Christ and a Theology of the Environment

Daniel McNamarra

The author begins with a situationer on the effects of global warming in the Philippines. The author then discusses a theology of the environment that sees the environment as a System. Particular focus is given to the work of Teilhard de Chardin and his exposition of the Christic element in evolution. The nexus between the modern system approach to the environment and Teilhard's theology is the theme of energy. For Teilhard de Chardin, Christ is the central axis of the evolving world and so it's prime "Energy".

Climate Change in the Philippines

I will introduce the Climate Change scenario for the Philippines, focusing on the global warming aspect of the changes. This overview stems from the work of colleagues in the Manila Observatory, principally. From this we may move on to the theology reflection proper for this paper.

For the Philippines climate change is a very real issue though of course it affects the whole earth. The reason for this stems from the nature of the archipelago. We are situated in the tropics and have many unique environmental properties the main one of which is the tropical cyclone belt affecting us. The effects of global warming in the Philippines will be in the areas of temperature, rainfall, and tropical cyclone activity. These effects will in turn cause impacts on other sectors such as agriculture, forests, water resources, etc.

Trends in regional surface temperature show a rise in mean temperatures between 1960 and 1968. This would mean for the future more hot days, warm nights, fewer cold days and nights.

Data also show shifts in rainfall patterns in the Philippine archipelago, with decreasing rainfall or drought due to the El Niño phenomenon.

The tropical typhoon picture of the region has also been affected by global warming. The number of tropical cyclones appearing in the Western Pacific has been increasing. In the Philippines, the rise in typhoon crossings is most pronounced over the Visayas region. Sea levels have also been rising and this will impact flood prone populated areas in the Philippines.

Let us also consider the country's biosphere:

Taxonomic Group	Species	Endemic	Species Percent Endemic
Plants	9,253	6,091	65.8
Mammals	167	102	61.1
Birds	535	186	34.8
Reptiles	237	160	67.5
Amphibians	89	76	85.4
Freshwater Fish	281	67	23.8

As we see from this data there are unique flora and fauna in the country and these will be affected by global warming. Some species will no doubt move to more 'friendly' habitats as the temperature warms and their food supplies become affected as well as the prey –predator balance. Before the 1970's, colder temperatures in higher elevations have kept mosquitoes and mosquito-borne diseases to lower elevations. Today, with the effects of global warming, we see the spread of mosquito-borne tropical diseases such as dengue and malaria to higher areas which have become warmer and more hospitable to mosquitoes.

In short the presence of more heat in the atmosphere will give rise to changes in the local environment especially in the areas of night and day air temperatures, rainfall, storms and biodiversity.

Christ and a Theology of the Environment

The energetics of global warming and its effects fit very well into the philosophical and theological thinking of Fr. Pierre Teilhard de Chardin, the French Jesuit of the last century. He had a great interest in energy as he saw this category as a common point between

science and theology. His lifelong interest was to better explain that the theory of Evolution and the teaching of the church were not in conflict. It was precisely in the category of energy that these seeming conflicts could be resolved. Teilhard coined the term "hyperphysics" and within that system of his he focused on energy. For him there are two kinds of energy: radial and tangential. As we will see in what follows the energy of global warming and climate change are for Teilhard examples of tangential energy and radial energy. This latter is due to the fact that human beings are making this excess contribution to the world climate and so exercising their prerogative as rational beings endowed with 'radial' energy. This energy is meant to lead them to the Source of all energy, Christ, as we will see below.

In this paper I will be speaking of a theology of the environment through the optic of a theology of Creation. But before that presentation let me clarify the very broad term "environment" as it is used today. Environmental groups who usually focus on the flora and fauna of planet Earth are scientifically dealing with what is referred to as the Earth System. This term stresses the interconnectivity of all the, especially living, components on our planet. As a science this System approach is relatively new, an outgrowth of the twentieth century's concern with complexity science, as we shall see later in this paper.

