

THE COSMOLOGICAL VALUE OF HUMAN LIFE*

John Caiazza, Ph.D.**

Senior Lecturer, Department of Philosophy, Rivier College

1. Human life, I am convinced, must be seen to be built into the fabric of the physical universe if its value is to have an ultimate moral and intellectual basis. Otherwise, asserting that human life has a value may be seen as an imposition on an otherwise uncaring universe which is unresponsive to human needs and is not intended for human existence. As a result, the value of human existence must be discoverable, I further believe, by modern empirical science. The good news is, as I hope to show in this paper, that recent developments in modern empirical science, particularly the hard sciences of physics, astronomy and chemistry, have made the value of human life much easier to accept in a scientific understanding. This has come about not because of an upsurge in religious belief or humanistic understanding by scientists but as a direct result of developments within the hard sciences themselves including astronomy, physics and chemistry.

The primary evidence for the new interest in human life within certain fields of scientific investigation is the development of *cosmology* which describes the universe as a whole. Cosmology is not a new field of inquiry, but until lately it has been seen more as a branch of philosophy than as a proper scientific field. By one definition, cosmology is that branch of philosophy (or science) that “concerns itself with the origin and general structure of the universe, its parts, elements and laws, especially with such characteristics as space, time, causality [and] freedom.” Until recently, such a comprehensive look at the universe has been thought to be the province of philosophy and speculative philosophy at that. Now however, cosmology has recently been developed as a part of empirical science because of the two revolutions that took place in physics in the XXth Century, Relativity and Quantum Mechanics.¹ The development of scientific cosmology as a new scientific field however has mostly come about as a result of Einstein’s Theory of Relativity which with mathematical precision enables science to describe the origin of the universe (sort of) and its general structure, including space, time and causality.

Now it is not my intent here to give readers a thumbnail sketch of relativity theory, especially since I am not a physicist but a philosopher. But on an imaginative basis what Einstein did was to enable us to conceive of the universe as an optional thing, in other words to imagine that the universe may have been otherwise than it is. These alternative universes may be imagined to have been too hot or too cold to have allowed life to exist, or to have too powerful or too weak a pull of the sub-atomic forces that binds atoms and molecules together. We could have had a universe without planets or stars, i.e. simply hot gases with no solid matter; or, alternately a universe which would never attain a temperature level much above absolute zero. Such universes cannot support life; in fact is true of most universes that may be imagined scientifically. As for the universe that actually exists and of which humanity is a part, as scientists continue to pursue the fine-grained parts and processes of the universe they have found an increasing degree of complexity. As a result, some scientists have concluded that the present arrangement of our universe is too complex to have happened by accident; if, that is, life is to exist. The underlying issue in the development of scientific cosmology is that this universe supports life and especially intelligent life.

2. The cosmological implications of the value of human life are apparent in the search for life on other planets. The search for alien life has generated great interest in the last half century including the “SETI” program (“Search for Extra-Terrestrial Intelligence”) which uses radio-telescopes to detect possible

signals from alien civilizations and the rocket launched “rovers” that have traveled the surface of Mars which are designed to detect the presence of biochemical molecules in the Martian soil. Despite all the time, human energy and funds that have been expended in the search, there is no actual evidence that life exists anywhere else than on Earth. No electronic signals have been detected coming from outer space that indicate the presence of advanced civilizations, and despite many reports of alien abductions and flying saucers, there is no likely evidence that alien astronauts have been visiting the Earth. Rockets sent to explore other planets have not been able to detect any sign of life and this includes explorations on planets other than Mars. The Soviets sent an exploratory rocket to Venus in the 1970’s but rather than discovering a lush jungle planet, they found an oven hot planet shrouded by greenhouse gasses; the Russians also discovered that Venus is a dead planet. Mars has seemed a more likely candidate for life, and the possibility of this has been increased by the discovery that water once ran in liquid form on the surface of the planet. But so far there has been no sign of life of Mars, i.e. no discovery of primitive one-celled organisms or even of the pre-biotic compounds required for life. The final word on life on Mars however will probably have to wait until astronauts visit the planet, which may take us well beyond this century.

