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Original Paper

How Christianity, Western Science & Technology Exploited Nature in America: Birth of the Environmental Movement

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Abstract

The objective of this paper is to understand why the Western civilization had exploited nature so much that its own quality of life--even its survival--was now at stake. The answer is: the Judeo-Christian tradition.

A central belief of the Judeo-Christian theology has been dualism—that man is separate from nature—and anthropocentrism: that man is the master and the center of this universe, with a license to exploit nature.

Christianity prospered in the great cities of the time which were--like today--the centers of economic and cultural attraction. Therefore, a concentration of population in urban areas must have exerted a deep influence over the entire character of Christianity.

Victory of Christianity over paganism was the greatest psychic revolution in the history of the Western culture. Pre-Christian cultures believed in animism: that every part of the environment--living and non-living—had a consciousness. By destroying pagan animism, Christianity made it possible to exploit nature in a mood of indifference to the feelings of natural objects. Severed from the human community and its ethical protection, nature was fully exposed to human greed.

The whole concept of the sacred grove is alien to Christianity and to the ethos of the West. For nearly two millennia Christian missionaries have been chopping down sacred groves, based on the idea that they are idolatrous because they assume spirit in nature.

St. Francis was the greatest spiritual revolutionary in Western history since Christ. He preached the notion of equality of all creatures—including man—in opposition to the idea of man's unlimited rule over nature sanctioned by Christian theology. Unfortunately, he failed.

Aristotle's scientific philosophy of nature—animate and alive—dominated Western thought for two thousand years after his death. However, thanks to the Scientific Revolution, a radical change occurred in scientific thought during the 16th and 17th centuries. As a result, this medieval worldview went through a fundamental change. The notion of an organic and spiritual universe was replaced by that of the world

as a machine, and the word machine became a dominant metaphor of the modern era.

Around 1850, Western Europe and North America arranged a marriage between science and technology that signified the Baconian creed of power over nature. Its acceptance as a normal pattern of action may mark the greatest event in human history since the invention of agriculture.

While the Transcontinental Railroad connected East and West, yet, in its wake, lives of countless Native Americans were destroyed. In addition, tens of million buffalos were almost driven to extinction.

Pre-Christian societies believed that every part of the natural environment had a consciousness or spirit. The work of Suzanne Simard provides an excellent real-world example of the veracity of such belief. Her research shows that forests have a social life, and that trees talk to each other.

Sheldrake, based on his controversial theory of Morphic Resonance, says that natural systems inherit a collective memory from all previous things of their kind, no matter how faraway they were, nor how long ago they existed.

The Scientific Revolution's theory of reductionism encourages an atomistic and disintegrated view of nature. However, Nature is through and through relational, and interference at one point, has interminable and unforeseeable results on the other.

The first occupants of North America—the Native Americans--were better custodians of the ecosystem than the subsequent tenants. Native Americans considered the rights of animals, plants—and even rocks—as sacred.

America is a leader in the creation of national parks and wilderness areas, and has served as a model for countries around the world.

Eastern religions--e.g., Hinduism, Buddhism, Taoism, and Zen Buddhism—totally reject the dualism and anthropocentrism of Christianity. By advocating the submersion of the human self in a larger organic whole, they cleared the intellectual way for environmental ethics.

An extraordinary transformation has taken place in America: one that has replaced fear and hatred of wilderness in the past, to appreciation—and even reverence.

Wilderness is not so much a place, but rather as a feeling about a place: a perceived reality, and a state of mind.

The image of the earth as Mother is found in traditional cultures all over the world. So, we feel uncomfortable when we realize that we are polluting our own Mother.

Finally, astronomer Carl Sagan--and 22 other well-known researchers--issued an appeal in 1990. Their message was:

- *The "efforts to safeguard and cherish the environment need to be infused with a vision of the sacred."*

Keywords

Ecological Crisis, Christianity, Dualism and Anthropocentrism, Paganism, The Scientific Revolution and Reductionism, Mycorrhizal Networks, Morphic Resonance, America's National Parks, Native Americans and Nature, Eastern Religions, Environmental Movement, Wilderness, Gaia--Mother Earth

1. Introduction

In a *path-breaking* essay, historian Lynn White (1967) wanted to understand *why* the Western civilization had *exploited* nature so much that its own *quality* of life--even its survival--was now *at stake*. White concluded that the answer is: the *Judeo-Christian* tradition (Nash, 1989, p. 88).

Environmentalist, Prof. Roderick Nash (1989, p. 89) argues that White knew that the right question to ask was *not* Christianity's view of nature for all time, but rather: "what did it mean to a *particular* society at a *given* time and place" (*italics* added).

A *central* tenet of the Judeo-Christian theology has been *dualism*—that man is *separate* from nature—and *anthropocentrism*: that man is the *master* and the *center* of this universe, with a license to *exploit* nature (White, 1967; Nash, 1989, p. 88).

White accepted the idea that there was a biblical basis for environmentalism. However, he points out that "for nearly *two* thousand years the Christian *tradition* had *not* been so construed" (Nash, 1989, p. 89, *italics* added).

"Instead, people used *Scriptures* to justify the *exploitation* of nature in the same way that defenders of *slavery* used it to justify ownership and exploitation of certain classes of humans (Nash, *ibid*, *italics* added). White believes that modern "Christians *no* longer see the Bible as a justification for slavery. He thinks that perhaps a similar *reinterpretation* of the Bible about *nature* may now be under way. *Revelation*, after all is supposed to be an *unending* process" (Nash, 1989, p. 89; *italics* added).

The West has been a *leader* in science and technology since medieval times. By the end of the 15th century, the technological superiority of Europe was such that even the *weakest* of the European nations, Portugal, could go around the rest of world conquering, looting, and colonizing (White, 1967, Datta, 2021).

Because of the *wide* scope of this paper, we have divided it in *ten* parts as follows:

Part I. The Roots of Christianity

Part II. Western Science &Technology in the Middle Ages

Part III. The Scientific Revolution

Part IV. Nature Has a Consciousness or Spirit

Part V. Cosmos an Evolving Organism: Not an Eternal Machine

Part VI. Native Americans Better Environmental Stewards than White Colonists

Part VII. America's Magnificent System of National Parks and Wilderness Areas

Part VIII. The Dangerous Illusion that Man can Control Nature

Part IX. Humans and Nature: Part of a Single Living Organism

Part X. Conclusion

Part I. The Roots of Christianity

2. Christianity's Model of God as a Monarch

Theologian Sally McFague (1987, pp. 65-66) says God as *monarch* ruling over his kingdom is a *widely* accepted model in Jewish, Catholic, and Protestant religions. But the relationship between a king and his subjects can only be a *distant* one because royalty is "untouchable." According to this model, "God as king is in his kingdom--which is *not* of this earth." The *monarchial* model extends God's benevolence *only* to humans, so it leaves out earth and its many creatures.

Then McFague underscores an important point. She says in this picture "God is *worldless*, and the world is G*odless*" (*ibid*, p. 65, *italics* added).

2.1 God is Not King, But Spirit

Radhakrishnan (1940), a scholar of Eastern religions, points out that the concept of God as King tends to *mask* the central truth that God is *Spirit*. He argues that such an image *limits* the thought of the divine and *prevents* a more spiritual view of God. He cautions that such a *narrow* image of God can sometimes lead to absurd lengths (pp. 59-60):

- [W]hen the *Titanic* was going down, a rich American retired to his cabin *no*t to say prayers, but to put on his dinner clothes. The reason he did so was because he wanted to "go before his *maker* looking like a *gentleman*" (*italics* added).

2.2 Christianity the Only True Religion

Nash (1989, p. 90) points out that Judaism and Christianity are "*rigidly monotheistic*" religions. The "*first* commandment of these religions is to worship *no* other god or idol or spirit *except* Yahweh/God/Heavenly Father" (*italics* added).

Jordan & Rowntree (1976, p. 228), too, say that Christianity asserts that there is only *one* true view of God, and that *every* other view or religion is *false* (also, Datta, 1998).

In a similar vein, Radhakrishnan (1973, p. 16) suggests that Christian theology is based on a *belief* in the "immediate *certitude* of Jesus" (*italics* added; also, Datta, 1998).

In contrast, Hindu thinkers readily admit that there may be *other* points of view which may be just as worthy of attention (Radhakrishnan, 1973, p. 16).

2.3 Christianity's Mechanical Acceptance of Doctrine or Dogma

According to Alan Watts (1991, p. 33), a Zen-Buddhism scholar—and a practicing Buddhist--points out that in Christianity the emphasis is upon "*belief* rather than experience." Furthermore, Christianity has always "attached *immense* importance to an acceptance of the *correct formulation* of a dogma, doctrine, or rite" (*ibid*, *italics* added).

He then goes on to say (Watts, 2019, p. 11):

- The Judeo-Christian "tradition identifies the Absolute God with the moral and logical order of *convention*. This might almost be called a major cultural *catastrophe*, because it weighs the social order with *excessive* authority…It is one thing to feel oneself in *conflict* with socially

sanctioned *conventions*, but quite *another* to feel *at odds* with the very root and ground of life, with the *Absolute* itself" (*italics* added).

Radhakrishnan (1973, p. 14), too, believes that the unfortunate legacy of the path Christian theology followed in Europe "has come to connote a *mechanical* adherence to authority" (*italics* added). When "righteousness is practiced *not* for its own sake but because it is the *will* of God, it is practiced with a *fervor* and *fanaticism* that are sometimes *ungodly*" (Radhakrishnan, 1989, p. 9; *italics* added).

The Jews *firs*t invented the *myth* that only *one* religion could be true. However, because they believed themselves as the 'Chosen People,' they did *not* feel the urge of embarking on a mission to convert the whole world. Moreover, the Jews gave Christianity an "*ethical* passion and a sense of *superiority*" (Radhakrishnan, 1989, pp. 9-10). As a result:

- [Christianity's] desire for world *dominion* transformed the *simple* faith of Jesus into a fiercely *proselytizing* creed…that displayed systematic *intolerance* towards other forms of religious belief…(*italics* added).

2.4 Christianity's Quest for Certainty and Psychological Security

As we have seen above, the *major* characteristics of Christianity have been belief in a *single* true God; an enormous emphasis on acceptance of *dogma* or *doctrine* that is *correctly* formulated; and a *mechanical* adherence to religious authority. This is clearly a reflection of the *mind-set* that is looking for *certainty*. That is why, commenting on Western societies in general, this is what Watts has to say (1977, p. vi):

- "[We] are used to *absolutes*, to *firm* principles and laws to which we can *cling* for spiritual and psychological *security*" (*italics* added).

A modern example of such an outlook has been provided by managers in America. Compared to their Japanese and European counterparts, American managers have had *trouble* dealing with *ambiguity* and *uncertainty* (Pascale & Athos, 1981, pp.141-142; Hayes & Abernathy, 1980; also, Datta, 1998).

3. Christianity's Belief in Dualism and Anthropocentrism

A *central* creed of Judeo-Christian theology has been *dualism*—that man is *separate* from nature—and *anthropocentrism*: that man is the *center* of this universe, with a license to *exploit* nature. Modern critics of this legacy were alarmed by the untold *damage* these teachings had done to the natural environment over a *long* time. Their concern crystallized around an *essay* in 1967 by historian Lynn White (Nash, 1989, p. 88).

According to White (1967) Christianity inherited the story of *creation* from Judaism:

- "Finally, God had created Adam, and, as an *afterthought*, Eve to keep man from being lonely. Man *named* all the animals, thus establishing his *dominance* over them. God planned all of this explicitly for *man's* benefit and rule: no item in the physical creation had any purpose *but* to serve man's purposes. And although man's body is made of clay, he is *not* simply part of nature: he is made in *God's* image" (*italics* added)

Continuing in the same mode White (*ibid*) adds:

- "Man shares, in great measure, God's *transcendence* of nature. Christianity is the *most anthropocentric* religion that the world has ever seen…Christianity, in absolute *contrast* to ancient *paganism* and *Asia's* religions…not only established a *dualism* of man and nature but also insisted that it is God's will that man *exploit* nature for *his* proper ends" (*italics* added).

