



Essay

A Media Ecologist/Physicist's Take on Pope Francis' Encyclical Laudato Si: An Ecumenical Approach to a Dialogue of Science and Religion

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Abstract: An analysis is made of Pope Francis' Encyclical Laudato Si from a general systems approach. A call is made for a dialogue between theologians and environmental scientist. A parallel is found between the Pope's identification of rapidification as a root cause of global warming and McLuhan's notion of the speedup of modern life due to the emergence of electric technology. An analysis of Hebrew Scriptures is made, suggesting that rather than subduing the earth, the translation of Gen 1:28 seems to indicate that the intention was to occupy and tend the land. The Jewish notion of *Bal Tashchit* one of the 613 *mitzvos* or commandments from Scripture, supports this interpretation as it calls for stewardship of G-d's gifts.

Keywords: Laudato si'; globalwarming; climate change; Pope Francis

"I used to think that top environmental problems were biodiversity loss, ecosystem collapse and climate change. I thought that thirty years of good science could address these problems. I was wrong. The top environmental problems are selfishness, greed and apathy, and to deal with these we need a cultural and spiritual transformation. And we scientists don't know how to do that."—James Gustave Speth, US advisor on climate change

"But astronomers will agree that since we are here, and know that we are here, we have important responsibilities to our planet, such as not destroying our atmosphere or depleting the available oxygen or polluting the oceans. They will agree that human greed, ignorance, and indifference are a greater threat to the planet than comets."—Neil Postman, media ecologist

Laudato Si, praise be to you Pope Francis for your courageous encyclical. I am not a follower of your faith. I am the grandson of a Rabbi, but your encyclical speaks to me on the scientific, ethical, and spiritual level. I am a scientist and a media ecologist, and I am responding to your call that "science and religion, with their distinctive approaches to understanding reality, can enter into an intense dialogue fruitful for both (see Paragraph 62 of the encyclical)". I am a member of the Pugwash movement that was formed to deal with nuclear disarmament and other global problems of war and peace. In 1988, in a workshop at our annual meeting in Dagomys USSR (Russia today), I drafted a statement to the effect that environmental concerns were as much a threat to human survival as the possibility of a nuclear war. The statement was refined by others and adopted by the Pugwash members assembled there and then by the Pugwash Board of Directors. It is known as the Dagomys Declaration (see www.umich.edu/~pugwash/Dagomys.html for the text of the Declaration).

I believe that a dialogue with the Roman Catholic Church, other religious groups such as the members of my Jewish community, members of the Pugwash movement, and other scientists is in

order. In January 2016, at the University of St. Michael's College in the University of Toronto, I made a modest start by holding a dialogue with scientists and theologians in a symposium entitled "Faith, Science, Climate Change and Pope Francis's Encyclical *Laudato Si*".

The aim of this think piece is to identify the common ground of *Laudato Si* and the general systems approach that many scientists who reject reductionism have adopted. I believe it can form the basis of the dialogue of science and religion that Pope Francis has called for. I believe the general systems approach, as first formulated by Ludwig von Bertalanffy [1], is a common ground where scientists and theologians can dialogue as Pope Francis has urged us to do.

In Paragraphs 1–16 of the encyclical, Pope Francis pays homage to Saint Francis of Assisi and his predecessor Popes—Saint John XXIII, Paul IV, Saint John Paul II, and Benedict XVI. I would also like to pay homage to Rachel Carson, whose book *The Silent Spring* first brought the challenges of environmental degradation to the attention of the general public. I also would like to pay homage to all the scientists and environmental groups who have worked and are working hard to find ways for us to minimize the impending disaster of climate change. It is not a question of whether we can avoid climate change but rather how we can minimize the impending disaster and reduce its impact on humankind. Without sounding alarmist, I believe that global warming and climate change is as much a threat to human survival on this planet as is the possibility of nuclear war.

As an interdisciplinarian and a general systems scientist, I like the approach of Pope Francis in his encyclical of tying climate change and its effects on our common home (Paragraph 17) to economics and to the effects of technology and not just those technologies that use fossil fuels but those technologies that accelerate the pace of modern life, which the Pope calls "rapidification", and leads to increased consumerism. This parallels the thinking of Marshall McLuhan, who attributes the speedup of modern life to the emergence of electric technology. The actual speedup began with the invention of the steam engine and the very first burning of fossil fuels. Before this development, green energy was harvested from the environment with muscle power both human and animal, wind and moving water. The mechanical devices that were used to harvest wind and moving water were later adapted for use with the steam engine.

