

# Naming a New Geological Era: The Ecozoic Era, Its Meaning and Historical Antecedents

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## 1. Introduction

The universe gropes its way forward in fits and starts, progressing by trial and error through a multiplicity of attempts and efforts, moving in many directions as it looks for a breakthrough to leap forward in evolution and consciousness.<sup>1</sup> This is how Jesuit paleontologist Pierre Teilhard de Chardin described evolutionary progress. Indeed, the universe seems to be groping now for a breakthrough in

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1. Teilhard uses “groping” “to express the idea of progression by trial and error. Multiplicity of attempts, efforts, in many different directions, preparing a breakthrough and forward leap.” It is a “Teilhardian keyword.” Sion Cowell, *The Teilhard Lexicon* (Brighton, England: Sussex Academic Press, 2001), 89.



human consciousness leading to a new geological era in the history of planet Earth. Thomas Berry named this new era the “Ecozoic era.”

In this article I share my personal and intellectual journey of discovery of this emerging era. I offer the etymology and the story of how the word was invented, its relationship to geology, and the 19th century terms and milieu that preceded it. I also offer a discussion of contemporary humans’ relationship to deep time, and the possibility of humans directing geology in a mutually enhancing manner. My ultimate intent is to contribute to the development of a richer vocabulary with which to value life, Earth community, and human-Earth relations.

## 2. My Instructions

*“We get our instructions from visions and dreams.” - Thomas Berry<sup>2</sup>*

For years I have been enamored with Thomas’s neologism “Ecozoic” for reasons intellectual and spiritual, personal and planetary, obvious and mysterious. My fascination is so strong that I am attempting to recreate my professional life around the flourishing of the word and, more importantly, the profound ideas encompassed by it.

A number of years ago, during a period of intense doubt about all things Ecozoic, I imagined myself trying to explain Ecozoic to an audience at a local bookshop. A disdainful detractor at my imaginary presentation aggressively stood and loudly challenged me. He loudly demanded from the back of the room “Who are you to promote such a made-up word? Who gives you the right to promote it?” He was mean, rude, and border-line crazy. Who was I to use this made-up word with such confidence? Who gave Thomas the authority to invent it? In fact, by what authority did any geologist, any thinker, any inventor ever invent anything? After a time I realized the imaginary man at the back of the room was one of my Guides asking me, in a not so subtle way, to clarify my thinking about the Ecozoic.

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2 Thomas Berry, “The Ecozoic Era,” (lecture, Schumacher Society, Great Barrington, MA, October 1991), <http://neweconomicsinstitute.org/publications/lectures/berry/thomas/the-eco-zoic-era> (accessed June 30, 2013). Original audio lecture available at [http://www.archive.org/details/Ecozoicera\\_berry](http://www.archive.org/details/Ecozoicera_berry) (accessed June 30, 2013).

The vision reminded me that we humans live in a self-made world. Every word, every concept, every tool—large or small, grand or mundane—was first conceived or invented by one of our human ancestors. While Earth and universe are the original sources of creativity, it was a particular human being, responding to a creative force, who invented each word, concept, and tool. While humans did not make our tongues, we made our languages; while we did not make our continents, we made our countries; and while we did not make trees, we made our tables. Of course, the human community had to find the invention useful, adopt it, and incorporate it into the culture. But look around! Everywhere there is proof our ancestors confidently acted on their own authority and collectively invented the human world we live in today.

Who gave Thomas the right, the authority, to invent the term “Ecozoic era”? Earth and universe endowed Thomas with unique sensitivities, and Thomas acted on his own authority—a grand human tradition. And, if the **Ecozoic Era is to be created we, groping with the universe, will have to rely on our own authority to bring it into being.**

### 3. Origins of the Word “Ecozoic”

The etymology of “Ecozoic” is “eco-,” derived from the Greek word “oikos” meaning house, household, or home, and “-zoic,” from the Greek word “zoikos” meaning pertaining to living beings. Thus, Ecozoic era, based on this etymology, means the era of the house of living beings.

The term was coined by Thomas while working with Brian Swimme in the late 1980s. Brian reported,

When Thomas and I were writing *The Universe Story*,<sup>3</sup> this would have been the late 1980s, we wanted to get the right name for the emerging era. We went round and round and round trying out possibilities. This was while we were working in motels or eating meals in restaurants or talking on the phone in between meetings.

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3. Brian Swimme and Thomas Berry, *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era* (New York: Harper Collins, 1992).

