

Social History, Religion, and Technology: An Interdisciplinary Investigation into Lynn White, Jr.'s "Roots"

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An interdisciplinary reappraisal of Lynn White, Jr.'s "The Historical Roots of Our Ecologic Crisis" reopens several issues, including the suggestion by Peter Harrison that White's thesis was historical and that it is a mistake to regard it as theological. It also facilitates a comparison between "Roots" and White's earlier book *Medieval Technology and Social Change*. In "Roots," White discarded or de-emphasized numerous qualifications and nuances present in his earlier work so as to heighten the effect of certain rhetorical aphorisms and to generalize their scope and bearing well beyond what the evidence could bear. The meaning of Genesis and other biblical books proves to be just as important in White's thesis as their historical reception. In "Roots," White presents, alongside other contentions, the claims that Christian doctrines have all along been both anthropocentric and despotic, especially in the West, and that this is where the real roots of the problems are to be found. These claims, however, conflict with most of the relevant evidence. An adequate reappraisal of White's work needs to recognize that there is a cultural determinism parallel to the technological determinisms alleged by R. H. Hilton and P. H. Sawyer, to endorse Elspeth Whitney's "single-cause" critique of links between religion and technological change in the Middle Ages, and to treat sympathetically Whitney's claim that White and some of his eco-theological critics (despite their disagreements) have in common both their valorizing of individual beliefs and values and their neglect of economic and institutional factors. Nevertheless, our ecological problems need to be understood through explanations turning on beliefs and values *as well as* on economics and institutions.

I. INTRODUCTION: SCOPE AND AIMS

Lynn White, Jr.'s famous and controversial essay from 1967, "The Historical Roots of Our Ecologic Crisis"¹ has had a widespread influence, permeating not only scholarly circles in the disciplines of history, theology, and philosophy, but

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¹ Lynn White, Jr., "The Historical Roots of Our Ecologic Crisis," *Science* 155 (1967): 1203–07. This essay has been reprinted in many places, for example, in John Barr, ed., *The Environmental Handbook* (London: Ballantine, 1971), pp. 3–16. White himself reprinted it in Lynn White, Jr., *Dynamo and Virgin Reconsidered: Essays in the Dynamism of Western Culture* (Cambridge, Mass. and London, England: MIT Press, 1968), pp. 75–94 (page references in the article refer to the pages numbers of this republication).

also youth organizations and many other branches of semi-popular culture, being reprinted in numerous publications including *The Boy Scout Handbook* and the hippie newsletter *The Oracle*, and being reprised in *Time Magazine* and in *The New York Times*.² By now, the influence of “Roots” has become a cultural given, unlikely to be modified by journal articles, however broad or scholarly. To cite one prominent example, the history of Western attitudes to animals and to nature in the chapter entitled “Man’s Dominion: A Short History of Speciesism” of Peter Singer’s seminal and in many ways admirable work from 1976 *Animal Liberation*³ was almost certainly written under the influence of “Roots” (among other sources), and has long been exercising a powerful influence of its own. By now, the genie of White’s impact can hardly be put back in its bottle.

Nevertheless, after forty years, a reassessment is needed. For example, environmentalists and ethicists need to determine whether White’s claims should figure in their understanding of the causes of ecological problems, and whether their solutions should be influenced in turn by what they conclude about such causes. Theologians, many of whom have developed overtly new approaches to ecological issues (ecotheologians), albeit ones often held to be rooted in theological traditions, need to reflect on the extent to which White was ascribing blame to Christian beliefs, not the least so as to be able to attain clarity about the correctives that would be necessary if this is what he was doing, and if he was doing so justifiably. Alternatively, different correctives could be in place if his remarks were theologically misleading. Historians too need to relate the claims made by White in “Roots” to his own parallel studies of medieval history in more sustained works, and also to reflect on his methodological stance. In short, nothing less than an interdisciplinary review is needed.

No single essay can supply conclusive answers to all the above questions. But that is not a conclusive reason against attempting an interdisciplinary study, particularly where (as in this case) recent research prepares the way, throwing light on many of the key issues. Fortunately, White’s own works on medieval history, or so I claim, allow a more nuanced approach to medieval technology than is found in “Roots,” and relatedly a rather different interpretation of cultural history; and all of this may turn out to have a bearing both on history, on methodology, and on addressing ecological problems. First, however, an attempt to retrieve his message is needed, since only by doing so can it be judged whether this message was historical, theological, or both.

In section two, I present an overview of “Roots.” Section three is an appraisal of certain historical claims made in “Roots,” initially by comparing “Roots” with parallel passages in White’s earlier *Medieval Technology and Social Change*, where a much more qualified, if vulnerable, historical narrative is supplied. In section four I consider whether the central message of “Roots” was historical as opposed

² Elspeth Whitney, “Lynn White, Ecotheology, and History,” *Environmental Ethics* 15, no. 2 (1993): 157–58.

³ Peter Singer, *Animal Liberation: A New Ethics for Our Treatment of Animals* (London: Jonathan Cape, 1976).

to theological, as has been claimed, or whether White's claims extend to both of these fields. Some earlier research on the reliability of his theological claims is also summarized. In section five I turn to issues of methodology, from his determinism to his interpretative assumptions, and introduce some of the findings (historical, theological and methodological) of Elspeth Whitney, who criticizes both White and his critics for ignoring systemic explanations of ecological problems. In the afterword (section six) I comment on the relation of systemic explanations and explanations like those implicit both in White and in his ecotheological critics that stress individual beliefs and values, suggesting that both are needed.

II. AN OVERVIEW OF "ROOTS"

At the core of White's "Roots" article, connected theses are presented concerning medieval technology, cultural history, and the relations between (on the one hand) religious beliefs and values and (on the other) technology and attitudes to it. Commentators divide between those who construe White's message as relating to medieval history rather than to theology, and those who take seriously White's apparent portrayal of Christianity as the cause of our ecological problems and take his message to be theological as much as anything else. White's eminence as a historian of medieval technology helps explain the former view, while the appearance, partly in response to White, of a considerable body of writing in the field of ecotheology helps explain how the latter view is also credible. My own view, defended below, is that significant theses are present both about history and about theology, together with significant assumptions about the causal role of individual values.

