

Chapter 3

Spiritual and Religious Perspectives of Creation and Scientific Understanding of Nature

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We have come to recognize that human society is on a path that degrades and threatens the integrity of the biosphere. Scientific understandings of nature and nature's degradation have not been sufficient to correct our course; neither has the ethical and moral compass of religion. Consequently, many scientific and religious leaders have advocated that science and religion work together in complementary fashion to address our environmental situation. This raises two basic questions: (1) Do spiritual and religious perspectives of creation complement scientific understandings of nature? and, assuming a positive answer to the first question, (2) Does a partnership of religion and science hold promise for the integrity of the biosphere?

In seeking answers, we can reasonably invoke Aldo Leopold, the scientist who has extended ethics to embrace the environment in his essay, *The Land Ethic*. Moreover, since he also had good knowledge of the Bible, his thought is a particularly appropriate place to begin. In his well-known essay, "The Land Ethic," Aldo Leopold he writes, "An ethic, ecologically, is a limitation on freedom of action in the struggle for existence."¹ "Killing whomever gets in the way of human ambition is constrained by conventions or commandments such as "Thou shalt not kill." Noting that the biblical Ten Commandments applied to the personal and individual level, Leopold sought an ethic that extended to land and its biotic communities. Knowing that land was incorporated in the ethics of the biblical prophets, Ezekiel and Isaiah, and informed by his Bible study as a student at Yale University and afterwards, he could write, "Individual thinkers since the days of Ezekiel and Isaiah have asserted that the despoliation of land is not only inexpedient but wrong."²

Leopold declared the biblical prophets Ezekiel "a woodsman and an artist," Isaiah "the Roosevelt of the Holy Land," and Joel "the preacher of conservation of watersheds." Job he labelled "the John Muir of Judah." Each had vital ecological understanding coupled with an ethical commitment to the rightness of preserving creation. Their ecological understanding and ethical understanding were complementary, one mutually fulfilling and completing the other.³

Complement means "to make whole, to fulfill, to complete." A *complement* is "something which, when added, completes or makes up a whole—each of two parts which mutually complete each other or supply each other's deficiencies." As a verb, *complement* means "to make complete or perfect, to supply what is wanting."⁴ From the perspective of Leopold, Roosevelt, Muir and the biblical prophets, ecological knowledge (science) is incomplete unless joined with knowledge of what ought to be. Mirroring the land-ethics connection of the prophets, Leopold re-ligates what had been joined before—science and ethics.

Prophets, then and now, expose and describe environmental degradation, and they call upon its perpetrators to mend their ways. Today, most prophets are scientists, who “more than any other single segment of general public today...more, even than most mainline preachers” are telling us that “...our world is in critical shape and that the human element is chiefly to blame for it.”⁵ Exposing and describing the way things are, challenged by cross-fire of intended confusion and mis-information, these scientists are looking for ethical partners. And recently, they have joined key religious leaders to make their appeal.

The Joint Appeal by Religion and Science for the Environment

In their “Joint Appeal by Religion and Science for the Environment” made in Washington D.C. on May 12, 1992, scientists and religious leaders announced:

We are people of faith and of science who, for centuries, often have traveled different roads. In a time of environmental crisis, we find these roads converging. As this meeting symbolizes, our two ancient, sometimes antagonistic, traditions now reach out to one another in a common endeavor to preserve the home we share. ...

We humans are endowed with self-awareness, intelligence and compassion. At our best, we cherish and seek to protect all life and the treasures of the natural world. But we are now tampering with the climate. We are thinning the ozone layer and creating holes in it. We are poisoning the air, the land and the water. We are destroying the forests, grasslands and other ecosystems. We are causing the extinction of species at a pace not seen since the end of the age of the dinosaurs...

We believe that science and religion, working together, have an essential contribution to make toward any significant mitigation and resolution of the world environmental crisis. What good are the most fervent moral imperatives if we do not understand the dangers and how to avoid them? What good is all the data in the world without a steadfast moral compass?...

...Insofar as our peril arises from a neglect of moral values, human pride, arrogance, inattention, greed, improvidence, and a penchant for the short-term over the long, religion has an essential role to play. Insofar as our peril arises from our ignorance of the intricate interconnectedness of nature, science has an essential role to play. ...

...We believe that the dimensions of this crisis are still not sufficiently taken to heart by our leaders, institutions and industries. We accept our responsibility to help make known to the millions we serve and teach the nature and consequences of the environmental crisis, and what is required to overcome it.⁶

This Joint Appeal urges reconnection of the break between science and religion’s “moral compass,” advocates preservation of our biospheric home, finds it necessary for people of

science and religion jointly to address the environmental crisis, and appeals to people to live rightly and responsibly, to cherish and protect all life and natural treasures and to spread the word.

The Importance of Religion

Their Appeal sees religion, lately perceived as the cause of the environmental crisis,⁷ is necessary for its solution. "For most of my adult life I believed, as many environmentalists do, that religion was the primary cause of ecological crisis..." writes environmental philosopher Max Oelschlaeger. But, "I lost that faith by bits and pieces... My conjecture is this: There are no solutions for the systemic causes of ecocrisis, at least in democratic societies, apart from religious narrative."⁸ A similar strain is echoed by Sierra Club Director, Carl Pope, "Many of us have inherited and uncritically accepted the 19th century idea that religion could be discarded because it had been superceded by science. We failed to realize—as some eminent scientists now tell us—that science and religion offer two distinct approaches to knowledge, and that neither has a monopoly on the truth." Pope says pungently, "We acted as if we could save life on Earth without the same institutions through which we save ourselves... it is time to recognize our allies in the faith community." Recognizing integration of the ethical, spiritual, and scientific in Sierra's creator, he commends his readers to the "frankly spiritual writing of our founder John Muir."⁹ Earlier, Max Planck wrote, "Human beings need science in order to know; religion in order to act," and that "Beliefs about the universe can as little take the place of knowledge and skills as the solution of ethical problems can be achieved through pure intellectual knowledge."¹⁰ Religious ethics and science are reciprocally fulfilling; one does not substitute for the other.

