhard's life and thought receive little critical attention. The most pathetic example of this emerges in Richard Leakey's essay, *Human Unity: Past and Future*, which opens with the statement, "I must confess . . . having listened with you to so much that I did not understand—fills me with fear." Leakey admits that he has not "read a great deal of Teilhard" and demonstrates it conclusively in the rest of an essay that spends most of its time in diatribe with opponents of evolutionary theory. If Leakey is ignorant, Paolo Soleri is merely obscure is his essay, *Teilhard and the Esthetic*, which includes such doublethink phrases as "Given a reality which is intrinsically unknowable and which development, evolution, is intrinsically inequitable the human soul is prey of an inextinguishable anguish impervious to the blandishment of science, medicine, psychology, religion, philosophy, politics, etc. . . . "

Christian scholars hoping to discover fresh food on intellectual integration will go hungry. Despite the use of terms like "God," "Lord," "creation" and even "Jesus" by many of the participants, their theological position is a thinly disguised pantheism. If Soleri is abstruse elsewhere, he is the most explicit on this, "My contention is that God and all its attributes is but an aesthetic manifestation."

In the familiar fairy tale, it is a child who must state, "The emperor has no clothes on." Likewise, it seems to have fallen

to this obscure reviewer to say that many of the symposium's participants are intellectually naked. The book certainly demonstrates that clear, hard-headed Christian thinking is needed to solve the problems of a despairing world. However, attempts to find solutions in such pantheistic confusion only lead us to the words of Paul, "The world by its wisdom knew not God."

Reviewed by Fred Van Dyke, Fort Wayne Bible College, Fort Wayne, Indiana, 46807.

THE SPIRIT OF THE EARTH by John Hart, Paulist Press, New York, 1984, 165 pages, $8.95, paperback.

"The King decreed during a time of famine that for every poor person who died of starvation a rich person would be executed. Thereafter, no one starved." Such was the policy relevant to land ownership and use instituted by King Agud of Persia in 996 A.D., and cited by John Hart in *The Spirit of the Earth*. In this book, subtitled *A Theology of the Land*, Hart surveys current trends in land ownership, use, and abuse in the United States, and suggests concrete courses of action for Christians concerned about justice related to land use. (King Agud's policy is not recommended.)

Hart, a faculty member in religious studies at the College of Great Falls, Montana, draws in this book from a 1980 work, *Strangers and Guests: Toward Community in the Heartland—A Regional Catholic Bishops' Statement on Land Issues*, of which he was the principal author.

In chapter one of this book, Hart paints a depressing canvas, depicting the current state of the land, particularly agricultural land, in the United States. His colours are bold and graphic, but unfortunately his strokes are too broad. Hart brushes only the surface of such serious problems as soil erosion, land lost to urbanization, land contaminated by hazardous wastes, acid rain and radioactive wastes, extreme reliance on the use of pesticides and herbicides, consolidation of farms and genetic homogenization. Each of these topics is complex, multi-faceted and difficult to discuss meaningfully in isolation. It is even more difficult to do justice to this complexity in a few sweeping pages. The use of herbicides in agriculture, for example, is best discussed in conjunction with overall energy use on the farm and alternative methods of tillage. Most farmers and industrial manufacturers probably fall somewhere between the extreme categories of exploiter and nurturer mentioned by Hart. In several cases, the author's arguments would have gained significantly more impact if he had cited sources in addition to newspaper articles.

The power of Hart's book lies in the chapters that follow, in which he presents a historical survey of attitudes toward the land and a program for re-forming the land.

Hart maintains in chapters two and three that Native American and Judaeo-Christian veiws are similar in their respect for the land and attempts to live in harmony with the rest of creation. Native Americans saw the land as provider, not property. Therefore it could not be owned by individuals and must be treated with respect.

At its roots, the Judaeo-Christian notion was that everything in the universe is created by God and anything that God creates is good. Hart leads the reader through a fascinating comparison of the Genesis story and its reversal in Exodus. In Genesis, Adam and Eve are thrown out of the Garden of Eden because of their sin. In Exodus, the Jewish people are called and led from exile in a strange land to triumphantly inhabit their new homeland.