By this stage the conclusion has become undeniable that an inquiry aiming to understand and appraise White's message (and indirectly his influence too) would be bound to fail if it did not seek to be interdisciplinary. It is for this reason that the current essay has sections on medieval agriculture and technology, on theological themes, and also on historical methodology. But first it is appropriate to present readers with some key themes and moments from "Roots" itself.

The following extract shows how claims about a new kind of plough are used to illustrate a supposedly distinctive change of cultural attitude toward nature:

By the latter part of the seventh century after Christ, however, following obscure beginnings, certain northern peasants were using an entirely new kind of plough. . . . Thus, distribution of land was based no longer on the needs of the family but, rather, on the capacity of a power machine to till the earth. Man's relation to the soil was profoundly changed. Formerly man had been part of nature; now he was the exploiter of nature. Nowhere else in the world did farmers develop any analogous agricultural implement. Is it coincidence that modern technology, with its ruthlessness toward nature, has so largely been produced by descendants of these peasants of northern Europe?⁴

⁴ White, "Roots," pp. 83–84.

White reinforces this interpretation, and amplifies its scope, further down the same page:

The victory of Christianity over paganism was the greatest psychic revolution in the history of our culture.⁵

White proceeds to explicate this verdict by attempting to answer the question “What did Christianity tell people about their relations with the environment? Christianity is not initially characterized here as Western, although some of his claims are qualified by the expression “Especially in its Western form, . . .” Nor is his subject matter qualified as *medieval* Christianity, for it is here that he cites the second-century church fathers, Tertullian and Irenaeus. Writing, then, of the conversion of Europe and the whole Mediterranean region from paganism to Christianity, he states that

The spirits *in* natural objects, which formerly had protected nature from man, evaporated. Man’s effective monopoly on spirit in this world was confirmed, and the old inhibitions to the exploitation of nature crumbled.⁶

Seeking to summarize the paragraphs that follow, Peter Harrison has produced the following paraphrase:

The Christian doctrine of the creation sets the human being apart from nature, advocates human control of nature, and implies that the natural world was created solely for our use.⁷

This passage well captures what White is saying here, despite Harrison’s later claim that White’s message concerns the medieval reception of Christianity rather than its central message.

Nevertheless, White later attempts to limit the scope of his claims, or rather to apply them more particularly to the West than to the East of Europe, although not exclusively so.

What I have said may well apply to the medieval West, where in fact technology made spectacular advances. But the Greek East, a highly civilised realm of equal Christian devotion, seems to have produced no marked technological innovation after the late seventh century, when Greek fire was invented. . . . Eastern theology has been intellectualist. Western theology has been voluntarist. The implications for the conquest of nature would emerge more easily in the Western atmosphere.⁸

⁵ *Ibid.*, p. 84.

⁶ White, “Roots,” p. 87.

⁷ Peter Harrison, “Subduing the Earth: Genesis 1, Early Modern Science, and the Exploitation of Nature,” *Journal of Religion* 79 (1999): 86.

⁸ *Ibid.*, p. 87.

White develops this theological distinction with further historical claims, summarized as follows by Harrison:

In the Christian Middle Ages, according to White, we already encounter evidence of attempts at the technological mastery of nature, and of those incipient exploitative tendencies that come to full flower in scientific and technological revolutions of later eras. All of this is attributed to the influence of Judeo-Christian conceptions of creation. Christianity, White concludes, “bears a huge burden of guilt for environmental deterioration.”⁹

Thus, Christianity is substantially to blame for the nineteenth-century alliance of science and technology (offshoots both, in White’s account, of Christianity) and for their “ecologic effects.”¹⁰

It is at this stage that White suggests that we either find a new religion, or rethink our old one.¹¹ In the first connection, White considers Zen Buddhism and Hinduism, but expresses doubt about “their viability among us” (Westerners, presumably). His preferred alternative is to adopt the nonanthropocentric values of the “heretical” St. Francis, whom he proposes as a patron saint for ecologists,¹² and to reject what he depicts as “the Christian axiom” that “nature has no reason for existence save to serve man.”¹³

Some immediate remarks are appropriate here. First, White can hardly be interpreted as having nothing to say about theology. Second, his advocacy of a nonanthropocentric metaphysic (and implicitly of a nonanthropocentric value theory) will be a welcome one to many environmental ethicists, whether or not the success of such advocacy would be sufficient even to begin to cure ecological problems. Third, his interpretations of Christianity (and also of Francis as a heretic) are open to legitimate questioning. But fourth, the same is also true of his interpretations of cultural history, the topic which should next be addressed.

III. THE ROOTS OF “ROOTS” AND ITS HISTORICAL MESSAGE

White’s book *Medieval Technology and Social Change*, published in 1962, includes a chapter on medieval agriculture, of which a large section relates to the introduction of heavy ploughing, its social impacts, and what it symbolizes.¹⁴ A comparison of this section with relevant paragraphs in “Roots” (which was, as noted above, first published in 1967) suggests that this section was his direct source

⁹ Harrison, “Subduing the Earth,” p. 86.

¹⁰ White, “Roots,” p. 90

¹¹ *Ibid.*, p. 91

¹² *Ibid.*, pp. 91–94

¹³ *Ibid.*, p. 93

¹⁴ Lynn White, Jr., *Medieval Technology and Social Change* (Oxford: Clarendon Press, 1962), pp. 41–57.

for those paragraphs, particularly in view of the considerable verbal similarities. Some of his more striking sentences in "Roots" are in fact direct quotations from this section.

It is worth comparing the two passages. The earlier passage from *Medieval Technology* is full of qualifications. The "Roots" passage turns out to be nuanced in places to reflect the need for such qualifications, but the lessons drawn are neither nuanced nor, I argue, compatible with the qualifications of *Medieval Technology*. Further, the *Medieval Technology* passages that were subsequently quoted in "Roots" prove to be rhetorical sentences that appear to conflict with the style and to some extent the content of their 1962 contexts.

One of these is a passage about the "new" plough and its impacts. "No more fundamental change in the idea of man's relation to the soil can be imagined: once man had been part of nature; now he became her exploiter."¹⁵ How far does the section on heavy ploughing bear out either this summary or the general implication of "Roots" that it was the conversion of northern Europe to Christianity that explains the new "exploitation of nature"?