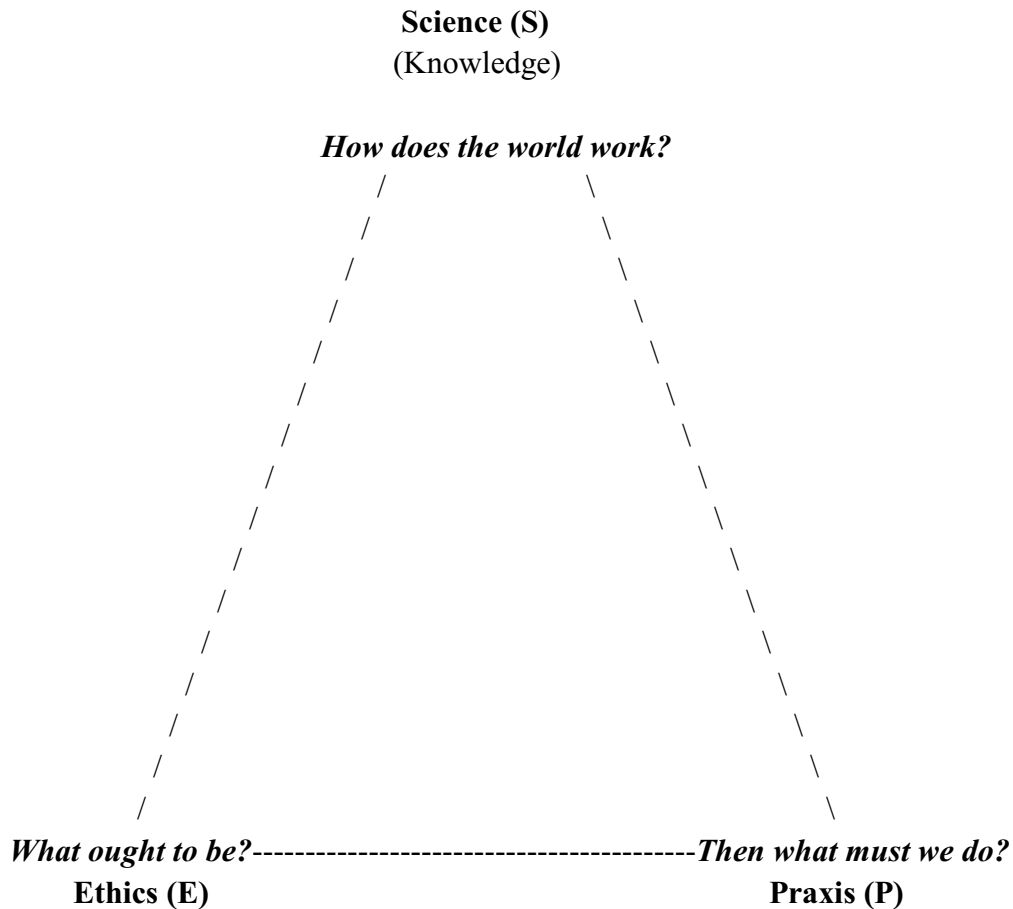
Religion and Re-Ligation

Wayne C. Booth defines religion as follows:

Religion is the passion, or the desire, both to live right—not just to live but to live *right*—and to *spread* right living, both desires *conceived as responses* to some sort of cosmic demand—that is, to a demand made to us by the *way things are*, by the way the world is, by the nature of Nature (as some would say) or by God himself (as explicitly religious people put it).¹¹

Within this definition of religion is complementarity of the kind we are evaluating. The desire to live right and spread right living requires an understanding of what ought to be (ethics), while to know the way things are requires knowledge (science). *Within* religion, therefore, we have the necessity both for science *and* ethics, one completing the other to enable right action in the world (praxis).

Science, broadly defined to include all knowledge, linked with ethics and praxis can be related in a "science-ethics-praxis triad." This triad, and the principal question each of its corners addresses, follows:



Science, ethics, and praxis are connected here with three ligaments. When any ligament is degraded or torn, one or all corners are freed from the constraints and contributions of the others, with consequent problems: Science without ethics may produce praxis that degrades human-environment relationships and weapons of destruction and impoverished genetic diversity. Ethics disconnected from science may bring removal of dead wood and other signs of death from forests at the expense of soil-building, may unwisely use pesticides to erase evidences of “The Fall.” Praxis separated from science and ethics (just doing something!) may find cities put onto river flood plains, houses built on geological fault lines. All three need to be connected. And ideally, each should be complementary to the others. And this brings us to our question.

Do Spiritual and Religious Perspectives of Creation Complement Scientific Understandings of Nature?

Recalling our definition of *complement*, we ask, “Do scientific understandings of nature complement ethical imperatives derived from spiritual and religious perspectives of creation?” There are at least four routes for evaluating such complementary: (1) Individual scientists who adhere to a religious perspective; (2) definitions of “religion”; (3) etymology of “religion”; and (4) scriptural teachings within the Judeo-Christian-Islamic tradition.

Routes to Finding Complementarity between Science and Religion

1. Complementarity in Individual Scientists. A potent source for answering our question are the scientists who profess a particular religious belief. Their scientific and religious confession can be found in various books, such as *Ecology and Religion: Scientists Speak, Professors Who Believe*, and *Real Science, Real Faith*¹². Here are examples of scientific and religious communities joining together within individual people. Complementarity can and does exist for science and religion at the level of individual people.

2. Complementarity within Definitions of Religion. In seeking complementarity, we also can look at definitions of religion, such as this restatement of the definition by Wayne C. Booth:

Religion is the passion or desire both to live *right* and to *spread right* living as desires *conceived as responses* to some sort of cosmic demand made to us by the *way things are*, by the nature of Nature, or by God who orders Creation and holds all things together with integrity.

Either this or the Booth's original has complementarity built into it. Living rightly according to the way things are—in response to the nature of nature—requires complementarity. If religion is the passion to live rightly with respect to nature, or with respect to God who orders creation, then it must complement a scientific understanding of nature.¹³

3. Complementarity in the Etymology of “Religion.” Although Cicero connected the word *religion* with *religere* (to read over), later authors connected “religion” with *religare* (to bind or to religate). The latter etymology was chosen by subsequent writers. Closely related words are *ligate* to tie with a ligature, and *ligature* something that is used to bind, or the action of binding or tying. Also related are *religate* (to bind up or back) and *religation* (the action of tying up)¹⁴. This means that whenever religion, science, and ethics are ligated and re-ligated that they must of necessity be complementary.