Seeing the environment as a System will also allow us to present a theology which deals with nature in much the same systematic way. In particular I have made reference to the work of Teilhard de Chardin and his exposition of the Christic element in evolution.[1]

For Teilhard de Chardin, Christ is the central axis of the evolving world. Chardin set out to help the Christian world understand that evolution was not something to be feared, to be taken as opposed to the Christian tradition.[2] Thus he would quote from Scripture:

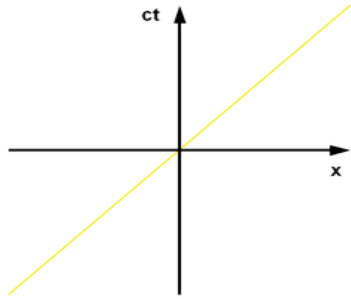
> For the believer who has understood- in their full force and with no qualification - the words of St. John and St. Paul,

1. Pierre Teilhard de Chardin, *The Phenomenon of Man* (New York: Harper & Row, 1965); Pierre Teilhard de Chardin, *Writings in a Time of War* (New York: Harper & Row, 1968), 166.

2. Pierre Teilhard de Chardin, *Activation of Energy* (San Diego, CA: Harcourt Brace Jovanovitch, 1970), 302.

> Christ reveals himself at the heart of *every* being that progresses, as a Center that is at once very near and very distant: very near, because he is, and it is his will to be, at the source of every affection; very distant, because the being cannot unite himself to Christ except at the term of a long process of perfection.

We see here two spatial references: "very near" and then "very distant". I will interpret these as references to a picture of the cosmos that comes from the modern science of Teilhard's time with which he was familiar: the spacetime picture coming from the work of Albert Einstein. Springing from Einstein's work of Relativity theory we have the conjoining of spatial dimensions and temporal dimensions. Just as we are familiar with 3 dimensions of our spatial world so Einstein joined the time dimension to these three so as to form the 4-dimensional world of spacetime. Often this model of the actual world is pictured as follows:

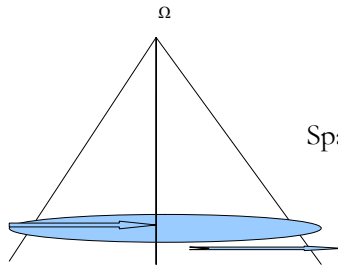


In this picture we have the spatial coordinates of our world (height, width and length) all represented by just one coordinate=x. The vertical axis is the time axis pointing upward. The yellow line shows an object's path in this system as it moves in space and time. This is called its 'worldline' and all objects in our world have therefore a particular worldline for they exist in space as material objects but also in time. Their worldline traces their material existence in spacetime.

With this system in mind Teilhard introduces the Cosmic Christ, the Alpha and Omega of time.[3] Now the vertical axis, the time axis of spacetime, becomes the worldline of Christ, present at all times

3. Ibid., 288.

as evolution proceeds. All created things existing in space live and grow in the horizontal plane "perpendicular" to the Cosmic Christ worldline. Again we may picture this as a cone where at each moment in time the cosmos fills a circle, a cross section of the cone. Within in this circular cross section we may draw a line in the radial direction and another tangent to it pointing therefore along the circumference of the circle. These two lines represent two key ideas of Teilhard's system. [4] The radial line pointing toward the center is the Radial Energy always present in each era of the evolutionary process. Likewise the tangential line is the "Tangential energy" pointing along the circumference of the circle.[5]



Time axis = vertical;
Space coordinates=horizontal

These are key ideas for Teilhard since he wished to explain to the scientific world his vision of the Cosmic Christ of evolution in a language they could accept. Today we may use this same image to better understand how to think about the Environment in a Christian sense.[6]

All the environment and in particular the Earth System we commonly call the environment: the trees, the seas, the earth, the atmosphere-all the components that we encounter on planet earth, makeup the Earth System. This totality science today calls the Earth System to stress its interconnectivity, its 'togetherness' which we often hear referred to as 'Mother Earth'. As a scientific entity this united system is often seen in the light of the energetics which comprise its unity. So Teilhard used Energy as a central theme in his philosophical/