The claim in "Roots" that the eight-oxen plough was new is actually undermined by White himself, who in *Medieval Technology* cites the younger Pliny as describing such a plough as in use in Italy (in the Po Valley, White suggests) in the second century C.E.¹⁶ White proceeds to discuss the gradual introduction of heavy ploughing in various places in Europe (far from all of them in Northern Europe) over the period up to the eleventh century. Marc Bloch, who in 1931 synthesized and promulgated the theory that heavy ploughing produced a new field system and social system in Northern Europe (and to whose memory *Medieval Technology* is dedicated), did so with wide-ranging reservations and doubts, and these qualifications are summarized here by White.¹⁷ For example, strip-fields of the kind supposedly resulting from the introduction of the heavy plough are to be found in places where the old kind of plough remains in use (Syria and Sardinia), while open fields of the kind supposed to result from this agricultural revolution are to be found in pre-conquest Mexico, where no ploughs were in use at all.¹⁸ In any case, the open-field system, as also found in Sardinia, served equally "to increase the facilities for rearing cattle" as well as "putting maximum arable into grain,"¹⁹ and was thus likely to be introduced when either of these motives was present, rather than specifically requiring the one relating to ploughing.²⁰

¹⁵ *Ibid.*, p. 56.

¹⁶ *Ibid.*, p. 42. R. H. Hilton goes further, and claims that the heavy plough was in use among the Belgae in the first century B.C.E. See R. H. Hilton and P. H. Sawyer, "Technical Determinism: The Stirrup and the Plough," *Past and Present* 24 (1963): 97.

¹⁷ White, *Medieval Technology*, p. 41.

¹⁸ *Ibid.*, p. 47.

¹⁹ *Ibid.*, p. 55.

²⁰ Hilton supplies convincing evidence of the existence of open fields in England in the seventh century, before the arrival of the Danes; see Hilton, "Technical Determinism," p. 98.

Further evidence shows that the heavy plough was in use among Slavs (western, eastern, and southern ones alike) prior to the Avar invasion of 568 C.E., which separated southern Slavs from the others.²¹ But this evidence seems to suggest that heavy ploughing was widespread in the sixth century among ethnic groups who were either (just possibly) Christians of the Eastern variety (contrary to White's thesis exempting Eastern Christianity from the "exploitative" tendencies epitomized in his view of the new kind of ploughing) or more probably pagans (whose inhibitions to "the exploitation of nature" were yet "to crumble," since this crumbling was to take place, according to "Roots," with the adoption of Christianity).

As for England, the balance of evidence suggests, according to White, that heavy ploughing was introduced into the Danelaw by the Viking invaders of the later ninth and early tenth centuries, from whom the English word *plough* (spelt thus in British English) seems to derive (from the Old Norse term *plogr*).²² If so, there can scarcely have been an agricultural revolution across Northern Europe in the seventh century. Further, given that some of the ninth and tenth-century Vikings were pagan, not even at this late stage in the history of the heavy plough can it be regarded as a Christian innovation. The evidence does support changed methods of agriculture in the Rhineland in the seventh century, suited to supporting a greatly enlarged population there,²³ although this interpretation has been challenged.²⁴ But not even White believed that it spread to the Norse until somewhat later, maybe shortly before they brought it in the ninth century to England and to Normandy.²⁵

The overall picture, then, is that while it is true that "certain northern peasants" were using heavy ploughs in the seventh century, these ploughs were not new, not distinctively Western (but derived from places further south and east), not distinctively or characteristically Christian, and only sometimes associated with changes in field-systems or in the organization of society. White's claim about the uniqueness of the plough of these northern peasants is cast into doubt by his own evidence about its presence many centuries earlier both in Italy (as attested by Pliny) and in the northern Balkans or Danube valley (among the Slavs). Further, White's remark in "Roots" about modern technology originating in the descendants of these peasants,²⁶ far from reflecting an obvious truism, is itself either untestable or implausible, since we scarcely know who these peasants were, and, to the extent that we are confident that they were Rhenish Franks, since his remark hardly fits the geographical distribution of subsequent technological inventions. For the same reasons, while White proceeds to show (not the least in *Medieval Technology*) that

²¹ White, *Medieval Technology*, pp. 49–50.

²² *Ibid.*, p. 51.

²³ *Ibid.*, p. 54.

²⁴ Hilton suggests that rather than increased food causing population growth, the reverse may have been the case: see Hilton, "Technical Determinism," pp. 99–100.

²⁵ White, *Medieval Technology*, p. 54.

²⁶ White, "Roots," p. 84.

there was considerable technological development in northern and western Europe in the later middle ages, we are utterly unable to correlate the attitudes concerned (whether “exploitative” or otherwise) with those of the peasants who introduced the “new” plough.

Similar reservations are in place about White’s claim about a changed relation of humanity to the soil. If there can be strip-field systems and open fields run on a communal basis either with or without heavy ploughs, then the introduction of these ploughs can hardly have significantly changed the relation to the soil of humanity, or even of the Northern European segment of humanity. The suggestion that there was such a dramatic change might begin to make sense if, as used to be supposed, the heavy plough was introduced very quickly over a significant area, e.g., with the Anglo-Saxon invasion of England; but it is White himself who discounts such a theory.²⁷ Harrison credits the interpretation of “Roots” about heavy ploughing: “The introduction of the heavy plough into northern Europe made possible the large-scale cultivation of land and lifted agricultural production above the level of subsistence farming. This technological innovation thus revolutionized the relationship between human beings and the land that they inhabited. . . .”²⁸ However, this interpretation hardly coheres with the facts insofar as they are disclosed in White’s fuller and earlier text from 1962.

But in any case, how credible is it that users of the scratch plough, unlike users of the heavy plough, were parts of nature (as White seems to imply, both in *Medieval Technology* and in “Roots”²⁹)? As we have seen, the scratch plough was compatible with the same land systems and social systems as Bloch’s theory attributes to the heavy plough. Besides, is ploughing of any kind best described or understood as “being part of nature”? Are Hesiod and Varro, Columella and Vergil best described as parts of nature, with no traces or tendencies toward its mastery? More plausibly the transition from hunter-gathering to agriculture was a far more significant transition even than that from hoeing to ploughing. If, however, deployers of the scratch plough can be considered “parts of nature,” perhaps through living in some kind of harmony with natural forces and cycles, then why are things so very different with the introduction of the eight-oxen plough with its share and mouldboard? The change hardly warrants White’s claim that “now” (in the seventh century, apparently) man became nature’s “exploiter.”³⁰

Yet this is the phrasing used by White in *Medieval Technology* as well as in “Roots,” immediately after regaling his readers (in *Medieval Technology*, albeit not in “Roots”) with all the qualifications cited above, and with more. As will be seen, White seems to have had a hankering after aphorisms, particularly double-barrelled ones, such as the one about man, who was formerly part of nature, becoming nature’s

²⁷ White, *Medieval Technology*, p. 43.

