

JOURNAL of SPACE PHILOSOPHY

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And to the memory of Astronaut Neil Armstrong, Humankind's first Lunar visitor.









Kepler Space Institute

Meeting the needs for the future of humans on Earth and in Space, with dreams and skills of global scholars.

Preface

Philosophy – the search for knowledge, truth, understanding, and meaning – has occupied thought since Plato's *Thirty-Six Dialogues (424-348 BC)*. Every person who has gazed at the heavens has wondered what it means for themselves and for humankind. Philosophy is the oldest research subject. Every science has defined its philosophical foundations. Humans have only philosophized while personally experiencing Space since the middle of the 20th Century. Kepler Space Institute takes pride in creating its online periodical *Journal of Space Philosophy*.

A qualified Board of Editors meets the criteria for a professional peer reviewed journal. Article submissions, to <u>BobKrone@aol.com</u>, will be accepted for publication consideration from anyone on Earth or in Space.

Readers will note that Kepler Space Institute creates for the first issue of the Journal its own prescription for Space Philosophy (Article #8). Evaluation and/or expansion of that philosophy is invited. With the Journal of Space Philosophy Kepler Space Institute has created a professional online Blog-interactive journal for a major academic and science discipline.

Over time, this Journal will be an increasingly valuable research source for educators, students, NASA Centers, libraries, Space organizations, and Space enthusiasts. Views contained in articles will be those of the authors; not necessarily reflecting policy of Kepler Space Institute. Reproduction and downloading of Journal content for educational purposes is permitted, but authors will hold copyrights of their material and professional accreditation is required.





Bob Krone, PhD, Editor-in-Chief Gordon Arthur, PhD, Associate Editor









Press Release – 7 October 2012



Journal of Space Philosophy to debut October 15 By Walt Putnam, KSI Dean of Communications

The Journal of Space Philosophy, which will explore the spirituality and ethics, the cultural imperatives and moral values of the human quest for the stars, will make its debut October 15.

The online publication was developed by Dr. Bob Krone, provost of Kepler Space Institute, who said the *Journal* is a natural fit for anyone interested in extraterrestrial exploration and development.

"Every person who has gazed at the heavens has wondered what it means for themselves and for humankind," Dr. Krone said.

He added that "Philosophy is the oldest research subject," going back to the ancient Greeks in the Western world, yet "Humans have only philosophized while personally experiencing space since the middle of the 20th Century."

Dr. Krone has assembled a distinguished Board of Editors to guide the publication – including *The Overview Effect* author Frank White, Dr. Paul Werbos of the National Science Foundation, science author Howard Bloom, and Mars Society President Dr. Robert Zubrin.

The first issue will feature "Nature's Cosmic Intelligence" by Dr. Joel Isaacson, professor emeritus of computer science at Southern Illinois University and another member of *The Journal of Space Philosophy* editorial board.

Dr. Krone, author of the *Journal*'s second installment, "Philosophy for Space: Lessons from the Past –Visions for the Future," will make the case that human explorers beyond Earth must avoid the sort of mistakes made as Western civilization advanced in conquest mode during the Age of Discovery that began more than 500 years ago with Columbus's journey to the New World.

Article submissions, to <u>BobKrone@aol.com</u>, will be accepted for consideration from "anyone on Earth or in Space," Dr. Krone said. He said reproduction and downloading of *Journal* content for educational purposes will be permitted, but authors will hold copyrights for their material, and professional accreditation is required.

With the Journal of Space Philosophy, Kepler Space Institute has created a professional online blog-interactive journal for a major academic and science discipline – Space.



About Kepler Space Institute and University

By Robert L. Frantz, President, Kepler Space Institute

The vision for a United States Space University has been held by thousands of Space professionals and educators for decades. Our Founding President and inspirational leader, Dr. Richard Kirby, unfortunately died on 24 September 2009. I was elected President. By 2010 it was clear to the KSU leadership that becoming qualified and registered as a new university in America is a complex task. The Board of Directors decided to register the Kepler Space Institute (KSI) in South Carolina. The Institute, as a 501(c) (3), permitted education, programs and events that would be building blocks for achieving University status.

Kepler Space Institute and University is committed to direct its efforts, resources, qualifications and talents to endeavors that benefit humanity now and in the future. Our KSI leadership formulated the *Law of Space Abundance* in 2009, defined as *"Space offers abundant resources for humanity's needs."* It was a logical law, flowing from research and discoveries over centuries. We seek to guide people, groups, businesses, agencies, and international organizations to achieve new goals and visions facilitated by the material and spiritual resources that await us in Space.

