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Our Earth, Our Responsibility

Ebenezer Yaw Blasu

Introduction

The topic for our discussion contains only four words: Our Earth, Our Responsibility. The word 'Our' occurs twice so who is being referred to as 'our' in the topic? There are three groups that come to mind: all creatures on planet Earth, what I call 'Earthlings'; then all human beings, including Christians, hence 'Humanity'; and, finally members of the group called Christians in Science. However, charity, they say, begins at home. Since this is the first in the series of Faraday Lectures, organised by a particular group of people, aiming at getting the rest of humanity to wake up to our Creator's call to be responsible for and to the Earth I choose to direct my address more to the last category of the 'our' for now. That is, those of us seeing ourselves as Christians in Science, although humanity in general is by that implied to underpin it.

We must first be identified with what we would have others do. I set for myself, therefore, the task of looking at what it means ecotheologically when we say 'Our Earth'. Then I shall draw our attention to some reasons why we must be responsible for earthkeeping, making a few practical suggestions as to our responsibility, particularly because we are African Christians in Science.

I Whose Planet is the Earth?

1. Biblical issues

As I implied in my introduction earlier, our gathering over these two days has focussed on the objective of looking at how best we may be responsible humanly for planet Earth by educating ourselves. Our intention in this self-education is for better understanding of ecological issues as particularly relating to our background—religiously Christians who professionally serve as scientists and Christians who want to understand better how to relate their beliefs with science—so as to be better keepers of the Earth, even in our unique orientation.

In my view this is essentially a cultural matter. It is what we human beings think or want to think of and do on the Earth about the Earth by engaging our cultural occupation in Science with our Christian faith. It is seeking a bet-

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ter self-understanding of our faith in Christ in the face of scientific facts to enhance our ecological actions toward sustaining the Earth.

The late Ghanaian theologian, Kwame Bediako, refers to this process as gospel-culture engagement, and teaches us that the Bible must be central in any engagement of gospel and culture,[1] because Scripture is the yardstick and model for testing, pointing to and also controlling all engagements of gospel and culture in the continuing divine-human encounter which characterises our faith.[2] It is implied, therefore, that the Christian Scriptures offer us a hermeneutic for answering the question: Whose planet is the earth?

Yet we must tread cautiously, because Patrick Curry, author of *Ecological Ethics*, observes that although religions act as significant cultural repositories of human wisdom, and therefore have resources with which to meet ecological demands, most of them—especially the monotheistic ones—have lent themselves to a ruthlessly anthropocentric exploitation of nature.[3] Concerning Christianity, in particular, Lynn White Jr. is well known to have argued strongly against the western Christian anthropocentric view and the incorrect claim of a biblical justification in Genesis 1:28 to dominate nature; he blamed the wanton destruction of natural resources on this 'domination' theology.

In an influential paper in 1967 entitled *The Historic Roots of Our Ecological Crisis,* White claimed that in antiquity every tree, every spring had its guardian spirit. Before one cut a tree, dammed a brook, or killed an animal, it was important to placate the spirit in charge of that particular situation. By destroying what he referred to as 'pagan animism', he claimed that 'Christianity made it possible to exploit nature in a mood of indifference to feelings of natural objects'.[4] Lynn White might have based his arguments on observations of the vast deforestation in Europe in the nineteenth century[5] for instance, which ecologists think resulted from the western Platonism (uncritical distinction between spiritual and material) and Christianity's theology of human devaluation and domination of nature. It was a theology that disenchanted or de-sacralised nature as essentially a passive and inanimate object with no intrinsic value, and so underscored the desire to do with it whatever humans will.[6]

The probability for humans to will

1 Kwame Bediako, 'Scripture as the hermeneutic of Culture and Tradition', *Journal of African Christian Thought,* Vol 4, No 1 (June 2001), 2-11 (p.2).

2 Bediako, 'Scripture as the hermeneutic of Culture and Tradition', 3.

3 Patrick Curry *Ecological Ethics—An Introduction, 2nd ed* (Cambridge: Polity Press, 2011), 138.

4 Lynn White Jr., 'The Historical Roots of Our Ecological Crisis', *Science*, Vol. 155, March 1967, 1203-7. See also William P. Cunningham and Barbara Woodworth Saigo, *Environmental Science—A Global Concern*, 6th ed., (New York: McGraw-Hill Companies Inc., 2001), 41.

5 Houghton, *Global Warming: The complete briefing*, cited by Y. B. Osafo, 'Reducing emissions from tropical forest deforestation: Applying compensated reduction in Ghana' in Paulo Moutinho and Stephan Schwartzman (eds.), *Tropical Deforestation and Climate Change*, 63-72 (64).