Then one night, I don't know the exact date, the phone rang and I answered and it was Thomas. He didn't say "Hello" or anything. He just launched right into it. His voice was explosive with excitement. "I've got it! It's the Ecozoic era!" We both burst into laughter—our instant, mutual recognition of just how right this term was. It was the first time the word was ever thought of. It's an example of Thomas's geological consciousness.<sup>4</sup>

This would have occurred sometime after Thomas's *The Dream of the Earth* (1988) was published.<sup>5</sup> Although the concept is developed in Chapter 5 of that book, "The Ecological Age,"<sup>6</sup> the term Ecozoic era is absent. Thomas publicly used the term in the 1990 VISION-TV series filmed at Holy Cross Centre in Port Burwell, Ontario.<sup>7</sup> By 1991, Thomas had fully developed it. His October 1991 Schumacher Lecture is entitled "The Ecozoic Era."<sup>8</sup> In 1992, Thomas and Brian used it in the subtitle of the book they co-authored, *The Universe Story: From the Primordial Flaring Forth to the Ecozoic Era*, and the final chapter of the book was on "The Ecozoic Era."<sup>9</sup>

Brian continued: "I'm also fairly certain that his invention of the word came in reflecting on Teilhard de Chardin. Teilhard's word for the next era was "psychozoic." Thomas always found that too anthropocentric. I love the way the ideas of Teilhard blossomed forth in Thomas with new dimensions, especially regarding ecology."<sup>10</sup>

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4. Brian Swimme to Allsyn Kiplinger, emails (edited), January 29, 2010, at 10:47 a.m. and 4:15 p.m. (footnote added) (hereafter, "Swimme emails").

5. Thomas Berry, *The Dream of the Earth* (San Francisco: Sierra Club Books, 1988)

6. *Ibid.*, 36-49.

7. This series was transcribed and published in 1992 as *Befriending the Earth*. Thomas Berry, *Befriending the Earth* (Mystic, CT: Twenty-Third Publications, 1992).

8. Berry, "The Ecozoic Era."

9. Swimme and Berry, 241-61.

10. Swimme emails. Pierre Teilhard de Chardin (1881-1955) was a major influence on Thomas's thought as Brian mentions. Teilhard was a Jesuit priest, philosopher, paleontologist, and geologist educated at the end of the 19th and beginning of the 20th centuries. He reflected at length on human-Earth-universe relationships. For additional information on Teilhard's influence on Thomas, see Mary Evelyn Tucker, "Biography of Thomas Berry," <http://www.thomasberry.org/Biography/tucker-bio.html> (accessed February 15, 2010).

Thomas explained his use of the term in his Schumacher Lecture:

I suggest the name “Ecozoic” as a better designation than “Ecological.” Eco-logos refers to an understanding of the interaction of things. Eco-zoic is a more biological term that can be used to indicate the integral functioning of life systems in their mutually enhancing relations.

The Ecozoic era can be brought into being only by the integral life community itself. If other periods have been designated by such names as “Reptilian” or “Mammalian,” this Ecozoic period must be identified as the era of the Integral Life Community. For this to emerge there are special conditions required on the part of the human, for although this era cannot be an anthropocentric life period, it can come into being only under certain conditions that dominantly concern human understanding, choice, and action.<sup>11</sup>

The glossary of *The Universe Story* offers this definition of the Ecozoic: “The emerging period of life following the Cenozoic, and characterized, at a basic level, by its mutually enhancing human-Earth relations. The word derives from the scientific tradition that divides the Phanerozoic Eon into the Paleozoic, Mesozoic, and Cenozoic eras.”<sup>12</sup>

#### **4. The Three Eras of Complex Life: Paleozoic, Mesozoic, Cenozoic<sup>13</sup>**

The words we use to describe the stages of Earth’s story, like all words, were coined by someone. Because Thomas invented Ecozoic to stand with other geologic terms, my curiosity led me to inquire about the origins of Paleozoic, Mesozoic, and Cenozoic.

What is revealed as one studies the story of Earth and life is that Earth has been about different things at different stages of its devel-

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11. Berry, “The Ecozoic Era.”

12. Swimme and Berry, 280.

13. It was not until 1930 that these three eras were grouped into the Phanerozoic Eon—from the Greek words meaning “make life appear.”

opment. While trying to understand Earth's story, geologists of the 18th and 19th centuries noticed that lower strata of rocks contained fossils of simpler life forms while higher strata contained fossils of more complex life forms. If one assumed that the higher strata were deposited later than the lower strata, it followed that life became more complex over time. By studying these deposits, one could create a narrative of the development of life on Earth<sup>14</sup> with three distinct stages: the Paleozoic, Mesozoic, and Cenozoic eras.

Adam Sedgwick (1785-1873), a founder of modern geology, teacher of Charles Darwin, and professor at Cambridge University coined the term Paleozoic era (Greek for "ancient life") in 1838. In 1840, inspired by Sedgwick, John Phillips (1800–1874), a savant and professor of geology at Kings College London and Oxford University, coined the terms Mesozoic era (Greek for "middle life") and Cenozoic era (Greek for "new or recent life").<sup>15</sup> In the naming of the Paleozoic, Mesozoic, and Cenozoic eras, Sedgwick and Phillips created a narrative of the story of Earth and of life, and in so doing extended our imaginations to understand Earth's story.

## 5. A Primer on the Nomenclature of Geochronology<sup>16</sup>

Developed over the last three centuries, Earth's geological story has been classified into ever-more-specific units of geological time. The

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14. The ability to date geologic features was not be possible until the early decades of the 20th century when the English geologist Arthur Holmes (1890-1965) invented and performed the first uranium-lead radiometric dating.