Our Kepler Team, which collectively has spent one thousand work years within the Space Community, is proud to be launching the world's first *Journal of Space Philosophy* with this Issue in the Fall of 2012. We invite global Space professionals and enthusiasts to subscribe to the Journal on our website, <u>www.keplerspaceuniversity.com</u>. There is no charge and we encourage global comments on our blog dedicated to the Journal, regarding the streams of intelligence you will find; and to our proposed KSI Space Philosophy, *"Reverence for Life Within Ethical Civilization"* provided by our Provost, Dr. Bob Krone.

Philosophy has been the study of the meaning of life and of humanity since Plato. The era of humans living in Space has begun. *The Journal of Space Philosophy* will document the set of ideas that will enhance that movement from Earth both for Earth's benefits and for humankind's survival.

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About the Author: Robert "Bob" Frantz's first career was as a United States Marine Corps Fighter Pilot. His flying achievements and Vietnam War combat decorations led to his Chairman of the Board position in America's Distinguished Flying Cross Society. His second flying career was as a commercial airlines Captain flying the globe with United Airlines. Between flights he earned a Master of Science in the University of Southern California's Systems Management Degree Program, which launched him into the field of Education. He became an expert in the technology of online education, which he has applied to Ashburn University and Kepler Space Institute. He earned his PhD in Earth and Space Sciences. As this Journal of Space Philosophy is published online, he is teaching, consulting, and undertaking strategic planning for the future of Kepler Space University.



Editor's Note: Kepler Space Institute and University (KSI & KSU) has been blessed throughout its short existence by the volunteer work of talented entrepreneurs with extensive experience in the Space Community. When our Founding President, Dr. Richard Kirby, died at the height of his intellectual productivity, on 24 September 2009, our group of Kepler leaders turned to Robert L. Frantz who had all the qualifications needed to become President. He said "*Yes*" (no salary was available) and has brought KSI to operational status and supervised KSU planning ever since. *Bob Krone, PhD*.

Nature's Cosmic Intelligence

By Joel Isaacson, PhD

Introduction

Philosophical naturalism holds that all beings and events in the Cosmos are natural and that there is in nature regularity, unity, and wholeness that imply objective laws.[1]

In this paper we will discuss what these laws might be and whether they are indeed entirely objective.

A scientific revolution began in the 17th century, with dramatic changes in our concepts of cosmology (Kepler, Galileo, and Newton) and celestial mechanics, in addition to better understanding of the sciences of mechanics and physics in general.

The modern science we have today is largely rooted in that scientific revolution and the subsequent Age of Enlightenment that followed in the 18th century. Central to the physics that emerged from these shifts, from Newton to Einstein, are two fundamental concepts: matter and energy.

During the second half of the 20th century and into the 21st, notions of information (alongside matter and energy) have increasingly become part of the framework of modern science. We wish to reflect on this third component, information, in this short essay.

Recursive Distinctioning

The modern science of Information Theory was founded by Claude Shannon.[2] Information theory involves the quantification of information (or data) and usually disregards meaning that may be conveyed by bits of data streams. It was initially developed to find limits on signal processing (telephony in particular), including technical issues, such as data compression, storage, and communication.

There have been many applications of information theory in numerous fields, some of which have been very successful, but this discipline was never designed to deal with semantic and pragmatic forms of communication (see C. S. Peirce).

We think that biological information and communication is of a different kind from the data manipulation techniques of conventional information theory.

Bypassing Shannon's information theory, we introduce a naturalistic principle that accounts for many of the patterns and regularities that are observed in our Cosmos. We call it Recursive Distinctioning (RD). What is RD?

In perception, we encounter patterns in a variety of signal modalities that are detected by our various senses, but if there was no capacity for distinction-making of elementary features in patterns there would be no patterns (relative to our perception and cognition). Thus we posit local distinction-making as the most primitive operation in perception and subsequently in cognition.

When distinction-making is applied to a pattern there is a new pattern that is comprised of the variety of distinctions recorded. Thus, a new pass of distinctionmaking can be applied to the pattern of distinctions and this kind of a process can repeat itself recursively, indefinitely. I have shown elsewhere[3] that such processes are always circular. In addition, they tend to self-organize into dialectical patterns, akin to patterns of dialectics elaborated by Hegel and the German idealists.

The term was coined recently in the course of discussions on an Internet forum of the cybernetic community, CYBCOM,[4] but I had actually developed it myself during the 1960s and the first half of the 1970s. (It was then called BIP, for Basic Intellector Process.) Many people in CYBCOM hold that information that is not interacting with a cognitive entity is of no consequence in the biology of cognition. Meaning takes precedence over bits and bytes and their statistical properties.