4. Complementary in Religions and Religious Texts. In taking this fourth route we need first to recognize the wide array of religions and to respect the differences among them that are vital to their own worth and worship. Yet, all share in the human habitation of the biosphere, in environmental use and degradation, and concern for environmental degradation and caring for creation. Their shared commitment is indicated by The Assisi Declarations, which tell us that:

- "destruction of the environment and the life depending upon it is a result of ignorance, greed and disregard for the richness of all living things" (Buddhist);
- we should "declare our determination to halt the present slide towards destruction, to rediscover the ancient tradition of reverence for all life" (Hindu);
- "now, when the whole world is in peril, when the environment is in danger of being poisoned and various species, both plant and animal, are becoming extinct, it is our... responsibility to put the defense of nature at the very center of our concern" (Jewish);
- We "repudiate all ill-considered exploitation of nature which threatens to destroy it" (Christian); and

● people as God's trustees "are responsible for maintaining the unity of His creation, the integrity of the Earth, its flora and fauna, its wildlife and natural environment" (Muslim)¹⁵.

And by the statements of the Alliance for Religion and Conservation, which tell us that:

- “the grandeur and diversity of the natural world are purposeful reflections of the majesty and bounty of God” (Baha’i);
- “all life is inter-related” and believers “are called to show compassion to every living thing” (Buddhist);
- “Conserve ecology or perish” is the the Bhagavad Gita’s injunction (Hindu);
- avoiding “violence towards all of nature” is a fundamental doctrine resulting in “reverence for all life in all forms” and leading to “compassion for all living beings” (Jainism);
- “the purpose of humanity is to serve the world and to protect all of creation” (Sikh);
- “Humanity follows the Earth, the Earth follows Heaven, Heaven follows the Tao, and the Tao follows what it natural” (Taoism);
- “the world belongs to God and humanity has a place as leader and custodian of the natural world, responsible to God” (Judaism);
- God’s creating and sustaining the Earth motivates people “to properly care for the land” (Christian); and,
- humanity's role is “Trustee of God, on earth”—people “are entrusted by God with its safekeeping” (Muslim).¹⁶

Each of these religions show complementarity with science in the sense that they recognize creation’s order and integrity, are committed to addressing human arrogance, ignorance and greed, and are dedicated to protecting and caring for creation. “The person who speaks for the life of the Spirit today cannot remain indifferent to the destruction of that primordial cathedral which is virgin in nature, nor maintain silence concerning the harm human beings do to themselves as immortal beings by absolutizing the ‘kingdom of man’ and as a consequence brutalizing and destroying everything else in nature in the name of the earthly welfare of members of that kingdom.”¹⁷ The complementarity of these and other religions can perhaps be summed up in believing people should be “walking in beauty,” as the Navajo put it.¹⁸ However, as these basic statements indicate, we may not create the fiction that all these religions are one without doing them a disservice, and we cannot cover each one of them individually.

Some religions encourage or require withdrawal from wider human society, requiring simpler or monastic living that is less manipulative of the environment, thereby achieving a kind of benign harmony in the creation. Others engage with the goings-on of the wider world and society, requiring more manipulation of their environment, and thereby find it necessary to constrain behavior that otherwise might be destructive. The religions of Judaism, Christianity, and Islam are generally of the latter type. And, understandably, they also have strong connections with the origins and history of science and technology. All three are Abrahamic monotheistic religions and hold the Bible in high regard among their textual material. Their adherents—the “People of the Book”—share the Judeo-Christian-Islamic Tradition¹⁹. For the purposes of this paper, the scope will be limited to the People of the Book, and more specifically, to the Bible.

Complementarity of Persistent Qualities

Taking the Bible first with a rather grand sweep, historian of science, Colin Russell in his book, *The Earth, Humanity and God*, concludes that its persistent qualities are in concord with current science: (1) It perceives Earth and the heavens as unified within the same universe under their Creator; (2) It affirms consistent and lawful operation of the Earth and universe; and (3) It puts Earth in its place within the universe (e. g., as God's footstool)²⁰.

Eight Biblical Ethics

At a more specific level, there is need to examine particular teachings, and it is appropriate again to have Aldo Leopold, open the Book for us²¹. In “his essay, “ The forestry of the prophets” he cites Ezekiel 34:18²² in which the prophet asks:

“Is it not enough for you to feed on the green pastures? Must you also trample them with your feet? Is it not enough for you to drink the pure water? Must you also muddy it with your feet?”

And also Isaiah, who prophesies:

“Woe to them that join house to house, and add field to field, that they may take away something of their neighbour’s...”

Leopold’s opening is an invitation to numerous biblical ethical teachings on human dealings with creatures and creation. Among these are eight basic ethics: four on the economy of the biosphere and four on the economy of human behavior.

A. Economy of the Biosphere:²³ Four Basic Ecological Ethics

1. Earthkeeping Principle: As the Creator's keeps and sustains us, so must we keep and sustain the Creator's Creation.
2. Fruitfulness Principle: We must assure flourishing of the biosphere.
3. Sabbath Principle: We must not relentlessly press creatures and ecosystems.
4. Fulfilment and Limits Principle: We must provide for Earth’s fulfillment in biodiversity and abundant life, within Earth’s finite limits.

B. Economy of Human Behavior: Four Basic Human Behavioral Ethics

5. Sabbath Buffer Principle: We must not press the biosphere’s absolute limits.
6. Contentment Principle: We must seek contentment, not material accumulation.
7. Priority Principle: We must seek first biospheric integrity rather than self-interest.
8. Praxis Principle: We must not fail to act on what we know is right²⁴.

These appear to be complementary to corresponding scientific knowledge.²⁵ I have selected three of these for elaboration here: the Earthkeeping Ethic, Fruitfulness Ethic, and the Sabbath Ethic,

and have added a fourth: the Con-Service Ethic. Each is presented with references to specific books of the Bible (Genesis, Exodus, Leviticus, Numbers, Deuteronomy, Psalms, Isaiah, Ezekiel, John, Colossians, etc.) and specific chapters set off from specific verses by a colon.

Earthkeeping Ethic

The earthkeeping ethic is derived from Genesis 2:15 where God expects Adam to *keep* the garden. The Hebrew word translated as *keep* is *shamar*,” and merits careful attention. It also appears in the blessing of Aaron (Num. 6:24): "The Lord bless you and *keep* you." This does not look for a preservationist keeping as would *natsar*, but a full dynamic keeping. Both *natsar* and *shamar* are applied to keeping the Law, which must both be preserved and kept. And given the availability of both words, it is significant that *shamar* is used for keeping people and keeping the garden. For people, it expects that God’s keeping will nurture human life-staining and life-fulfilling relationships with vibrant wholeness and dynamic integrity—social relationships with parents, mates, children, siblings, and neighbors. For the garden, it expects that human keeping of the garden will respect and nurture life-sustaining and life-fulfilling ecological relationships with and among land, air, water, and other creatures, imaging God’s love for the world.