15. John Phillips's uncle and guardian was William Smith, "the father of English geology" and maker of the first geologic map of England.

16. The names and length of each time unit is maintained and ratified by a body of the world's scientific community called the International Commission on Stratigraphy, a sub-organization of the International Union of Geological Sciences, which was founded in 1933. "Its primary objective is to [set] global standards for the fundamental scale for expressing the history of the Earth." Website of the International Commission on Stratigraphy at <http://www.stratigraphy.org/> (accessed August 5, 2011). It can take a generation or two for the scientific community to vet and accept a new name for a geologic time unit. This gives me hope that in the future the Ecozoic will be accepted as the name of the next geological era. The current International Chronostratigraphic Chart v. 2013 may be downloaded at <http://stratigraphy.org/ICSchart/ChronostratChart2013-01.pdf>.

units are called:

*Supereon* - a unit of time spanning billions of years and being more than one era. There is one supereon, the Precambrian, which is divided into the Hadean, Archean and Proterozoic eons.

*Eon* - a unit of time spanning hundreds of millions of years and being divided into eras. There are four eons, the three listed above comprising the Precambrian Supereon, and the Phanerozoic eon, which is divided into the Paleozoic, Mesozoic and Cenozoic eras.

*Era* - a unit of time spanning dozens of millions of years; for example, the Cenozoic era.

*Period* - a unit of time spanning millions of years; for example, the Jurassic period (named in 1795). The current period, which began 1.8 million years ago, is called the Quaternary period.

*Epoch* - a unit of time spanning many thousands of years, now, with standardization of nomenclature, indicated by the suffix "cene." The current period, which began 12,000 years ago is called the Holocene epoch.

*Age* - a smaller unit of time spanning thousands of years; for example, the Calabrian age within the Pleistocene epoch.

Time units of the same title need not span the same number of years. For example, the Paleozoic era lasted about 291 million years, while the Mesozoic spanned about 180 million years, and the current Cenozoic era began about 65 million years ago.

Because there are non-geological meanings for the terms used to identify geological time scales (eon, era, period, epoch, age), many a conversation about the Ecozoic era has gotten unfocused and off point. To understand the full implications of the term Ecozoic era, I encourage you to stay focused on the scientific definition of a geological era and on how Thomas defines the Ecozoic era as a geological era.

## **6. Thinking in and Relating to Deep Geologic Time**

By offering us the term Ecozoic era, Thomas asked us to look into the deep time of the planet and the biosphere, just as his predecessors

Sedgwick and Phillips did when they named the Paleozoic, Mesozoic, and Cenozoic eras. By suggesting the term Ecozoic era (as the successor to the Cenozoic era) Thomas asked us to think, to be aware, to pay attention in the scale of “eras,”—in other words, in tens of millions of years, not decades, not millennia, not even a few million years, but in tens of millions of years. We are being asked to think in deep time.

Why? We are asked to think this way because the effect of human actions today will reach through ages, epochs, and periods into eras. Thomas didn’t suggest the name Ecozoic age, or Ecozoic period, but rather Ecozoic era. He wanted us to expand our deep-time consciousness and realize the long-term effects of our current dysfunctional, maladaptive behaviors, which are bringing to life and life systems as they have functioned in the Cenozoic era to an end, the consequences of which will last for millions of years into the future. We are deforming the land, extinguishing species, desolating the biosphere, poisoning the atmosphere, desiccating the hydrosphere—all of which are changing the starting point for future generations of life and for all Earth systems.

When we describe the geological impact of humans as extending into anything less than a geological period or era (in other words, less than a time scale of millions of years) we delude ourselves.<sup>17</sup> When Paul Crutzen, Nobel Laureate and atmospheric chemist at the Max Planck Institute for Chemistry in Germany, began using the term “Anthropocene” in 2000 as the name for our geological phase within the Cenozoic era, he wasn’t thinking in deep enough time. Anthropocene, has the etymological suffix “-cene,” meaning the term identifies an epoch, a scale of thousands of years. The changes we have made and are making will reach far beyond thousands of years.

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17. *Editor’s Note:* Thomas Berry writes about the “terminal Cenozoic,” which is the point made by the author here. Namely that human impacts on Earth are so great that they are causing the sixth mass extinction in the Phanerozoic eon and are terminating the way Earth has functioned in the Cenozoic era, and that this necessarily will result in a new geo-biological era. It does not follow, however, that this succeeding era will be the Ecozoic era, which, as indicated in Section 9 of this essay, is a prescriptive term.



I invite Crutzen, his colleagues, and the scientific community<sup>18</sup> to consider nesting the new epoch, the Anthropocene epoch, within a new era, the Ecozoic era. Identifying that we are—for the first time in human history—in the midst of the termination of a geological era, with the destruction and creativity that entails, changes our orientation to Earth and life.

By using the term Ecozoic era we are also being invited to have a personal relationship with this new geologic era that is beginning to rise in our lifetimes. It seems we are the ones who will shape it.