4. Ibid., 125.

5. Ibid., 120.

6. Pierre Teilhard de Chardin, *The Divine Milieu* (New York: Harper & Row, 1960), 100.

theological writings. Einstein had already shown that matter and energy were convertible. For Teilhard energy had an even deeper equivalent and so he coined the term "hyperenergy" to show that in the evolutionary process all energy had not only a tangential or physical component but also a 'spiritual' component. This is required by his seeing a physical law operating in nature which he called the Law of Complexity -Consciousness.[7]

Here we reach an essential component of the Teilhardian system. There is present in nature, in the environment, this law which he sees operating over the vast times and course of evolution which he studied as a paleontologist. In the course of eons he sees simple beings coming together and forming more complex beings. This extends even back into the very roots of material reality such as the moment of the Big Bang. For Teilhard the fact that modern cosmology sees particles forming in the microseconds after the initial energy explosion and then these in turn becoming more complex in the seconds that follow as the spacetime continuum expands is a confirmation of his intuited theory. It is a process at the very heart of the Environment then and today. He sees physical energy most manifest in the simple, less complex entities at the start but as time passes and the more complex entities come to be and they in turn have a deeper energy. What he calls an 'inner' component or radial component, radial energy.[8] So the law of complexity-consciousness dictates that there is written into nature and so the environment an evolutionary process by which beings grow more complex in time and so become more endowed with radial energy, a 'within' as well as their physical energy, the 'without'. This is Evolution at work and so this is the Environment we speak of today.

Every creature, every aspect of the living world of the environment consists of these natures, these complexes. They have come from those which went before them and continue to develop in accord with these natures, these dynamisms which have evolved over eons of time. In accord with the thought of Teilhard we may say they act in accord with their "inside", their 'within".

---

7. Harold J. Morowitz, Nicole Schmitz-Moorman, James F. Salmon, "Teilhard's Two Energies," *Zygon,* 40, (September 2005), 721-732.

8. Chardin, *Activation of Energy,* 120.

These elements of the larger system, the Environment, all fit together in an integrated whole which is studied today precisely in its inter- connectivity. Hence the fear of many in the environmental movement that if we lose this perspective by simply using earth's elements without regard for their connectedness we will destroy the Earth System which as far as we know is the only such system in creation. We stand again in the Garden and are asked to be the Caretakers of the Owner.[9]

With this system of Hyper-physics Teilhard hoped to be able to speak to the world of the early 20th century in the language of physical science. Today however his ideas have found a new voice as physics does not speak of a law of complexity- consciousness but rather of Emergence. In the words of Nobel Laureate Philip Anderson writing in the later part of the 20th century: "The whole is greater than the sum of its parts".[10]

To anyone versed in scholastic philosophy this is nothing new but to 20th century scientists and especially physics this is new. It seems to contradict the very ethos behind the atomistic reductionist theory for doing science that has been so successful through the 20th century. Anderson goes on to illustrate his point in the following diagram:

X	Y
Solid state physics or many-body physics	Elementary particle physics
Chemistry	Many-body physics
Molecular biology	Chemistry
Cell biology	Molecular biology
-	-
-	-
-	-
Psychology	Physiology
Social Sciences	Psychology

But this hierarchy does not imply that science X is "just applied Y." At each stage, entirely new laws, concepts, and generalizations

9. Alwyn C. Scott. *The Nonlinear Universe: Chaos, Emergence, Life* (Berlin: Springer-Verlag Berlin and Heidelberg GmbH & Co. KG, 2007).

10. Quoted in George Ellis, "Physics and the Real World", *Physics Today* 58 (July 2000).

are necessary, requiring inspiration and creativity to just as great a degree as the previous one. Psychology is not just applied biology nor is biology applied chemistry.

Anderson here is expressing the idea that physical science had come to see, especially through the findings in biological research done by means of application of physics and chemistry to biology, that newness in living beings appears and is not necessarily able to be explained by the reductionist paradigm. As he says "biology is not applied chemistry."