As in “peoplekeeping” so in “earthkeeping.” Earthkeeping maintains and assures dynamic vitality, energy and beauty of the garden and its creatures. Informed by science, we know that such keeping involves fine balancing between constructive and destructive processes. In people and other vertebrates it includes the dynamic re-formation of the skeletal system of dynamic creatures in a dynamic world. Osteoblasts build up bone where needed as osteoclasts tear it down where superfluous, in a controlled and finely-tuned process that maintains a strong skeletal system responsive to needs of a changing body under changing stresses. In nature this includes dynamic re-formation of living systems from previously living systems in a dynamic biosphere. Photosynthesis builds up material and energetic resources energized by the sun while respiration and decomposition processes break down dead materials to energize and perpetuate species and ecosystems, controlled by constraints of material and energy budgets that sustains life as a flowing stream of biotic intricacy, complexity and biodiversity.

When people *keep* the garden and creation they do so in this deep, full, and dynamic sense. Reflecting God’s keeping of them, they profess and confess in deeds and actions that creatures under their care must be kept with dynamic integrity. They must be preserved, maintained and enabled to maintain proper connections with members of their own kind and with many other creatures with whom they interact—the soil, and with the air and water upon which they depend for life and fruitfulness. They must be maintained, in ways complementary to our scientific understanding of the world, within the trophic cycles of life and death—within the trophic energy and material transfers upon which the life of the biosphere depends.

We must keep and sustain God’s creation as God keeps and sustains us.

Fruitfulness Ethic

The fish of the sea are accorded God's blessing of fruitfulness. So are the birds and other living creatures. "Let the water teem with living creatures, and let birds fly above the earth across the expanse of the sky," (Gen. 1:20) and "Be fruitful and increase in number and fill the water in the seas, and let the birds increase on the earth." (Gen. 1:22). This blessing is also given to, Creation's caregivers, as next we read in Genesis 1:28.

God's Creation reflects God's fruitful work of giving to land and life what satisfies, as Psalm 104 proclaims:

He makes springs pour water into the ravines;
it flows between the mountains.
They give water to all the beasts of the field;
the wild donkeys quench their thirst.
The birds of the air nest by the waters;
they sing among its branches.
He waters the mountains from his upper chambers;
the earth is satisfied by the fruit of his work. (Psalm 104: 10-13)

As God's fruitful work brings fruit to Creation, so should people. Imaging God, people should also provide for the creatures. And as Noah spared no time, expense or reputation when God's creatures were threatened with extinction, (Gen. 6-9) neither should we. Countering "development" at the expense of other creatures, our knowledge of human behavior and population provide a base for the proclamation of the prophet Isaiah: "Woe to you who add house to house and join field to field till no space is left and you live alone in the land" (Isaiah 5:8).

The Jewish teaching of *bal taschit*—Hebrew words that mean "do not destroy!" is an expression of the Fruitfulness Ethic: "When you lay siege to a city, you must not destroy the fruit trees" (Deut. 19:19-20). People may take of the fruit of creation, but using our knowledge of requirements for maintaining the lineages of species, we must not destroy creation's fruitfulness. And, "When you come across a mother bird on its nest with young, you may take the young but not the mother" (Deut. 22:6-7), and thus, while we might never take birds, if we do so, we must not destroy the ability of the bird to produce more offspring; we must preserve its fruitfulness.²⁶

Speaking strongly to the Fruitfulness Ethic are parallel passages in the Psalms and Ezekiel. In Psalm 23:

He maketh me to lie down in green pastures;
He leadeth me beside the still waters;
He restoreth my soul.

And this divine provision for contented living and peaceful fulfillment is paralleled with the Ezekiel passage quoted by Leopold (Ezek.34:18):

Is it not enough for you to feed on the green pastures?
Must you also trample them with your feet?
Is it not enough for you to drink the pure water?
Must you also muddy it with your feet?

In using the gifts of creation human beings are restored and satisfied. But we are admonished not to make a mess of them—people are not to go beyond grateful and reasonable use of them. And, after the example of Noah, must keep creation's biodiversity and the biosphere, with all of their dynamic integrity.

We should enjoy, but must not destroy, Creation's fruitfulness.

Sabbath Ethic

Exodus 20 and Deuteronomy 5 require that one day in seven be set reserved for rest by people and animals. The biblical reason is that God also rested after making the heavens and the earth, and as human beings and animals are to be given their times of sabbath rest, so is the land. Exodus 23 commands, "For six years you shall sow your land and gather in its yield; but the seventh year you shall let it rest and lie fallow..." And "You may ask, 'What will we eat in the seventh year if we do not plant or harvest our crops?'" to which God answers in Leviticus 25 and 26: "I will send you such a blessing in the sixth year that the land will yield enough for three years," so do not worry, but practice this law so that your land will be *fruitful*. "If you follow my decrees and are careful to obey my commands, I will send you rain in its season, and the ground will yield its crops and the trees of the field their fruit"

More than a legal requirement, the Sabbath Ethic is a principial one. In Mark 2:27, Jesus describes the meaning of the Sabbath in terms of its beneficiaries; the Sabbath is for the ones served by it. Thus, observance of the sabbath year protects land from relentless use. By rest it rejuvenates itself and gets things together again. The sabbath land ethic prevents all creatures and the biosphere from being relentlessly pressed. Failure to observe divine commands results in depopulation of degraded land, and, no longer inhabited by people "...the land will rest and enjoy its sabbaths. All the time that it lies desolate, the land will have the rest it did not have during the sabbaths you lived in it."

We must provide for Creation's Sabbath rests.

Con-Service Ethic

Beyond recognizing the full meaning of *shamar* in Genesis 2:15 it is helpful to attend to the word, *'abad*, that proceeds it. In Young's Literal Translation of the Holy Bible²⁷ it is rendered, "And Jehovah God taketh the man and causeth him to rest in the garden of Eden, to *serve* it and to keep it." It is also used in the book of Joshua, "...choose for yourselves this day whom you will *serve*... But as for me and my household, we will *serve* the Lord."²⁸ While serving the garden or creation might have a peculiar ring to it, we should consider its meaning for Eden, a garden

planted by God²⁹ where hoe, shovel, and plow might have simply been out of place. Eden could be more like gardens of some tropical peoples where interplanting and high diversity are the rule. It might best be viewed as not amenable to turning over the ground but still open to service.