## 7. Where Do Humans Fit In? A Quest to Name the Human Era of Earth<sup>19</sup>

Imagine you are a 19th century geologist. It is 1850. The idea of deep time and “evolution” seems pretty likely to be true. Creating a narrative of transmutation over time, you’ve arranged your large collection of fossilized animals from less complex to more complex anatomies. You have correlated this fossil narrative with the stratigraphy of rock formations. Your theories about geology and the story of Earth are only strengthened. You become more confident as more evidence arrives from colleagues around the world, as geologic periodicals increase in number, and as meetings of geologists become more frequent as travel becomes easier and more reliable. The global geological conversation is happily intensifying.<sup>20</sup> It seems that the arc of understanding Earth’s development may be in place. The puzzle that is geology seems nearly complete. But then you notice you forgot one puzzle piece in your hand—the human piece! Where do human beings fit into your geological narrative? Are they part of Earth? The Christian theology that surrounds you in the culture suggests that humans are not of this world, but are unnatural additions to Earth, sinners, fallen foreigners hailing from another realm. Yet, you privately wonder – “What if humans are a natural part of creation?” Where

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18. “The New World of the Anthropocene” in *Environmental Science & Technology* (American Chemical Society), Vol. 44, No. 7 (2010): 2228-2231, is only one of the recent articles that advocate for adoption of the term.

19. I thank Karen Harwell for this insight during one of our conversations.

20. Teilhard de Chardin might recognize this as the “hominization of geology.”

would they fit into the geological narrative you know so well?

Many 19th century geologists, while studying and publishing about the grand, macro-phase development of Earth, also studied and wrote short field guides to areas they knew well, often the lands around their childhood homes. The field guides described organic geologic forms like mountains, hills, cliffs, and rivers. They also included anthropogenic incursions into organic geology by mines, quarries, canals, tunnels, and roads—obvious and powerful examples of human impact on geology. As witnesses to the rapid industrialization of the 19th century, geologists noticed that humankind commanded as much power to affect geology as oceans, hurricanes, floods, earthquakes, tsunamis, forest fires, landslides, volcanoes, and asteroids.

For 150 years a question has nagged at the geologic community: “What is the relationship of humans to geology and to Earth?” Perhaps it occurred in other disciplines, but geologists were particularly sensitive to the relationship between time, Earth, life, and human beings. The task of being a geologist required that they develop a unique sensitivity to the story of Earth requiring the inclusion of how humankind was responsible for changing that story. They saw things in a way others did not. They developed a new way of looking at and understanding Earth. They evolved a new organ of perception.<sup>21</sup>

## 8. The Family Tree of the Ecozoic Era

I’d like to introduce you to the family tree of the term Ecozoic era. There were terms that existed before the 19th century, like Georges-Louis Leclerc, Comte de Buffon’s “realm of man,” but I regard them as Dante Alighieri regarded the virtuous Pagans in the first circle of Hell of his *Inferno*: well-meaning but unable to join the journey because they were unbaptized by the geological and evolutionary discoveries that erupted in the 19th century.<sup>22</sup> So for this brief study I begin in the 19th century.

As with any genealogy, more information is known about some ancestors than others. New members may be added and new details

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21. Thank you to Professor Arthur Zajonc for this insight.

22. I thank Brian Swimme for his great and difficult class on *The Divine Comedy* as a cosmological journey which he gave at California Institute of Integral Studies in San Francisco in 2001.

may come to light. Between 1859 and 2000 we know of seven terms that were proposed by geologists and cultural historians for the time when humans participate in shaping Earth and thus the Earth community. I've included a few historical background events, indicated with an arrow and an indent, to briefly sketch the historical milieu out of which the terms came. Let us begin.

*1838 – Adam Sedgwick coined “Paleozoic era.”*

*1840 – John Phillips coined “Mesozoic era” and “Cenozoic era”.*

*1857 - The Alpine Club of London founded. The oldest gentlemen's mountaineering club.*

*1859 – Charles Darwin's *On the Origin of Species* published.*

*1863 – Inspired by the London club, the Italian Alpine Club was founded. Stoppani, the inventor of the Anthropozoic era, was President of the Milan chapter in 1874. A generation later the Italian Alpine Club helped inspire John Muir to start the Sierra Club in Martinez, California, in 1892.*

## **1859 – Age of Mind**

The “Age of Mind” was coined by geology professor James Dwight Dana (1813-1895) of Yale University. In 1859 he wrote an article called “Anticipations of Man in Nature” in the journal *The New Englander*, in which he stated: “The present age, the Age of Mind, is that towards which all the preceding ages were preparatory—a fact strongly urged by Dr. (Horace) Bushnell.”<sup>23</sup> Many of Dana's ideas carried forward for generations, including, 1) the idea of Earth as a single evolving

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23. James Dwight Dana, “Anticipations of Man in Nature,” *The New Englander*, Vol. XVII (May 1859): 296.

unit;<sup>24</sup> 2) the term “radial”;<sup>25</sup> 3) the idea of “cephalization” or the “headward movement” of evolution;<sup>26</sup> 4) the “law of progress of the whole though not necessarily of all the parts”;<sup>27</sup> as well as 5) geologist Agassiz’s idea of the “law of differentiation,”<sup>28</sup> which Dana promoted. I believe many important seeds of Teilhard’s philosophy, as well as Thomas’s and Brian’s, and therefore the philosophy of the Ecozoic era, will be found in 19th century geology.