George Lodge (1976, p. 33) also offers a view of Christianity similar to that of White:

- "[E]mbodied in the Judeo-Christian conception of the individual is the notion of man as the world's *master*. 'God bless them, saying to them.' 'Be fruitful, multiply, fill the earth and *conquer* it'" (*italics* added).

4. How Deeply its Urban Roots Have Shaped Christianity

After it disavowed paganism, the first centers of Christianity in the Roman Empire were the great *cities that* included Antioch, Corinth, Ephesus, Alexandria, and Rome itself. Christianity prospered in the cities at a time--like today—when the big city was the *center* of economic and cultural attraction. Therefore, a concentration of population in urban areas must have exerted a *deep* influence over the entire *character* of Christianity (Watts, 1991, p. 25).

In its efforts to evangelize the West, one of the *hurdles* Christianity encountered—for as long as *fifteen* hundred years—was a strong *opposition* from the tenacious *peasantry* who believed in *nature*. Watts (1991, pp. 25-28) then makes the following *emotional* account of his feelings for Christianity that is quite *powerful*:

- "I have been puzzled by the fact that I can feel like a Christian *only* when I am *indoors*. As soon as I get into the open air, I feel entirely *out* of relationship with everything that goes on in a church—including both the worship and the theology…I am well aware that early training implanted in me the bitter-sweetness of a Christian conscience. But all this is in a *watertight* compartment, or rather, in a *closed* sanctuary where the *light* of the *open sky* comes *only* through the symbolic jewelry of *stained-glass* windows" (*italics* added).
- "It has seemed well-nigh *impossible* to relate God the Father….to the universe in which I *actually* live. Looking at trees and rocks, at the sky with its clouds or stars, at the sea...I find myself in a world where this religion simply does *not* fit…[It] is a characteristically Christian attitude to confirm this impression, since 'my kingdom is *not* of this world'" (*italics* added).

5. Victory of Christianity over Paganism Greatest Psychic Revolution in History

In exploring the relationship between Christianity and paganism, White (1967, *italics* added) has made a *remarkable* statement: That the "victory of Christianity over paganism was the *greatest* psychic revolution" in the history of the Western culture.

The term *pagan* comes from the Latin word *paganus* which refers to those who lived in the *country* (Watts, 1991, p. 25).

Paganism was originally a *pejorative* term for *two* reasons. One is that it was a religion of the *peasants*, as mentioned above. Second, its adherents believed in *polytheism*--belief in more than one God (Note 1).

Pagans have been generally defined as anyone involved in a religious act, practice, or ceremony which is *not* Christian. Jews and Muslims also use the term to refer to anyone who is *not* part of their religion (Note 2).

Often paganism is *not* identified as a traditional religion, per se, because it has *no* official doctrine. However, while it has a variety of traditions, a *common* belief is the "*divine* presence in *nature* and the *reverence* for the *natural* order in life" (Note 2; *italics* added).

Pre-Christian cultures believed in *animism*: that every part of the environment--living *and* non-living—had a "*consciousness* or *spirit*" (Nash, 1989, p. 90, *italics* added). White (1967) has described how this idea worked for the *common* public:

- "In Antiquity every tree, every spring, every stream, every hill had its own genius loci, its *guardian* spirit…Before one cut a tree, mined a mountain, or dammed a brook, it was important to *placate* the spirit in charge of that particular situation, and to keep it placated."
- By "*destroying* pagan animism, Christianity made it possible to *exploit* nature in a mood of *indifference* to the feelings of natural objects" (*ibid*, *italics* added).

"Severed from the *human* community and its *ethical* protection, nature was fully exposed to *human greed*" (Nash, 1989, p. 91, *italics* added).

6. How the Christian Church Destroyed Sacred Groves during the Middle Ages

Druids (Note 3) were members of the high-ranking class in early *Celtic* (Note 4) cultures in ancient *Gaul* (Note 5) in Western Europe. During the Middle Ages, the Christian church *destroyed* Celtic and Druid *sacred* groves throughout *Europe* because Christian ideology did *no*t permit tree worship (Note 6).

According to Mathews and Mathews (2002), practically every tribe in ancient Gaul seems to have possessed a *nemeton*: a *sacred* meeting place surrounded and protected by *trees*. These were centers of *religious ritual*, and their destruction was seen with the same *horror* that would be viewed with the burning of a church or temple today.

Many "settlements [in Europe] were built *besides*, or derived their names from, the sites of *ancient groves*. Once Christianity began to move across the Western world, the *nemetons* were *destroyed*, and Christian churches *built* on their ashes…" (*ibid*).

Commenting on the destructive treatment of sacred groves mentioned above, this is what White (1967) has said:

- "To a Christian a tree can be *no* more than a physical fact. The whole concept of the *sacred* grove is *alien* to Christianity and to the *ethos* of the West. For nearly 2 *millennia* Christian missionaries have been *chopping down* sacred groves, which [they consider] idolatrous because they assume *spirit* in nature" (*italics* added).

7. St. Francis of Assisi: A True Radical

St. Francis of Assisi (1181–1226), was an Italian Catholic friar, deacon, and mystic (Note 7).

White (1967) argues that St. Francis was "the *greatest* spiritual revolutionary in Western history" since Christ. He proposed an *alternative* view of nature and man's relationship to it. He preached the notion of *equality* of *all* creatures—including man—in *opposition* to the idea of man's unlimited rule over nature sanctioned by Christian theology.

The key to understanding St. Francis is his belief in the virtue of *humility*. What he tried was "to *depose* man from his monarchy over creation and set up a democracy of *all* God's creatures" (White, *ibid*). Unfortunately, he failed (White, 1967).

8. How Christianity Has Influenced Modern Science

From the 13th century onward every major scientist, including Galileo, has explained his motivation in *religious* terms. Newton seems to have considered himself more as a *theologian* than a scientist (White, 1967). Likewise, Bacon "equated the *dominion* over nature with Adam's *naming* of the animals…in which *woman* had *no* part, since it took place *before* the creation of Eve" (Sheldrake, 1994, p. 41, *italics* added; also, White, 1967).

So, White (1967) has concluded that "modern Western science was cast in a matrix of Christian *theology*. The dynamism of religious *devotion* shaped by the *Judeo-Christian* dogma of *creation*, gave it *impetus*" (*italics* added).

Part II. Western Science &Technology in the Middle Ages

9. The West: Science & Technology Leader Since Middle Ages

The *West* has been a *leader* in science and technology since *medieval* times. By the end of the 15th century, the technological superiority of Europe was such that even the *weakest* of the European nations—Portugal--could go around the rest of world *conquering*, *looting*, and *colonizing* (White, 1967; also, Datta, 2021).

By A.D. 1000, and perhaps even 200 years earlier, the West started to apply *water power* to industrial processes other than milling grain. This was followed in the late 12th century by the harnessing of *wind power*. The West rapidly expanded its skills in the development of *power* machinery, *labor-saving* devices, and *automation*. The most enormous achievement in the history of *automation* is the *weight*-driven *mechanical clock*, which appeared in two forms in the early 14th century (White, 1967).

In 1444, Bessarion, a great Greek clergyman, who had gone to Italy, wrote a letter to a prince in Greece. He was amazed by the "s*uperiority* of Western ships, arms, textiles, glass. But *above all* he was "*astonished* by the spectacle of waterwheels *sawing timbers* and *pumping* the bellows of blast furnaces. Clearly, he had seen *nothing* of the sort in the Near East" (White, 1967, *italics* added).

10. Medieval Western View of Man and Nature

Until recently, *agriculture* has been the chief occupation even in Western societies. Early *scratch* plows, drawn by *two* oxen, did *not* normally turn the sod but just *scratched* it. So, there was a need for *cross-plowing*. According to the Merriam-Webster dictionary, cross plowing means "to plow (a field) so that the furrows *cross* those of an earlier plowing" (*italics* added).

In the fairly *light* soils and semiarid climates of the Near East and the Mediterranean, this worked quite *well*. But such a plow was *not* suited to the *wet* climate and often *sticky* soils of Northern Europe (White, 1967).

However, by the latter part of the 7th century AD, some northern peasants were using an entirely *new* kind of plow: one that was equipped with a "vertical *knife* to cut the line of the furrow, a *horizontal* share to slice under the sod, and a *moldboard*," a *curved* metal blade that *turns* the earth over. The *friction* of this plow with the soil was so *high* that it normally required *eight* oxen. It "attacked the land with such *violence* that cross-plowing was *not* needed, and fields tended to be shaped in *long strips*" (White, 1967, *italics* added).

In the days of the *scratch-plow*, fields were distributed generally in units capable of supporting a *single* family. But *no* peasant owned eight oxen. So, to use the new more efficient plow, peasants *pooled* their oxen to form *large* plow-teams, receiving plowed strips in *proportion* to their contribution. Thus, this distribution of land was *no* longer based on the needs of one family but, rather, on the *capacity* of a "power machine" to till the earth (White, 1967).

11. From Being Part of Nature, Man Became Exploiter of Nature

The use of the "power machine," as mentioned above, profoundly *changed* man's relationship to the soil. *Nowhere* else in the world did farmers develop any similar agricultural implement. So, "is it coincidence that modern technology, with its *ruthlessness* toward nature, has so largely been produced by *descendants* of these peasants of northern Europe?" (White, 1967).

Part III. The Scientific Revolution

12. The Scientific Revolution

12.1 From a Cosmic Organism to a World as a Machine

Aristotle's (384-322 BC) scientific philosophy of nature—*animate* and *alive*—*dominated* Western thought for two thousand years after his death (Capra, 1996, chap. 2; Sheldrake, 1994, p. 44; Datta, 1998).

However, a *radical* change occurred in scientific thought during the 16th and 17th centuries. As a result, this medieval worldview went through a *fundamental* change. In the words of Capra (1996, p. 19, *italics* added), the "notion of an *organic* and spiritual universe was replaced by that of the world as a *machine*, and the word machine became a *dominant* metaphor of the modern era.

This *major change* was brought about by the new *discoveries* in physics, astronomy, and mathematics known as the *Scientific Revolution*, and associated with the names of Copernicus, Galileo, Descartes, Bacon and Newton (Capra 1996, p. 19; also, Sheldrake, 1994, pp. 3, 49; Datta, 1998).

Rene Descartes' (1596-1650) philosophy was "to *objectify* the world, to turn everything into an object or thing to be *manipulated*, and *controlled*" (Rockefeller in Rockefeller & Elder, 1992, p. 150, *italics* added).

To Descartes goes the credit of inventing the method of *analytic* thinking: the principal of *reductionism*. That means *breaking* a complex system into *parts.* So, if you understand the *parts* that means you understand the *whole;* in other words, that the *whole* is equal to the *sum* of its *parts* (Capra, 1996, pp. 19-20; also, Datta, 1998).

Descartes divided the universe into two distinct realms: *mind* and *matter*. He characterized the material universe, or *nature*—including living organisms—as a perfect *machine* governed by *precise* mathematical laws. In addition, he placed a special emphasis on *certainty* and immunity from doubt in scientific research (Solomon & Higgins, 1996, p. 183; Capra, 1991, p. 333; also, Datta, 1998).

Francis Bacon (1561-1626), who was not a scientist but a lawyer, "was one of the early prophets of the *power* and promise of science." He "triumphantly proclaimed that the new science would soon make 'Nature, with all her children' the '*slave*' of humankind" (Rockefeller in Rockefeller & Elder, 1992, pp. 150-151, *italics* added; also, Montuschi, 2010).

Watts (1991, p. 3), too, makes the point that "the *scientist*, despite his theoretical naturalism, tends to regard *nature*, human or otherwise, as a world to be *conquered* and *reordered*" (*italics* added).