These ideas I am sure would please Teilhard as they would fit his paradigmatic law of complexity-consciousness. In contemporary language they point in the direction of complexity as an "emergent" property of the material substrate. Here too Teilhard would be on the same ground as so many of the environmental movement who see the many possibilities of new emergent properties budding forth from the present flora and fauna of our world. The fear that these emergent properties will be lost if bio-diversity is not cherished propels many an environmental activist today.[11]

This Anderson idea encapsulated as early as the 1970's the quiet revolution in scientific thinking that is usually called Chaos Theory. Here science with its mathematical language and way of proceeding admitted that it had been overlooking the more realistic physical realities of the world which are in fact nonlinear. This means that science ever since Isaac Newton in the 17th century had been pursuing humanly tractable problems as it attempted to explain the world. The more realistic problem was either not appreciated or if it was considered too difficult to bother with. It was the advent of the computer in the 1960's that changed all of that. With the power of the digital world at its finger tips the scientist could now solve problems which before would have taken lifetimes to calculate and so were not treated. Within this new power also came the realization that such involved problems were many times not in the form of 'linear' equations but non-linear ones. With these in turn appeared

11. Global and Regional Air and Energy Program, Environmental Defense (www.environmentaldefense.org) and Earth Communications Office (www.oneearth.org). (accessed September 14, 2010)

even more complications in what came to be called chaos theory. As Crutchfield puts it:

> "Chaos brings a new challenge to the reductionism view that a system can be understood by breaking it down and studying each piece….Chaos demonstrates.. that a system can have complicated behavior that emerges as consequence of simple, nonlinear interaction of only a few components."

Such thinking and ways of seeing the physical world fits nicely in the Teilhardian synthesis under his law of complexity. But what of consciousness? With the notion of consciousness or mind we enter a world of contention among scientists. There are those true among physicists who argue that matter is the valid subject of physics and mind is not matter. For them Teilhard would use the matter-energy equation approach since they will accept this Einsteinian bedrock of modern physics. But even for Teilhard the issue was serious enough that he created his own language. His hyper-physics allows for consciousness to emerge through the complexity law because he sees all energy and therefore matter as having a component of radial and so "consciousness" energy at every stage of the evolutionary process. He used the French term "psychique" to describe this component of energy and in a mistranslation into English it was called "Psychic"energy. This did not help his English readers understand his system.

The mind-brain issue has been around for a long time in the world of psychology and even today is unresolved. Is the brain the same as the mind or are these separate elements of the human person? Teilhard sidesteps this issue in a sense. Yet he does come down on the side of the unity of the two in the sense that the mind is a manifestation of the radial energy present, in degrees, in all matter. It becomes more manifest and so identified by science as the "brain" when the complexity of the organism has achieved a physical level that we call brain and on the consciousness level achieved the level which we call "mind".

We even see this law again in the post-Teilhardian sciences of the late 20th century and here we see it extending into what we call the "environment."

Molecular biology has shown a complexity operating in the natural world even at the atomic molecular level. To quote a late 20th century work:

> "The quantity and activity of gene-regulating molecules often depends on the environment surrounding the whole individual....Each cell's nucleus is at the center of a veritable symphony of chemical signals arriving from all directions."
> "...genes-stamped with an evolutionary legacy formed over billions of years-and the evanescent molecular signals of each cell's environment, which is changing by the moment...Achieving a complete understanding of the billions of interactions among cells in the developmental dance will remain one of biology's greatest ...challenges..."[12]

We have seen therefore all the pieces needed to bring the vision of Teilhard de Chardin forward into the modern concern for the environment. His Cosmic Christ, operating at all levels of the world as manifest in the law of complexity-consciousness, calls forth radial energy at every stage of the world's evolution and in every creature, each according to its own capability. Recall that in our diagram showing the Cosmic Christ each stage of the world's growth was pictured as a cross-section of the cone, i.e., as a circle centered on the axis. This is a good representation of how everything in the world, everything in the spacetime continuum at every moment is connected. The Cosmic Christ is the Lord of All Evolution, He is the Lord of the Dance.

Daniel McNamarra, SJ
Ateneo de Davao University
E. Jacinto St., 8000 Davao City
email address: daniel@observatory.ph

12. Climate Change Solutions (www.climatechangesolutions.com) (accessed 15 September 2010)