In Christian teaching, the human role as servant is widely taught; even Jesus is described as someone who took the form of a servant. The biblical expectation is that human work in the garden is an act of service. Clearly, not only do we serve the garden but also serves us and other creatures. Creation’s service is returned with our service to creation.. One reciprocally serves the other. When supplied with the prefix, *con-*, *service* becomes *con-service*. People are expected ethically to be about the business of con-servancy. While the reciprocal relation between people and the garden can be service, it also can take the form of human abuse and creation's retribution. Intended and unintended abuse of creation can have severe consequences. When people fail to serve, but abuse creation, they have reason to expect a reciprocal in-kind payment.

When dominion is seen as license to serve one’s self-interest, it is a misappropriation of the image of God, and in Christianity, a failure to follow the example of Jesus. Key to proper service always is to consider our service as Christ's service. Our service should reflect God's love for the world.³⁰ Responsible reflection of God’s love seeks not itself, but the Kingdom of God. Responsible imaging of God's love and law reflects God's goodness, righteousness and holiness. It employs intellectual powers, natural affections, and moral freedom to reflect the wisdom, love, and justice of God. It expresses the depths of one's soul in responsible praxis.

We must con-serve Creation.

Ethics - Science Complementarity

These four biblical ethics can be examined for complementarity:

	Ethic	Science
Earthkeeping	● We must keep the Earth and biosphere with their dynamic integrity.	● The integrity of Earth and the biosphere can be and is degraded by human action.
Fruitfulness	● We must behave in ways that assure continued fruitfulness and biodiversity.	● Biodiversity and the flourishing of life can be diminished and degraded by human action.
Sabbath	● We must provide creatures and creation with times for restoration and regeneration.	● Relentless exploitation of Earth and the biosphere can work against their sustainability.
Con-Service	● We must return service we derive from the Earth and its creatures with our own.	● Continuous taking from Earth and the biosphere degrades and tends to deplete it.

These four ethics complement our scientific understanding of the natural world, with science describing the world and the consequences of human action in the world and biblical

ethics describing what human beings ought to be doing in the world. However, complementarity has little significance if the ligaments are broken. And broken ligaments pose problems.

Linkage of the kind advocated by the Joint Appeal is necessary for achieving complementary contributions of ethics and science. Such linkage does not equate science and ethics; rather, it recognizes the distinct contribution of each. The re-ligation respects the language and role of each, and in partnership provides a basis for acting upon what we know and believe. But how to re-ligate both of these with praxis? That is the problem we ultimately must squarely face.

Complementary Praxis

I began by noting that scientific knowledge of the nature and causes of environmental degradation does not necessarily bring corrective action; neither do ethical imperatives of religion. Thus, in the context of knowing the desire expressed in the Joint Appeal for religion and science to work together for the environment, we looked for complementarity between religion and science. In seeking ethical teachings from religion and scientific understandings that mutually complete each other—that supply each other’s deficiencies—we have positive findings. We now need to ask whether science and religion, working together in complementary fashion, can bring corrective action to our environmental situation, and more specifically, whether our praxis complements our scientific and ethical understandings of nature and creation. Since religion and science have been operating with long-standing complementarity (without much cooperation), we can ask if there is clear evidence that our science and ethics are working for the good of nature and creation. Unfortunately, the answer is not an unequivocal “yes.”

Here is what we see through the eyes of two twentieth century witnesses, Aldo Leopold for the first half-century and Tony Ends for the second: Aldo Leopold, in his unpublished 1947 Forward to *Great Possessions*, a manuscript precursor to *A Sand County Almanac*, observed:

During my lifetime, more land has been destroyed or damaged than ever before in recorded history. ...concurrent growth in knowledge of land, good intentions toward land, and abuse of land presents a paradox that baffles me, as it does many another thinking citizen. Science ought to work the other way, but it doesn't. Why?³¹

And Tony Ends, Director of the Michael Fields Institute, writes for the second half of the 20th Century, “I ask you to reflect with me about what I have witnessed in my lifetime... There were 89,000 more farmers on the land in Illinois when I was 4 years old. There were trees and flowering shrubs along many of the roadsides. There were small orchards, berry patches and vegetable gardens in the farmyards. There was livestock visible in the pastures... Almost every vestige of that world has been swept away with those 89,000 farms and with them a rich culture, healthy communities and vibrant rural economies. Most of the barnyards that remain are silent, empty islands in oceans of bare ground, crop residue or stubble, which lap up against the very sides of dilapidated buildings. How can we live our faith in such a setting, knowing what our created world and its nurturing, spiritual qualities looked like such a short time ago?”³²

We human beings know much about what environmental integrity means and believe it ought to be maintained; yet we degrade the Earth. “The biblical description of this problem is, “what I do is not the good I want to do; no, the evil I do not want to do—this I keep on doing” (Romans 7:19). “I discover this principle then: that when I want to do right, only wrong is within my reach. In my inmost self I delight in the law of God, but I perceive in my outward actions a different law, fighting against the law that my mind approves...³³“ This problem is “ the human predicament.”³⁴

“Science ought to work the other way, but it doesn't. Why?” asked Leopold. He answered this in part with his essay, “The Land Ethic.” We respect, appreciate and honor his work. The Land Ethic is a wonderful contribution, and it has had some wonderful impacts, but, by and large, the degradation described by Aldo Leopold and Tony Ends has continued. Now, more than 50 years later, we ask a question parallel with Leopold’s, “Ethics should work the other way, but it doesn't. Why?” Its connections with science and praxis are broken. When the praxis connections—the ligaments connecting praxis to science and ethics—are degraded or torn, praxis is freed from the constraints and benefits of science and ethics. But praxis needs to be connected with science and ethics in complementary fashion. Praxis needs to be informed, shaped, and constrained by science and ethics.