There is also an ideological aspect to the search for life on other planets that involves the issue of the value of human life, which is the subject of this paper. There is an underlying idea that if there is life on other planets - in fact if there is life on a lot of other planets — that life is not so special a thing in the universe. Furthermore, it has been argued that given the extreme likelihood that there is life on a nearly infinite multitude of planets, then it is very probable that on some of these planets which support life, intelligent life has evolved (this view was expressed in a formulaⁱⁱ). Thus it can be concluded that even intelligent life is not so special a phenomenon since it probably occurs throughout the universe, and in this way, the value of human life in a cosmological context is diminished. The view that human life is not special and that assertions of its importance are merely examples of humanity’s self regard, has been held by some of the best known proponents of what may be called modern scientific ideology including Bertrand Russell, Steven Jay Gould and many others.ⁱⁱⁱ

The scenario of a universe filled with life and producing intelligent life as the result of automatic, evolutionary processes has until recently dominated scientific thinking about extra-terrestrial life. What is beginning to change the thinking about the occurrence of life in outer space is that despite constant searching for it, no actual sign of life on other planets has been discovered thus far. To the degree that life is rare in the universe, its significance and value becomes that much more apparent. So when we send up Mars rovers and await the slow transmissions of data, we are not only looking to see if there is life on the “Red Planet”, we are looking to find an indication of mankind’s place in the universe.

3. I have called the attitude of those scientists, philosophers and popularizers who deprecate the value of human life an “ideology.” I do not mean to imply by the use of that term that it is a political position, although it may be connected to one. Rather their attitude constitutes an overriding idea which these folks have in mind when they approach the question of the value of human life. That attitude is an illicit extension of what is called the *Copernican Principle* which is described as “one of the primary pillars of the science of astronomy [which] says simply that we do not occupy a privileged location in the universe.”^{iv} Just as Copernicus removed the earth from the center of the solar system to replace it with the sun, so in general it is the aim of science to displace mankind from any significant or unique place in the universe. The Copernican Principle was, according to this ideology, verified by Darwin’s theory of evolution because it reduced mankind from a special place in nature, ordained by God to be the apex of creation, to merely another species of animal, albeit the most advanced one. The Copernican principle it

is fair to say, has been elevated from a rule of thumb useful to assess the relation between human observation and astronomical phenomena to a philosophical principle that asserts the unimportance of human existence from a scientific point of view.

There is a counter to this denigration of the value of human life from a purportedly scientific point of view which, in fact, comes from the new field of scientific cosmology, in turn derived from relativity physics and astronomy and other fields of hard science including chemistry, quantum physics and meteorology. There was, as it is often described, a “revolution” in XXth Century physics about by relativity theory and quantum mechanics. Again, speaking as a philosopher and not as a physicist, that revolution can be described in general terms as the replacement of the mechanical view of the universe which was essentially static, with a time-bound view which in the new version of the universe is dynamic. The older view was based on the mechanical science of Newton in which the universe was pictured as vast machine, infinitely large but mostly empty, containing only the occasional star, planetary system or galaxy whose motions were completely predictable by mathematical laws. Pascal, the 17th Century French religious writer and mathematician said that the infinity of the space of the Newtonian universe terrified him.^v Indeed, the mechanical view showed neither an appreciation of the existence of God or of understanding the value of human life. Another Frenchman, Laplace, who wrote a mathematical work improving on Newton’s account of the universe, said in response to a question by Napoleon why his account did not include God, “Sire, I have no need of that hypothesis.” Not coincidentally, Laplace was the first formulator of the philosophical doctrine of physicalist determinism based on modern science, a doctrine which in its extreme form eliminates the possibility of free will and thus of moral responsibility in human nature.^{vi} Subsequent materialist thinkers would explain human behavior as the result of economic conditions or evolutionary biology.