In an interesting twist of history, it was the lack of conservation of trees in industrial England that gave rise to the steam engine. With the depletion of forests in England, coal was used as a substitute for wood to heat homes. The mining of coal led to the flooding of mines and the need to pump the water out of those mines. At first, horses moving along a circular path were used to pump the water out of the coalmines. In time, an engineer—Newcomen figured out a way to have the pumps operate powered by the steam created by burning the very coal being mined. Then along came Watt, who modified the steam engine so that it could create rotary motion and be applied to factory mechanization and travel technologies like the steamboat and the steam driven locomotive. The idea of engines for transportation led to the gasoline fired automobile and before humanity woke up to the dangers of burning fossil fuel we found ourselves in the current regime of catastrophic human-caused global warming and climate change. None of our dependency on fossil fuels and the rapidification of life show any signs of abating. However, with the exception of a small minority of climate change deniers, we are at least aware of the problem today.

With scientific precision, Pope Francis identifies the source and the nature of the problems facing us, including pollution, degradation of the environment, depletion of fresh water supplies, and the loss of biodiversity (Paragraphs 22–45). He also identifies the social problems that these environmental challenges pose, such as the hardships facing the poor and the developing countries, North-South inequalities, the unavailability of employment for many, and military conflicts resulting from competing claims on natural resources (Paragraphs 46–52). He even identifies the complication of environmental problems due to information overload (Paragraph 47).

He then takes to task our political and business leaders for their lack of foresight, their green washing, and for putting profit and economic growth ahead of human welfare (Paragraphs 53–59). He then turns to his stock and trade, religion, ethics and the Bible, where many lessons can be

learned as we search for a solution to the problems we face (Paragraphs 60–98). It is not that the Judeo-Christian tradition is any better than the other wisdom literatures, but the cultures that followed the Judeo-Christian traditions were the ones most responsible for global warming and climate change. Those cultures, with their focus on progress interpreted as economic growth, have misread the Hebrew scriptures in which it is written in Genesis 1:28:

And God blessed them; and God said unto them: ‘Be fruitful, and multiply, and replenish the earth, and subdue (וכבשׁוּהָ) it; and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that creepeth upon the earth.

I do not think that the translation of the Hebrew word וְכִבְּשׁוּהָ in the text as “subdue” is correct because without the root of the word—without the ׀—it is better translated as “to occupy” rather than “subdue”. The etymology of word כִּבְּשׁוּהָ is from שׁוּבַב (to occupy) and originally comes from Aramaic “kabsh” and from Akkadian “kabasu”, which means “stepped on something” (private communication from Anat Ringel Raveh via the Even Shushan dictionary). In Modern Hebrew, the word means military subduing, but perhaps the original meaning in ancient Hebrew was “occupy” and its meaning changed over time. Later in Genesis in Gen 2:15, God puts Adam in the Garden of Eden and tells him to watch over it and tend it, which is certainly not subduing. In Deut 20:19–20, the Hebrews are told they may cut down trees to build a siege engine as long as the trees do not bear fruit, but they are forbidden to cut down fruit trees.

The translation of וְכִבְּשׁוּהָ as “and subdue” has had the effect of providing English readers of the Bible with a license for subduing or exploiting the bounty of nature for humankind’s own immediate selfish ends. The translation of וְכִבְּשׁוּהָ into other languages of Europe also has the connotation of subdue. Rather than subduing nature, we need to be the stewards of nature. The lack of stewardship of fossil fuels is what has led to our global warming and climate change crisis. However, there are also other examples where our lack of stewardship has led to serious problems.

I have consulted a long-time friend, Morley Markson, who studies Torah and Talmud, about the meaning of Gen 1:28 and in particular the interpretation of וְכִבְּשׁוּהָ by Jewish scholars. I asked him about the meaning of the Hebrew word in the context of Gen 1:28, the very same portion of the Torah/Bible that Pope Francis referred to in his encyclical. I am including his response in its entirety. It parallels, in my opinion, exactly with the thinking of Pope Francis and contributes to his call for a dialogue with other religions. Here is Morley’s response word for word (Morley’s words are in italics and his quote from Wikipedia in the nonitalic font. Note that Morley refers to the Almighty as “G-d” because in the Jewish tradition one is not allowed to write the name of the Almighty):

First of all, there is a mitzvah, called Bal Tashchit, one of the 613 mitzvos [commandments from G-d] of the Torah.

Secondly, there is a rich reward in words relating to man’s dominion over the world. It is generally meant to mean stewardship, for G-d is the Creator, and man his servant and steward of creation... in a way, as Joseph was given by the Pharaoh stewardship over Egypt. And how did he deserve it?

Through his wisdom, his righteousness, his prophetic connection with G-d. So man as steward over creation (the earth as an example) must act justly and intelligently over it. In a sense, he becomes second to the king in ruling the earth, but in the physical sense primarily, becoming a kind of sub-king. And as a wise ruler must never destroy his tax base, his sustenance, he must never exploit it to its ruination Bal tashchit.