²⁸ Harrison, “Subduing the Earth,” pp. 94–95

²⁹ White, *Medieval Technology*, p. 56; “Roots,” p. 84. These two passages are all but identical.

³⁰ *Ibid.*

exploiter. These aphorisms are somewhat reminiscent of that Hebrew parallelism to be found in the Old Testament Psalms and other poetic writings. White could have come across this literary form in Christian worship (for, despite his apparent criticism of the legacy of Christianity, he was himself a believing Christian³¹); or he could have encountered it in the aphorisms of Francis Bacon's *New Organon*. He also seems to have judged that this particular trope has much greater effect if employed sparingly, unexpectedly and suddenly.³²

However, White used another such double-barrelled aphorism on the next page of *Medieval Technology* and at the end of the next paragraph of "Roots," after describing the new style of illustrations of the calendars of Charlemagne's reign. Instead of passive personifications of the months, the new illustrations relate to human activities, and were said by Henri Stern (whom White here quotes) to show a "coercive attitude towards natural resources." (The new activities include ploughing, harvesting, wood chopping, and pig slaughtering.) At this point, White inserts his further aphorism: "Man and nature are now two things, and man is master,"³³ replicated in "Roots" with the omission of *now*.³⁴ The omission of *now* marginally assists his case, since he is here writing of the ninth century, rather than of the seventh, as in the previous paragraph. But similar reservations are again in place. Were humans really part of nature at any time, since the year was reflectively divided into a calendar of months by the Greeks and the Romans, or by their predecessors, the Mesopotamians and the Egyptians? On the other hand, can any creature dependent on nature's seasons (and thus the calendar) be altogether nature's master, or even see themselves as such?

In both the case of ploughing and that of calendar illustrations, White magnifies a phenomenon of the early Middle Ages so as to confer on it something approaching cosmic significance. Whitney cites a later passage of White which throws light on this tendency: "It is better for a historian to be wrong than to be timid."³⁵ White's sparing employment of sonorous aphorisms, intermingled with an amazing array of well-honed scholarship, seems to have persuaded many readers to treat them as gospel.

Harrison's eventual interpretation of technological innovations such as heavy ploughing (which is also applicable to Carolingian calendar illustrations) is far more appropriate. "Yet in none of this," he affirms (in a passage about early medieval practices), "do we encounter the explicit articulation of an attitude of indifference to, or hostility toward, nature. Indeed, there seems to be no compelling reason to view these developments as anything more than particular expressions of the universal tendency of all cultures to seek efficient means to provide for basic human needs."³⁶

³¹ Whitney, "Lynn White," p. 154, where she cites White, *Dynamo*, 33–55.

³² White, *Medieval Technology*, p. 56.

³³ *Ibid.*, p. 57.

³⁴ White, "Roots," p. 84.

³⁵ White, *Medieval Technology*, p. xx, cited by Whitney, "Lynn White," p. 168.

³⁶ Harrison, "Subduing the Earth," p. 95.

As he adds, there is, in this analysis, no “religiously motivated ideology of exploitation, explicitly informed by the Christian doctrine of creation.”³⁷

IV. THE MESSAGES OF “ROOTS”: HISTORICAL, THEOLOGICAL, OR BOTH?

In this section, I discuss whether White’s thesis is really about the historical reception of Christian texts, as Harrison has suggested,³⁸ as opposed to concerning, in part, their meaning and their theological interpretation. I suggest that White was propounding not only a historical thesis, but also an interpretation of Christianity.

Harrison has some distinctive insights about what White’s thesis consists in. He maintains that what is relevant to White’s thesis is not the meaning of Genesis 1 but its reception in different periods, and proceeds to supply interesting and original interpretations of the different receptions of Genesis in the middle ages and in the seventeenth century.

White’s thesis is not concerned with the meaning of the text as such, with how it was understood by the community in which it first appeared, or with what modern biblical scholars have made of it, but rather with what the text was taken to mean at certain periods of history, how it motivated specific activities, and how it came to sanction a particular attitude toward the natural world. . . . White’s thesis does not therefore lie within the ambit of biblical criticism or hermeneutics but in the sphere of history.³⁹

However, while the reception of Genesis is certainly relevant (as he proceeds to show), the meaning of Genesis and other Old Testament books is far from obviously irrelevant, despite Harrison’s claims that attention to the meaning of these texts involves “a common but misplaced line of argument,” undertaken by a wide range of historians, theologians, and philosophers.⁴⁰ “. . . it is the reception of the text, and not its presumed meaning, which is at issue here,” he concludes.⁴¹ Harrison finds a passage in Whitney’s paper which appears to say much the same:

White’s claim that the Bible had inspired the development of Western technology and control of nature rested not on the biblical text per se or on any “timeless” theological explication of it. . . . The crucial question, therefore, was not so much what the writers of the Old and New Testaments had meant about technology, or even how their world might be construed by modern readers, but how the Bible had been interpreted in the Middle Ages and after.⁴²

Yet, Whitney nevertheless goes on to consider seriously (in my view, to her credit) the

³⁷ Ibid.

³⁸ Ibid., p. 89.

³⁹ Ibid.

⁴⁰ Ibid, p. 88.

⁴¹ Ibid., p. 89.

⁴² Whitney, “Lynn White,” p. 162; Harrison, “Subduing the Earth,” p. 90, n. 13.

stances of the various ecotheologians as responses to White which carry both merits and demerits, including assumptions which they and White hold in common.