### **1862 – Era of Mind - Age of Man**

Dana published a ground-breaking textbook *The Manual of Geology* in 1862. A standard text for decades, revised editions were published in 1863, 1865, 1867, and 1875. I have an undated “Revised Edition” which has a chart on page 132 calling the top stratigraphic layer of Earth the “Age of Man.” He anticipated Stoppani’s 1873 claim of humans as *sui generis*, humankind standing alone as a unique fruit of creation.

*1864 – Man & Nature: Physical Geography as Modified by Human Action, by George Perkins Marsh was published. Marsh’s book began the conversation, which continues today, about the role of humankind in the physical shaping of Earth. Marsh included Stoppani’s new term “Anthropozoic era” in the 1874 edition.*

*1866 – Ernst Haeckel coined the term “ecology.”*

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24. Daniel Gilman, *The Life of James Dwight Dana* (New York: Harper & Bros., 1899), 250.

25. Dana identified many radial forms in nature. He used the term radial to refer to these forms. Teilhard used the term radial to refer to “radial energy,” in contrast to “tangential energy.” Radial energy for Teilhard roughly corresponded to psychic energy, a force in the universe driving all elements to greater complexity and consciousness. See Teilhard de Chardin, “The Inside of Things,” in *The Phenomenon of the Human*, trans. Sarah-Appleton Weber (Brighton UK: Sussex, 1999), 22-32.

26. Gilman, 253.

27. Ibid, 255.

28. Ibid, 254.

### 1873 - Anthropozoic Era

In Volume II of *Corso di Geologia*, the Italian abbot Antonio Stoppani (1824-1891) introduced the term “Anthropozoic era.” He was President of the Milan Alpine Club (1874), and was the maternal uncle, friend, and influencer of the great educator Maria Montessori. George Perkins Marsh says Stoppani saw “the action of man as a new physical element altogether *sui generis*.”<sup>29</sup> “‘The creation of man,’ says he, ‘was the introduction of a new element into nature, of a force wholly unknown to earlier periods. . . . It is a new telluric force which in power and universality may be compared to the greater forces of the earth.’”<sup>30</sup> I believe Marsh’s book, which quotes Stoppani, was the first introduction of the term Anthropozoic era to English readers, although the idea of an age of the human had been present since Dana’s 1859 article.

1875 – Eduard Suess coined “*biosphere*,” “*hydrosphere*,” “*lithosphere*.” (“*Atmosphere*” was coined in 1638.)

### 1877 - Psychozoic Era

Joseph LeConte (1823-1901),<sup>31</sup> professor of geology at the University of California at Berkeley, coined the term “Psychozoic era.” It first appeared in his 1877 text book *Elements of Geology*,<sup>32</sup> which had thirteen revisions from 1878-1907. He defines “the Psychozoic era, or era of mind,” (p. 269) by saying “the Neolithic commences the Psychozoic era, or reign of man” (p. 561). As a geologist and well-read gentleman, I believe LeConte would have known of Dana’s terms

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29. Antonio Stoppani, *Corso di Geologia*, vol. ii, chap. xxxi, section 1327 (Milan, Italy: 1873), quoted in George Perkins Marsh’s *Earth as Modified by Human Action: A New Edition of ‘Man and Nature’* (New York: Scribner Armstrong & Co., 1874), 609.

30. Ibid.

31. The LeConte family graveyard is in Mountain View Cemetery in Oakland, California, one mile from my home.

32. Joseph LeConte, *Elements of Geology* (New York, D. Appleton and Co., 1877). The 1882 edition of LeConte’s book is available online at <http://archive.org/details/elementsgeology02lecontegoog>. The final chapter of the book, titled “Psychozoic Era—Age of Man—Recent Epoch” begins on page 586.



“Era of Mind - Age of Man,” as well as Stoppani’s term “Anthropozoic era.” I further believe LeConte’s term, “Psychozoic era,” is his attempt at improving the previous terms. Impressively, the word was adopted and disseminated throughout American society for about two generations with the following examples.

1877 – Psychozoic included in *Oxford English Dictionary*: “psychozoic (> from *psycho-* entry) of or belonging to the geological period of living creatures having souls or minds, i.e., the human period.”

1878 - Nathaniel Bartlett Sylvester, *History of Saratoga County, New York*, 1878, reproduces a “Table of Geologic Time” that includes “Psychozoic Era – Age of Man – Mind.” He attributes it to Dana’s *Manual of Geology*.<sup>33</sup>

1897 - Psychozoic Era listed by Peabody Academy of Science, Salem, Massachusetts, after Paleozoic and Cenozoic. *Bulletin of the Essex Institute*, 112 (March 28, 1897).