12.2 Quantum Mechanics and a Holistic Worldview

With the arrival of quantum mechanics early during the last century, the physicists *abandoned* the idea of identifying matter with "things" or "solid objects." Instead, they adopted a new *holistic* view based on the notion of *relationships* (Capra, 1982, pp. 77-78; Datta, 1998). Nevertheless, even not very long ago, the majority of management theorists and practitioners still shared the traditional Western scientific ideology, based a *mechanistic*, *reductionis*t worldview (Hurst, 1989; Datta, 1998).

13. How Opening up the American West Destroyed the Natural Environment

President Abraham Lincoln signed the Pacific Railway Act in 1862 to *open up* the American West: the region *west* of the Mississippi River. While the *Transcontinental Railroad* connected East and West, it accelerated the *destruction* of what had been in the *center* of North America (King, 2012).

This event attracted a relentless wave of *speculators* and *settlers*. The process of transformation took place at such a *speed* that it surprised everyone. As a result of this onslaught retreated the *wilderness* and the *Native Americans* "who had lived so *lightly* on their *sacred* land" (Sheldrake, 1994, p. 58, *italics* added).

In its wake, lives of countless *Native Americans* were *destroyed*. In addition, *tens* of *million* buffalos--which had roamed *freely* upon the Great Plains since the last *Ice Age*--were almost driven to

extinction (King, 2012).

Two forces fueled the drive toward westward expansion: *The California Gold Rush*, and *Manifest Destiny* (*ibid*).

13.1 The California Gold Rush

The California Gold Rush was *triggered* by the discovery of *gold* nuggets in 1848 in the Sacramento Valley, California. It was perhaps one of the most *important* events that shaped American history during the *first half* of the nineteenth century (Note 8).

13.2 Manifest Destiny

Manifest Destiny is a phrase that was coined in 1845. Its *advocates* believed that America was *destined*—by *God*--to *expand* its territory over the *whole* of North America. This quest for territorial *expansion* was used to *justify* the *forced* removal of Native Americans (Note 9), who the colonists considered *inferior* to whites, and who Thomas Jefferson had earlier characterized as "merciless Indian savages" (Datta, 2021).

13.3 How America Conquered Lands of Plains Indians and Drove them to Reservations

Deadly European *diseases* and hundreds of *wars* with the white colonists, had decimated the lives of numerous Native Americans. The American government had *ratified* about 400 treaties with the Plains Indians. However, given the pressures of the *Gold Rush*, *Manifest Destiny*, and *land grants* for railroad construction, *most* of these treaties were *broken* (King, 2012).

13.4 The Wounded Knee Massacre

In the 1860s General William *Tecumseh* Sherman assumed the military command of the area. *Ironically*, Sherman's middle name was that of a great Indian *prophet* who was brutally *murdered* by the whites. In a letter to his brother, he outlined his plan (Sheldrake, 1994, pp. 58-59):

- "The *more* we can *kill* this year, the *less* will have to be killed the *next* war, for the more I see of these Indians the more convinced I am that *all* have to be *killed* or maintained as a species of *pauper*. Their attempts at civilization are simply *ridiculous*" (*italics* added).

With the *massacre* at Wounded Knee in South Dakota in 1890, Sherman was finally able to realize his dream (Sheldrake, 1994, p. 59).

In this *massacre* 150 Native Americans were killed: *half* of which were women and children (Note 10).

13.5 Prior History of How the U.S. Government Seized Native American Land

What happened to the Plains Indians, as mentioned above, is *not* the first time Native Americans were subjected to this horrible fate.

The U.S. government used the *Declaration of Independence* as a *license* to commit *genocide* of Native Americans, and to *seize* their land. Between 1803 and 1842, the U.S. *expropriated* a vast expanse of the *Native-American* lands in the Deep South, and moved them to areas west of the Mississippi (Datta, 2021).

Under Andrew Jackson's 1819 treaty with the Choctaw nation, the U.S. acquired 5 million acres of extremely *fertile* land in the Yazoo-Mississippi delta, in exchange for vastly *inferior* lands in Oklahoma

and Arkansas (Datta, 2021).

13.6 How Millions of Buffalos were Hunted to Near Extinction

According to an estimate, 30-60 million buffalos roamed the plains during the mid-nineteenth century. The *completion* of the Transcontinental Railroad hastened their *destruction* (King, 2012).

As the railroads reached out westward, it created the need for *meat*. So, the buffalos were slaughtered on a mass scale, or gunned down for pleasure. *Improved* rifles were invented and more deadly methods of hunting (Sheldrake, 1994, p. 58; King, 2012).

Huge hunting parties began to arrive in the West by train with thousands of men carrying .50 caliber rifles. Unlike the Native Americans, who killed for food, clothing, and shelter (tepee), the white hunters from the East killed mostly for *sport* (King 2012).

The *railroads* started to advertise *excursions* for "hunting by rail," where trains came across massive buffalo *herds* alongside or crossing the tracks. Hundreds of men aboard the trains climbed to the train *roofs* and shot the buffalos, or fired from their *windows*, leaving numerous 1,500-pound animals *dead* (King, 2012).

A great *hide* industry sprang up, and at its peak--between 1872 and 1874--*over* three million buffalos were hunted, and by 1880 they were gone. By the *end* of the century, fewer than a *thousand* of the buffalos survived on the reservations (Sheldrake, 1994, p. 58).

Part IV. Nature Has a Consciousness or Spirit

14. The Social Life of Forests: How Trees Talk to Each Other

Pre-Christian societies believed that *every* part of the *natural* environment had a *consciousness* or *spirit* (*Section* 5). The work of *Suzanne Simard* provides an excellent *real-world* example of the veracity of such belief (Jabr, 2020).

In an *incisive* article, Ferris Jabr (2020), a contributing writer for *The New York Times Magazine*, presents an *in-depth* look at the *thirty* years of meticulous research by *Prof. Suzanne Simard* (Note 11) about the life of *forests*.

14.1 The Importance of Mycorrhizal Networks

When she was in graduate school at Oregon State University, Simard realized that commercial *clearcutting* had largely *supplanted* the sustainable logging practices of the *past*. Loggers were replacing *diverse* forests with *homogeneous* plantations, evenly spaced in *upturned* soil *stripped* of most underbrush. The idea was that *without* any competition, the newly planted trees would *thrive* (Jabr, 2020).

Instead, they were generally *more* vulnerable to *disease* and *climatic stress* than trees in *old-growth* forests (Jabr, 2020).

Simard noticed that up to 10 percent of *newly* planted *Douglas fir* trees were likely to get *sick* and *die* whenever *nearby* aspen, paper birch and cottonwood were *removed*. It was not clear why? The planted

saplings had *plenty* of space, and they received *more* light and water than trees in old, dense forests. So why were they so *fragile*? (Jabr, 2020).

Simard has studied webs of *root* and *fungi* in the Arctic, temperate, and coastal forests of North America. Her initial hunch about the importance of *mycorrhizal* networks--*symbiotic* relationships between *fungi* and *plants*--was *prescient*. This *insight* stimulated entirely *new* lines of research that eventually *reversed* the longstanding misconceptions about forest ecosystems. By analyzing the DNA in *root* tips--and tracing the movement of molecules through *underground* channels--Simard has discovered that *fungal* threads *connect* nearly *every* tree in a forest: even trees of *different* species. As a result, carbon, water, nutrients, alarm signals, and hormones can *pass* from *one* tree to *another* through these *subterranean* conduits (Jabr, 2020).

Resources tend to flow *from* the *oldest*--and the *biggest*--trees *to* the youngest and the smallest. Chemical *alarm signals* produced by one tree, prepare *nearby* trees for *danger*. Seedlings *cut off* from the forest's underground lifelines are much more likely to *die* than their networked counterparts. And if a tree is close to *death*, it sometimes bequeaths a *substantial* share of its *carbon* to its *neighbors* (Jabr, 2020).

David Janos, co-editor of the scientific journal *Mycorrhiza*, characterized her published research as "sophisticated, imaginative, cutting-edge" (Jabr, 2020).

Since the time of *Darwin*, biologists have underscored the importance of the *individual*. They have emphasized the perpetual *competition* among different species in a constant *struggle* for survival and the ability to reproduce *within* their own species. Underlying this fight, according to this theory, is the single-minded motivations of *selfish* genes (*Jabr*, 2020).

Before Simard--and other ecologists--discovered the importance of *mycorrhizal* networks, foresters generally considered *trees* as solitary *individuals* that *competed* for space and resources, and otherwise didn't care for each other. Simard and her peers have demonstrated that this framework is far too *simplistic*. In *contrast*, the trees, undergrowth plants, fungi and microbes in a forest are so *fully* connected, communicative and codependent that some scientists have described them as *superorganisms* (Jabr, 2020).

Simard says these *trees* are quite *perceptive* of *who's* growing around them. She noted that trees *sense* nearby plants and animals, and *change* their behavior accordingly. For example, the gnashing mandibles of an *insect* might prompt the production of chemical *defenses*. Some studies have even suggested that plant roots grow *toward* the sound of *running water*, and that some flowering plants *sweeten* their nectar when they detect a *bee's* wing beats (Jabr, 2020).

When Simard started publishing her provocative research, some of her peers *disapproved* vociferously. Many were *confused* as to *why* trees of *different* species would help each other even at their *own* expense? (Jabr, 2020).

This amazing *altruism* seems to *contradict* the central principle of *Darwin's* theory of evolution (*ibid*).

Yet, it is *not* yet clear *why* resources are exchanged between trees in the first place, particularly when

those trees are *not* closely related (Jabr, 2020).

Other researchers have been able to *replicate* most of Simard's major findings. It is now well *established* that *resources*—carbon, water, nutrients, and hormones—*travel* among trees and other plants connected by *mycorrhizal* networks. Furthermore, most ecologists agree that the *amount* of carbon exchanged among trees is *sufficient* to benefit *seedlings*, as well as *older* trees that are *injured*, entirely *shaded* or severely *stressed* (Jabr, *ibid*).

14.2 Darwin's Theory of Evolution by Natural Selection

In a paper, Charles Darwin and his co-author Alfred Russel Wallace, credited *Thomas Malthus* as an important inspiration for their theory of evolution by *natural selection*. Darwin was also influenced by *Adam Smith*, who believed that societal order and efficiency could emerge from *competition* among inherently *selfish* individuals in a *free* market. "Darwin's theory of evolution by natural selection is obviously 19th-century *capitalism* writ large," according to the evolutionary biologist Richard Lewontin (Jabr, 2020, *italics* added).

Yet, Darwin *knew* that ruthless competition was *not* the only way organisms interacted. Ants and bees gave their *lives* to protect their colonies. Vampire bats *vomited* blood to prevent one another from starving. Vervet monkeys and prairie dogs cried out to *warn* other monkeys and dogs of predators, even when doing so put them at *risk* (Jabr, 2020).

Darwin worried whether such *selflessness* would be "fatal" to his 1859 theory of natural selection. However, subsequently, as evolutionary biology and genetics *matured*, scientists converged on a *resolution* to this paradox:

- Behavior that *seemed* to be altruistic was often just *another* manifestation of *selfish* genes—a phenomenon known as *kin* selection. Members of *tight-knit* social groups generally *share* a large portion of their DNA. So, when one individual sacrifices for another, it is still spreading the genes of its own *social group* (Jabr, 2020).

14.3 Resource Sharing Among Trees Undercuts Darwin's Theory of Individualism

Jabr (2020) reports that *several* ecologists he interviewed *agreed* that--*irrespective* of *why* and *how* resources and chemical signals move among the various members of a forest's *symbiotic* webs--the result is still *identical*. So, what *one* tree produces, can feed, inform or rejuvenate *another*. Such *reciprocity* does *not* require universal harmony, yet it does *undercut* the dogma of *individualism*, and *weakens* the doctrine of competition as the *primary* engine of *evolution*.

14.4 Forests Behave as a Single Organism

The most *radical* interpretation of Simard's findings is that a *forest* behaves "*as though* it's a *single* organism," as she says in her TED Talk (Simard, 2021). Some researchers have proposed that *cooperation* within or among species can *evolve* if it helps *one* population *outcompete* another: an *altruistic* forest community *outlasting* a selfish one (Jabr, 2020).