6 Patrick Curry *Ecological Ethics—An Introduction, 2nd ed* (Cambridge: Polity Press, 2011), 140.

and do so was high at the time perhaps because of the early struggles to find a relationship between Science and Theology. According to Arthur Holmes, by the beginning of the 17th century the *Novum Organon* or 'new science' revolution started, with Francis Bacon, the Lord Chancellor of England, being the most influential voice.[7] The Baconian scientists challenged both the humanists and scholastics (Aristotelian scientists) on the grounds of not restoring humanity's dominion over creation to relieve our estate and glorify God. Patrick Curry claims that 'Bacon notoriously advised that to "conquer and subdue Nature with all her children, bind her to your service and make her your slave," she must be "pierced", "vanquished" and "put to the question" (in other words, interrogated under torture); the new science [knowledge] that results will "extend bounds of human empire, as far as God Almighty in his goodness shall permit"'.[8]

For Bacon, scientists should formulate their educational purpose to develop knowledge that is full of hard-core facts or realities (thus appearing to be wholly objective), because we are directly aware of only physical things.[9] This began the journey of disparity between Theology and Science, revelation and empirical fact, faith and rationalism, resulting in scepticism towards reliance on the Bible to know whose planet is the Earth, particularly from its genesis.

Perhaps it is for this reason that David Bookless, Theological Director of A Rocha UK, makes the laudable suggestion, that to avoid being distracted and drawn into the never ending but ever-dividing argument over creationism and evolution, Christians should engage issues concerning the genesis of the Earth with the 'why' rather than the 'how'.[10] Even so, I personally think it may be necessary to consider that as Christians we became very certain in our minds of the 'how', so that we could hold fast and even deepen our faith when overwhelmed with newer scientific discoveries and assertions.

For with the contributions of science our worldview and faith are already being challenged to seek more understanding, rethinking our theology and pastoral practice positively. For instance, Brian Thomas Swimme and Mary Evelyn Tucker, authors of *Journey of the Universe*, inform us that we are the first generation to learn the comprehensive scientific dimensions of the universe story. We now know that the observable universe emerged 13. 8 billion years ago, and we live on a planet orbiting our sun, one of the trillions of stars in one of the billions of galaxies in an unfolding universe that is profoundly creative and interconnected.

7 Arthur F. Holmes, *Building the Christian Academy* (Cambridge: William B, Eerdmans publishing, 2001), 75.

8 Curry, *Ecological Ethics,* 37.

9 According to Arthur Holmes, *Building the Christian Academy*, 75, 'Descartes' theory of indirect or representative perception had not yet taken over'. Moreover, this was the time when the Reformation had created a vacuum of authority in matters on which scripture is silent, and Protestantism was torn by differing interpretations of the Bible. Everywhere there was obvious need for an objective, universally assured system of acquiring knowledge independent of divisive beliefs.

10 David Bookless, *Planetwise* (UK, Nottingham: Intervarsity Press, 2008), 19-20.

With our empirical observations expanded by modern science, we are now realizing that our universe is a single immense energy event that began as a tiny speck which has unfolded over time to become galaxies and stars, palms and pelicans, the music of Bach, and each of us alive today. The great discovery of contemporary science is that the universe is not simply a place, but a story—a story in which there is evidence that evolution does occur in which we are immersed, to which we belong, and out of which we arose.[11] Scientific claims point to an evolutionary story in which humans started to emerge some six to seven million years ago[12] as *Homo Africanus* (apelike beings in Africa). Science again points to *Homo sapiens* emerging two hundred thousand years ago, and it is the *Homo sapiens*—us—who in the last two centuries have radically altered the ecosystems of the planet to the point where scientists are now suggesting we call the current epoch, the Holocene epoch, the "Anthropocene epoch".[13]

Imagine teaching in a mission-minded Christian university like the Presbyterian University College, Ghana. Present the above information to undergraduate students in a plural religious classroom context on Saturday evening. Then meet some of the same students on Sunday morning at chapel with a sermon that says God created the universe in five days and on the sixth day he created, not evolved, humankind from the soil before resting on the seventh day, knowing that all he created was good. Where is the connection between your pronouncements as a lecturer in the classroom and as pastor in the chapel to the same audience? May we not expect some serious challenges instead of motivating and deepening Christian faith of the students in the face of the huge overwhelming scientific facts?

Perhaps it should not be a surprise to have one bold person among your hearers who looks you in the face and points out that after all it was not a vast heaven and huge planet Earth that emerged initially as we read and imagine from the Bible. God did not create humans from clay, but we evolved from the apes. This was my experience when in 2010 some Environmental Science students in a Christian university reacted against my use of biblical insights and examples, arguing that faith and facts have no relationships nor did they pay fees for Christian calls for moral environmental responsibility. Indeed, that shock is what sent me on this academic and pastoral research.

In short, many questions may easily challenge the Christian faith of young minds when overwhelmed with hard core scientific facts and inductive reasoning as against deducted revelations

11 Brian Thomas Swimme and Mary Evelyn Tucker, *Journey of the Universe*, (New Haven and London: Yale University Press, 2011), p. 2.