But this is the older scientific version of the universe which was indifferent to the subject of cosmology and thus pushed the subject of the universe as a whole almost entirely into the realm of philosophic speculation. This happened because there was not much that was interesting about that vision of the universe; there was no mystery and no engagement of the sense of awe or beauty in a universe that was essentially a vast, empty space with nothing to differentiate one part from another, and from which any possibility of meaning had been eliminated. Even the notion of time was somehow absent, for as odd as it may seem, the passage of time of which our culture has become almost pathologically aware did not affect the atoms and forces that constituted the mechanical universe. True, time was an axis along which the mathematical description of motion moved, but in theory the time coordinate was completely reversible. It made no difference whether the physical processes were played forward or backward, the outcome was always the same. From a beginning point, Laplace stated that given enough information, the paths of particles and bodies could be completely predicted; from the condition of an endpoint, the beginning position and momentum of the particles could be accurately determined. But this vision was about to be scrapped.

The idea that time was in the same category as the three dimensions of space – height, length and breadth — was not new with Einstein. What was new in Einstein’s conceptualization in both the Special and General theories of Relativity was the exact mathematical treatment of space-time from which could be deduced, among other things, the famous equation that described the equivalence of matter and energy which both indicated the possibility of the atom bomb and explained the power of the Sun. Time had now entered the scientific view of the universe in a forceful manner and its impact could be felt in an astonishing fact; the universe was as time bound as any organic thing found on the Earth, for the universe it was soon established had undergone birth in the “Big Bang”, had gone through a process of maturation in which like an adolescent, nascent properties were developed such as the heavy elements,

but also ineluctably, the universe was on a path to death.^{vii} The universe has a *life-cycle*, like a May fly or a man, and as it is often said is undergoing *evolutionary development*; metaphors you might notice which are not taken from machines but from life, so that the new model of the universe we have is not only time bound, it is in a sense organic.^{viii}

It may seem that metaphors have nothing to do with scientific explanation, but as we try to derive the implications of scientific discoveries are for our understanding of the meaning of life, they serve as a link between scientific description and explicit philosophic doctrines; Dawkins, the current champion of atheistic evolutionism is famous for the use of metaphors including “selfish genes,” “mountains of improbability,” etc. But empirically as well as metaphorically, the new, organic vision of the scientific universe is amenable to the idea of life in a way that the earlier static, mechanical version was not.

4. The new cosmology has not only uncovered the fact that universe is dynamic and has a life cycle, it has also made discoveries about the nature of matter on the atomic, molecular and sub-atomic levels that reveal the fine details of physical reality that make life possible, and human life in particular. A host of physical facts and constants have to be precisely what they are in order for life to exist and such facts can be discovered at all levels of physical reality. On the atomic level, the peculiar inner structure of the carbon atom enables it to form chains with six atoms linked together. From each of the six carbon atoms, a string of other atoms and molecules can extend allowing the existence of the complex organic compounds which are the basis of life. On the astronomical level, the position of the earth is not too close to the Sun like Venus or too far away like Jupiter and so is in just the right orbit for life to evolve and exist, a condition called by astronomers, “the Goldilocks effect.” On the middle level, water, praised by St. Francis as “very useful, humble, precious and pure” has unique qualities among chemical compounds which are necessary for the existence of life. Due to its peculiar chemical structure, for example, water in its solid state, as ice, is lighter than its liquid state. This means that lakes and rivers do not freeze from the bottom up but from the top down, enabling aquatic plants, fish and other life forms to survive over the winter. As science has proceeded to uncover the complexity of the physical universe in ever more detail, the conditions necessary for life have added up until the probability that life arrived in the universe and on the earth *by accident* is no longer plausible.^{ix} Consideration of these new discoveries provides a high tech version of the classical argument from design, now refined by the addition of new forms of scientific evidence.^x