This theory remains *unpopular* with most biologists, who regard natural selection *above* the level of the *individual* to be evolutionarily *unstable* and exceedingly *rare* (*ibid*).

14.5 How Microbiomes Contribute to Human Health and Wellness

The microbiome (Note 12) is the collection of all *microbes*: e.g., bacteria, fungi, viruses, and their genes, that naturally live *on* and *inside* our bodies. Although microbes require a *microscope* to see them, they *support* human *health* and *wellness* in many ways. They protect us *against* pathogens, help our *immune* system develop, and enable us to *digest* food to produce energy.

Recently, inspired by research on *microbiomes*, *some* scientists have argued that the *traditional* concept of an *individual* organism needs *rethinking*--and that *multicellular* creatures, and their symbiotic microbes--should be regarded as *cohesive* units of *natural selection* (Jabr, 2020).

15. Darwin's Theory of Evolution Is Deterministic, Mechanistic

The *legendary* Procrustes placed his victims on an iron bed, *cutting* them to size if they were longer than the bed, or *stretching* them if they were shorter. According to Sheldrake (1994, pp. 123-124), "Charles Darwin has tried to fit the *evolution of life* onto the *Procrustean* bed of *deterministic*, *mechanistic* universe of nineteenth century physics. He has made "*random* genetic mutations the *ultimate* source of all evolutionary novelty," and has "allowed nature a kind of creativity consistent with a *blind*, *purposeless*, *nonevolving* universe" (*italics* added).

However, as mentioned in *Section* 12.2, with the arrival of *quantum mechanics* early during the last century, the physicists *abandoned* the idea of identifying matter with "things" or "solid objects." Instead, they adopted a new *holistic* view based on the notion of *relationships.*

Sheldrake (1994, p. 124) notes that *physics* itself has now adopted an *evolutionary* cosmology, and that *all nature* now seems to be *evolving*: not just life on earth.

16. Forests: Our Planet's Vital Organs

Human beings have *relied* on forests for *food*, *medicine* and *building materials* for thousands of years. Similarly, forests have provided *nourishment* and *shelter* for *innumerable* species over the ages. More importantly, forests function as some of the planet's *vital* organs. Forests have created a *breathable* atmosphere with a high level of *oxygen* we continue to enjoy today. Forests saturate the air with *water vapor*, *fungal spores* and *chemical* compounds that *seed* clouds. They *cool* the Earth by *reflecting* sunlight and provide much-needed precipitation to *inland* areas that might otherwise remain dry (Jabr, 2020).

A majority of this *carbon* resides in *forest soils*, anchored by networks of symbiotic roots, fungi and microbes. Each year, the world's forests capture more than *24 percent* of global *carbon* emissions. However, *deforestation*, by *destroying* trees that would otherwise continue storing carbon, can considerably *reduce* that effect.

Although *clearcutting* is *not* as common now as it was in the past, it is still *practiced* on about *40* percent of logged acres in America, and 80 percent of them in Canada (Jabr, 2020).

In a thriving forest, a lush *understory* (Note 13) captures a *large* amount of *rainwater*. Also, *dense* root

networks *enrich* and stabilize the soil. Clearcutting removes these living *sponges* and *tampers* with the forest floor, increasing the chances of *landslides* and *floods*, *stripping* the soil of nutrients and *releasing* stored *carbon* to the atmosphere (Jabr, 2020).

Also, when *sediment* falls into nearby *rivers* and *streams*, it can *kill* fish and other aquatic creatures, and *pollute* sources of drinking water. When so many trees are suddenly felled, it *damages* and *removes* countless species of birds, mammals, reptiles and insects (Jabr, 2020).

17. The Science of Forest Management

Simard's research suggests there is an even more *fundamental* reason *not* to deprive a logging site of every single tree. When a *seed* germinates in an *old-growth* forest, it immediately *taps* into an extensive underground *community* of interspecies partnerships. In *contrast*, uniform plantations of young trees planted *after* a clear-cut are *deprived* of ancient roots and their symbiotic fungi. The trees in these forests are much *more* vulnerable to *disease* and *death* because, despite one another's company, they have been *orphaned* (Jabr, 2020).

Mother trees are those that have the most *robust* and *diverse* mycorrhizal networks. Simard believes that *retaining* some *mother* trees will substantially *improve* the health and survival of *future* seedlings (Jabr, 2020).

Sm'hayetsk Teresa Ryan, a forest ecologist of *Tsimshian* heritage, who completed her graduate studies under Simard, explained that research on *mycorrhizal* networks, and the forestry practices that follow from it, *mirror* aboriginal insights and traditions: insight that European colonists often *dismissed* or *ignored*. She says: "Everything is connected, absolutely everything" (Jabr, 2020).

17.1 Menominee Forest: A Model of Forest Management

According to Teresa Ryan, the 230,000-acre Menominee Forest in Wisconsin has been harvested *sustainably* for more than 150 years. The Native Americans of the *Menominee* nation believe that sustainability means "thinking in terms of *whole* systems, with all their *interconnections*, consequences and feedback loops" (Jabr, 2020).

The Menominee Forest maintains a *large*, *old* and *diverse* growing stock of trees. It places a higher *priority for* the removal of *low-quality* and *ailing* trees, compared to more *vigorous* ones allowing them to age 200 years or *more* to enable them to become what Simard would call *Grandmothers* (Jabr, 2020).

Ecology, *not* economics, guides the management of the Menominee Forest, yet it is still highly *profitable*. To many, this forest may seem pristine and untouched. In reality, however, it is one of the most *intensively* managed tracts of forest in the Lake States (Jabr, 2020).

17.2 Bob Leverett: Proforestation Best Way to Minimize Global Warming

Ecologists had thought that America's primeval forests were long gone. However, Bob Leverett, an engineer, proved them *wrong*. In the early 1980s, in hard-to-reach spots in the New England forests, Leverett began to notice a *hidden* patch of forest that reminded him of the *primeval* (ancient) woods of his childhood: the old *hemlocks* and towering *white pines* of the Great Smoky Mountains (Degner,

2022).

Leverett also observed that the *height* of tree species had been widely *underreported*. The reason for this is that *no* one allowed for the fact that trees grow *crooked*. Talking about the fallen remains of a sugar maple tree whose *height* he had measured 30 years ago, he said his measurement was 30 feet *lower* than what it should have been (Degner, 2022).

To *minimize* global warming, scientists stress *three* different approaches to forest management (*ibid*):

- *Afforestation*, or planting *new* trees
- *Reforestation*, or *regrowing* forests,
- *Proforestation*, or managing *existing* forests

Proforestation is a term *coined* by William Moomaw to describe the *preservation* of *old* existing forests. Moomaw was the *lead* author of five *major* reports of the *Intergovernmental Panel on Climate Change*, for which it was awarded the Nobel Peace Prize in 2007 (*ibid*).

Leverett has shown that *Proforestation* is *much more* valuable than scientists first thought. The hard data he has provided shows that *older* trees accumulate *far more* carbon *later* in their life cycles (Degner, 2022).

When Leverett studied individual *white pines over* the age of 150 years, he discovered an important finding: that these trees accumulate 75% of their total carbon *after* 50 years of age (Degner, 2022).

A recent study Leverett coauthored with William Moomaw and Susan Masino (Note 14) found that individual *white pine* trees capture *more* carbon between 100 and 150 years of age, as opposed to what they do in their first 50 years: an important *insight* because every year counts in our efforts to *diminish* the effect of climate change (Degner, 2022).

The Leverett et al. study—and others—challenge the long-standing view that younger, faster-growing forests sequester more carbon than "mature" forests (*ibid*).

This research *strengthens* the importance of *Proforestation* as the *simplest* and most effective way to fight climate change through forests (Degner, 2022).

Suzanne Simard's research (*Sections* 15, 16, 18) also bolsters Bob Leverett's case for *Proforestation* with its focus on *large*, *old* trees. Simard *underscores* the importance of *Mother* trees: trees that have the most *robust* and *diverse* mycorrhizal networks. She believes that *retaining* some *mother* trees will substantially *improve* the health and survival of *future* seedlings.

18. Ronald Reagan and the Magnificent Redwood Trees

"Redwood trees are always described in *superlatives*: the tallest, the biggest, the oldest, the most massive. But the best way to describe them is simply: *magnificent.*" Giant coastal Redwood trees in California are the *tallest* living things in the world, growing up to 380 feet tall and 16 to 18 feet across (Malloy, 2020, *italics* added).

It was in 1966, when Ronald Reagan, a two-term U.S. President, first ran in the California gubernatorial election. One hot-button political issue at the time was, how much of the California's remaining

old-growth Redwood forests should be *preserved* against commercial logging, and *converted* to a protected national park. It was in this context that candidate Reagan, speaking before the Western Wood Products Association, said the following (Mikkelson, 2020, *italics* added):

- "I think, too, that we've got to recognize that where the preservation of a natural resource like the redwoods is concerned, that there is a commonsense limit. I mean, if you've looked at a hundred thousand acres or so of trees—you know, *a tree is a tree*, how many more do you need to look at?"

So, the incumbent governor, Pat Brown's campaign soon *mocked* him by transforming his statement into a more *catchy* phrase: "*If you've seen one redwood, you've seen them all*" (Mikkelson, 2020, *italics* added).

Lou Cannon, a Reagan biographer, has pointed out that Reagan's statement equating the magnificent redwood trees, a national treasure, to *ordinary* trees: *"a tree is a tree,"* was *not* simply a use of "artless language." It is because he said "what he *believed*" (Mikkelson, 2020, *italics* added). Cannon further adds:

- "Reagan was *reluctant* even to acknowledge the grandeur of the trees. Of one of the oldest and *loveliest* groves of redwoods, he said (15 March 1967), "I saw them; there is *nothing* beautiful about them, just that they are a *little* higher than the others" (*italics* added).

White (1967), too, has recognized this Reagan episode about the Redwood trees.

Part V. Cosmos an Evolving Organism: Not an Eternal Machine

19. Presence of the Past: Morphic Resonance & the Memory of Nature

Cambridge biologist, Rupert Sheldrake (2012) presents new evidence and research in support of--in his *own* words—his *controversial* theory of *morphic resonance* which means: a *paranormal* influence by which a *pattern* of events or behavior can facilitate *subsequent* occurrences of *similar* patterns" (Note 15).

Sheldrake (2012, pp. 1-2) poses his *radical* hypothesis that *memory* is inherent in *nature*. He suggests that *natural systems*, e.g., termite colonies, pigeons, orchid plants, or insulin molecules inherit a *collective* memory from all previous things of their kind, *no matter* how *faraway* they were, nor how *long* ago they existed.

Sheldrake (2012, p. 1) suggests that *habits* may be *innate* in the *nature* of *all* living organisms: in *crystals*, *molecules*, *atoms*, and even the entire *cosmos*. A *beech* (Note 16) seedling, as it grows into a tree, takes on the characteristic shape, structure, and habits of a beech tree. It is able to do so because it *inherits* its nature from the *previous* beech trees. However, this inheritance is *not* just a matter of chemical genes. It depends *also* on the *transmission* of the *habits* of growth and development from *numerous* beech trees of the *past.*

Similarly, as a *swallow* grows up, it flies, feeds, preens, migrates, mates, and nests: as swallows normally do. It inherits the *instincts* of its species through an *invisible* influence that makes the

behavior of swallows in the *past* in some way *within* it. It *draws on* and is *shaped* by the collective memory of its species (Sheldrake, 2012, pp. 1-2).

Sheldrake (2012, p. 2) believes that all *humans*, too, draw upon a *collective* memory, to which *all* in turn contribute.

19.1 What is Morphic Resonance?

A *morphic field* is one that consists of *patterns* that govern the development of forms, structures and arrangements (Note 17)**.** The *process* by which the past becomes present within *morphic fields* is called *morphic resonance*.

Morphic resonance involves the *transmission* of *formative* causal influences through both *space* and *time*. The memory *within* the morphic fields is *cumulative*, and so all sorts of things become *habitual* through *repetition* (Sheldrake, 2012, p. 3).