12 Swimme and Evelyn Tucker, *Journey of the Universe*, p. 2.

13 John Grim and Mary Evelyn Tucker, *Ecology and Religion* (Washington, DC: Island Press, 2014), 9. Edward S. Ayensu, in a glossary to his book *Field Guide to the Volta River Basin* (Accra: Volta River Authority, 2013), 254, states that the Holocene epoch, formerly known as the 'Recent Epoch,' is the more recent of the two epochs of the Quarternary Period of the geological time. It is taken to have started around 12,000 years ago; its start is generally taken to be when humans first made enduring impressions on the surface of the Earth.

recorded in the Bible. Yet as Christians we know of the Earth first from faith in the biblical narratives. In the New Revised Standard Version (NRSV) of the Bible the writer of the Letter to the Hebrews succinctly puts it 'By *faith* we understand that the *worlds* were prepared by the word of God, so that what is seen was made from things that are not visible.'

2. The world

Christopher J. H. Write argues that the English expression, 'the world', as used in the Bible is complex and flexible. It rarely translates one Hebrew or Greek word.[14] It is noteworthy that the English word in the Letter to the Hebrews 11:3 is 'worlds', translating the Greek *aiōn*. This means 'universe or ages'. While the English usage implies that creation is related to the 'world' as a one-time act of one spatial arena, the meaning of this verse from the Greek sense is that it is God who has been creating and is still creating. It refers to a long period of time without reference to beginning or end; and suggests spaces other than the earthly space alone that we tend to imagine when reading the Bible.

It suggests that this God's acts of creating spaces have been occurring over long periods of time, in different epochs. Kwame Bediako argues that the Twi translation of this word 'aiōn' is *mresantee*, which is more accurate than the English, because it accounts for eras of time.[15] In other words, both the Greek and the Twi give an opening for understanding creation as occurring over very long periods of time, and that the universe may not consist of only the earthly space as we know it or imagine it on reading the Bible.

From the history of Science we may infer that it was through monastic reflections seeking deeper understanding of faith in this biblical cosmology that theology was born and then astronomy as the first cosmic science. Hence, theology became the 'Queen of the Sciences'.[16] As I have indicated earlier, we in the twenty-first century have a more expanded mental-picture of the universe than generations before us due to the extensive and incredibly amazing findings and explanatory theories of Cosmological Sciences.[17]

The scientific evolution theories try to arrange a systematic and chronological out-birthing of the complex cosmos. They may be convincing to many, but still limited to only the 'observable universe' and significantly unable to explain the source of the already existing 'single point' mixture of visible 'luminous matter' and the invisible 'dark matter' that 'was trillions of degrees

14 Christopher J. H. Wright, 'The World in the Bible', *Evangelical Review of Theology*, Vol. 34, No. 3, (July 2010), 208.

15 Kwame Bediako, 'Christian Faith and African culture—An Exposition of the Epistle to the Hebrews', *Journal of African Christian thought,* Vol. 13, No. 1, June 2010, 47.

16 Williams, L. Pearce, 'History of science', p. 1, Accessed 24/10/2014, http://www.britannica.com/EBchecked/topic/528771/history-of-science, The natural philosophers insisted that genuine understanding of the natural order or laws demanded explanations of the cause, and would attribute it all to God, by faith. This explains why and how astronomy coupled to theology became the queen of the sciences.

17 Swimme and Evelyn Tucker, *Journey of the Universe*, 1.

hot and that instantly rushed apart' to become 'all of space and time and mass and energy'.[18]

To the Christian the source of even that single point of matter that may have evolved into the cosmos over billions of years in scientific assertions is still God.[19] This simply is the biblical record in Job 38 and 39 as well as Genesis 1 that we affirm by our Christian faith. In Job 38 God did not mince words but categorically declared his authorship of the earth (v 4) and the heavens (v 33) and all that there is in them, including darkness (v 9) and light (v 12). Then in chapter 39 God asks if Job could explain how living creatures are sustained on the earth.

3. God's earth?

In short, God was posing the same question we are considering today: Whose Planet is the Earth? Job was a farmer, but he couldn't answer any of these questions. So God showed Job that this universe belongs to him (God). Creation and created beings exist and are there because of God's power and sustaining hand. Then in Genesis we see further why it then becomes 'our earth', because God gives to humanity a responsibility.

We have a role as guardians of this theology of life. Science helps us only now to explain, at least the empirical aspects of the universe—how possibly what God had already created might have expanded thereafter and even that according to energy potencies already endowed it by the Creator. In other words, given that it works on only the empirically 'observable universe', Science has not and perhaps may never ever answer the question of the very pre-historic origin or non-observable phenomena that put the 'single point of cosmic matter' that became the universe in place. That story is still left to faith.