The author presents an informative discussion of the concrete laws laid down by God to ensure that the Israelites took proper care of the homeland entrusted to them. In Leviticus 25:23 God tells the Jewish people: "The land belongs to me and to me you are only strangers and guests." The sabbatical year was instituted every seventh year, to both rejuvenate the land and force the people of Israel to rely on God for their "daily bread." The jubilee year (every seventh sabbatical) served the purpose of redistributing the land; all slaves were to be set free and landed property returned to owners. The practice of gleaning was one more indication of the *right* of the poor to be fed. Those who harvest their land are commanded (Leviticus 19:9–10) to leave some for the poor.

Turning to early American legislation regarding land use and distribution, Hart suggests such leaders as Thomas Paine and Thomas Jefferson intended to foster widespread ownership of the American land heritage by the new settlers. They made serious legislative attempts to ensure that most of the "new land" not be owned by a small group of wealthy people, but be available to all. Unfortunately, history shows that the principle of distribution of land to all settlers who desired it was the beginning of the end for the traditional life of the earliest Native Americans.

Hart presents favorably both the early settler and Native American approaches to land use. Unfortunately, the success of one philosophy led to the demise of the other. Today, Hart says, both Christians and many Native Americans have wandered far from their philosophical roots in relating to the land.

In a chapter entitled "The Church and the Land," Hart focuses on attitudes of the Catholic Church toward land use. He includes 10 principles of land stewardship from *Strangers and Guests: Toward Community in the Heartland*, and argues compellingly for church involvement in stewardship of the land, to "reaffirm the worth of creation."

The book ends with a call to apply an ethics of transformation to the earth. Principles to follow in re-forming the land can be summed as follows: The land is God's; the land is entrusted to humanity; and the land is to be shared equitably through the ages. To make these principles concrete Hart suggests 20 steps of land reform. His attempts to be specific and constructive in converting general ethical principles into avenues for individual and communal action appear to be carefully formulated and helpful.

Reviewed by Peter G. Mahaffy, Assistant Professor of Chemistry, The King's College, Edmonton, Alberta, Canada T5H 2M1.

RITES OF LIFE, by Landrum B. Shettles with David Rorvik, Grand Rapids, MI., Zondervan Publishing House, 1983, 162 pages.

In 1954 Landrum Shettles had the idea of fertilizing a human egg in a test tube and was successful but in 1972 he removed an egg from a Florida woman and fertilized it with her husband's sperm; a colleague destroyed it, following which jurors awarded the woman a substantial sum because her potential child was destroyed. Thus Dr. Shettles subsequently was convinced of the "meaningfulness of life before birth and consolidated his opposition to abortion." This book is a fascinating account of life before birth, a defense of the antiabortion position, and an evaluation of birth control methods to avoid the excuse for abortion. He believes life created in the laboratory should be intended for implantation in a womb to overcome infertility and embryos should be transplanted from women who don't want them to women who do.

The biology of egg and sperm cells is recorded accurately with special accounts of events not often realized, such as "you could put all the eggs that were required to create the entire world population today in a single cookie jar. The sperm required for that same job would fill no more than a thimble." Life begins at conception; preventing implantation should be considered abortion.

Using such chapter titles as "Humanity at Under One Ounce, the Second and Third Months" and "Finishing School, the Next Six Months," Dr. Shettles holds your attention by his unique way of reciting well known facts and also observations not usually recognized. He points out "medicine's great and continuing progress in sustaining the fetus, at ever earlier ages, outside the mothers womb when it becomes necessary," and that there are "more than thirty different defects that can be treated in the womb." However, financial return directly influences a doctor's morality when it comes to abortion.

Do you know that "the thoughts and experiences of the mother during pregnancy can and do affect her unborn child"? Other details are equally enlightening about mother/child relationships before birth.