In a review of Sheldrake's book, Michael Kernan (1988) of *Washington Post,* says that Sheldrake's exposition of his theory is so *compelling* that it leads readers to *underlining* words and *scribbling* notes in the margin.

Experiments going back to 1920 showed that the 22nd generation of *rats* put into a *maze* ran it *far more* efficiently than the first. Even when the maze was moved to *another* continent, a *new* batch of rats picked up where the last one had left off (Kernan, 1988).

It seems as if what the *earlier* rats had learned, was *transmitted* somehow to all other rats *around* the world (Kernan, 1988).

Once Roger Bannister *broke* the *four-minute* mile *barrier*, other runners were able to do it everywhere. Similarly, let us take the case of *crystals* made from newly-devised compounds. Initially, they are very *hard* to form, but *in time* the compound seems to "remember," and, as a result, crystals become *easier* to form (Kernan, 1988).

Still another example is the amazing *ease* with which *children* learn their *native* language (*ibid*).

19.2 An Example of the Giraffe

Zoologist Jean-Baptiste Lamarck (1744-1829) placed a strong emphasis on the role of *behavior* in the *evolution* of an animal's development of *new* habits that led to either use or disuse of organs, which were either strengthened or weakened. His most famous example was the *giraffe* (Sheldrake, 2012, pp. 159, 333):

- Giraffe is the *largest* of the mammals. It lives in the interior of *Africa* in places where the soil is almost always *arid* and *barren.* This forces the giraffe to *browse* on the *leaves* of *trees* and make a constant effort to reach them. The result of this long-standing *habit* is that the giraffe's *fore-legs* have become *longer* than its hind legs. Moreover, its *neck* has become so long that the giraffe, *without* standing up on its hind legs, has attained a *height* of six meters, or around 20 feet.

19.3 Why Morphic Resonance Theory Has Not Received Much Recognition

As mentioned in *Section* 12, a *radical* change occurred in scientific thought during the 16th and 17th centuries.

The notion of an *organic* and spiritual universe was replaced by that of the world as a *machine*.

Sheldrake (2012, p. 3) says that until the 1960s, the *universe* was generally believed by physicists to be *eternal* or *static*. However, *now* the universe is considered to have been *born* in a *primordial explosion* since the *beginning* of time at about *fourteen* billion years ago. More *importantly*—it has been *growing* and *evolving* ever since.

Sheldrake (2012, p. 3) then points out that the concept of *morphic resonance* does *not* exist in contemporary physics, chemistry, or biology. This is because, according to the *current* orthodoxy, morphic resonance--and the *known* fields of *physics*—are governed by *eternal* laws of nature.

In sharp *contrast*, morphic fields arise and *evolve* in time *and* space, and are *influenced* by what has already *happened* (Sheldrake, 2012, p. 3).

Sheldrake (2012, p. 3) says that theoretical physics is in *ferment*. Theories are reaching *back* into the *first* moments of *creation*. Altogether new *evolutionary* views of matter and of fields are coming into being, so much so, that the *cosmos* now sems more like an *evolving organism* than an eternal machine.

Thus, *habits* may be more *natural* than immutable laws (*ibid*).

Part VI. Native Americans Better Environmental Stewards than European Colonists

20. Native Americans Considered Rights of Animals and Plants as Sacred

In the words of Roderick Nash (1989, p. 117) "the *first* occupants of North America were *better* custodians of the ecosystem than the subsequent tenants" (*italics* added).

Nash (1989, pp. 92-93) says that Native Americans considered the rights of animals, plants—and even rocks—as *sacred*.

20.1 The Most Famous Tear in American History

It may be the *most* famous *tear* in American history. The camera zooms in closely on the face of *actor* Iron Eyes Cody, looking like a Native American, to reveal a single *tear* falling, slowly, down his cheek. This tear made its television debut in 1971 (Dunaway, 2022; also, see Nash, 1989, p. 117).

So many viewers believed that the commercial represented an image of *genuine* feeling captured by the camera. As the television scholar, Robert Thompson explains (Dunaway, 2022, *italics* added):

- "The tear was such an *iconic* moment. . . Once you saw it, it was *unforgettable*. It was like *nothing* else on television. As such, it *stood out* in all the clutter we saw in the early 70s."

20.2 Native Americans' Belief: Humans and Nature One Family

Like the Eastern religions of Hinduism and Buddhism (*Section* 22), Native-American religions did *not* believe in dualism that has characterized Christianity (*Section* 3). A fundamental *philosophy* of the religions of Native Americans was that humans *and* other forms of life constituted a *single* society. For

example, Indians regarded *bears* as "bear people," and plants were also people. A complex system of *rituals* and *ceremonies* strengthened the familial *bonds* between the Indians and their environment (Nash, 1989, p. 117).

In the American Indian culture, *respect* and *courtesy* were obligatory in all interactions with *nature*. Even when Indians took the life of an animal to *sustain* their own, they did it with reverence and gratitude (Nash, 1989, p. 118).

Nash (1989, p. 118) presents a *powerful* account of the Native American culture about their reverence for *nature*:

- "Traditional Indian culture expressed a sense of *disbelief* at the tendency of *white* colonists "to *objectify*, *desacralize*, and *exploit* nature" (*italics* added).
- The idea of *owning*, buying and selling a piece of land was particularly *unthinkable* to Indians.
- This Indian *mindset* may have contributed towards making them an *easy* prey of white colonists. The Indians *never* realized how a *mark* on a piece of paper, and the exchange of a few *beads* and *tobacco*, could *convert* land into property. To an Indian, ownership of nature was morally *wrong*: a form of *slavery*.

In his book *The Day Before America*, environmental writer, William MacLeish (1994) describes a story of the North American continent from 18,000 years ago to the present. He paints a clearest portrait available of the dramatic *shifts* in climate and ecology that swept through North America during the *prehistoric* period, and of how Native Americans *adapted* to them (Lee, 1994).

MacLeish gives *moderately* good marks about the way most tribes interacted with the *flora* and *fauna* around them. Although the Iroquois were fierce hunters, they also embraced a *respect* for deer and other prey to *prevent* overhunting (ibid).

In the western areas where *bison* roamed, trapping techniques showed increasing levels of *sophistication*--and, even *sensitivity*. Crude, early methods killed the animals in large numbers--for example, by setting fires to drive them off cliffs. But the hunters *later* devised ways to *herd* them down trails and into corrals. And when bison populations began to *drop*, there is some evidence that the hunters may have *limited* the number of bison they killed (Lee, 1994).

The *religious* beliefs and *traditions* of many tribes *propagated* the view that humans were *part* of the *natural* world, *not* its masters. For example, the Iroquois viewed *other* living creatures as possessing qualities of *humanness* and even *kinship*. And in *plant-animal* relationships, a certain reciprocity existed, according to George Hamell, a specialist on the tribe at the New York State Museum in Albany (Lee, 1994).

However, the Native Americans' environmental record was *far* from perfect. In the Northeast, they *burned* forests to force out elk and deer. They also created elaborate devices to *drive* herds of white-tailed deer into *enclosures* in the forest, where they *slaughtered* them (Lee, 1994).

According to forest ecologist Prof. Marc Abrams (2020) (Note 18) Native Americans have long been considered in the U.S. as "ecosystem architects, *taming* nature and *molding* it in ways to *sustain* their

needs for food and shelter." The anthropological evidence suggests that this is *true* in most places *around* the world (*italics* added).

One example in *central* part of America is the existence of vast areas of *tallgrass prairie* that existed for *millennia* before the arrival of European colonists. These grasslands were a great source of *food* for humans *and* the animals the natives hunted. Most ecologists attribute this to recurrent *fires* set by Native Americans, because fires caused by lightning are rare in that region. However, the Native Americans used fire to *prevent* the *natural* transformation of grasslands to forests: a process known as *succession* (Note 18).

Oak and *hickor*y are great *nut* producers, and *pine* was important to build canoes and seal it with sticky resin. So, the natives *burned* vast expanses of oak, hickory and pine forests in the Eastern U.S. to *prevent* the emergence of *less* desirable trees (Abrams, 2020). This is because burning *reduces* the thickness of *leaf litter*, which allows the germination and establishment of *desirable* plants (Note 19).

Abrams (2020) cautions that *if* we ignore the *important* role that Native Americans played as *custodians* of nature--and in some areas still play—it further *marginalize*s them. It also *hampers* our ability to understand how best to *manage* vegetation against the invasion of *unwanted* species and future *catastrophic* fires. This can be done by reducing the chance of fire by forest *thinning* and restoring *natural* fire cycles with *controlled* burning.

Part VII. America's Magnificent System of National Parks and Wilderness Areas

21. George Catlin and the Idea of National Park

The *splendor* of the American West inspired the idea of national parks. There were vast landscapes still untouched by development. Artists, authors, and scientists struggled to capture this beauty and to record and share their discoveries. However, they were worried: "What would happen when westward expansion arrived on the *doorstep* of the wilderness?" (Note 20, *italics* added).

Artist George Catlin, during an 1832 trip to the Dakotas, was perhaps the *first* to suggest a *novel* solution to this imminent reality. He wrote that Native American civilization, wildlife, and wilderness were all in *danger*, unless they could be preserved "by some great *protecting* policy of government...in a magnificent park.... A *nation's Park*, containing *man* and *beast*, in all the wild[ness] and freshness of their *nature's* beauty!" (Note 20, *italics* added; Gilio-Whitaker, 2019).

Caitlin's work received widespread *acclaim*. While the idea of a national park was not yet taken seriously, "a growing national *angst* about modernity made conditions ripe for it by the early 1870s" (Gilio-Whitaker, 2019, *italics* added).

22. Yellowstone: America's First National Park

The U.S. Congress made Yellowstone America's *first* national park in 1872. In the following years environmentalists--including John Muir--lobbied for wilderness preservation throughout the *American*

West. They called for the creation of many *more* national parks and monuments (Note 21).

President Woodrow Wilson established the National Park Service in 1916 to consolidate management of America's federal parklands under a single agency. The National Park Service today manages 84 million acres across all U.S. states and territories, and has served as a *model* for countries around the world (Note 21).

One movement, that eventually led to the creation of America's first national park, was *transcendentalism* that began in the early 1800s. Its primary practitioner, Ralph Waldo Emerson, and Henry David Thoreau *underscored* the idea of human *harmony* with nature. They believed that *nature* can help us improve *spiritually* and make it possible for us *connect* to the rest of the world. According to Transcendental ideas, "*everything* is connected, *everything* is one" (Note 22).

As mentioned above, popular 19th-century *writers*, including Emerson, Thoreau, and Walt Whitman drew *inspiration* from *nature*, while *artists* of the era—including Thomas Cole, Asher Durand and Albert Bierstadt—"depicted the sublime *beauty* of the American landscape." These writers and artists influenced the *ideals* of the American conservation movement (Note 22, *italics* added).

23. Removal of Native Americans and the Establishment of National Parks

The national park system has long been *acclaimed* as "America's greatest idea." However, only relatively recently has it begun to receive more *critical* scrutiny. In his 1999 book, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks*, Mark David Spence has delivered an overdue critique that has yielded a *remarkable* revelation. And that is that the creation of the first *national parks, and* the U.S. Government's policy of *removing* Native Americans from those lands, were joined at the *hip* (Gilio-Whitaker, 2019).

Spence makes two important points. When the first national parks were established, the so-called wilderness areas that needed to be preserved were in reality landscapes *occupied* by Native Americans. So, the current occupants of those lands had to be *evacuated* first in order to make the wilderness *uninhabited* (Gilio-Whitaker, 2019).

Spence examines the creation of Yellowstone, Glacier and Yosemite National Parks to illustrate, that for more than a century, the *myth* of uninhabited virgin wilderness has *concealed* an *ugly* history: a history of *removal* of Native Americans from their lands in the *name* of preservation and conservation (Gilio-Whitaker, 2019). This finding should *not* come as a surprise. As we have reported in *Section* 13, this has been the terrible history of how white American colonists have *stolen* Native American' lands throughout the history of the United States (also see Datta, 2021).