I argue here that the meaning of Genesis and related works is just as important in White's thesis as their historical reception, in view of White's claims about the message and perennial impact of Christianity (and implicitly about those of Judaism as well). If so, considerable doubt is cast on Harrison's claim (quoted above) that "White's thesis does not lie within the ambit of biblical criticism or hermeneutics but in the sphere of history."⁴³ Further, while White seeks (in "Roots") to exempt Orthodox Christianity from his interpretations,⁴⁴ it is far from clear that he can consistently do so, for if Christianity is anthropocentric and supports a despotic role for humanity (according to which human beings may treat nature as they please: see below), these interpretations will be equally applicable to all traditions that subscribe to Christian theology, even if some were linked to a less "voluntarist"⁴⁵ (activist) cultural attitude than others.

White, for example, asserts that "Especially in its Western form, Christianity is the most anthropocentric religion the world has seen."⁴⁶ But an anthropocentric religion is one that either regards the entire material creation as created for human benefit (metaphysical anthropocentrism), or which treats none but human beings (plus maybe God) as having moral standing, and none but human interests (plus perhaps God's) as warranting moral consideration (normative or ethical anthropocentrism). White's text suggests that he intended more particularly the former interpretation (although the former is often treated as an obvious basis for adherence to the latter as well), for he wrote later in "Roots" that "we shall continue to have a worsening ecologic crisis until we reject the Christian axiom that nature has no reason for existence save to serve man."⁴⁷ But this is a claim about a (supposed) fundamental tenet of Christianity in general, and not only of medieval or Western Christianity. (Here it is worth remarking that for neither of these interpretations does White offer a shred of evidence, despite the accuracy of most of his other claims. The evidence that he cites, from Tertullian and Irenaeus,⁴⁸ discloses a high view of humanity as embedded in Christianity [Christ being the "Second Adam"], but does not begin to bear out anthropocentric interpretations, whether metaphysical or normative.) In any case it is becoming clear already that White was deeply in the business of theological interpretation, and that his theological interpretations are going to be crucial to his claims about historical impacts.

This view is strongly supported by the content of the programmatic single-sentence paragraph which opens this phase of his argument: "What did Christianity tell

⁴³ Harrison, "Subduing the Earth," p. 89.

⁴⁴ White, "Roots," p. 87.

⁴⁵ *Ibid.*, p. 88.

⁴⁶ *Ibid.*, p. 86.

⁴⁷ *Ibid.*, p. 93.

⁴⁸ *Ibid.*, p. 86.

people about their relations with the environment?"⁴⁹ His use of the past tense here does not relate solely to the medieval period, let alone to the reception of Christian teaching in that period, for in the next paragraph he writes of what Christianity inherited from Judaism through texts such as Genesis,⁵⁰ and it is in the paragraph following that he cites Tertullian and Irenaeus (of the second century C.E.).⁵¹ His use of the past tense concerns, then, what Christianity was teaching all along and from earliest times.

In case it is suggested that White had in mind something less than metaphysical or normative anthropocentrism, it should be remarked that he proceeds, in the same paragraph as that in which this term is used of Christianity, to illustrate his claim with the supposed implication that Christianity "insisted that it is God's will that man exploit nature for his proper ends."⁵² Yet, this further claim, besides implicitly ascribing to the Christianity of all periods both metaphysical and normative anthropocentrism of a rather Aristotelian kind, goes further by suggesting that it teaches that human beings are authorised to treat the natural world as they please, as long as the treatment is related to "their proper ends," an Aristotelian or Stoic phrase that White neglects to explain, let alone defensibly relate to Christianity in general. Indeed, this further claim amounts to what John Passmore, writing in 1974, was to call "the despotic view."⁵³ White attempts to illustrate this further claim by asserting that "By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects,"⁵⁴ but once again no evidence is cited. Indeed, as Whitney has remarked, White's claim that Christianity banished animism in the West clashes with evidence of pagan survivals in popular religion in the Middle Ages, and with the conception of the universe as a living organism that survived into the sixteenth and seventeenth centuries.⁵⁵

The main point, though, is that in "Roots" White presents not only a thesis about the reception of Christian doctrines in the Middle Ages, and about this reception comprising the roots or origin of subsequent ecological problems, but also the further thesis that those doctrines have all along been both anthropocentric and despotic, especially in the West, and that this is where the real roots of the problems are to be found. (Indeed, these further theological claims are crucial to his overall case. To the extent that White is concerned with medieval interpretations of Christianity, his theological claims permitted him to imply that the exploitative attitudes to nature which he purported to discover arose naturally from the axioms

⁴⁹ Ibid., p. 85.

⁵⁰ Ibid.

⁵¹ Ibid., p. 86.

⁵² Ibid.

⁵³ John Passmore, *Man's Responsibility for Nature: Ecological Problems and Western Traditions* (London: Duckworth, 1974), p. 9.

⁵⁴ White, "Roots," p. 86.

⁵⁵ Whitney, "Lynn White," pp. 166–67.

of the Christian religion, which contrasted strongly in relevant respects with, for example, the religions of pre-Christian paganism.) Much of this account is confirmed as accurate in Harrison's summary of "Roots," despite Harrison's claims a few pages later about White's main message. The following sentence figures in Harrison's paraphrase: "The Christian doctrine of the creation sets the human being apart from nature, advocates human control of nature, and implies that the natural world was created solely for our use."⁵⁶ (Needless to say, Harrison by no means endorses White's view, and in due course implies considerable scepticism.⁵⁷)

These being the claims that White was making, it is entirely reasonable for theologians and philosophers (insofar as philosophers discuss metaphysical and normative anthropocentrism) to debate White's claims, and not only historians. While theologians must be free to contest White's interpretations of Christianity (Western, Orthodox, or ecumenical), philosophers must also be free to debate his methodology in looking for explanations of ecological problems. Thus, the debate needs to be conducted through all these disciplines, and not only through the discipline of history. Once again, it emerges that the debate about "Roots" needs to be interdisciplinary—just like White's own writings.