Summarising the content of their book *Journey of the Universe* as 'the newer story of the universe', Brian Swimme and Evelyn Tucker argue that their story is 'a story of *the story*'.[20] Perhaps this is because they realised rightly that theirs is only 'a historical account of how *our awareness* of this universe story came forth'.[21] In short, the *Journey of the Universe*, based on evolutionary philosophy, narrates only the story of how we human beings, with God's gracious endowment of scientific tools, are beginning to gain more systematic empirical insights, and guess some details about the summarised biblical cosmological record.

The universe story itself, however—its formation when there was nothing observable—still remains to be told. In my opinion, that is what the Bible has already revealed and human beings can know it only by faith. Faith then is also learning, a gaining of knowledge of reality without empiricism. It is the simple story or knowledge that God

18 Swimme and Evelyn Tucker, *Journey of the Universe*, 5.

19 David Bookless points out that the difference between biblical cosmology and those of others is that only God creates out of nothing, while other accounts either have an already existing material from which the world is shaped or the world just emanated from a creator. See Bookless, *Planetwise*, 20.

20 Swimme and Evelyn Tucker, *Journey of the Universe*, 3. Italic emphasis is mine.

21 Swimme and Evelyn Tucker, *Journey of the Universe*, 3. Italic emphasis is mine.

created the universe, and hence the earth and all in it, out of nothing.

Bookless asserts, agreeably, that good science is humanity seeking to explore and understand God's world; hence, true science can only ever inform and confirm God's word in the Bible.[22] But if God created, then the earth he created belongs to him. This also is the recorded biblical revelation that we believe as Christians. Again the Bible clearly spells this out unequivocally: 'The earth is the Lord's and the fullness thereof, the world and those who dwell therein…' (Ps 24:1).

God's ownership then doesn't include only the bare planet, but all the creatures he has made: 'For every animal of the forest is mine, and the cattle on a thousand hills. I know every bird in the mountains, and the creatures of the field are mine' (Ps 50:10-11). In my view, Christians in science may not shy from claiming and owning the Christian cosmic faith when faced with questions of how the earth began. Simply but convincingly we could present our faith-stance that God created the earth.

4. Our earth?

Therefore if asked whose planet is the earth, the Christian in science may unhesitatingly answer first 'the earth belongs to God'. But if the earth is God's how can we say it is ours, as posited in the topic under discussion?

As I have indicated earlier, when God interrogates Job, the Christian affirmation that the Earth is the Lord's is true and biblically unchallengeable, but does not, in another sense, preclude us from saying the earth is ours. It can be argued convincingly from several texts in the same Scripture that God gave the earth to humanity to enjoy responsibly: imaging him as guardians of the very earth of which we are part. God gives the plants for food (Gen 1:29) and also 'everything that lives and moves' (Gen 9:3). The Psalmist is even more specific: 'The highest heavens belong to the Lord but the earth he has given to man' (Ps 115:16).

It is our Earth because it is our gifted home and where we get both material and spiritual support for life. From the very beginning just after creating the Garden of Eden, which ecotheologically may be a symbol of an ecosystem or even the ecosphere, God gave it to the first human couple with a charged responsibility 'to till it' or use it to support life 'and keep it' sustainably (Gen 2:15).

David Bookless suggests resolving the apparent conflicting ideas of the earth belonging to God and to us at the same time by considering the case of tenant farmers. 'It is their field to use productively and to enjoy its fruits, but it does not actually belong to them—it belongs to the owner'.[23] He derives this thought from land in the context of Israel: God gives them a promised fruitful land, but they must not sell it permanently because 'the land is mine and you are but aliens and my tenants' (Leviticus 25:23).

In his comment Bookless sees God's chosen nation not ultimately owning but using land under certain terms and conditions, which suggests that God is the landowner of planet earth, its flora,

22 Bookless, *Planetwise*, 146.

23 Bookless, *Planetwise*, 29.

fauna, water bodies, atmosphere and geological contents. Yet he has given us the use of this good earth on condition that we are responsible to him for how we use and leave it.[24] But how have we used the good earth given to us so far—how is our earth today?

II Our Earth Today

That the good earth that God entrusted to us is today miles away from what it was is well known. So this is not the place to spell out the current ecocrisis or its context in detail, but since it is a primary reason why we are talking about being responsible, it must at least be pointed out.

Patrick Curry asserts rightly that irrespective of controversies our earth is facing a serious ecological crisis—considering climate change, biodiversity loss, habitat challenges and pollution all over the world.[25] The socio-economic impacts of climate change, for instance, appear to be not only similar in the global South, especially in many parts of Africa, but also more than in the North.