Part VIII. The Dangerous Illusion that Man Can Control Nature

24. Present Science & Technology Infused with Orthodox Christianity's Arrogance toward Nature

One idea that sharply distinguishes Judeo-Christian theology from the fatalism of Eastern religions, is

the concept of *evolution* and *progress*: a notion that provides the world with a basis for *optimism* and *hope* (Datta, 2021).

Ironically, however, this philosophy *confuses* progress and happiness with acquisition of more and more *material* goods (Watts, 1991, p. 51).

White (1967) believes that *both* our "present science *and* our present technology are so tinctured with orthodox Christian *arrogance* toward nature that *no* solution for our ecological crisis can be expected from them *alone*" (*italics* added).

Around 1850 Western Europe and North America arranged a "*marriage* between science and technology that signified the Baconian creed of *power* over nature (*Sections* 8, 12.1). "Its *acceptance* as a *normal* pattern of action may mark the *greatest* event in human history since the invention of agriculture, and perhaps in *nonhuman terrestrial* history as well (White, 1967, *italics* added).

24.1 The Whole is Not Equal to the Sum of its Parts

Perhaps the most *profound* legacy of the *Scientific Revolution*, even to this day, is the principle of *reductionism*. That means *breaking* a complex system into *parts.* So, if you understand the *parts*, you understand the *whole*.

What this really means is that the *whole* is *equal* to the *sum* of its *parts* (*Section* 12.1).

Watts (1991, pp. 60-61) argues that this approach encourages an *atomistic* and *disintegrated* view of nature. He says:

- Nature "*cannot wisely* be controlled the same way it has been *studied—piecemeal*. Nature is through and through *relational*, and interference at *one* point," has "*interminable* and *unforeseeable* results" on the *other*…"But whereas formal scientific knowledge is *departmentalized*, the world is *not*, so that mastery of a *single* department of knowledge is often as *frustrating* as a closetful of *left* shoes" (*italics* added).
- Man "*exploits* the resources of the earth and the energies of *radioactivity* with only the *fragmentary* knowledge of the *complex* relationships so *disturbed*" (Watts, 1991, p. 5, *italics* added).

24.2 How Burning of Fossil Fuels Endangers the Chemistry of the Earth

The novel concept of *ecology* first appeared in the English language in 1873. Today, "the impact of our race upon the environment has so *increased* in force, that it has changed its *essence.*" In particular, burning of *fossil* fuels *threatens* to change the chemistry of the *entire* globe (White, 1967).

In an indictment of the human race, White (1967) says that with "the population *explosion*, the carcinoma of *planless urbanism*, the new geological deposits of *sewage* and *garbage*, surely *no c*reature other than *man* has ever managed to *foul* its nest in such *short* order" (*italics* added).

24.3 The Faustian Bargain of Nuclear Bombs

White (1967) warns us that *Hydroge*n bombs pose an *existential* threat to the universe. This is because, a "war fought with them might *alter* the *genetic*s of *all* life on this planet" (*italics* added).

Sheldrake (1994, pp. 39-40) says that Dr. Faust epitomized the quest for *superhuman* power. Similarly,

like Faust, Frankenstein, too, was driven by a desire to attain *godlike* power. *Ironically*, Frankenstein was *destroyed* by the monster that he himself created.

Similarly, Oppenheimer and his Manhattan project team, that created the world's first *nuclear* bomb, did *not* realize that they were creating a *monster* (Datta, 2010).

24.4 The Humbling Power of Nature to Disrupt, Upend, or to Curb Human Ambition

Nash (2014, pp. vii-viii) reveals the *lessons* that he learned from his *decades*-long association with the running whitewater rapids. "For me, keeping an *oar* in the water has always been a way to maintain *contact* with natural processes and wild places." As a result, he "became more *sensitive* to the *humbling* power of *nature* to *disrupt*, *upend*, or *diminish* human ambition, its capacity to *frustrate* our drive to claim control over that which we dub as *wild*" (*italics* added).

Nash (2014, p. xiii) says one such marker is *Colorado River's Lava Falls* considered to be the most *difficult* stretch of runnable white water in the West. Those who make it past its violent gyrating waters might give in to the "exultation of the moment," and be *tempted* "to think you have *conquered* the rapid." However, Nash was not one of them (*italics* added).

Nash (2014, p. viii) then goes on to say: "You *never* really beat the *big* ones…The river just decides to *let* you through" (*italics* added).

Part IX. Humans and Nature: Part of a Single Living Organism

25. Eastern Religions: Man, and Nature--An Organic Whole

From the previous discussion (*Section* 3), it is clear that Christianity believes in a *hierarchy*: God—Man--Nature. Moreover, Jesus Christ--a man—has a *special* status because he is the s*on* of God. Although God created this earth, yet he is *not* part of nature. Also, man, too, is *separate* from nature, but God has insisted that man *exploit* it for his proper ends (Nash, 1989, p. 90).

Radhakrishnan (1973, p. 11) talks about the enormous contribution India—the homeland of *Hinduism* and *Buddhism*--has made to the *spiritual* world. He says that "*half* the world moves on independent *foundations* which Hinduism supplied." He adds that China and Japan, and numerous other nations, "look to *India* as their *spiritual* home" (*italics* added).

Nash (1989, pp. 112-113) points out that Eastern religions--e.g., Hinduism, Buddhism, Taoism, and Zen Buddhism—totally *reject* the dualism and anthropocentrism of Christianity. He further states:

- "Eastern religions assumed the ultimate *oneness* of all of nature's components. By advocating the *submersion* of the human *self* in a larger *organic whole* they cleared the intellectual way for *environmental* ethics" (*italics* added).

In the words of Nash (1989, p. 114, *italics* added), one scholar who "has *stood out* for his influence on American thought about *nature*," is Alan Watts, a Zen Buddhism scholar—and a practicing Buddhist. "Watts's readers came away with an unmistakable message: a fully developed moral sense *must* include *everything* in nature."

Commenting on the Christian tenet of *dualism*, Watts (1991, p. 4) offers the following insight that is quite *compelling*:

- From "the most coldly *intellectual* point of view, it becomes clearer and clearer that we do *not* live in a divided world. The harsh *division* of spirit and nature, mind and body, subject and object, controller and controlled are seen more and more to be *awkward* conventions of language. These are *misleading* and clumsy terms for describing a world in which all events seem to be mutually *interdependent*—an immense complexity of subtly *balanced* relationships which, like an endless *knot*, has *no* loose end from which it can be untangled and put in supposed order…" (*italics* added).
- A "world of *interdependent* relationships" "is a *seamless unity*," "where things are intelligible *only* in terms of each other." In such a world it is *impossible* to consider man apart from nature," and where "[man] is himself a *loop* in the endless *knot*..." *(italics* added).

26. The Religious Roots of Wilderness in Western Civilization

26.1 Genesis 1: 28: Subdue Nature and Make it a Slave of Mankind

According to Nash (1989, pp. 89-90), the original language in the Old Testament--Jewish Bible--provides an *affirmation* of White's (1967) description of Christianity's view of nature. Hebrew linguists have looked at Genesis 1:28 and found *two* operational words. One is *kabash* meaning "subdue." The other is "*radah*" that means "having a dominion over" or "rule." Nash then goes on to provide a *graphic* account of their relationship to *nature* (*italics* added):

- "Throughout the Old Testament *kabash* and *radah* are used to signify a *violent* assault or *crushing*. The image is that of a *conquero*r placing his foot on the *neck* of a defeated enemy, exerting absolute domination. Both Hebraic words are also used to identify the process of *enslavement*. It followed that the Christian tradition could understand Genesis 1: 28 as a divine commandment to *conquer* every part of nature and make it humankind's *slave."*
- Such "an interpretation has proved useful for *centuries* to provide "intellectual *lubrication* for the *exploitation* of nature."

26.2 What is behind such a Dark View of Nature?

What could possibly be the origin of such *harsh* views about nature expressed in Genesis 1:28?

Under the leadership of Moses, Jews wandered in the wilderness of the Sinai Peninsula, allegedly for *forty* years. The Old Testament account of this desert underscores the *hardships* Jews encountered in this "howling waste of the wilderness." Without advanced technology people could *not* survive for very long in such a *brutal* environment (Nash, 2014, pp. 16, 13).

Father John McKenzie (1967, chap. 1, Note 23) offers an answer to this mystery that makes a lot of sense. He says Israelites could *never* forget that they were a *desert* people. They saw the *unforgiving* environment of the Sinai desert as a symbol of nature's *cruelty*. As such, they did not see nature as a friend, but rather as *evil*, and an *enemy*.

Jordan and Rowntree (1976, p. 248) also suggest, that following the Judeo-Christian ideology, we regard the most blatant *butchery* of the land as "development," and the dwindling *wilderness* areas as "undeveloped" (*italics* added).

27. Revolutionary Change in American Attitude towards Nature and Wilderness

For "*most* of their history Americans regarded wilderness as a moral *and* physical *wasteland* fit only for *conquest* and *fructification* in the name of progress, civilization, and Christianity" (Nash, 2014, p. xx).

In general, until the late nineteenth century, wilderness was a place be "*feared, fought*, and *flattened*. Euro-American colonists believed that this *coarse* terrain—and the Native Americans who inhabited it—must be "civilized" and brought "under *control* by *gun, plow*, and *rail*" (Nash, 2014, p. ix, *italics* added, Note 24).

However, no sooner than this objective was realized, then a groundswell of "*nostalgia* for the "sharp, formative, edges of the Western frontier swept through the *urban East*" (Nash, 2014, p. ix, Note 24, *italics* added).

From the *ancient* symbol of the *Garden of Eden* to our *present* controversaries about conservation, man's attitude towards nature has reflected a *gamut* of *conflicting* feelings (Nash, 2014, back of front cover, p. 2):

- A "state of nature he *feared, romanticized*, felt he had to *conquer* and *change*, wished to *preserve*, used as a *refuge* from an unsatisfactory culture, and in most cases *despoiled*" (*italics* added).

However, now an extraordinary *transformation* has taken place: one that has *replaced* fear and hatred of wilderness in the past, to *appreciation*—and even *reverence* (2014, p. xx; back of front cover; *italics* added).

- "From the perspective of *city* streets and comfortable *homes*, wild country inspired quite *different* attitudes than it had when observed from a frontiersman's clearing." In *contrast*, the *wealth* that came from an industrialized society allowed *urbanites* to look at "wilderness from the point of view of the *vacationer* rather than the *conqueror*" (Nash, 2014, p, x, *italics* added).
- This was a "*revolution* in meaning," that gave birth to its *inverse*: "many of the repugnant connotations of wilderness were *transferred* to the new *urban* environment" (*ibid*, *italic*s added).

This momentous change in perspective was "one of the most *revolutionary* changes in the history of ideas about *nature*" (Nash, 2014, p. xx, *italics* added).

28. Birth of the Environmental Movement in America

In 1967, Environmentalist, Prof. Roderick Frazier Nash published his *phenomenal* book: *Wilderness and the American mind*. *The Los Angeles Times* listed it as one of the *hundred* most influential books during the *past* quarter century. The *Outside Magazine* included it in a survey of "books that *changed*

our world" (Nash, 2014, back cover, *italics* added).

In a *Foreword* to the Fifth edition of the book (Nash, 2014), Char Miller (Note 25) "provides a *twenty-first-century* perspective on how the environmental movement has *changed* since 1967, including the ways in which contemporary scholars are *reimagining* the dynamic relationship between the *natural* world and the *built* environment" (back cover, *italics* added).