Some years ago, I published an essay called "Christian Attitudes to Nature" in *Journal of the History of Ideas*, which contested White's theological claims, as well as some of his historical interpretations, and some related claims of Passmore and of William Coleman.⁵⁸ Some parallel research was also included in my book *The Ethics of Environmental Concern*.⁵⁹ Since the central conclusions of this research have not, to my awareness, been contested, there is no need to recapitulate them in detail here, let alone to add a detailed defence. But it may be appropriate to specify here some of the conclusions of "Christian Attitudes to Nature," of a companion piece entitled "Western Traditions and Environmental Ethics,"⁶⁰ and of *The Ethics of Environmental Concern*, since they have a bearing on several of the claims shown above to be made by White. These conclusions include the following: the Old Testament is neither metaphysically nor normatively anthropocentric (as Passmore had already argued⁶¹); passages such as Psalm 104 and Job, chapters 39 to 41, reflect quite different attitudes, as do Leviticus, Deuteronomy, and Proverbs. Nor is the New Testament anthropocentric either, when enough passages are

⁵⁶ Harrison, "Subduing the Earth," p. 86.

⁵⁷ *Ibid.*, p. 95.

⁵⁸ Robin Attfield, "Christian Attitudes to Nature," *Journal of the History of Ideas* 44 (1983): 369–86. Together with a companion essay discussing parallel themes of John Passmore and of Peter Singer, called "Western Traditions and Environmental Ethics," this essay can be found in Robin Attfield, *Environmental Philosophy: Principles and Prospects* (Aldershot: Avebury, 1994).

⁵⁹ Robin Attfield, *The Ethics of Environmental Concern*, 2d ed. (Athens, Ga. and London: University of Georgia Press, 1991), chaps. 2 and 3.

⁶⁰ Robin Attfield, "Western Traditions and Environmental Ethics," in Robert Elliot and Arran Gare, eds., *Environmental Philosophy: A Collection of Readings* (St. Lucia: University of Queensland Press, 1983), pp. 201–30; reprinted in Attfield, *Environmental Philosophy*, pp. 41–68.

⁶¹ Passmore, *Man's Responsibility for Nature*, pp. 11–17

considered. There again, the “despotic view,” endorsed by Passmore as the stance of most Christians and generally of the Stoics,⁶² does not fit the Bible any more than anthropocentrism does; the most appropriate interpretation is what Passmore called “the stewardship view”⁶³, which is actually itself ascribed by Passmore’s (deservedly) most favored source, C. J. Glacken’s *Traces on the Rhodian Shore*, to the Bible and to most of the church fathers alike.⁶⁴ Indeed this tradition, regarded (in company with the “cooperation with nature” tradition) by Passmore as a minority tradition,⁶⁵ was arguably (and like the “cooperative view”) as significant and influential as any other attitude to nature from the early centuries of Christianity onwards. In any case, Christianity has been much more varied in its attitudes than most commentators acknowledge (a point also made, as it happens, by White).⁶⁶

If these conclusions are granted (even in part), then White’s theological claims have to be regarded as a distortion of Christianity. It would not follow, however, that Christianity was not received as anthropocentric, despotic, and exploitative in the medieval period; and it would certainly not follow that there were not links between theology and technological developments. Issues surrounding these links will be considered in the next section. But in view of White’s explicit appeal to Genesis,⁶⁷ it is appropriate to cite here, as Harrison does, “the one extensive study that has been carried out on the history of the interpretation of the crucial text, Genesis 1:28 (‘be fruitful and multiply, and fill the earth, and subdue it; and have dominion’),” that of Jeremy Cohen.⁶⁸

This text sounds likely, if any text was going to be used in support of exploitative practices, to be the one that would be selected. But this is not the interpretation that Cohen finds. Instead, he relates that “the primary meaning of Gen. 1:28 during the period we have studied [ancient and medieval times, that is] [consists in] an assurance of divine commitment and election, and a corresponding challenge to overcome the ostensive contradiction between the terrestrial and the heavenly inherent in every human being.⁶⁹ For the Middle Ages, he adds, this text “touched only secondarily on conquering the natural order.”⁷⁰ Instead, this text was given

⁶² Passmore, *Man’s Responsibility for Nature*, p. 17. More recently, grounds have emerged to cast doubt on Passmore’s ascription of anthropocentrism and of a despotic view to the Stoics. See Carmen Velayos Castelo, “Reflections on Stoic Logocentrism,” *Environmental Ethics*, 18, no. 3 (1996): 291–96.

⁶³ Passmore, *Man’s Responsibility for Nature*, pp. 28–32.

⁶⁴ C. J. Glacken, *Traces on the Rhodian Shore, Nature and Culture in Western Thought from Ancient Times to the End of the Eighteenth Century* (Berkeley: University of California Press, 1967).

⁶⁵ Passmore, *Man’s Responsibility for Nature*, p. 39.

⁶⁶ White, “Roots,” p. 87.

⁶⁷ *Ibid.*, p. 85.

⁶⁸ Harrison, “Subduing the Earth,” p. 95, referring to Jeremy Cohen, *Be Fertile and Increase, Fill the Earth and Master It: The Ancient and Medieval Career of a Biblical Text* (Ithaca, N.Y.: Cornell University Press, 1989).

⁶⁹ This is Harrison’s quotation, in Harrison, “Subduing the Earth,” pp. 95–96, from Cohen, *Be Fertile and Increase*,” p. 313.

⁷⁰ Cohen, *Be Fertile and Increase*,” p. 313.

psychological and spiritual interpretations. Thus in a period when attempts to tame or domesticate nature were much in evidence (for White is in general right about the progress of medieval technology),⁷¹ such practices were not standardly justified by reference to the most obvious Biblical passage.⁷² Cohen, indeed, concludes, insofar as the medieval period is at issue, that “with regard to Gen 1:28 itself, the ecologically oriented thesis of Lynn White and others can now be laid to rest.”⁷³ So we should entertain doubts about whether Christianity was used as a central justification for such practices in that period. Not even its reception in the Middle Ages suggests otherwise, any more than the message that it embodied from earliest times.

As Harrison proceeds to show, things were somewhat different in the seventeenth century, including the uses to which Christianity was newly put, although in that century the texts were not interpreted anthropocentrically, even if they had sometimes been so interpreted previously.⁷⁴ But that period is not discussed by White, and is not relevant here, while I have commented elsewhere on Harrison’s account and verdicts about the early modern period,⁷⁵ and there is no current need to repeat those comments. So we can now turn, as promised, to links between theology and technology, and to issues of historical causation.