And now, with an ecological view that is becoming universal since, for example, the dawning consciousness of the western frontier as enclosure rather than infinite possibility, man gained new insight into limitations of his use of the earth’s resources. Yet the Jews, a biblical people, have found this consciousness in Torah, of which Bal Tashchit is prime example.

Now for the granting of man his stewardship (Gen 1:28 etc) over the earth, that is, over nature, is multiplied lately in its effect through advances in science and technology. All the more so must man find and utilize the Creator's wisdom and guidance in his explorations and utilizations of what exists. Or, with good ecological intentions and wisdom, without considering G-d's role. But in my view, I prefer the fuller treatment.

Rabbi Malevsky of blessed memory, who came to Toronto after being chief Rabbi in Mexico, lectured once on the above ideas. My conclusion from a lecture on the first chapter was that advances in agriculture and animal husbandry and modern science and tech and whatever means man can devise, are meant as his role as "כִּבְדֵשׁ וַיְרִדוּ" to rule over the "earth." That would include all the elements of nature, including time, space, matter, energy, etc. an exciting prospect for both the scientist and the Jew.

Relevant commentary below taken from Wikipedia "Bal tashchit":

(Hebrew: בל תשחית) ("do not destroy") is a basic ethical principle in Jewish law. The principle is rooted in the Biblical law of Deuteronomy 20:19–20. In the Bible, the command is said in the context of wartime and forbids the cutting down of fruit trees in order to assist in a siege.

In early rabbinic law, however, the *bal tashchit* principle is understood to include other forms of senseless damage or waste. For instance, the Babylonian Talmud applies the principle to prevent the wasting of lamp oil, the tearing of clothing, the chopping up of furniture for firewood, or the killing of animals [1]. In all cases, *bal tashchit* is invoked only for destruction that is deemed unnecessary. Destruction is explicitly condoned when the cause or need is adequate.

In contemporary Jewish ethics on Judaism and ecology, advocates often point to *bal tashchit* as an environmental principle.

The parallels of these Jewish teachings and the teachings of Pope Francis in his encyclical are fairly obvious, especially if one considers the following excerpts from *Laudato Si*. This should be of no surprise, since both traditions take their roots in the wisdom and the holiness of the same text.

66. The creation accounts in the book of Genesis contain, in their own symbolic and narrative language, profound teachings about human existence and its historical reality. They suggest that human life is grounded in three fundamental and closely intertwined relationships: with God, with our neighbour and with the earth itself. According to the Bible, these three vital relationships have been broken, both outwardly and within us. This rupture is sin. The harmony between the Creator, humanity and creation as a whole was disrupted by our presuming to take the place of God and refusing to acknowledge our creaturely limitations. This in turn distorted our mandate to "have dominion" over the earth (cf. Gen 1:28), to "till it and keep it" (Gen 2:15). As a result, the originally harmonious relationship between human beings and nature became conflictual (cf. Gen 3:17–19).

67. We are not God. The earth was here before us and it has been given to us. This allows us to respond to the charge that Judaeo-Christian thinking, on the basis of the Genesis account which grants man "dominion" over the earth (cf. Gen 1:28), has encouraged the unbridled exploitation of nature by painting him as domineering and destructive by nature. This is not a correct interpretation of the Bible as understood by the Church. Although it is true that we Christians have at times incorrectly interpreted the Scriptures, nowadays we must forcefully reject the notion that our being created in God's image and given dominion over the earth justifies absolute domination over other creatures. The biblical texts are to be read in their context, with an appropriate hermeneutic, recognizing that they tell us to "till and

keep” the garden of the world (cf. Gen 2:15). “Tilling” refers to cultivating, ploughing or working, while “keeping” means caring, protecting, overseeing and preserving. This implies a relationship of mutual responsibility between human beings and nature. Each community can take from the bounty of the earth whatever it needs for subsistence, but it also has the duty to protect the earth and to ensure its fruitfulness for coming generations. “The earth is the Lord’s” (Ps 24:1); to him belongs “the earth with all that is within it” (Dt 10:14). Thus God rejects every claim to absolute ownership: “The land shall not be sold in perpetuity, for the land is mine; for you are strangers and sojourners with me” (Lev 25:23).

68. This responsibility for God’s earth means that human beings, endowed with intelligence, must respect the laws of nature and the delicate equilibria existing between the creatures of this world, for “he commanded and they were created; and he established them for ever and ever; he fixed their bounds and he set a law which cannot pass away” (Ps 148:5b-6). The laws found in the Bible dwell on relationships, not only among individuals but also with other living beings. “You shall not see your brother’s donkey or his ox fallen down by the way and withhold your help . . . If you chance to come upon a bird’s nest in any tree or on the ground, with young ones or eggs and the mother sitting upon the young or upon the eggs; you shall not take the mother with the young” (Dt 22:4, 6). Along these same lines, rest on the seventh day is meant not only for human beings, but also so “that your ox and your donkey may have rest” (Ex 23:12). Clearly, the Bible has no place for a tyrannical anthropocentrism unconcerned for other creatures.