Many *iconic* writers, such as, Henry David Thoreau, George Caitlin, John Muir, Aldo Leopold, and John McFee have extolled the virtues of wilderness. In the early *sixties*, far-reaching *changes* in American values and attitudes were powering growing interest in *wilderness* and its *preservation*. Among these were the following developments (Nash. 2014, pp. ix, xviii):

- Rachel Carson launched an extraordinary decade with her 1962 book, *Silent Spring* on insecticides.
- Aldo Leopold's book, *A Sand County Almanac*, which had *languished* since its publication in 1949, became a *best-seller*, and *changed* the definition of *ethics* for an entire generation of *conservation*-oriented Americans.
- In 1968, the plans to *damn* the Colorado River in the Grand Canyon were *defeated*.
- In 1970, the American public celebrated the *first* Earth Day.
- In 1970 the National Environmental Policy Act was passed.
- In the next *three* years the passage of Marine Animal Protection Act, and the Endangered Species Act, showed that the American politicians *and* public really *did* understand Rachel Carson's message of *ten* years ago.

The Wilderness Act of 1964 provided *substance* to Bob Dylan's observation about *changing times*. *Yet*, the legislation included a number of qualifications, special conditions, and *loopholes* that *diluted* its effect. This means that these *compromises*--in the words of Nash--were "a classic instance of Americans' *ambivalence* about the relative merits of wilderness and civilization" (Nash, 2014, p. xi, *italics* added).

29. Wilderness Not a Place: But a "Feeling" and a "State of Mind"

In his aforementioned book on wilderness, Nash (2014, p. xviii) presents a *novel* view of what we mean by the notion of *wilderness*. He says "wilderness was *not* so much a place, but rather as a *feeling* about a place: a *perceived* reality, and a *state of mind*" (*italics* added).

29.1 History of the Meaning of Wilderness

Nash (2014, p. 1, *italics* added) provides a comprehensive *history* of how the meaning of "wilderness" has evolved *over time* and in different *places and settings*. He points out that the word "wilderness" has a "*deceptive*" concreteness to it. The word is a *noun*, but it acts like an *adjective*. In the early *Teutonic* (Germanic) and *Norse* languages, from which the English word *evolved*, the *root* seems to have been "will," meaning "self-willed, willful, or uncontrollable." The word "willed" gave rise to the adjective "*wild*": signifying the "idea of being lost, unruly, disordered, or confused."

"In Old Swedish, the word 'wild' derived from the figure of *boiling water*": which essentially meant of

"being *ungoverned* or *out of control*" (Nash, 2014, p. 1, *italics* added).

The *first* known use of wilderness was in the early *thirteenth* century in the book *Layamons Brut*, published in London. However, the word did *not* get general recognition until *late* in the *fourteenth* century when John Wycliffe wrote the first English translation of the *Latin Bible*. Wycliffe and his associates, described wilderness as *uninhabited*, and *arid land* of the *Near East* (Note 26) *similar* to the environment described in the *Testaments* (Nash, 2014, pp. 2-3).

William Tyndale's 1526 translation of the Greek and Hebrew versions of the *Scriptures*, and the compilers of the *King James Bible*, continued to follow a *similar* theme (Nash, 2014, p. 3).

Thus, this *Biblical* usage of the concept of a *treeless wasteland* became closely associated with *wilderness*, so much so that in 1755, Samuel Johnson defined wilderness in his *Dictionary of the English Language* as: "a *desert*; a tract of *solitude* and *savageness*" (Nash, 2014, p. 3, *italics* added).

Johnson's view of wilderness remained a *standard* in America and in England for *many* years (*ibid*).

29.2 Modern View of the Meaning of Wilderness

Now-a-days dictionaries define wilderness as "*uncultivated* and otherwise *undeveloped* land." The *Merriam-Webster* dictionary (Note 27) offers a similar definition. This implies the *absence* of people and the *presence* of *wild* animals (Nash, 2014, p. 3, *italics* added).

Nash says *today* the word also *includes* other *non-human* environments, e.g., the *sea*—and more recently—*outer space*.

However, he makes an *important* point. He says equally significant "are the *feelings* they produce in the observer. So, "any *place* in which a person feels stripped of *guidance*, *lost*, and *perplexed* may be called a wilderness" (2014, p. 3, *italics* added).

This usage with its rich *symbolic* possibilities, has *extended* the meaning of wilderness *far* beyond its original application (Nash, 2014, p. 3).

As such, large and *disordered* collection of things—even *man-made*—may be regarded as wilderness. Thus, that part of a formal garden which is *knowingly* planted with hedges in the form a *labyrinth*—a maze—may be called wilderness (Nash, 2014, p. 3).

The rise of the *city* opened up another avenue for wilderness. So, it became common to speak of a wilderness of *streets* or of ships' *masts* in a crowded harbor. This may also include the *slum* conditions and urban *degeneracy*. A recent study of metropolitan areas refers to "this new 'wilderness' that has grown up in *Megalopolis*" (Nash, 2014, p. 3, *italics* added).

The implication of the above discussion is, that the modern man feels as *insecure* and *confused* in an *urban* environment, as he once did in the *forest* among wild beasts (Nash, 2014, p. 3).

The *usual* dictionary connotation of wilderness implies *hostility* from human beings. Nevertheless, a *favorable* sense of the term wilderness has also emerged. Although English dictionaries *avoid* the dual meaning, the chief German work of Jacob & Wilhelm Grimm—and their revisers--do *not.* Jacob & Wilhelm Grimm provide the following conceptualization of wilderness that is not only more *realistic* but also quite *powerful* (Nash, 2014, p. 4, *italics* added):

- "Wildnis (wilderness) has a *two-fold* emotional tone. On the *one* hand it is inhospitable, alien, mysterious, and threatening; on the *other*, beautiful, friendly, and capable of elevating and delighting the beholder."
- "Involved, too, in this *second* conception is the value of *wild* country as a *sanctuary* in which those in need of *consolation* can find *respite* from the *pressures* of civilization."

Finally, Nash (2014, p. 5), argues that since wilderness is a *state of mind*-- as we have mentioned earlier--it seems a good idea to "let the term *define* itself: "to *accept* as wilderness those places people *call* wilderness." The *underlying* reason behind this view is *not* what wilderness is, but what people *think* it is (*italics* added).

30. Wilderness: A Moral Restraint on Humans, Notorious for their Greed

At present only about 2% of the contiguous forty-eight states in America is legally *wild*. And about an *equal* amount is *paved*. Today "wilderness is just as *dead* in the garden as it is in the concrete wasteland." "Once gone, it *cannot* be regenerated, once lost, it *cannot* be found" (Nash 2014, p. xi, *italics* added; Note 24).

Nevertheless, America is a *leader* in the creation of national parks and wilderness areas (Nash, 2014, p. 380).

Nash (2014, p. 379) says that we are now starting a new millennium. So, he poses the question: what would wilderness be *like* in thousand years from now? He then adds that to address this question, one has to have a *vision*: such as, Martin Luther King's 1963 "dream," and that was that *ethics* should encompass *people* of *all* races and colors. However, here is what Nash has to say about *his* vision:

- *Mine* "pushes that moral circle *wide* enough to include *all* species and *nature* itself. It concerns how we want to occupy this planet over the *long haul*…My vision is *Island Civilization* and a world that is, once again, largely *wild*…The core idea is to use *technology*, may be for the *first* time, to *lessen* rather than enlarge human impact on the *natural* world. The point is to *share* rather than dominate Earth. It's really just an *extension* to *all* life of the ethic of *respect* that we never learned very well in kindergarten" (*italics* added).

Nash (2014, p. 381) believes there are *two* major plausible scenarios that are available to humanity to decide what kind of a planet we want to live in the *future*:

30.1 The Wasteland Scenario

- "It anticipates the *growth* of human *population* and environmental *deterioration* to the point of dysfunction and *breakdown*. Civilization, and the philosophy that *growth* always equals *progress*, proves to be *cancerous* and unsustainable. We end up with a *ravaged* planet populated by the remnants of a *desperate* species that has *devastated* the rest of the ecosystem" (*italics* added).

30.2 The Garden Scenario

- "Imagine that a thousand years from now human effect on nature is also nearly *total*, but this time it is *beneficent*—at least for people. The Green Movement has *triumphed*. Our species has turned the planet into a beautiful, bountiful, and *sustainable* garden" (*italics* added).

So far, we have valued *wild* spaces, and protected them for *people:* whether "involving scenery, recreation, or the economics of nature tourism, wilderness seemed to be all about *us*" (Nash, 2014, p. xix, *italics* added).

However, now we need a *new ecocentric* rationale that *values* "wilderness as a symbol of the *capacity* of *restraint* on the part of a species notorious for its *selfishness*" (Nash, 2014, p. xix, *italics* added).

Nash (2014, pp. xviii-xix) warns that we must *change* our direction and *control* the growth of our *population*—and its *sprawl*—as well as *consumption*, and to develop *beneficent* forms of *centralization*: and the technologies that would make it possible.

In the past *technology* has been employed to *hasten* the conquest and domination of wilderness. However, Nash believes he has a *vision*: a *high-tech low-impact* road for humans to occupy this planet way out into the future in a manner that *protects* wilderness. It is a path that would *permit* humans to follow "their evolutionary horizons," while, at the *same time*, "giving all the other, *wild* species the *same* opportunity" (Nash, 2014, p. 382).

Nash calls it *Island Civilization* (*ibid*).

31. Gaia, Mother Earth: The Source and Sustainer of All Life

Sheldrake (1994, p. 10) points out that the official ideology of the modern world is the *conquest* of nature for the sake of human *progress*.

The image of the earth as Mother is found in traditional cultures all over the world. So, we feel *uncomfortable* when we realize that we are *polluting* our *own* Mother.

With the rise of the *green* movement, *Mother Earth* now "strikes a responsive chord in millions of people" --in particular, "the acknowledgment that our planet is a *living* organism…" (Sheldrake, 1994, p. 10).

So, when we *personify* nature in this sense, "she is *Mother Nature*, an aspect of the *Great Mother*, the *source* and *sustainer* of *all* life, and the *womb* to which all life *returns*" (Sheldrake, 1994, p. 10, *italics* added).

A view of the earth from *outer space* has had a *deep* and *mystical* effect on astronauts. Many space explorers were moved by her "*beauty,* her *purity* and *splendor*." Cosmonaut Aleksandr Aleksandrov summed up his feelings for people all around the world. Looking down on America and then on Russia, he said that we are *all Earth's children*, and that we should treat her as our *Mother* (Sheldrake, 1994, p. 150).

32. Conclusion

Historian Lynn White wanted to understand *why* the Western civilization had exploited nature so much that its own quality of life--even its survival--was now at stake. White concluded that the answer is: the *Judeo-Christian* tradition.

A central creed of the Judeo-Christian theology has been *dualism*—that man is separate from nature—and *anthropocentrism*: that man is the master and the center of this universe, with a license to exploit nature.

The victory of Christianity over paganism was the greatest psychic *revolution* in the history of the Western culture.

The first centers of Christianity in the Roman Empire were the great *cities* tha*t* included Antioch, and Rome. Thus, a concentration of population in *urban* areas must have exerted a *deep* influence over the entire character of Christianity.

Pagans believed in *animism*: that every part of the environment--living and non-living—had a consciousness or spirit.

By destroying pagan animism, Christianity made it possible to *exploit* nature in a mood of indifference to the feelings of natural objects. Severed from the human community and its ethical protection, nature was fully exposed to human *greed*.

To a Christian a tree can be no more than a physical fact. The whole concept of the sacred grove is *alien* to Christianity and to the ethos of the West. For nearly two millennia, Christian missionaries have been chopping down *sacred groves* on the ground that they consider idolatrous because they assume *spirit* in nature.

St. Francis of Assisi was the greatest spiritual *revolutionary* in Western history since Christ. He preached the notion of *equality* of all creatures—including man.

Unfortunately, he *failed*.

From the 13th century onward, every major scientist has explained his motivation in religious terms. Newton seems to have considered himself more as a theologian than a scientist. Bacon equated the dominion over nature with Adam's naming of the animals…in which woman had no part.

Aristotle's scientific philosophy of nature—*animate* and *alive*—dominated Western thought for two thousand years after his death. However, thanks to the Scientific Revolution, a *radical* change occurred in scientific thought during the 16th and 17th centuries. As a result, this medieval worldview went through a fundamental change. The notion of an organic and spiritual universe was replaced by that of the world as a *machine.*

Around 1850, Western Europe and North America arranged a marriage between science and technology that signified the Baconian creed of *power* over nature. Its acceptance as a normal pattern of action may mark the *greatest* event in human history since the invention of agriculture.