Arrogance, Ignorance, and Greed

In searching for the causes for this disconnect, I ask each of my 42 Environmental Science students at the University of Wisconsin to identify the most serious environmental problems. Next, they work in six groups to discover the underlying causes for all these problems. Over the years, the most frequently identified causes are human arrogance, ignorance, and greed³⁵. Environmental crises are accompanied often by an arrogance that elevates our immediate exploitative capabilities while neglecting and obscuring the long-standing natural processes that have brought us present benefits; we are quick to say that we know and to act upon it as though the world may have a life not much longer than our own. Our ecologic crises often are accompanied by ignorance—an ignorance that eschews understanding of both the short-term and long-term effects of our actions; we prefer it seems to act before we understand the consequences of our actions; and we might even work to preserve ignorance of Earth's sustaining ecosystems and of the effects of human actions on Earth's integrity. And our greed brings our society to convert long-standing components of the biosphere into short-term personal or corporate gain even when superseding the long-term interests of a sustainable biosphere and continued integrity of Earth. Unchecked by scientific knowledge of nature and ethical understanding, we might hunt whales to total annihilation, destroying entire species and prospects for whaling in the future.

Greed is the term we apply to (1) seeking first our own gain; (2) adapting our belief systems to self-interest; and (3) cultivating a mind-set that emphasizes winning over against participating. My students' findings are informed by Lynton K. Caldwell: "The environmental crisis is an outward manifestation of a crisis of mind and spirit. There could be no greater

misconception of its meaning than to believe it to be concerned only with endangered wildlife, human-made ugliness, and pollution. These are part of it, but more importantly, the crisis is concerned with the kind of creatures we are and what we must become in order to survive.”³⁶

“The kind of creatures we are” is a principal focus of religion. “If we consider human behavior to be the product of evolution and that our actions are influenced by genes and are at least in part “hardwired,” doesn’t this suggest that unpleasant aspects of human behavior such as aggression and violence cannot easily be modified?”³⁷ “Seek first yourself—preserve and transmit your own genes”—would seem to be our evolutionary heritage. But religion counters this selfishness, as Mahatma Gandhi reminded us in his talk to the Economic Society at Allahabad University, India in 1916. He told his audience he had read the most basic book on economics. Identifying this book as the New Testament, Gandhi paraphrased Matthew 6:33, “Let us seek first the Kingdom of God and His righteousness and the irrevocable promise is that everything will be added to us.” And, countering an economics that puts self-interest as a principal presupposition, he concluded, “These are real economics. May you and I treasure them and enforce them in our daily lives.”³⁸

The context of this “biospheric” (or “ecumenical”) economics is the Sermon on the Mount (Matthew 5-7) in which “one is free to leave one’s best interest in God’s hands and to respond to others out of love rather than self-interest.”³⁹ “Seeking the Kingdom of God is first:

“After this manner therefore pray ye: Our Father which art in heaven, Hallowed be thy name. Thy kingdom come. Thy will be done on earth... Lay not up for yourselves treasures upon earth... For where your treasure is, there will your heart be also... Ye cannot serve God and mammon... Consider the lilies of the field, how they grow; they toil not, neither do they spin: and yet I say unto you, that even Solomon in all his glory was not arrayed like one of these... But seek ye first the kingdom of God, and his righteousness; and all these things shall be added unto you.”⁴⁰

Addressing the Human Predicament

How do we who participate in Creation’s degradation come to grips with the human predicament? John Maynard Keynes proposed in 1930 that we address it by harnessing greed to achieve the good:

I see us free, therefore, to return to some of the most sure and certain principles of religion and traditional virtue-- that avarice is a vice, that the extraction of usury is a misdemeanor, and the love of money is detestable, that those who walk most truly in the paths of virtue and sane wisdom who take least thought for the morrow. We shall once more value ends above means and prefer the good to the useful. We shall honour those who can teach us how to pluck the hour and the day virtuously and well, the delightful people who are capable of taking direct enjoyment in things, the lilies of the field who toil not, neither do they spin.”⁴¹

“But beware!” warns Keynes, “The time for all this is not yet. For at least another hundred years we must pretend to ourselves and every one that fair is foul and foul is fair; for foul itself is useful and fair is not. Avarice and usury and precaution must be our gods for a little longer still. For only they can lead us out of the tunnel of economic necessity into daylight”⁴². And perhaps never, added former presidential economic advisor, Charles Schultz in 1977: “Market arrangements not only minimize the need for coercion as a means of social organization, they also reduce the need for compassion, patriotism, brotherly love, and cultural solidarity as motivating forces behind social improvement”⁴³

Now, the better part of a century after Keynes we are finding that harnessing greed to achieve the good is degrading the good in nature and humanity. Nature and humanity have been converted into natural and human resources, reduced to land, labor, and capital.

Keynes wrote that someday we shall honor “the delightful people who are capable of taking direct enjoyment in... the lilies of the field who toil not, neither do they spin!” But, as pointed out by theologian Joseph Sittler in his “Ecological Commitment as Theological Responsibility,” examination of this text shows that this is not the focus of the religious invitation:

“When the New Testament... reports Jesus as saying, ‘Behold the lilies of the field’ (Matt.6:28), one is precisely *not* saying, ‘Look at those lilies!’ The word ‘behold’ lies upon that which is beheld in a kind of tenderness which suggests that things in themselves have their own wondrous authenticity and integrity... To behold means to stand among things with a kind of reverence for life which does not walk through the world of the nonself with one’s arrogant hat on... it is... a rhetorical acknowledgement of a fundamental ecological understanding of man whose father is God but whose sibling is the whole Creation... we must somehow bring under question the notion that man... is so set apart from the rest of God’s Creation that he can deal with it with Olympian arrogance as if it had no selfhood of its own by virtue of the Creation.” So wrote⁴⁴

The arrogation of the biospheric economy by the monetary economy that puts self-interest as a principal presupposition is the latest manifestation of the human predicament.

And so we again ask, How do we who participate in Creation’s degradation come to grips with the human predicament? The good in nature and humanity must be freed.