Part 2 considers "The Debate: Life or Death" and includes a history of court decisions about abortion, which follow the new ethic. These decisions justify abortions with the sociological idea "to seek the greatest good for the greatest number, even if that means that some individuals must suffer and die in the public interest," i.e. that some fetuses should be aborted. However many people "are assiduously resisting the new ethic, convinced that it will ultimately undermine the freedom of all of us, not just the freedom of the unborn or others too weak to fight for their natural rights."

The question of when life begins is dealt with from the viewpoint of those who believe it happens at conception, implantation, "viability," birth, graduation from Princeton, or never. Arguments pro and con are fairly considered.

Four case histories illustrate the disillusionment of women who have had abortions and add the reactions of the men who caused the pregnancies. In "Family Planning Versus Abortion" the author not only evaluates birth control methods but lists organizations which will help women through troubled pregnancies. Dr. Shettles concludes, "I may be wrong, but I will predict that the 'abortion era' will ultimately be judged by society with abhorrence." Instead of abortion, we should use adoption or transplants.

Reviewed by Russell Mixter, Professor Emeritus of Biology, Wheaton College, Wheaton, Illinois.

MORAL CLARITY IN THE NUCLEAR AGE, by Michael Novak. Nashville, TN: Thomas Nelson, Inc., 1983. 144 pp.

One of the most crucial and emotional ethical controversies faced by the contemporary church is the proper Christian response to nuclear weaponry. On May 3, 1983, the American Roman Catholic Bishops issued their historic pastoral letter on war and peace. Although hailed by many, the Bishops' statement was not greeted with universal acclamation. One Catholic who strongly disagrees with the drift to the left in the Church is Michael Novak, noted author and former professor of religion at Syracuse University. *Moral Clarity in the Nuclear Age* is the product of this disagreement.

The book consists of four essays on the subject of nuclear armaments. The title essay appeared in *Catholicism in Crisis* in March, 1983, and then in William Buckley's *National Review* in April, cosigned by 112 other Catholics, including nine Republican congressmen and several priests. Prior to its publication it was submitted to the Vatican and distributed to several European Catholic bishops. This statement seeks to present an alternative to the pacifist viewpoint which was being advocated by a segment of the American bishops during the long process of the formation of the pastoral letter.

Novak's second article seeks to address the topic of nuclear armaments from a European perspective. Attention is focused again on the pastoral letter in chapter three, which contains the author's response to the final draft and his evaluation of the changes from earlier drafts which it incorporates. A final short essay considers the possibility of arms reduction negotiations with the Soviets, especially in view of the bishop's demand that a nuclear deterrent is tolerable only when coupled with such actions.

The recurring thesis of the various essays is clear. Some ethicists have declared not only nuclear war itself to be unethical, but also the possession of such weapons, even as part of a strategy of deterrence. In contrast to this view, Novak maintains that to eliminate this deterrence would be immoral, for it would jeopardize the lives and freedoms of masses of people.

Behind the various arguments presented in the book is the author's distrust of the Soviet government, nurtured by its history of oppression and by the writings of leading Russian

dissidents. His reminder of the dark side of the current situation is a sober deterrent to naive, utopian trust. Yet, until the nuclear burden is lifted, our world will likewise remain in need of those visionaries who will call us to take risks for the sake of peace and for the oppressed, risks nurtured by a trust in God.

Reviewed by Stanley Grenz, Associate Professor of Systematic Theology, North American Baptist Seminary.

IDOLS FOR DESTRUCTION by Herbert Schlossberg, Thomas Nelson Publishers, Nashville, Tennessee, Hardcover, $14.95; Paper $8.95 (1983).

Idolatry has been a popular theme in contemporary religious materials. This book should put much of the discussion to rest as it leaves little else left to say.

Schlossberg's thesis is that idolatry offers the best framework for understanding society. Because idolatry substitutes what is created for the creator, all relationships are altered. Man erects a pyramid of values and ultimately serves whatever is at the top. Consequently, his life and all of society is affected by an array of idols with their assorted and distorted notions of truth and beauty.