V. METHODOLOGY, CAUSATION, AND WHITNEY’S CRITIQUE

Ever since soon after the publication of *Medieval Technology*, historians have raised sceptical problems about White’s methodology. In the joint introduction to their separate reviews of *Medieval Technology*, R. H. Hilton and P. H. Sawyer wrote:

Technical determinism in historical studies has often been combined with adventurous speculations particularly attractive to those who like to have complex developments explained by simple causes. The technical determinism of Professor Lynn White Jr., however, is peculiar in that . . . he gives a misleadingly adventurist cast to old-fashioned platitudes by supporting them with a chain of obscure and dubious deductions from scanty evidence about the progress of technology.⁷⁶

While these strictures were written about *Medieval Technology* (at a time when “Roots” was unwritten), it is worth considering what these writers had in mind when using the phrase “technical determinism.” This is most clearly elucidated by Sawyer, in his reply to White’s view that the introduction of the stirrup explains

⁷¹ See, for example, Lynn White, Jr., *Medieval Religion and Technology: Collected Essays* (Berkeley: University of California Press, 1978).

⁷² Here I am paraphrasing Harrison, “Subduing the Earth,” p. 96.

⁷³ Cohen, “*Be Fertile and Increase*,” p. 5, quoted Whitney, “Lynn White,” p. 165.

⁷⁴ Harrison, “Technical Determinism,” pp. 96–107.

⁷⁵ Robin Attfield, *Environmental Ethics: An Overview for the Twenty-First Century* (Oxford: Polity Press and Malden, Mass.: Blackwell, 2003), pp. 34–36.

⁷⁶ Hilton and Sawyer, “Technical Determinism,” p. 90.

a change in methods of warfare (toward the superiority of cavalry) in the early medieval period. To this theory, Sawyer replies:

The most serious weakness in this argument is that the introduction of the stirrup is not in itself an adequate explanation for any changes that may have occurred. The stirrup made new methods possible, not inevitable.⁷⁷

Yet, as Sawyer shows through a quotation from *Medieval Technology*,⁷⁸ White had used, with regard to such changes, the term *inevitably*, even though in other passages,⁷⁹ he had accepted that societies do not respond automatically to technological change. Thus, the criticisms of Hilton and Sawyer seem to be on target in this particular regard. But should it be held that White proceeded to allege too deterministic a relation not only between technology and social change, but also between theology and technology? Hilton and Sawyer evince no interest in this aspect of *Medieval Technology*, but the issue has recently been investigated in the context of "Roots" by Whitney.

Whitney, besides supplying numerous valuable historical qualifications and correctives to White's account of medieval culture (too many for most to be cited here), raises a number of important methodological issues. One of these concerns the aura of inevitability cast by White upon the West's rise to technological dominance, represented by White as "our nature and destiny."⁸⁰ Here Whitney accuses White of an essentialist view of medieval culture,⁸¹ but whether or not this accusation holds good, she seems justified in claiming that in "Roots" Western culture "takes on a life of its own, as if culture existed independently of social, economic, political and other factors and remains essentially unchanged through time."⁸² Whitney here emphasizes the need to introduce institutional factors into explanations; in the absence of the introduction of such factors, culture is inappropriately endowed with tendencies (as just mentioned) to inevitable development, which are liable to be falsified (as she proceeds to show) when more detailed studies are conducted and taken into account. Insofar as the inevitability of White's account ascribes a causal role to religious values, there may be some justification in finding here a form of cultural determinism in White, parallel to the technical determinism alleged by Hilton and Sawyer.

A related methodological problem, raised by Whitney on the next page, concerns the move from what she regards as the undisputable association between religious values and technology in the West to White's implicit claim of a causal relationship.⁸³

⁷⁷ Sawyer, in Hilton and Sawyer, "Technical Determinism," p. 91.

⁷⁸ White, *Medieval Technology*, p. 38.

⁷⁹ *Ibid.*, p. 28.

⁸⁰ White, "Roots," p. 93.

⁸¹ Whitney, "Lynn White," pp. 155–56.

⁸² *Ibid.*, p. 156.

⁸³ *Ibid.*, p. 157.

Later she adds that, while White supplies ample evidence (for the Middle Ages) of this association, he sheds little light on “the more difficult problem of causality.”⁸⁴ She adds that by 1978 he had resiled from ascribing causal influence to religious values, writing that the reasons for the medieval development of technology were “by no means clear.”⁸⁵ In any case, in the Middle Ages religious terminology was bound to be used in the justification of technology; as Jacques Le Goff puts it, “. . . nothing could become an object of conscious reflection in the Middle Ages except by way of religion.”⁸⁶ Besides, as Le Goff’s research has also shown, the more favorable attitude to labour in the late Middle Ages remarked by White was probably due to social change rather than to inherent attitudes of Christianity.⁸⁷ But this all casts serious doubt on the “single-cause theory” of “Roots,”⁸⁸ particularly where a “more nuanced interpretation” is in place, as recent medieval research warrants, such as the interpretation that “religious values provided some encouragement, but, equally importantly, a justification for activity that most likely was taking place for other reasons.”⁸⁹ This claim chimes well with Harrison’s remark, cited above, about people simply doing their best in the circumstances to satisfy human needs.

Whitney (as has been mentioned above) also appraises the responses to White of ecotheologians (including myself), partly on theological grounds. Thus, they “had a well-documented argument against certain aspects of White’s thesis, and could argue persuasively that the Christian tradition provided a readily accessible and convincing statement in favor of a sensitive and responsible attitude to the environment.” They also had liabilities, such as that stewardship interpretations preclude deep ecology (hardly, I suggest, a problem for those not wishing to be associated with that movement) and the constraints of Christian orthodoxy (pollution having to be interpreted as “sin”), which discouraged “independent human agency” (but if so, I suggest, Christian orthodoxy should be either modified or disowned).⁹⁰

Whitney’s willingness to discuss these responses betokens her recognition that White’s thesis was in part an exercise in theological interpretation. Thus, when she wrote that “The crucial question, therefore, was not so much what the writers of the Old and New Testaments had meant about technology, or even how their world might be construed by modern readers, but how the Bible had been interpreted in the Middle Ages and after,”⁹¹ her point was that this was the basis on which White

⁸⁴ *Ibid.*, p. 167.

⁸⁵ White, “The Future of Compassion,” *Ecumenical Review* 30 (1978): 101; quoted in Whitney, “Lynn White,” p. 157.