The ancients understood the cosmos to be ordered and that human beings affirm this in ordered lives and land. These people learned what was consistent with the establishment and maintenance of order, and wanting to act within the unity and harmony of the universe, behaved accordingly. Their learning reached dramatic proportions in the eighteenth and nineteenth centuries in response to environmental degradation that began to appear on a regional and continental scale. However, as Clarence Glacken notes, large scale emergence of environmental degradation also posed a serious threat to the concept of stewardship. Moreover, instrumental and mechanical views of the world shook the foundations of stewardship, as did the emergence of a

new economy designed to work outside of creation's economy. Defining both creation and people as resources, this economy set aside creation as a respected model of cosmic order. Moreover, *creation* was joined with its derivative, *creationism*, a concept that had nothing to do with responding ethically to the way the world is but instead relating to Earth's foundations and origin. *Creation*, strongly associated with *creationism*, joined a world that invented the words *environing* and *environment*. The first of these, coined by Chaucer, led to the second that provided a prerequisite for separating people from "the environment." And Adam Smith abstracted creation's enormous complexity and overwhelming biodiversity and its dynamic fluxes and flows, converting all of this into a mere three categories: land, labor, and capital. Creation was sequestered, creation's economy was supplanted, and creation was converted to resources squeezed into three abstractions. Stewardship was reduced to giving money in church. The practice of creation-stewardship largely evaporated, both in word and deed.

In recent decades, the stewardship concept is re-emerging, perhaps out of necessity for addressing our biospheric problems. John Maynard Keynes proposed in 1930 that we address it by harnessing greed to achieve the good: Science by itself cannot overcome it; neither can ethics, and even science in partnership with ethics will not.

The arrogation of the biospheric economy by a monetary economy with self-interest as its principal presupposition is the latest manifestation of the human predicament. Religions address self-interested arrogation by instilling reverence for life in its wondrous authenticity and integrity. But more than this, religions have the capacity to address the human predicament. Religious responses to the problem of human society's walking a path we do not wish to take toward degradation of creation and the biosphere are available to us. These responses can repair the broken connections among science, ethics, and praxis and going beyond this, can also set the path of human society toward personal and biospheric integrity. Assisting in this work are scientists bold enough to describe the way things are; journalists, writers, editors and publishers daring enough to describe the human predicament as revealed in the present; ethicists forthright enough to engage in pursuit of what ought to be; builders, engineers, economists, designers, planners, and managers disciplined enough to confine their work within the bounds of what ought to be in nature and creation; and religious leaders committed enough to practice what they preach. Religion in all its fulness, as the binding together of science, ethics, and praxis,⁴⁵ can thus nurture the passion both to live *right* and to *spread* right living in response to the cosmic demand made to us by the *way things are*,⁴⁶ by the nature of nature, and by God who orders creation and holds all things together with integrity.⁴⁷

Endnotes⁴⁸

1. A. Leopold, "The Land Ethic," in *A Sand County Almanac and Sketches Here and There* (New York: Oxford University Press, 1949), 202.
2. Ibid., 203.
3. A. Leopold, "The Forestry of the Prophets," *Journal of Forestry* 18 (1920): 412-419.
4. *The Compact Edition of the Oxford English Dictionary*, s.v. "complement."
5. D. J. Hall, *Imaging God: Dominion as Stewardship* (Grand Rapids, Mich.: Eerdmans), 8.
David Ehrenfeld defines a prophet as one "who describes the present" (Personal communication, 1994).
6. "Declaration of the Mission to Washington: Joint Appeal by Religion and Science for the Environment," reprinted in R. S. Gottlieb, ed., *This Sacred Earth: Religion, Nature, Environment* (New York: Routledge, 1996), 640-742.
7. This assertion is based in large part by an essay by Lynn White, Jr. "The Historical Roots of Our Ecologic Crisis." *Science* 155 (10 March 1967):1203-7.
8. M. Oelschlaeger, *Caring for Creation* (New Haven: Yale University Press), 1994, 1-2.
9. C. Pope, "Reaching beyond ourselves: It's time to recognize our allies in the faith community," *Sierra* 1998 (November/December): 16-17.
10. M. Planck, "On Religion and Science," 1937, reprinted in translation in A. Barth, *The Creation in the Light of Modern Science* (Jerusalem Post Press: Jerusalem Post Press, 1966).
11. This is Booth's restatement of Ernest Hocking: "If, to agree on a name we were to characterize the deepest impulse in us as a 'will to live,' religion also could be called a will to live, but with an accent on solicitude—an ambition to do one's living well. Or, more adequately, *religion is a passion for righteousness, and for the spread of righteousness, conceived as a cosmic demand.*" W. C. Booth, "Systematic Wonder: The Rhetoric of Secular Religions." *Journal of the American Academy of Religion* 53(1984):677-702.
12. J. Carroll and K. Warner, eds. *Ecology and Religion: Scientists Speak* (Quincy, Illinois: Franciscan Press, 1998); P. M. Anderson, ed., *Professors Who Believe*. (Downers Grove, Ill.: InterVarsity Press, 1998); and R. J. Berry, ed., *Real Science, Real Faith*. (Crowborough: Monarch Books, 1991).

13. See W. P. Brown, *The Ethos of the Cosmos* (Grand Rapids, Mich.: Eerdmans, 1999); G. J. Spykman, *Reformational Theology: A New Paradigm for Doing Dogmatics* (Grand Rapids, Mich.; Eerdmans, 1992); and H. Bavinck, *Christelijke Wereldbeschouwing* (Kampen, Netherlands: Kok, 1913). Spykman quotes Bavinck: “The Christian worldview holds that man is always and everywhere bound by laws set forth by God as the rule for life. Everywhere there are norms which stand above man. They find a unity among themselves and find their origin and continuation in the Creator and Lawgiver of the universe.” (*Christelijke Wereldbeschouwing*, 90-91).
14. *The Compact Edition of the Oxford English Dictionary*, s.v. “religion, ligate, ligature, religate, religation.”
15. World Wildlife Fund, *The Assisi Declarations: Messages on Man & Nature from Buddhism, Christianity, Hinduism, Islam & Judaism* (Gland, Switzerland: World Wildlife Fund, 1986).
16. Alliance for Religion and Conservation, World Wildlife Federation, 2000, Available on-line at http://www.panda.org/livingplanet/sacred_gifts/assisi_2.html
17. S. H. Nasr, “Islam and the environmental crisis,” in *Spirit and Nature : Why the Environment Is a Religious Issue (An Interfaith Dialogue)*, eds. Steven C. Rockefeller and John C. Elder (Boston: Beacon Press, 1992), 83-108.
18. Milford Muskett, Univ. of Wisconsin-Madison, personal communication, November, 2000.
19. The term used by Nasr, “Islam and the Environmental Crisis.”
20. C. A. Russell, *The Earth, Humanity, and God: The Templeton Lectures, Cambridge 1993*. (London: University College London Press, 1994).
21. Leopold wrote, “In closing, it may not be improper to add a word on the intensely interesting reading on a multitude of subjects to be found in the Old Testament. As Stevenson said about one of Hazlitt’s essays, ‘It is so good that there should be a tax levied on all who have not read it’” (Leopold, “Forestry of the Prophets,” 419). Northrop Frye sees the Bible necessary for understanding Western culture (*The Great Code: The Bible and Literature*. New York: Harcourt Brace Jovanovich, 1982).
22. In that essay, Leopold quotes from the Moulton’s Readers Bible, ‘Seemeth it a small thing unto you to have fed upon the good pasture, but ye must tread down with your feet the residue of your pasture? And to have drunk of the clear waters, but ye must foul the residue with your feet?’ (Leopold, *The Forestry of the Prophets*). Unless otherwise noted, biblical are from *The Holy Bible: New International Version* (New York: New York International Bible Society, 1978).
23. I use *biosphere* as equivalent to *oikomene* as used in Psalm 24:1 in the Septuagint (translated from the Hebrew, *tebel*) and in I Corinthians 10:26,28.