Added to these newly acquired facts is a new appreciation of what has always been true about scientific discovery – namely, that it is human beings with their wills and intellects who are making the controlled observations and devising the abstract theories that are the basis of scientific inquiry. The fact that humans beings have evolved as part of the universe and may be discerned to be an intended part of it, and whose existence is necessarily involved with the detection of scientific truth is encapsulated in a new principle, the *anthropic* principle. The anthropic principle asserts that the universe cannot be understood without including the fact of human existence — that is, to use Teilhard de Chardin’s terminology, science has to take into account “the phenomenon of man.” Much has been written about this principle and whether it has a place in physics, but it has several variations, from “strong” anthropic principles to “weak” versions. The strong version asserts generally that the universe evolved for the purpose of producing human intelligence, and that it would not exist if it were not for the presence of human intelligence.^{xi}

The strong version is not accepted by most scientists who consider the matter, and as you would expect it remains highly speculative; however, weaker versions of the anthropic principle do have a number of respected advocates. One weaker version asserts that in studying the cosmos as a whole, the

fact of human existence makes some physical values more probable than others, for the physical properties of the universe have to allow for the presence of sites which have the correct temperature, the necessary kinds of elements, and the presence of liquid water, etc., so that life may exist. This might seem obvious on its face to a non-scientist, but the weak version still faces significant resistance. One of the advocates of the weak anthropic principle is Steven Weinberg whom I cite because he is a Nobel Prize winning particle physicist, a renowned author on scientific topics for lay people, but also because Weinberg has attacked religion as “an insult to human dignity” and said other harsh things about it. Weinberg accepts a version of the principle which considers the possibility that there are a large number of alternate universes other than our own, perhaps an infinite number, but that of a large number of possible universes there must be a selection principle which prescribes the existence of the one we inhabit. Thus, Weinberg has not accepted the anthropic principle for religious or quasi-religious reasons but because as a physicist considering cosmological alternatives, he has deduced that there must be a boundary that allows for the existence of the one universe that we humans inhabit to exist.^{xii}

The discussion about the anthropic principle is an indication that human existence can now be accepted by the hard sciences as part of the “fabric of the universe” and not as an accidental or adventitious thing. As heartening as it is that some hard scientists have come around to recognizing that human beings are an intrinsic part of the cosmos, we should be aware that it is a limited concession. The part of human nature they are concerned about is human intelligence; the moral aspects of human nature are not part of their equations, but perhaps we can try to fill in the missing part.

5. Writing as I presume to a largely Christian audience, I would like to propose the possibility of a specifically *Christian* cosmology. Such a cosmology would agree with current scientific cosmology, resulting in an account which is intellectually coherent and has human life as its principle axis. Cosmology in its present scientific form remains incomplete because of the limitations inherent in scientific methodology which demands public and repeatable experimental proof as opposed to the spiritual reality indicated by revelation and non-repeatable personal spiritual experiences. In order to render a comprehensive view of the universe, a moral element is needed as much as an intellectual one and that moral element is available through the Christian faith.

Here we revert to the anthropic principle which like the Copernican Principle is not an inductive conclusion based on scientific evidence, but a meta-scientific principle which helps guide the general direction of scientific research. The value of human life in the anthropic view is inherent but limited, giving the impression that human beings are minds whose primary function is to observe physical phenomena. But the value of human life lies also and perhaps primarily in its moral dimension, for human beings have free will and make decisions which have moral consequences. The Christian religion recognizes the moral as well as the intellectual aspect of human nature and elevates it beyond the scientific definition while retaining the scientific insight. We have always known that human existence has a moral dimension unless we have succumbed to materialism and skepticism.

I have previously pointed out that in the Newtonian account of the universe there was literally no space for God or for the immortal souls of men. Prior to the advent of the modern scientific age, however, the possibility of a Christian cosmology was apparent. Medieval cosmology was based on the physical theories of Aristotle in which the universe was described as a nest of concentric spheres, with the *primum mobile* or sphere of fixed stars bounding the universe and the Earth at the center, an account vividly brought to life in Dante’s *Divine Comedy*. Augustine wrote several detailed commentaries on the first chapters of *Genesis*, attempting to understand the lineaments of God’s creation in physical as well as in theological terms. It was when writing these commentaries that Augustine concluded that time had

a beginning concurrent with the creation of the universe, for without motion or physical processes, time did not exist.^{xiii} As a result, Augustine anticipated Einstein's theory of relativity by approximately 1,500 years that also made time co-existent with the life span of the universe.