Michael Northcott sees the situation as a disturbing spiral or cyclic life undergirded by poverty. People rely on wood and charcoal for cooking and heating. While smoke and interior pollution from fires cause cardiovascular and respiratory disease in millions of households, dependence on timber for cooking and heating puts increasing strain on the land. As forests are thinned for fuel, soil thins as well, and the water table drops, so making conditions even harder for food growing and reducing the availability of potable water.[26]

The situation is not different from our local experience too as the following instance suggests. In 2010, a forty-five year old woman from Bawku West District in the Upper East Region of Ghana granted an interview to researchers from the Ministry of Environment, Science and Technology (MEST), who were reviewing the extent of the socio-economic impacts of Ghana's ecocrisis. She responded,

> I have seven children…The floods collapsed our three rooms and washed our crops…Hunger stared us straight in the face…Getting firewood is now very difficult and most times I have to climb trees for dried branches… sometimes I do this with my baby on my back…[27]

This woman's lamentation and her reference to 'getting firewood' points to the wider anthropogenic[28] causes of climate change, which impacts both human and non-human communities in many parts of Ghana. The results of climate change are being reflected in floods, loss of landed property, crop failure, hunger, land degradation, lack

24 Bookless, *Planetwise*, 29-30.

25 Curry, *Ecological Ethics,* 15-18.

26 Michael S. Northcott, *A Moral Climate: The Ethics of Global Warming* (London: Darton, Longman and Todd Ltd, 2007), 49.

27 National Climate Change Committee (NCCC), *Ghana goes for Green Growth, National Engagement on Climate Change, Discussion Document*, *Summary,* (Accra: Ministry of Environment, Science and Technology, (MEST), (November, 2010), 28.

28 See Patrick Curry, *Ecological Ethics*, pp. 201-202. Curry, asserts that a 'significant amount of climate change is certainly almost anthropogenic (human-caused)'.

of wood energy, vulnerability of people to various life-threatening dangers and gradual loss of biodiversity. The Environmental Protection Agency (EPA) of Ghana corroborates this reality with further evidence of difficulties with potable water as inland water bodies dry up and water tables fall deeper; food insecurity resulting from devastations of harvested crops due to high temperature and plant pathological factors.[29]

I have argued elsewhere that if climate change in Ghana contributes to a breakdown in human and non-human wellbeing, then it goes against the total wellness of all beings (3 John 1:2), which is the divine will, because it denies them their basic life essential needs.[30] Humans and other animals and birds and fish suffer food insecurity, ill health, and unsafe habitat, leading to more frequent migrations in search of safer and greener pastures. In addition, plant life is subjected to both the vagaries of the deteriorating climatic conditions and wanton destructive behaviour of humans.[31]

Patrick Curry, asserts that a 'significant amount of climate change is certainly almost anthropogenic (human-caused)'.[32] It stands to reason that if we humans are the cause of crisis in the good earth bequeathed us then all of us human beings, including Christians in science must be involved in resolving the crisis.

III Responsibility for Planet Earth

There are many reasons why people do or do not get involved in environmental issues. In the West, particularly in the United Kingdom, David Bookless has collected the opinions of many Christians concerning the Bible and environment. He classified the results and explains them as follows:

(1) Insidious—Ecology and environmental issues are a bit dodgy, and Christians should keep well clear;

(2) Irrelevant- Caring for the Earth is not important for Christians. The gospel is about saving souls, not saving seals;

(3) Incidental—I am glad somebody is already caring for the planet, just as long as it doesn't have to be me;

(4) Integral—Concern for the whole of God's creation is fundamental to the God of the Bible and to his purpose for human beings.[33]

I do not have extensive information in the African situation yet,[34] and I don't know where each of us here falls. But because we are Christians we may ideally want to identify with the fourth class, at least since that is the purpose of this gathering. For what it means is

29 Environmental Protection Agency 2005, Ghana State of Environment Report 2004, EPA, Accra Ghana, 6.

30 Ebenezer Yaw Blasu, '"Compensated Reduction" as Impulsion for Reducing Deforestation: An African Christian Theological Response', *Journal of Christian African Thought*, Vol. 18, No. 1, June 2015, 19.

31 Blasu, '"Compensated Reduction" as Impulsion for Reducing Deforestation', 19.

32 Curry, *Ecological Ethics*, 201-202.

33 Bookless, *Planetwise*, 13-16.

34 I understand this concern is a research area for some M.Th. students of Akrofi-Christaller Institute (ACI). Hopefully we may get some insights when they finalise their work.

that caring for creation is essential to following Jesus Christ. Although that is not to say that we must all be field environmentalists or professional ecotheologists, yet as Bookless contends, 'it is not an optional extra, but part of the core of our faith'[35] and we need be impelled naturally for it.