24. From C. B. DeWitt, "Ecology and Ethics: Relation of Religious Belief to Ecological Practice in the Biblical Tradition," *Biodiversity and Conservation* 4 (1995):838-848. Reprinted in N. S. Cooper and R. C. J. Carling, eds., *Ecologists and Ethical Judgements* (London: Chapman & Hall, 1996).

25. Compare these ethical principles with the content of G. Tyler Miller, Jr., *Environmental Science: Working with the Earth*, 5th ed. (Pacific Grove, Calif.: Brooks/Cole, 2001), 23 that reviews statements by the National Academy of Sciences and the Royal Society of London.

26. Job 40:19 suggests that the Maker of creatures is the only one with license to destroy them. Therefore, past extinction events give no excuse to extinctions caused by human action.

27. R. Young, *Young's Literal Translation of the Holy Bible*, rev. ed. (Grand Rapids, Michigan: Baker Book House, 1898). Emphasis has been added to the word, *serve* in this quote and the one from Joshua that follows.

28. Josh. 24:15.

29. Gen. 2:8.

30. See John 3:16, Psalm 104, and the hymn, "O Worship the King," for illustrations of God's love and care for the world. Also see Colossians 1:15-20, I Corinthians 15:45, and Hebrews 1:3.

31. Published in J. Baird Callicott, ed., *Companion to Sand County Almanac: Interpretive and Critical Essays* (Madison: University of Wisconsin Press, 1987), 281.

32. T. Ends, "Tilling and Keeping: Christians Working to Promote Sustainable Agriculture," Paper presented to the Christian Environmental Council, Michael Fields Agricultural Institute, East Troy, Wis., 2000).

33. *The Revised English Bible with the Apocrypha* (Oxford: Oxford University Press, 1989), excerpts from Romans 7 and 8.

34. See Russell, *The Earth, Humanity, and God*, especially pp. 136-137, "The Plight of Humanity."

35. These causes correspond with Colin Russell's "motivating springs for human action," human arrogance, ignorance, greed, and aggression. See also C. B. DeWitt, "Ideas of University of Wisconsin-Madison Students," Appendix B, in Donna Lehman, *What on Earth Can You Do: Making Your Church a Creation Awareness Center*, Scottdale, Pennsylvania and Waterloo, Ontario: Herald Press, 1993), 192-195.

36. L. K. Caldwell quoted by G. Tyler Miller, *Living in the Environment: An Introduction to Environmental Science* (Belmont, Calif.: Wadsworth, 1988), iii.

37. P. H. Raven and G. B. Johnson, *Biology* 3rd ed. (St. Louis: Mosby Year Book, 1992), 1216.
38. M. K. Ghandi to the Economic Society at Allahabad University, Uttar Pradesh, India, 1916. Quoted in H. E. Sri Krishna Kant, "Caste, Community, Conversion," (inaugural speech at the conference, "Main Streaming the Church for Nation Building," National Council of Churches of India, Hyderabad, India, June 7, 1991).
39. R. A. Guelich, "Sermon on the Mount," in B. M. Metzger and M. D. Coogan, eds. *The Oxford Companion to the Bible* (New York: Oxford University Press, 1993), 687-689.
40. Excerpts from Matthew 6:9-33 from *The Holy Bible, King James Version* (New York: Thomas Nelson, Inc., 1972).
41. J. M. Keynes, *Essays in Persuasion* (1930; reprint, New York: Norton, 1963), 371-372.
42. Ibid.
43. C. Schultze, "The Public Use of Private Interest." *Harper's* (May, 1977):45-46.
44. J. Sittler, "Ecological Commitment as Theological Responsibility" in S. Bouma-Prediger and P. Bakken, eds., *Evocations of Grace: Writings on Ecology, Theology, and Ethics* (Grand Rapids, Mich.: William B. Eerdmans Publ. Co., 2000), 76-86; quote 79-80. First published in *Zygon* 5 (June 1970): 172-181.
45. Oelschlaeger wrote: "I think of religion, or more specifically the church... as being more important in the effort to conserve life on earth than all the politicians and experts put together. The church may be, in fact, our last, best chance." Oelschlaeger, *Caring for Creation*, 5.
46. See e.g., W. P. Brown, *The Ethos of the Cosmos: The Genesis of Moral Imagination in the Bible* (Grand Rapids, Mich.: Eerdmans, 1999).
47. As an example of taking up this challenge, Ismar Schorsch wrote, "For my own part, I wish to offer a portrait of Judaism as a millennial effort to foster a religious culture of self-restraint that intuitively respects the value and integrity of its natural environment." I. Schorsch, "Learning to Live with Less," in *Spirit and Nature: Why the Environment is a Religious Issue: An Interfaith Dialogue*, ed. S. C. Rockefeller and J. C. Elder (Boston: Beacon Press, 1992), 25-38.
48. This paper was first presented as an invited paper for the symposium, *The Good in Nature and Humanity: Connecting Science, Religion and the Natural World*, May 11-14, 2000, Yale School of Forestry & Environmental Studies, Yale University. It is scheduled to be published as Chapter 3 in: S. R. Kellert and T. J. Farnham, eds., *The Good in Nature and Humanity: Connecting Science, Religion, and Spirituality with the Natural World*, Washington, D.C.: Island Press, 2002.