It is the major theme of this paper that by the end of the XXth Century with the development of cosmology as a *bona fide* scientific field that a renewed appreciation of the value of human life became possible. It has also made possible a Christian cosmology as evidenced by several prominent Christian thinkers who have attempted to construct a cosmological theory that combines the theories and facts of contemporary physical science with Christian truths and doctrine. The best known among them is Teilhard de Chardin whose book *The Phenomenon of Man* has become a kind of cult classic even as his biologically based account of cosmological history provoked criticism from both "orthodox" Darwinian biologists and religious authorities within the Catholic Church. Nevertheless, Teilhard's book remains influential as a prophetic work that combines science and religion based on a broad interpretation of evolutionary biology.^{xiv}

More recently, Christian thinkers have utilized the theories of the new scientific cosmology as the basis for a Christian cosmology: Wolfgang Pannenberg, a well known Lutheran theologian, has utilized the concept of the *field* from electromagnetic and relativity theory as a concept to bridge scientific and theological areas.^{xv} John Polkinghorne who is both a quantum physicist and a priest in the Anglican Church, has reflected on the indeterminism and "weirdness" of subatomic phenomena to show how materialism can be transcended to allow the possibility of providence and miraculous intervention in the physical universe.^{xvi} Nancey Murphy and a co-author^{xvii} have developed a detailed account of a "moral universe" based on recent developments in the philosophy of science, including Kuhn's theory of paradigms. Perceptive commentary on the relations between religion and science in the post-Newtonian scientific age has been made by Wolfgang Smith and Stanley Jaki OSB.^{xviii}

The new scientific cosmology provides the Christian thinker with the raw intellectual materials for the construction of a new model of Christian view of the universe. In conclusion, let me these materials: a time-bound universe which has a definite beginning and a projected end in time matching the biblical account, subatomic indeterminism which allows for a degree of moral freedom and responsibility, the biological and implicitly moral unity of the human race, a physical universe understood as including human existence as an inherent component, and human life itself as an aim of the universe and of such value that it provokes the sacrifice of the Creator's only begotten Son to redeem it.

NOTES and REFERENCES

ⁱ Stanley L. Jaki O.S.B. on the new scientific cosmology; "Where is scientific cosmology? When Chesterton wrote *Orthodoxy*, cosmology as science was non-existent, insofar as cosmology means a scientific discourse about the universe, that is, the totality of consistently interacting things." *Chesterton, a Seer of Science* (Urbana, 1986); pp. 98-99.

ⁱⁱ Known as Drake's Formula: $s \times p \times l \times i = n$; s [number of stars] $\times p$ [ratio of stars with planets] $\times l$ [ration of planets able to support life] $\times i$ [ratio of planets with life that evolve an intelligent life-form] = number of intelligent species that exist throughout the universe. The idea is that since the number of stars is so vast, that even tiny ratios of stars with planets, etc. results in the probability that the universe is filled with intelligent species.

ⁱⁱⁱ Bertrand Russell, "A Free man's Worship" in Louis J. Pojman, *Philosophical Traditions* (2nd ed.); (Belmont, CA, 2006), pp. 503-506. Stephen J. Gould, "Darwin's Delay" in *Ever Since Darwin*; (New York, 1977); pp. 21-27. See also Linda Badham, "A Naturalistic Case for Extinction" in *Death and Immortality in the Religions of the World*, Linda and Paul Badham eds.; (St. Paul, MN, 1987); pp. 158-169.

^{iv} *Professors Astronomy's Astronomy Blog*; <http://blog.professorastronomy.com/2009/05/copernican-principle.html>.

^v Blaise Pascal, *Pensees*, par. 88; many editions.