While the Transcontinental Railroad connected East and West, it accelerated the destruction of what had been in the center of North America. In its wake, lives of countless Native Americans were destroyed. In

addition, tens of million buffalos were almost driven to extinction.

Pre-Christian societies believed that every part of the natural environment had a consciousness or spirit. The work of Suzanne Simard provides an excellent real-world example of the veracity of such belief. Her research shows that *forests* have a social life, and that trees talk to each other.

The most radical interpretation of Simard's findings is that a forest behaves as though it's a *single* organism.

Forests function as some of the planet's *vital* organs. A majority of this carbon resides in forest soils. However, *deforestation*, by destroying trees that would otherwise continue storing carbon, can considerably *reduce* the amount of stored carbon.

Proforestation, or managing *existing* forests is much more valuable than scientists first thought, because *older* trees accumulate *far* more carbon *later* in their life cycles.

Sheldrake, based on his controversial theory of *Morphic Resonance*, says that natural systems *inherit* a collective *memory* from all previous things of their kind, no matter how faraway they were, nor how long ago they existed. Sheldrake says that physics itself has now adopted an *evolutionary* cosmology, and that all *nature* now seems to be more like an evolving organism than an eternal machine.

The first occupants of North America—the *Native Americans*--were *better* custodians of the ecosystem than the subsequent tenants. Native Americans considered the rights of animals, plants—and even rocks—as *sacred*. A fundamental philosophy of the religions of Native Americans was that humans and other forms of life constituted a *single* society.

America is a *leader* in the creation of national parks and wilderness areas, and has served as a *model* for countries around the world.

Eastern religions--e.g., Hinduism, Buddhism, Taoism, and Zen Buddhism—totally *reject* the dualism and anthropocentrism of Christianity. By advocating the *submersion* of the human *self* in a larger *organic whole*, they cleared the intellectual way for environmental ethics.

For most of their history Americans regarded wilderness as a moral and physical *wasteland* fit only for conquest and fructification. However, now an extraordinary *transformation* has taken place: one that has replaced fear and hatred of wilderness in the past, to *appreciation*—and even *reverence*.

This momentous change in perspective was one of the most *revolutionary* changes in the history of ideas about nature.

Roderick Nash, argues that since wilderness is a state of *mind*, it seems a good idea to let the term define *itself*: to accept as wilderness those places people call wilderness. The underlying reason behind this view is *not* what wilderness is, but what people *think* it is.

In the past technology has been employed to *hasten* the conquest and domination of wilderness. However, Nash believes he has a *vision*: a *high-tech low-impact* road for humans to occupy this planet. Nash calls it *Island Civilization*.

The image of the earth as *Mother* is found in traditional cultures all over the world. So, we feel *uncomfortable* when we realize that we are *polluting* our *own* Mother.

Finally, astronomer Carl Sagan--and 22 other well-known researchers--issued an appeal in 1990. Their message was:

- The "efforts to safeguard and cherish the environment need to be infused with a vision of the *sacred*."

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Notes

Note 1. https://en.wikipedia.org/wiki/Paganism

Note 2. https://americanhumanist.org/wp-content/uploads/2016/11/paganism.pdf

Note 3. https://en.wikipedia.org/wiki/Druid

Note 4. Who Were Celts - HISTORY

Note 5. Gaul is the region inhabited by the ancient Gauls, comprising modern-day France and parts of Belgium, western Germany, and northern Italy.

https://www.google.com/search?q=where+was+gaul+located&source=hp&ei=jRS8Ye6vCYiMwbkP2N-E-A8&iflsig=ALs-wAMAAAAAYbwinYpPGrcvZioJ60F-4CMRwaThyZJr&oq=where+was+gaul&gs_lcp=Cgdnd3Mtd2l6EAEYATIFCAAQgAQyBQgAEIAEMgUIABCABDIFCAAQgAQyBQgAEIAEMgYIABAWEB4yBggAEBYQHjIGCAAQFhAeMgYIABAWEB4yBggAEBYQHjoLCAAQgAQQsQMQgwE6EQguEIAEELEDEIMBEMcBEKMCOggIABCABBCxAzoLCC4QgAQQxwEQowI6DggueEIAEELEDEIMBEMcBEKMCOgsILhCxAxDHARCjAjoLCC4QgAQQsQMQgwE6CAgAELEDEIMBOggI

LhCABBCxAzoFCC4QgAQ6CAgAEIAEEMkDOgoIABCABBBGEPsBUABYizVg90hoAHAAeACAAagBiAH3CpIBAzguNpgBAKABAQ&sclient=gws-wiz

Note 6. https://www.fao.org/3/y9882e/y9882e15.htm

Note 7. https://en.wikipedia.org/wiki/Francis_of_Assisi

Note 8. https://www.history.com/topics/westward-expansion/gold-rush-of-1849

Note 9. https://www.history.com/topics/westward-expansion/manifest-destiny

Note 10. https://www.history.com/topics/native-american-history/wounded-knee

Note 11. Professor of Forest Ecology at the University of British Columbia, Canada.

Note 12. Microbiome (nih.gov)

Note 13. A layer of vegetation beneath the main canopy of a forest.

Note 14. Professor of Applied Science at Trinity College, CT.

Note 15. https://www.google.com/search?q=morphic+resonance+meaning&source=hp&ei=QmXLYfK-O66WwbkP6JasyAs&iflsig=ALs-wAMAAAAAYctzU9tFlVavIJmYPpr3Vf7F4BIAQbmt&oq=morphic+resonance+meaning&gs_lcp=Cgdnd3Mtd2l6EAEYADIFCAAQgAQyBggAEBYQHjIFCAAQhgMyBQgAEIYDOgsILhCABBCxAxCDAToOCC4QgAQQsQMQxwEQowI6CAgAEIAEELEDOgsIABCABBCxAxCDAToLCC4QsQMQxwEQowI6CAgAELEDEIMBOgsILhCABBDHARCjAjoICC4QgAQQsQM6CwguEIAEEMcBEK8BOg4ILhCABBCxAxDHARDRAzoKCAAQgAQQRhD5AToQCC4QsQMQsQMQxwEQ0QMQCjoKCAAQsQMQgwEQCjoHCAAQsQMQCjoLCC4QgAQQxwEQ0QM6BQguEIAEUABYxWVgh39oAHAAeACAAZkFiAHBF5IBCDE1LjkuNS0xmAEAoAEB&sclient=gws-wiz

Note 16. A large tree with smooth gray bark, glossy leaves, and hard, pale, fine-grained timber. Its fruit, the beechnut, is an important food for numerous wild birds and mammals. https://www.google.com/search?q=dictionary+meaning+of+beech&source=hp&ei=_JbMYbfNML6AqtsP__y6-As&iflsig=ALs-wAMAAAAAYcylDLMTAOVN0e4dSvccWx7iaBl8mTfd&ved=0ahUKEwi3u4vXwIn1AhU-gGoFHX--Dr8Q4dUDCAk&uact=5&oq=dictionary+meaning+of+beech&gs_lcp=Cgdnd3Mtd2l6EAMyBggAEBYQHjIGCAAQFhAeMgYIABAWEB4yBggAEBYQHjIGCAAQFhAeMgYIABAWEB4yBggAEBYQHjIGCAAQFhAeMgYIABAWEB4yBggAEBYQHjoOCC4QgAQQsQMQxwEQowI6CAgAEIAEELEDOgsILhCABBCxAxCDAToLCAAQgAQQsQMQgwE6CAguELEDEIMBOgUIABCABDoLCC4QsQMQxwEQowI6CAguEIAEELEDOgsILhCABBDHARDRAzoOCC4QgAQQsQMQxwEQ0QM6CwguEIAEEMcBEK8BOggIABCABBDJAzoFCAAQkgM6CAgAELEDEIMBOgUIABCxAzoECAAQCjoHCAAQgAQQCjoGCAAQBxAeOgQIABANOgYIABANEAo6CggAEAgQBxAKEB46CAgAEAgQBxAeOggIABAHEAUQHjoFCAAQhgM6BggAEA0QHjoECAAQHjoGCAAQBRAeOgYIABAIEB5QAFiegAJg7KICaABwAHgAgAGyAogBryqSAQgwLjI3LjIuMZgBAKABAQ&sclient=gws-wiz

Note 17. https://www.google.com/search?q=what+is+morphic+field+mean&source=hp&ei=_JbMYbfNML6AqtsP__y6-As&iflsig=ALs-wAMAAAAAYcylDLMTAOVN0e4dSvccWx7iaBl8mTfd&oq=what+is+morphic+field&gs_lcp=Cgdnd3Mtd2l6EAEYATIFCAAQgAQyBggAEBYQHjIGCAAQFhAeM

gYIABAWEB4yBQgAEIYDOg4ILhCPARDqAhCMAxDlAjoOCAAQjwEQ6gIQjAMQ5QI6EAgAEI8BEOoCEAoQjAMQ5QI6CwgAEIAEELEDEIMBOg4ILhCABBCxAxDHARCjAjoRCC4QgAQQsQMQgwEQxwEQowI6CAgAEIAEELEDOgsILhCABBDHARCjAjoOCC4QgAQQsQMQxwEQ0QM6CAgAELEDEIMBOgsILhCxAxDHARCjAjoLCC4QgAQQsQMQgwE6CAgAEIAEEMkDOgUIABCSAzoFCAAQsQM6BQguEIAEOggILhCABBCxAzoLCAAQgAQQsQMQyQM6BAgAEAo6BwgAELEDEAo6CAgAEBYQChAeUIYOWIVzYO3FAWgBcAB4AIABsQKIAe0dkgEIMC4xNy4zLjGYAQCgAQGwAQo&sclient=gws-wiz

Note 18. Marc D. Abrams, Ph.D., is the Nancy and John Steimer Professor of Agricultural sciences and a professor of forest ecology and physiology in the Department of Ecosystem Science and Management at Penn State University.

Note 19. https://content.ces.ncsu.edu/using-fire-to-improve-wildlife-habitat#:~:text=Burning%20reduces%20the%20thickness%20of,contain%20fewer%20chiggers%20and%20ticks

Note 20. Origin of the National Park Idea (U.S. National Park Service) (nps.gov)

Note 21. https://www.history.com/topics/us-government/national-park-service

Note 22. https://www.google.com/search?q=+transcendentalism+and+nature&ei=Df7vYeYsxYbBuQ_197qwAg&ved=0ahUKEwim54fyg831AhVFQzABHfW7DiYQ4dUDCA4&uact=5&oq=+transcendentalism+and+nature&gs_lcp=Cgdnd3Mtd2l6EAMyBQgAEIAEMgYIABAWEB4yBggAEBYQHjIGCAAQFhAeMgYIABAWEB4yBggAEBYQHjIGCAAQFhAeMgYIABAWEB4yBggAEBYQHjIGCAAQFhAeOgcIABBHELADOgcIABCwAxBDOggIABCABBCxAzoHCAAQsQMQQzoECAAQQzoMCAAQsQMQQxBGEPkBOgcIABCABBAKOgUILhCABDoICAAQFhAKEB5KBAhBGABKBAhGGABQtAtYu1Rg3GRoAXACeACAAWmIAYQJkgEEMTEuMpgBAKABAcgBCsABAQ&sclient=gws-wiz

Note 23. This author wrote an unpublished conference paper in 1999 from which this information was taken. Unfortunately, the reference section of that paper is missing. We have made a lot of effort to identify the source of this material, but perhaps the reason for this lack success seems to be that the book is out of print.

Note 24. Foreword by Char Miller.

Note 25. W. M. Keck Professor of Environmental Analysis at Pomona College, Claremont, CA.

Note 26. Includes Turkey, Egypt, and the Sinai Peninsula.

Note 27. https://www.merriam-webster.com/dictionary/wilderness