Schlossberg makes the distinction between secularization—a turning away from Christian faith—and idolatry which implies the substitution of something for God. In this sense, secularization is negative and idolatry is positive in its effect. In fact, idolatry provides a new unity and structure in society to counter the erosive and disorganizing effects of secularization. Ultimately, idolatry acquires the total capacity to reorganize society on values completely reversed from those intended by God.

Schlossberg has little concern for the usual listing of tangible idols; money, power and possessions. Instead, he concentrates on ideologies and faiths, which in their good intentions, present a distorted picture of some truth to be worshipped. Civil religion, for example, becomes an idol when religion distorts its true meaning and presents the people with false notions of eternal truths. Self-expression, by itself, may also be desirable. But when the individual believes himself to be the measure of all truth, self-expression becomes cultic.

Schlossberg's emphasis on the idolatrous nature of ideas and beliefs is more striking when he adds history, humanity, and religions to his list. Each is an idol in modern society because it has become an end in itself. Rather than recognize God's creative and sustaining power over time, man, and the church, each creation is absolutized and becomes a creator of something else. Ultimately, it becomes an idol worthy of worship.

The reader is impressed with the subtlety of idol-making. Ressentiment, for example, begins with the harmless comparison of one's attributes with another's and eventually leads to the distorted love of altruism. Rather than expressing concern for the genuine needs of the weak and helpless, altruism is directed toward abstractions and false notions of suffering. The result, as with all idols of humanity, is the worship of man's power rather than a concern for his weakness.

Schlossberg's scholarship is impressive. Indeed, the notes alone are worth the price of the book, which is provocative and wide ranging in its discussion. While one might prefer to see more in-depth treatment of the natural and physical sciences as idols of nature, his point is clear; reason is lost when it is valued to the point of idolatry. His conclusion that science is eclipsed by a new irrationality is familiar but trenchant.

When it comes to the destruction of idols, Schlossberg is skeptical about orthodoxy alone. What is needed is a recognition of the illusions with which we all live and a healthy suspicion of the world and its ways. The inevitable result would be persecution and a return of the church to its place as a first century community in a hostile world. As a minority group, Christians would understand more clearly the meaning of the New Testament and apply it in new found ways of faithful living.

Reviewed by Russell Heddendorf, Covenant College, Lookout Mountain, Tennessee.

Books Received and Available for Review

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

G. Adler, A. Jaffe and R. Hull, *Selected Letters of C.G. Jung*, 1909–1961, Princeton

N. Anderson, *Christianity and World Religions: The Challenge of Pluralism*, Inter Varsity

E. Blaiklock, *Jesus Christ: Man or Myth?* (A Contemporary Examination of Ancient Evidence), Nelson

R. Chopra, *Making a Bad Situation Good*, Nelson

C. Cochrane, *The Gospel According to Genesis*, Eerdmans

J. Draper & F. Watson, *If the Foundations be Destroyed*, Nelson

M. Evans, *Woman in the Bible*, Inter Varsity

G. Goldbery, *Reconsecrating America*, Eerdmans

J. Green, *How to Read Prophecy*, Inter Varsity

M. Holmes, *To Help You Through the Hurting*, Bantam

T. Howard, *Evangelical is Not Enough*, Nelson

B. Lindars, *Jesus Son of Man*, Eerdmans

C. Malz, *If You're Over the Hill, You Oughta' Be Goin Faster*, Chosen Books

W. Ringenberg, *The Christian College: A History of Protestant Higher Education in America*, Eerdmans

K. Runia, *The Present-day Christological Debate*, Inter Varsity

J. Sherrill, *Mother's Song* (A family learns the promise of "A time to die"), Chosen Books

S. Smalley, *John: Evangelist and Interpreter*, Nelson

M. Stackhouse, *Creeds, Society and Human Rights: Study in Three Cultures*, Eerdmans

Letters

Bible Archaeology and Scripture

In his article, *Bible Archaeology* (JASA *36*, 139 (1984), Richard L. Atkins refers to a "dogmatic pronouncement" of Billy Graham that "archaeology has never uncovered anything that disproved the Scriptures." This dogmatic pronouncement is very likely a paraphrase of another dogmatic pronouncement by the eminent Biblical archaeologist Nelson Glueck: "no archaeological discovery has ever controverted a Biblical reference" (as quoted in William F. Albright's review of Glueck's book *Rivers in the Desert*, Published in the New York Times Book Review, January 11, 1959).