My opinion concerning what can best impel or motivate the African Christian to act responsibly for the earth and to do things like reduce deforestation, as an ecological action for instance, is that since the earth ultimately belongs to God, failure to let God's concerns for his environment, rather than centralise it on monetary incentives, as being advocated by some people, could be classified as 'ecological sin'.[36]

I think the same argument holds here also as we discuss our responsibility for our earth. For me our failure to do all things, including ecological actions, for the glory of God (I Cor 10:31) or not to be constrained by *love* for God (2 Cor 5:14) and neighbour (including non-human life) to obey him (John 15: 10) is sin. The Greek Ecumenical Patriarch, Bartholomew, is the first one in the Christian world to draw the attention of the world community to the seriousness of the ecological problem.[37] He describes our current destruction of the environment as 'ecological sin' and 'crime against creation,'[38] which, as I have once said, affirms Paul's assertion in Romans 8:20-22 that creation already suffers innocently God's curse due to humankind's sin against God (Gen 3:17).[39] In order not to be disobedient children of God we need to be responsible for our Earth.

Even then the Earth's crisis has been already largely anthropogenic—due to human sin—since soon after the creation of humanity until now. Using a triangular relationship between God, humans and nonhuman creation, David Bookless explains that 'when human beings turn against God, this not only breaks the relationship with God, but also affects the other sides of the triangle'.[40] This is because creation has relational and an interdependent nature explaining why the sinful fall of humanity brought a curse on the whole Earth, from whence the Earth's crisis began. We need to pay responsible attention to our Earth because scientists are human and so part of the earth's problem.

In analysing the causes of ecocrisis, Patrick Curry compiles from litera-

35 Bookless, *Planetwise*, 16.

36 Blasu, '"Compensated Reduction" as Impulsion for Reducing Deforestation', 24.

37 Metropolitan John of Pergamon, 'Pope Francis' Encyclical Laudato si - A Comment.' Accessed, 19 June 2015, http://www.goarch.org/news/metropolitanjohnpergamon-06182015.

38 Ecumenical Patriarch, Bartholomew, cf. John Chryssavgis, 'Address in Santa Barbara, California (8 November 1997); On Earth as in Heaven: Ecological Vision and Initiatives of Ecumenical Patriarch Bartholomew, Bronx, New York, 2012.' Cited by Pope Francis, 'Encyclical Letter *Laudato Si'* of The Holy Father Francis on Care for Our Common Home, on 24th May 2015. http://w2.vatican.va/content/dam/francesco/pdf/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si_en.pdf. (See also Grim and Evelyn Tucker, *Ecology and Religion*, p. 166.)

39 Blasu, '"Compensated Reduction" as Impulsion for Reducing Deforestation,' 24.

40 Bookless, *Planetwise*, 37.

ture the summarised formula I=PLOT, where I is ecological Impact resulting from the interactions of P (Population size increases), L (Life styles of consumerism), O (organisational ideologies such as in political will) and T (Technology and Science that consumes energy and pollutes the ecosystem). Thus, despite all the good that we can and must attribute to technoscience for development on our earth, it is also a significant contributor to our earth's crisis.

Grim and Tucker observed many workers whose efforts together gave birth to the American Environmental Movement, but it was 'with the publication in 1962 of *Silent Spring*, [by Rachael Carson] documenting the devastating effects of DDT on bird life' that 'the contemporary environmental movement was born'.[41] DDT was an Agricultural Science product and tool for boosting food production, yet only when Carson pointed out its evil effects due to non-godly and non-ethical application was it banned in 1972.[42]

My point in short is that science and technology minus godliness and morality is devastation of our earth. What then must be our responsibility?

IV Responsibility as Christians in Science

Our Lord Jesus teaches us this life principle that much is required from him to whom much is given (Luke 12:48). I presume that. by virtue of our orientation as both Christians and scientists. we are more positioned to participate in creation care praxis than others. Perhaps, unlike the non-science Christians, we have better chances of appreciating ecological phenomena, but like them we also have the religious orientation that can motivate us to take ecological action for a sustainable earth.

Orienting ourselves in religious traditions opens to us the understanding of the universe as an ever-present and all-embracing reality. It provides a sense of direction and purpose to situate humans in a larger cosmological reality, both in the present and also into an unknown future.[43] Christianity images this cosmological reality as God the Transcendent Creator and the unknown future as the final eschatological paradise.

Thus the desire to participate in the eternal paradise ecosystem of the New Heaven and Earth (or Kingdom of God) impels us to take such ecological actions to please God, our cosmic reality, now in the temporal life on earth. He has called us apart, like all other human beings within creation, to image him in resolving the ecocrisis.[44] Moreover, many people, including governments, place their faith, though vainly, in new science and technology alone to resolve present and future ecological problems on the earth.[45]

Our major responsibility, therefore in my view as Christians in Science, is first to hold fast our faith in the face of intriguing scientific and technological

41 Grim and Evelyn Tucker, *Ecology and Religion*, 79.

42 Grim and Evelyn Tucker, *Ecology and Religion*, 79.

43 Grim and Evelyn Tucker, *Ecology and Religion*, 96.

44 Bookless, *Planetwise*, 89.

45 Curry, Ecological Ethics, 23.

discoveries about our earth. The study and practice of science should lead us to doxological experiences so that we become agents of closing the science-theology gap, something that is needed in our generation to improve human-earth relations for sustaining our earth. Thomas Berry, a scientist and Catholic theologian, stated that 'mutually enhancing human-Earth relations were critical to reverse the destruction of nature in the contemporary period'.[46]