1903 - Psychozoic Era used in Ezra Morgan Wood, “Chapter VI, Geology and Earth Building,” *Beginnings of Faith and Science*,<sup>34</sup> “The Psychozoic Era is the era of man” (p. 82), and “The Psychozoic is the era of soul life, and includes the stone age, the bronze age and the iron age. Man’s appearance on the earth is comparatively recent as compared with the geological periods.” (p. 83)

1913 - Psychozoic included in *Webster’s Revised Unabridged Dictionary*: “Psy’cho’zo’ic (Geol.) Designating, or applied to the era of man; as, the Psychozoic era.”

1938 – Teilhard, as a geologist, would likely have been aware of LeConte’s text book that contained the term Psychozoic Era. Teilhard used the term in *The Human Phenomenon*<sup>35</sup> completed by him in 1938, and first published in 1955 in France as *Le Phénomène Humain*.

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33. Sylvester properly referenced Dana for “Age of Man.” The term Psychozoic Era, however, came from LeConte.

34. Ezra Morgan Wood, *Beginnings of Faith and Science* (Pittsburgh, PA: Joseph Horner Book Company, 1903).

35. Teilhard de Chardin, 124.

1945 – Vladimir Vernadsky uses Psychozoic era in the last article published before his death.

1945–present - Why do you suppose the term and idea fell from use after the first decades of the 20th century?

*1892 - Sierra Club founded by John Muir at his home in Martinez, California with a total of 182 founding members, including Joseph LeConte. The purposes of the organization as stated in its Articles of Incorporation, were “to explore, enjoy, and render accessible the mountain regions of the Pacific Coast; to publish authentic information concerning them, and to enlist the support and cooperation of the people and government in preserving the forests and other natural features of the Sierra Nevada.”*

### **1919 – Anthropogene Period**

In 1919, Alexei P. Pavlov (1854-1929), the Russian geologist, coined “Anthropogene period,” which he suggested be used in place of the term Quaternary period.<sup>36</sup> This period, in conventional geology, is our current geological period that began about 2.5 million years ago. It is the period that saw the emergence of proto-humans and modern humans (*Homo sapiens*). Pavlov also used the term anthropogenic to designate an effect or object resulting from human activity.<sup>37</sup>

*1924 – An important book by R. L. Sherlock, Man as a Geological Agent, was published. Humans are characterized as a unique force of nature, as well as a geological force.*

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36. John A. Van Couvering, ed., *The Pleistocene Boundary and the Beginning of the Quaternary* (New York: American Museum of Natural History, 1997), xix.

37. The term was first used in the technical sense by Pavlov, and was first used in English by British ecologist Arthur Tansley. Matthew Bampton, “Anthropogenic Transformation,” in D. E. Alexander and R. W. Fairbridge, eds., *Encyclopedia of Environmental Science* (Dordrecht, The Netherlands: Kluwer Academic Publishers, 1999), 22.

Through his work at the Moscow geological museum, Pavlov was a decades-long colleague of Vladimir Vernadsky who wrote about the noosphere as the third stage in Earth’s development following on the geosphere and the biosphere. It is impressive that the Russians had the clarity, almost a century ago, to place humans in geologic time.



1924 – Vernadsky, Édouard Le Roy, and Teilhard de Chardin, extending Austrian geologist Eduard Suess's 1875 words "biosphere," "hydrosphere," and "lithosphere" coined "noosphere."

1935 – Arthur Tansley coined "ecosystem."

1935 – Maria Montessori, niece of Stoppani, coined "cosmic education" as a foundational idea for Montessori education.

1972 – The name "Gaia Theory" was suggested by William Golding to James Lovelock. Subsequently the theory was co-developed by James Lovelock and Lynn Margulis.

### 1989 – Ecozoic Era

Thomas Berry, in conversation with Brian Swimme, coined the term "Ecozoic era," as discussed above.

### 2000 - Anthropocene Epoch

We return to the term Anthropocene epoch coined by Paul Stoermer and popularized by Paul J. Crutzen. The term was meant to bring attention to the impact humankind has made on Earth. With regard to the beginning of this epoch, Crutzen and Stoermer wrote:

To assign a...specific date to the onset of the "anthropocene"...we propose the latter part of the 18th century, although we are aware that alternative proposals can be made (some may even want to include the entire holocene). However, we choose this date because, during the past two centuries, the global effects of human activities have become clearly noticeable. This is the period when data retrieved from glacial ice cores show the beginning of a growth in the atmospheric concentrations of several "greenhouse gases," in particular CO<sub>2</sub> and CH<sub>4</sub>. Such a starting date also coincides with James Watt's invention of the steam engine in 1784.