For an example beyond CYBCOM, Eshel Ben-Jacob of Tel-Aviv University has written on meaning-based natural intelligence vs. information-based artificial intelligence. Citing from the abstract:

We reflect on the concept of Meaning-Based Natural Intelligence – a fundamental trait of Life shared by all organisms, from bacteria to humans, associated with semantic and pragmatic communication, assignment and generation of meaning, formation of self-identity and of associated identity (i.e., of the group the individual belongs to), identification of natural intelligence, intentional behavior, decision-making and intentionally designed self-alterations. These features place the Meaning-Based natural Intelligence beyond the realm of Information-Based Artificial Intelligence. Hence, organisms are beyond manmade pre-designed machinery and are distinguishable from non-living systems.[5]

Second-Order Cybernetics and Radical Constructivism[6]

Much of this new way of looking at meaning vs. information constitutes an extended brand of cybernetics, called second-order cybernetics, or "cybernetics of cybernetics".

Purists even go further and subscribe to radical constructivism. What is radical constructivism? Definitions vary, but in the words of one of its more prominent adherents, Ernst von Glaserfeld:

It is an unconventional approach to the problem of knowledge and knowing. It starts from the assumption that knowledge, no matter how it is defined, is in the heads of persons, and that the thinking subject has no alternative but to construct what he or she knows on the basis of his or her own experience. What we make of experience constitutes the only world we consciously live in. It can be sorted into many kinds, such as things, self, others, and so on. But all kinds of experience are essentially subjective, and though I may find reasons to believe that my experience may not be unlike yours, I have no way of knowing that it is the same. The experience and interpretation of language are no exception.[7]

A contemporary explanation from Principia Cybernetica Web states:

Constructivism has its roots in Kant's synthesis of rationalism and empiricism, where it is noted that the subject has no direct access to external reality, and can only develop knowledge by using fundamental in-built cognitive principles ("categories") to organize experience. One of the first psychologists to develop constructivism was Jean Piaget, who developed a theory ("genetic epistemology") of the different cognitive stages through which a child passes while building up a model of the world. In cybernetics, constructivism has been elaborated by Heinz Von Foerster, who noted that the nervous system cannot absolutely distinguish between a perception and a hallucination, since both are merely patterns of neural excitation. The implications of this neurophysiological view were further developed by Maturana and Varela, who see knowledge as a necessary component of the processes of autopoiesis ("self-production") characterizing living organisms.[8]

Radical constructivists do not necessarily deny the existence of an independent reality, but assert that the only access we have to the Cosmos is via a cognitively constructed P-Cosmos, that is, our personal perceptions of the Cosmos, as distinct from the "real" Cosmos out there.

On this view, it can be argued, our science is colored by our perceptual processes and, if our perceptions are driven by RD, then science must mirror RD, especially at its most fundamental levels.

Indeed, when we study the properties of the most primitive perception imaginable[9] we obtain emergent patterns that are very similar to the formation of elementary particles, called in physics the "baryon octet", which include patterns of the proton and the neutron, in terms of their quark constituents. So, elementary perception mirrors certain fundamental aspects of our physical theories of particle physics and vice versa.

Dark Information

Ever since the results of NASA's Wilkinson Microwave Anisotropy Probe (WMAP) have been analyzed it has been common for cosmologists to hypothesize the existence of dark matter and dark energy in the Cosmos.

WMAP has mapped the Cosmic Microwave Background (CMB) radiation and produced the first fine-resolution full-sky map of the microwave spectrum. A number of important findings resulted from the WMAP project.[10] Among these are the following:

- Ordinary atoms (baryonic matter, i.e., atoms comprised of protons, neutrons, and electrons) make up only about 4.6% of the universe.
- Dark matter (nonbaryonic matter) makes up about 22.7% of the universe.
- Dark energy makes up about 72.8% of the universe.

These are astounding findings that indicate that more than 95% of the universe is made of dark stuff and only less than 5% is made of baryonic matter, the stuff that we are made of, things that we ordinarily think of as real.

Dark matter cannot be seen directly with telescopes, since it does not emit or absorb light or other electromagnetic radiation. Likewise, dark energy is not detectable directly and can only be inferred from indirect observations; for example, its effect of speeding up the expansion of the universe. So, all in all, our cosmological models of the universe are now replete with both dark matter and dark energy, things that are beyond our senses and our instrumentation.

Is there likewise also Dark Information? The short answer is: very likely.

In the mathematical theory of RD there is a clear indication that, similar to dark matter and dark energy there is dark information, which is embedded in "fantomark" patterns. There is reason to believe that, by analogy, dark information is prevalent in the universe in roughly the same proportion to ordinary information as dark matter is to ordinary matter.

Fantomarks (from phantom marks) are entities that, by definition, are not perceptible via our senses or our instruments. For technical details on fantomarks and streaks, see [3] and [11].