Thus we need to pursue appropriate ways of reviewing and reconstructing our theology and integrating our faith in interpreting reality in the laboratory and from field tests as well as in the practice of pastoral care. As Bookless suggests we may have to live on our earth wholly as if creation matters: in discipleship as we image God like Jesus who did everything to salvage all creation; in worship as we wonder at God's creation from newer scientific discoveries; in our lifestyle as we avoid the idolatry of consumerism but celebrate simplicity; and be in mission as we advocate and lead the rest of humanity also to participate in creation care praxis.[47]

Writing separately on the same topic Calvin B. deWitt and David Bookless argued and made distinctively clear that care of creation is part of Christian mission.[48] Since I am in the Christian academy, one way in which I have decided as my mission to lead young students to be morally responsible for our earth is to advocate an alternative approach in the curriculum for studying Environmental Science at undergraduate level in Christian higher educational institutes. I am proposing African Christian Ecotheology (ACE) as the alternative interdisciplinary undergraduate course. For in my view students in all academic programmes whether in the Sciences or the Humanities may be potential contributors either to the environmental hazards or solutions, depending on use of their knowledge gained.

A significant number of the environmental threats to terrestrial life may result from our application, or rather misapplication, of the cultural and technological knowledge gained from education, apart from increasing population etc. In his book, *A Moral Climate—the ethics of global warming*, Michael S. Northcott observes that through technology and economic and political artifice, and because of growth in the human population, the powers of modern humanity have grown to the point that humans are now the strongest biological force on earth.

But these new powers have not been accompanied by a growth in moral responsibility for the condition of the planet. On the contrary, as technology has heightened human power over nature, modern humans are increasingly alienated from the earth and their fellow creatures. People are therefore increasingly poorly equipped—ecologi-

46 Thomas Berry, 'The New Story', in *The Dream of the Earth* (San Francisco, CA: Sierra Club Books, 1988), 123-37. See also Grim and Evelyn Tucker, *Ecology and Religion*, 59.

47 Bookless, *Planetwise*, 88-143.

48 Calvin B, deWitt, 'To strive to safeguard the Integrity of Creation and Sustain and Renew the life of the Earth' in Andrew Walls and Cathy Ross, *Mission in Twenty-First Century—Exploring the Five Marks of Global Mission* (Maryknoll : Orbis Books, 2008), pp 84-93. That of David Bookless is on pages 94-103.

cally, morally and politically—to deal with the consequences and dangers of these enlarged powers both for the earth and for human wellbeing.[49]

Northcott points out that we live in times when both technological and cultural (politics, economics, educational) advancements have increasingly become powerful tools used by humans to dominate nature, without a moral conscience nor ability to undertake any redeeming actions regarding the dangers threatening the earth and its inhabitants including our own wellbeing. Consequently, irrespective of the field of academic or professional studies, education must impact students' environmental responsibility based on their understanding of themselves as humans made in the image of God.

As I said earlier, each student, as a human, in higher education is either a potential conserver or a threat to our environment, perhaps more than the lower educated or non-educated, depending on the response of our use of the higher knowledge gained. The tension between being a threat to and a conserver of earth at higher educational level is perhaps more pronounced in the case of Science students.

It is not difficult, for instance, to see Computer Science graduates from Christian higher institutions managing computer hardware firms, and these may be the first to be accused of polluting the environment indiscriminately with their dangerous computer waste. They would have learnt from Environmental Science that one function of the earth is to serve as the sink for waste products. Are the young Ghanaian chemical engineers who operate *galamsay* (small scale mining) with their expertise not a threat of pollution to our water bodies? Can we exonerate the Agricultural Scientist from the impoverishment of soil and inland water for food and fish production, using uncontrolled or improperly regulated inorganic substances?

I notice a serious problem from the data being analysed in my current research. It concerns a possible danger of infertility that seems to loom over the heads of women in the research area if they continue drinking water from the river in which tilapia farming is in progress. For I am told the farmers use a certain hormone (an androgen called 17α-methyl-testosterone) to 'unisex' the fryers so as to gain earlier market weight at lower cost.[50] Scientifically and logically a hormone that turns female fish to male will probably render a woman infertile as an accumulated residual effect.

Some of the participating farmers in this study seem to be aware of such possible danger.[51] They protect themselves from possible impotency by wearing rubber gloves and by strict attention to hand washing with carbolic soap.[52] But the unsuspecting girls living down-stream drink and wash with that water unawares and without any protection.