While the term is gaining currency, I believe it is too short-sighted in identifying the epoch as a continuation of the Cenozoic era, and it is too focused on the human. I find it curious that many cur-



rent English-language articles reviewing and discussing the term Anthropocene contain a certain shock at the idea that a new geologic stage has been inaugurated, and especially by humankind. What Thomas, Brian, and the Ecozoic movement are embracing, however, has greater scope and meaning than the Anthropocene.<sup>38</sup>

### 9. Is It Possible for Humans to Prescribe Geology?

The term Ecozoic was invented to stand in the scientific tradition of the fully accepted geologic terms Cenozoic, Mesozoic, and Paleozoic eras. But Ecozoic is a term that suggests a vision of how the human-Earth community could be, not just how it has been in the past. This is an intellectually challenging point. Geology is a descriptive activity, a descriptive science that narrates chapters of Earth's story based on the past. Geology does not describe how Earth should be in the future. Yet, Ecozoic is a prescriptive (or normative) term, describing a geological era that is yet to be, or has barely begun, that will mature and fruit in the future. Are we directing or "pre-scribing" geology when we use the term Ecozoic era?

We know humans have been an anthropogenic geologic force for at least six millennia. With micro-phase planning and micro-phase consciousness, humans have permanently altered, had a macro-phase impact on, geology and biology. We have done this with our quarries, henges, barrows, mounds, polders, pit-mines, strip-mines, mountain-top-removal mines, slag heaps, oil wells, water wells, dikes, drainage systems, embankments, diversions, canals, dams, tunnels, roads, excavations, sedimentations, dredging, break-waters, landfills, junk yards, bombs, nuclear waste, and so on.<sup>39</sup>

With the change of scale that has occurred with our technology and our population since the industrial revolution, and especially

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38. When we look at our family tree as a totality, we begin to see a pattern of groping toward greater geological consciousness. Cosmology professor Dr. Larry Edwards calls this the discovery of "how Earth Earth's."

39. For how this has happened in the past, see, e.g., Charles Redman, *Human Impact on Ancient Environments* (Tucson, Arizona, University of Arizona Press, 1999). The film *Manufactured Landscapes*, directed by Jennifer Baichwal, Zeitgeist Films, 2006, dramatically shows how this is happening in the present. See <http://www.zeitgeistfilms.com/film.php?directoryname=manufacturedlandscapes> (accessed August 4, 2011).

after World War II, we now live in a time of profoundly dysfunctional and maladaptive human behavior. Humans are a destructive geological force.<sup>40</sup> Would it be possible for humans to consciously prescribe a future life-enhancing, regenerative time? The fact that we have worked together to make Earth worse off proves we are capable of great things. Thank goodness we are beginning to understand that we can make Earth better off.

Thomas reminds us that we live “between stories,” of how the world came to be and how humans fit in (“Cosmology”). We, in the West, live between 1) the old story based on the Christian tradition— “[that] the original harmony of the universe was broken by a primordial human fault, and that necessitated formation of a believing redemptive community that would take shape through the course of time[, and that] human history was moving infallibly toward its fulfillment in the peace of a reconstituted paradise” (the “Old Cosmology”)—which has proved to be dysfunctional; and 2) the new story based on science—that of a creative, emergent, psychic-spiritual, organic, evolutionary universe in which “the human activates the most profound dimension of the universe itself, its capacity to reflect on and celebrate itself in conscious self-awareness” (the “New Cosmology”)—which has not yet matured to become fully functional.<sup>41</sup> It is like the time in the evolutionary development of the Earth community after life became perceptive, but before it became reflective in the human animal. The universe is groping toward a new way which can be sensed but which is not yet formed. Can you feel it?

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40. I thank Betty Kissilove for this insight during one of our conversations. For example, *archaeofructus*, a fossil of the oldest known flowering plant, was found near Beipiao, about 250 miles northeast of Beijing, China, in the Yixian formation. Yixian was made famous for its large number of pristine fossils of dinosaurs, insects, fish and other ancient life. The formation is likely to be lost forever, if it hasn't been already, because it stands in the path of a proposed highway tunnel. Nova, PBS, episode titled “First Flower” (first aired April 17, 2007), and Steve Orlando, “Chinese and U.S. Scientists Identify the World's Oldest Flowering Plant,” *ScienceDaily* (Nov. 27, 1998),

<http://www.sciencedaily.com/releases/1998/11/981123115202.htm>  
(accessed August 4, 2011).

41. Berry, *Dream of the Earth*, 124-32.

Thomas also reminds us that we are genetically coded toward further transgenetic cultural codings, which are invented by our human communities over generations.<sup>42</sup> In comparison to other animals, we are born very immature or “half-cooked.” The genetic adaptation of an immature birth allows the culture we are born into to complete us with its unique sensitivities of language, customs, habits, nutrition, body language, and so forth.

Earth gave humanity the cultural assignment to answer the question “How shall we live?” Historically, however, we have answered the question “How shall we make Earth so that we may live as we choose?” With the hominization<sup>43</sup> of Earth, having implicated ourselves deeply in Earth’s life systems, we find that we are now compelled to ask: “In what type of macro-phase anthropogenic geology shall we engage?”<sup>44</sup>

As I understand it, currently all human activity that changes the geologic face of Earth is called anthropogenic. But not all anthropogenic geologic activity and motivation is equal. Thomas has offered a prescriptive possibility, the Ecozoic Era—a vision of humans living in a mutually enhancing relationship with Earth. This vision must be compared and contrasted with our current life-destroying, geocidal geological activity. As we grope our way into the future, it is critically important that we draw a distinction between: 1) the consciously anthropogenic actions of families and neighbors deciding how to live sustainably for seven generations on mountain tops, and 2) the anthropogenic action of humans working for corporations that blow up the tops of mountains in the name of profits. I hereby name the latter,

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42. Swimme and Berry, 158-59.