⁸⁶ Jacques Le Goff, *Time, Work and Culture in the Middle Ages*, trans. Arthur Goldhammer (Chicago and London: University of Chicago Press, 1980), p. 109; cited in Whitney, “Lynn White,” p. 167.

⁸⁷ Whitney, “Lynn White,” p. 166; Le Goff, *Time, Work and Culture*, pp. 114–21.

⁸⁸ Whitney, “Lynn White,” p. 168.

⁸⁹ *Ibid.*, p. 169.

⁹⁰ *Ibid.*, p. 161.

⁹¹ *Ibid.*, p. 162.

had argued (and on which he should therefore be replied to, at least in part), and not that the meaning and message of the Bible were irrelevant.

It is appropriate to introduce here Whitney's implicit criticism of White's proposed solution (adoption of the values of the heretical St. Francis). Citing the research of Susan Power Bratton, she relates that detailed medieval studies show that Francis, "far from standing alone, is only one figure among a fully developed tradition of Christian appreciation of nature as God's Creation . . . human use of nature and animals was almost always conceived of as being governed by human spiritual and moral obligations."⁹² Further, Bratton's and others' research suggests that the large differences of attitude between Greek and Latin values were less absolute than White claims.⁹³ Thus, not only does White misrepresent the problem as concerning distinctively Western values, but his solution of adopting the supposedly heretical values of St. Francis turns out to consist, it could fairly be commented, in advocacy of little more than the adoption of a different tradition of still recognizably Christian values.

However, Whitney's main criticism of the ecotheologians concerns "how much they had in common with [White]." "White and his ecotheological critics all accepted religion as the common denominator or human action, and all therefore found the solution to the environmental crisis in personal and religious values."⁹⁴ Such assumptions incline those holding them to ignore economic and institutional factors. Indeed, while the ecotheologians rejected White's particular causal thesis, they "showed little interest in" where else the explanation really was to be found.⁹⁵ Since the current writer is included among the ecotheologians, it might be reasonable here to cite the opening chapter of *The Ethics of Environmental Concern* as an exception to this generalization, a chapter which considers to what extent capitalism, among other possible explanations, underlies the problems.⁹⁶ But Whitney's point must be acknowledged to be largely on target, and prepares the way for her eventual methodological claims.

Whitney concludes that White's thesis is attractive, beguiling, and dangerous, however illusory. Although ascribing the problems to our deep-seated values and the unfolding of our ideological destiny, it supplies a solution that does not require significant changes either of behavior or of structure. At the same time, it leaves large corporations and international agencies untouched. Its ascription of the problems to individual values thus diverts us from the kinds of action that are needed. To quote Whitney's final passage:

⁹² *Ibid.*, p. 163, citing Susan Power Bratton, "The Original Desert Solitaire: Early Christian Monasticism and Wilderness," *Environmental Ethics* 10 (1988) 31–53.

⁹³ Whitney, "Lynn White," pp. 163–64.

⁹⁴ *Ibid.*, p. 161. Whitney identifies the relevant ecotheologians and their works in notes 36 to 38 (p. 160) and note 41 (p. 162).

⁹⁵ *Ibid.*, p. 161.

⁹⁶ Attfield, *The Ethics of Environmental Concern*, pp. 1–19.

White's single-visioned reading of the past, however, encourages us similarly to oversimplify our understanding of the present by emphasizing one value, the legitimacy of human domination of nature in the name of spiritual progress, to the exclusion not only of other, non-religious values, but also of any consideration of how economic and political systems help create or reinforce values and provide the means for implementing those values. If White is incorrect in his analysis of the causes of the environmental crisis, and we continue to follow his prescription for a solution, we may be at the mercy of forces we are not even considering.⁹⁷

Besides concluding in this passage that White's thesis should be rejected, Whitney also persuasively explains here its continuing ideological role. White's explanation is of the wrong type, and this is due to methodological assumptions which his theological and philosophical critics have done too little to expose.

This being so, it is important to adduce historical, theological, and philosophical critiques of White's claims (as attempted above), without losing sight of the large and systemic nature of the problems (both past and present), and the need to understand the present as well as the past accordingly. At the same time, we need not to lose sight of the importance of multidimensional explanations to explain both how ecological problems have arisen and how they can be overcome.

VI. AFTERWORD

Solutions, then, need to be economic and political, and to be global as well as national and local. Yet, while Whitney's critique is to be applauded, can White's approach be entirely written off? His historical claims have been shown to be open to serious criticism, as have his theological interpretations. But what of his assumption that values and attitudes make a difference and can be historically significant? As a "single-visioned reading of the past," this assumption too is open to question. But, construed as a claim about attitudes and values having a contributory role both in causing problems and in their capacity to contribute to solutions, and to play a part in people's motivation to implement them, his assumption is less obviously misguided, and may even contribute to a defensible approach.

This more nuanced approach may seem a far cry from White's dalliance with determinism, but coheres well with elements of his overall stance, such as his view that adopting the beliefs and values of St. Francis could make a difference. It is more clearly consistent with the message of the ecotheologians, whether or not they specifically recognized the role of systemic factors. Indeed, their characteristic claim that an ethics and a metaphysics of stewardship (whether religious or secular) are needed and can contribute to resolute action as well as to desirable attitudes emerges, despite criticisms,⁹⁸ as not only a salutary corrective to White, but a

⁹⁷ Whitney, "Lynn White," p. 169.

⁹⁸ For criticisms, see Robin Attfield, *The Ethics of the Global Environment* (Edinburgh: Edinburgh University Press, 1999), pp. 45–55.

positive contribution to resolving current problems. Beliefs and values prove also to be central to Harrison's account of early modern culture, and potentially to his view of the spirit in which solutions to current problems could be approached.

Beliefs, values, and attitudes, then, should be integrated with systemic factors both in explaining the past, understanding contemporary problems, and in generating proposals for solutions. For example, a replacement of anthropocentric values with more biocentric ones arguably has an important role to play in moulding social and environmental policies. White's thesis in "Roots" was of little direct help in any of these regards, but because of the debate that he was proud of generating, and the awareness both of historical, ethical and ecological problems that it helped to arouse, his historical contribution should not be regarded as negligible or insignificant, let alone as a dangerous distraction.

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