My argument is that notwithstanding the good that science entails for development, teaching it without a mind-

49 Northcott, *A moral climate*, 6.

50 Edem Agbattor, interview at Sokpoe-Vogorme, 24 February 2016.

51 Mathew Agbattor, interview at Sokpoe-Vogorme, 24 February 2016.

52 Wisdom Kwame Blasu, interview at Sokpoe Bodzodipe, 28 March 2016.

set to induce moral transformation and responsibility for preserving our earth is a mission only half accomplished. Hence, the need for a holistic studying of Environmental Science, integrating it with faith to emphasise interrelationships between God, humans and the earth, and hopefully inducing moral responsibility for our Earth in the process.

I call the alternative curriculum African Christian Ecotheology because we are Africans and the move in our generation to practise theology the African way has been well established. Therefore we may need to engage with indigenous knowledge systems and the knowledge within other faiths to retrieve, re-evaluate and reconstruct values, ethics, and norms that promote creation care in Africa. Armed with both science and Christian doctrine we may better interpret the symbols and rituals and how they motivate ecological actions.

For instance, I found among the Sokpoe-Ewe that even birthing rites can prime babies for future creation care. As an animal reproductive physiologist I could appreciate the ritual of insisting that a new mother remain indoors with the baby especially in the first three days. During these three days and even until the seventh day the new mother is virtually confined in *didexorme* (maternity room) and provided with *didekple* (a special meal from roasted corn flour, red palm oil and salted fish). The confinement could be a way of ensuring immunoglobulin fortification for good health in the ecosystem by making colostrum available to the baby, while relying on the local food indirectly cares for creation by avoiding the otherwise huge and complex chain of climate-change processes and use of resources that would have gone into an imported industrialised formula.

Then, with my biblical knowledge of the Pauline warning against the vulnerability of humans to evil spirits in the ecosphere, I understand the precarious cosmo-vision of the Sokpoe-Ewe and hence the ritual of placing *xornudzorgoe* (food particles in a small gourd) hung at the door of the *didexorme*. This is to ward off *adzetorwo* (homophagus spirits) from eating the baby's flesh. My understanding that the earth is part of a vast cosmic space and an individual can be lost unless rooted in a certain family, society, culture and land explains why the baby must be left alone to cry and found by a loving woman and named by the father to signify paternal inheritance during the outdooring ceremony.

Prof Joshua Kudadjie, a Christian ethicist of the Methodist Church of Ghana, conducted a similar research among the Ada, whose outdooring rites are similar to those of the Sokpoe-Ewe in many respects. Perhaps bereft of serious science background, particularly cosmological science, or being more focused on ethics than science, he downplayed and discarded this aspect of the ritual from his reconstructed outdooring liturgy.[53]

In addition, those of us who are animal producers may have to consider how best to inculcate ideas from biocentric ethics, particularly animal welfare ideas from Peter Singer's ani-

53 Joshua Kudadjie, 'Researching morals and rituals', *Journal of African Christian Thought*, Vol. 2, No. 2, (December 1999): 35-43.

mal liberation movement[54] in our production systems. Generally all of us, scientists or not, as belonging to the human species of earthlings, may consider allowing our love for and obedience to God to be our moral impulsion for responsibility for our earth. We may begin with a decision to take the ecological actions we may be most comfortable with.

Some of us, especially city dwellers, may reduce and supplement industrialised food with increased levels of local food from backyard gardens, revisiting the 'operation feed yourself' and 'domestication' philosophies of the late Ghanaian politicians, General Ignatius Kutu Ackeampong and Daniel Lartey, respectively. For some it may be simple self-discipline to avoid wastage of utilities, especially electricity and water; reducing usage of 'take-away' polythene bags or stop throwing empty water sachets out of moving vehicle windows.

Scientists in the church may consider it as mission to encourage churches and Christians within them to act in an ecologically ethical way in taking and implementing church decisions such as avoiding siting chapels in waterways, greening church premises and homes of members, and discouraging 'galamsay' by refusing big harvest donations from such enterprises. We may be involved in prayer and Bible study and talking about our faith, alongside scientific and practical theological research, environmental education and sharing our lives as we explore sustainable earth community.

The important thing is that, whether we accept a creationist or evolutionary approach, we must realise that we are part of creation and at the same time we are to care for creation because we are made in God's image.[55]

V Conclusion

I have argued in this paper that the earth is the Lord's but is also ours because God gifted it to us as our home to use and leave it. However, historically since our inception on God's earth, we humans have damaged the relationship between us and God and other creations with our disobedience or ecological sin. This brought ecological crisis to our Earth.

Perhaps Christians in Science, apart from championing many useful scientific discoveries, may also be seriously contributing to the ecocrisis when we employ science and technology without theocentric ecological ethics. This in itself is a major reason we should engage in earthkeeping responsibilities. Despite the tension between our scientific facts and our revealed faith, we have responsibility for our earth, because our God to whom the earth belongs, gifted it to us on condition that we use it responsibly.

54 Peter Singer, Animal Liberation, (London: Granada), cited by Curry, *Ecological Ethics*, 44.

55 Bookless, *Planetwise*, 146-147.