The focus of *Laudato Si* is global warming, climate change, and our stewardship of fossil fuels. The encyclical also stresses the importance of biodiversity. However, there is still another looming crisis that arises from our lack of stewardship over groundwater—so essential for modern agriculture, which in turn is the only way we can feed the eight billion human inhabitants of our planet. Pope Francis, quoting from Gen 2:7, does mention the importance of water: “We have forgotten that we ourselves are dust of the earth (cf. Gen 2:7); our very bodies are made up of her elements, we breathe her air and we receive life and refreshment from her waters”. He also mentions the need for fresh drinking water: “Fresh drinking water is an issue of primary importance, since it is indispensable for human life and for supporting terrestrial and aquatic ecosystems”.

However, there is still another problem: We are rapidly depleting our supply of ground water. The amount of water removed from aquifers across the globe does not come anywhere near the refilling of these aquifers with rainfall and the melting of snow. This problem arises from the same basic human failing that Pope Francis has identified, namely, greed in the form of industrialized agriculture. At the current rate, many of the sources of groundwater for agriculture will no longer be available in the years to come. Today, farmers are drilling ever deeper to pump up groundwater at a rapidly increasing cost. God and nature has provided us with the gift of groundwater, and we are squandering this life giving resource. Without the stewardship of groundwater, our dominion over it and our excessive exploitation of it will eventually lead to global famine as the aquifers go dry and/or salt water leaches into them. We must carefully calculate the carrying capacity of our groundwater supplies for supporting human life. There are “limits to growth” as was pointed out in a study with the same name commissioned by the Club of Rome in the 1970s, and this includes limits on the growth of the human population. This is an issue where the Pope’s call for a dialogue between religion and science is needed. The question is whether to allow the human population to exceed the carrying capacity of the planet and thereby create the suffering that would ensue with a global famine or to take steps to avoid such a catastrophe now.

As a general systems thinker, one of the aspects of *Laudato Si* that I find particularly compelling is its general systems perspective, i.e., the way Pope Francis connects the physical challenges of climate change and global warming with economic issues, social justice, the dignity of work, and respect for the environment. The following excerpt from Paragraph 92 that warns against reductionism and proclaims that everything is interconnected is a perfect example of his systems thinking:

“Peace, justice and the preservation of creation are three absolutely interconnected themes, which cannot be separated and treated individually without once again falling into reductionism”. Everything is related.

Two other examples where Pope Francis takes a systems approach and reproaches reductionism are found in Paragraphs 107 and 112. From Paragraph 107:

It can be said that many problems of today’s world stem from the tendency, at times unconscious, to make the method and aims of science and technology an epistemological paradigm which shapes the lives of individuals and the workings of society. The effects of imposing this model on reality as a whole, human and social, are seen in the deterioration of the environment, but this is just one sign of a reductionism which affects every aspect of human and social life. We have to accept that technological products are not neutral, for they create a framework which ends up conditioning lifestyles and shaping social possibilities along the lines dictated by the interests of certain powerful groups. Decisions which may seem purely instrumental are in reality decisions about the kind of society we want to build.

As a former collaborator of Marshall McLuhan, I note with pleasure that Pope Francis recognizes technologies are not neutral, as this excerpt from Paragraph 112 demonstrates:

Yet we can once more broaden our vision. We have the freedom needed to limit and direct technology; we can put it at the service of another type of progress, one which is healthier, more human, more social, more integral. Liberation from the dominant technocratic paradigm does in fact happen sometimes, for example, when cooperatives of small producers adopt less polluting means of production, and opt for a non-consumerist model of life, recreation and community. Or when technology is directed primarily to resolving people’s concrete problems, truly helping them live with more dignity and less suffering. Or indeed when the desire to create and contemplate beauty manages to overcome reductionism through a kind of salvation which occurs in beauty and in those who behold it.

In calling for a dialogue between religion and science based on a general systems approach, I am mindful of the distinction Pope Francis makes between nature as a system to be “studied and controlled” and nature as a gift from God. However, given that science is value-free, nature as a system is a place where science and religion can meet and enter into a dialogue. Although science is value-free, scientists have values and the hard and fast separation of science and religion has been relaxed in some quarters. Among my personal acquaintances with whom I have collaborated, I will cite Stuart Kauffman’s [2] book *Reinventing the Sacred: A New View of Science, Reason, and Religion* and Terrence Deacon’s [3] book *Incomplete Nature: How Mind Emerged from Matter*, where Deacon attempts to deal with issues such as values, purpose, and meaning from a scientific perspective. These are two examples where scientists address a scientific approach to understanding values.

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