43. Hominization is another Teilhardian term referring to the appearance and development of the human phenomenon as well as movement of human beings into all areas of Earth. Cowell, *The Teilhard Lexicon*, 91.

44. Some might be tempted to call this kind of focus on human-Earth activities *geography*, or *human geography*, or *environmental geography*, but I’m not convinced that language or discipline goes far enough to keep us focused on the deep future as much as the term Ecozoic.

corporogenic geology.<sup>45</sup>

Anthropogenic geologic activity can be classified thus:

- A. Micro-phase impact of past historical times, and
- B. Macro-phase impact with the contemporary scale of activities, which can be divided into
  - 1. Unorganized, unconscious micro-phase geologic activity which now must be considered macro-phase because of the scale of human impact on Earth;
  - 2. Corporogenic geologic activity—contemporary, large scale activity that must be halted to preserve and enhance Earth community; and
  - 3. Ecozoic geologic activity—the nascent, generative and future Great Work of the human family.

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45. Corporogenic geology is carried out by the “person” known as a “corporation” that answers not to justice, not to domestic tranquility, not to the general welfare, not to posterity, not to the community of life, not to deep time, but to short-term, maladaptive, micro-phase profit. While corporations are considered legal “persons” today in the United States, they clearly are not human, not organic natural humans, not natural persons, not the fruits of evolution. Important work is underway to change the status of corporations. A headnote (summary) preceding the actual court opinion in *Santa Clara County v. Southern Pacific Railroad Company*, 118 U.S. 394 (1886) was the toxic genatrix of corporations as legal persons. This was a United States Supreme Court case dealing with taxation of railroad properties. The headnote stated: “The court does not wish to hear argument on the question whether the provision in the Fourteenth Amendment to the Constitution, which forbids a State to deny to any person within its jurisdiction the equal protection of the laws, applies to these corporations. We are all of the opinion that it does.” Wikipedia contributors, “*Santa Clara County v. Southern Pacific Railroad*,” Thus this was in the summary preceding the case, the court did not actually decide this. *Wikipedia, The Free Encyclopedia*, [http://en.wikipedia.org/w/index.php?title=Santa\\_Clara\\_County\\_v.\\_Southern\\_Pacific\\_Railroad&oldid=438491874](http://en.wikipedia.org/w/index.php?title=Santa_Clara_County_v._Southern_Pacific_Railroad&oldid=438491874) (accessed March 6, 2010).

With regard to efforts to change the status of corporations, see, *e.g.*, Thomas Linzey, Daniel Brannen, and Richard Grossman “*CELDF Model Brief to Eliminate Corporate Rights*,” <http://celdf.org/celdf-model-brief-to-eliminate-corporate-rights> (accessed June 29, 2013).

## 10. In Conclusion

In the largest sense, Ecozoic is a term that encompasses the ideas of space-time-human-Earth relations. It asks “How shall we live?” and “How shall we live so that others may live?” It is a perennial idea deeply embedded in what it means to be human, expressed and to be expressed in the cultures, customs, religions, myths, and facts of the developmental story of the human family. It has roots that reach deep into the mysterious development of our human body and our human psyche and into what Thomas calls the “dream of the Earth” itself.

The search for a name for our human-Earth era did not begin with Thomas. He is the inheritor of a rich intellectual tradition and part of the grand matrix of philosophical and practical inquiry that spans back to the 19th century and beyond. Others before him were trying to name and describe the human-Earth relationship within deep time.

It is no accident that the birth of the contemporary discipline of geology occurred at the same time, and within the same intellectual community, as awareness of human impact on Earth. It is as if Earth wanted humans to know and understand our geologic role. This is an early echo of Thomas’s *human-Earth relations*, a key to the Ecozoic era.

I close with a word to those who have become a movement under the Ecozoic banner and those of like mind who may not have known that word until reading this essay. I share with you this research because I want you to know that we are not the first generation to grapple with how humans change and impact Earth. We have intellectual and spiritual ancestors who thought about the role of civilization in a hominized Earth. I want us to feel the company and strength of our Ecozoic forebears as we proceed with our “Great Work” of moving from the Anthropocene and the terminating Cenozoic era into the Ecozoic era.

Those who came before may not have offered deeply sophisticated models of how to create a robust human civilization while living within a healthy Earth community (that would be our Great Work), but they gave a great gift to us by discovering Earth’s great geological story within which we think and act today. They gave us the early articulations of healthy human-Earth relations which we may build

upon. We are most grateful for their contributions.

I hope my findings provide you with context and historical background for better understanding the Ecozoic era, and for our Great Work of bringing it into being.<sup>46</sup>

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46. Thank you to Paul Hoffman, Dennis Rivers, Mary Reynolds Thompson, Karen Harwell, and Mary Ocken for editorial tasks, helpful suggestions, and important conversations.