John A. McIntyre, Professor
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The Limits of Human Wisdom: How Do We "Know"?

Two recent submissions to *JASA* by a fellow student here at Fuller Seminary are deserving, I feel, of some comment. I refer to Robert Weathers contributions to both the March and June editions, in which there appeared respectively a "Communication" and a book review. In the first, Mr. Weathers utilizes biblical wisdom literature in order to espouse his personalistic epistemological predilections. In this enterprise, he draws support from some of Neidhardt's work. Now, I must confess that in pondering Neidhardt's diagrams with all of their boxes, and arrows pointing here and there, the scientific aura is indeed profound. However, it did not take long to realize that these postulated epistemological maps could be used to defend the truth of conflicting truth claims simultaneously. Professors here at Fuller who are steeped in Torrancian "rationality" are oblivious to this point. The "ontic (alias the OTHER)" is to precede the ontological; objectivity is to be allowed to disclose itself prior to any rational comment. Weathers seems content to caboose himself to the Kierkegaard, Heidegger, Buber, Barth, Torrance epistemological train: "Essential to all such epistemologies are the priority of relationship and commitment to God and creation over scientific conceptualization and/or rational comment (JASA, March 1984, p.46)." Those of us with familiarity of Mormon philosophical theology recognize that nothing could better describe the process by which Joseph Smith ushered in the "restored gospel." With his priority of relationship and commitment to God, he allowed the OTHER to disclose itself, or, the ontic to precede the ontological. God was certainly the chief reality and center of things for him.

What did this encounter with the Thou disclose to Joseph Smith? Simply, that God is not Wholly Other at all. He is an exalted man, a resurrected flesh and bone being-among-beings, very much like ourselves—only bigger. Mormons individually have a burning "inner witness" experience to confirm the truth of Smith's definitive prophetic Encounter. The same "ontic" method has produced contradictory results. Note the comment of Mormon scholar Sterling McMurrin: "If St. Augustine were to return and be introduced to modern Christianity through Mormonism, he would be shocked and not a little disappointed to discover that he had not destroyed forever the heresies against which he directed his most vigorous and brilliant intellectual blows. For here he would encounter not only the Pelagianism that he fought so confidently, but also strong indications of the finitism which he identified with the Manichaeism that elicited much of his most intense assault. Here he would find little of the absolutism which in his later years he wrote so securely into the life and structure of Christianity (*The Theological Foundations of the Mormon Religion*, University of Utah Press, 1965, p.104)." I imagine on viewing such a situation upon his return, Augustine might be the first to reevaluate epistemological methodologies.

Finally, this leads to brief comment on Weather's review of Robert Roberts' *Spirituality and Human Emotion*. He finds fault with Roberts' "sideswiping sarcasm" in regard to process theologians. Now one wonders at this point if it might not be the case that in his appreciation of wisdom literature, Weathers has entirely missed the rich "literature of sarcasm" to be found in Scripture. It would not have been necessary to stray very far in the O.T. to appreciate Elijah's sarcasm in 1 Kings 18:27. Of course, Paul provides the most pointed example of N.T. sarcasm in Galatians 5:12. There are times, it seems, when the demands of truth and love take precedence over the "niceness" demanded by a benign pluralism. Our commission and command as believers is not to engage in "nice" dialogue with other religious traditions, but to reach them with the gospel which was once for all delivered. While dialogue is necessary to this end, it is a means. As with roads, not all epistemologies nor all religions lead to Rome. To think so is surely to fall prey to the obscurantism of which Weathers has such a healthy fear.

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