-
- vi See Marx W. Wartofsky, *Conceptual Foundations of Scientific Thought*; (New York, 1968), for a translation of Laplace’s iconic statement and a perceptive commentary; p. 298.
- vii Georges Lemaitre, a Jesuit astronomer, was the first scientist to describe the “Big Bang” in detail as a derived from Einstein’s general theory of relativity. Lemaitre’s account was developed prior to the discovery of the “red shift” by Hubble.
- viii See R.G. Collingwood, *The Idea of Nature*; (Oxford, 1960); pp. 133-136.
- ix My arguments and ideas generally in this section are based on *The Anthropic Cosmological Principle* by John D. Barrow and Frank J. Tipler; (Oxford, 1986). This comprehensive book gives a detailed account of the issues involved as they arise from modern cosmology, physics, biology and philosophy. The book, in certain parts, requires a scientific background.
- x *Ibid.*, pp. 27-31.
- xi The strong version of the anthropic principle seems almost to be a distorted copy of Idealistic metaphysics that reminds one of Bp. Berkeley’s dictum, *esse est percipi*.
- xii See the discussion in *The Trouble with Physics* by Lee Smolin; (Boston, 2006); pp. 165-169. Smolin disagrees with Weinberg’s application of the anthropic principle. Weinberg’s original paper is in: “Anthropic Bound on the Cosmological Constant,” *Physical Review Letters*, 59(22); 2607-10 (1987).
The anthropic principle has a seemingly obvious application in explaining the “multiverse”, the idea that there are a number of universes, perhaps infinite, besides our own. If there are many other possible universes, it becomes of interest why ours in particular exists. If there is a colossally large number of universes of which ours is one, why or how did it come into existence? On one level, this idea seems to be an extension of the Copernican Principle such that since man’s place in the universe is taken to be of no significance, there should be in existence a large number of alternate universes. Thus the multiverse concept is yet another way in which scientific advocates eliminate the significance of human existence. On another level, however, the existence of the multiverse reflects that in effect God had a choice when he created this universe but created this version in order to allow for the existence of human life. In this theological view, alternate universes are ideas in the mind of God. Apart from theology, the same question appears, why does this universe exist? Here the anthropic principle enters in and has been applied by Weinberg among others (see Smolin, Ch. 11) to isolate our universe out of a range of possible universes as existent based on its possessing those physical constants that make life and human life possible. However, Smolin has interestingly countered this by proposing what is explicitly a copy of natural selection being applied to all the theoretically possible universes; but what would be the selection principle? Smolin’s use of natural selection, like Darwin’s and his followers, is an alternative to design which however seems to have a good deal less evidentiary support.
- xiii Augustine, *Confessions*; Book 11; many editions.
- xiv Teilhard de Chardin, *The Phenomenon of Man*, trans. B. Wall; (New York, 1959).
- xv Wolfhart Pannenberg, “The Doctrine of Creation in an Age of Scientific Cosmology” in *An Introduction to Systematic Theology*, (Grand Rapids, 1991); pp. 37-52.
- xvi John Polkinghorne, *The Way the World Is*; (Grand Rapids, 1983).
- xvii Nancey Murphy and George F.R. Ellis, *On the Moral Nature of the Universe*; (Minneapolis, 1996).
- xviii Wolfgang Smith, *Cosmos and Transcendence*; (Lasalle, IL, 1984). Stanley Jaki, *Is There A Universe?*; (New York, 1993).

* Originally presented as a paper given at the Conference on “The Value of Human Life” held at the Franciscan University of Steubenville’s Institute of Bioethics in October, 2009. Due to perspicacious criticisms by anonymous readers this version has been somewhat modified from the original.

** **JOHN CAIAZZA** is a Senior Lecturer in Philosophy at Rivier College. He received his Ph.D. in Philosophy of Science from Boston University in 1972. His commentary on Pope Benedict’s Regensburg Address is scheduled to appear this year in *Homiletic and Pastoral Review*. He can be reached at jcaiazza@rivier.edu.