Just as in the case of dark matter/energy, we do not have sensory access to dark information and cannot perceive it directly. However, fantomark patterns emit "streaks" to which we do have access, which may bypass the ordinary five senses. It is very likely that we have receptors, perhaps directly in our brains, that accept streak-patterns of fantomark-patterns and, in that sense, it involves extrasensory perception. (Note that it is extrasensory only relative to the ordinary five senses, but not in an absolute sense.)

Streak patterns code for fantomark patterns but are generally simpler. By merely looking at streak patterns one cannot infer (or even suspect) the underlying fantomark patterns and thus streak patterns generally may appear as random noise. However, in the mathematical theory of RD, there is an operation, called Reclamation (REC), which restores the structures of fantomark patterns from their streak pattern representations. Thus RD processing can be done in streak mode, which is simpler to handle, and conversion to regular RD mode can be done via the application of REC.

We, Eshel Ben-Jacob and myself, think that neurons perform RD in streak mode and this is a key to the design of an experiment whereby live neural tissue is investigated for the possibility of performing RD in streak mode. When successful, we will be able to construct live neural circuitry, in a hybrid with electronic circuitry, that implements RD processes. We believe that such RD processes are plentiful in normal brain activity.

Fantomark patterns that are coded as streak patterns and are then processed in streak mode are many times removed from direct perception. There are multiple layers of masking, which compound the difficulty of their decoding and thus make them inaccessible to us without the application of RD technology. This presents new challenges and implications for SETI projects.

Perception of sensory inputs is predicated on the capacity for local distinction-making in sensory patterns. One of the pioneers of second-order cybernetics, Gregory Bateson, proposed a definition for information in 1972 which stated that "information is a

difference which makes a difference." Circa 1969, I independently generalized a similar principle by proposing that information is the dynamical process of recursive distinction-making that is applied in perpetuity. I was able to show that such processes are guaranteed to cycle and are self-correcting and very stable, as they always generate attractors. I dubbed these Hegelian cycles. See [3] and [11].

It turns out that those Hegelian cycles are generic to both dialectical idealism (such as in Hegel) and dialectical materialism (such as in Marx). They arise spontaneously, as by-products (or side-effects) of RD, that is, these are emergent, as opposed to being programmed.

It is proposed that cognition is dependent on RD processes and thus dialectical processes and patterns permeate cognition. Hence, we cannot perceive our P-Cosmos apart from applying RD and thus our Cosmos invariably appears to us as being dialectical through-and-through. Note that all this is independent of any political ideology, such as Marxism, or even Hegelianism per se, because it emerges from first principles relating to information processing via RD.

Summary and Concluding Remarks

It is likely that advanced civilizations elsewhere in the universe are long familiar with this and have adopted modes of communication that are independent of the particular sensory modalities of one intelligent species or another. Thus inter-species communication is pre-processed into streaks and streaks are the *lingua franca* of cosmic communication.

In this paper we argue that RD is a natural law that governs perception and cognition. We also argue that our access to the Cosmos is via a cognitively constructed P-Cosmos. The P-Cosmos construction is driven by a multitude of RD processes and thus mirrors these processes. An RD-based cosmology stipulates Dark Information in the Cosmos, alongside Dark Matter and Dark Energy. Dark Information is embedded in fantomark patterns that may be accessed by us, to a certain extent, via the application of RD technology. We speculate that the preferred mode of communication by intelligent extraterrestrial civilizations is by streak patterns that code for fantomark patterns.

I have been urged by well-meaning colleagues and supporters to compare these findings and their import with those of Newton and Einstein in their own respective times. I respectfully decline to do this. Both the Newtonian and the Einsteinian revolutions have been marvelous, unparalleled contributions to science in particular and civilization in general. The introduction of RD processes into our arsenal of scientific concepts and tools may be revolutionary as well, but, as of now, I decline to put these in a class with the aforementioned. It is sufficient to point out that this RD theory is meritorious and potentially significant for scientific and technological advancements on a number of crucial frontiers.

Postscript

Some reviewers suggested that I identify some of these potential advancements. Following is a list of some possible research directions.

- Development of an information theory that is extended to fantomark-coded messages and streaks would facilitate the invention of superior intelligent artifacts. It could also hold a key to communication with extraterrestrial modes of intelligence and eventually help us understand our cosmic ancestry and the relationship between the implicate and explicate orders as outlined by David Bohm.
- Recursive distinctioning is fundamental to all perception and, by extension, to cognition and intelligence. This finding is advanced as a law of nature, perhaps on a par with gravity, and is expected to play significant roles in new theories of cognition and intelligence.
- We can build computing machines that are called Recursive Distinctioning automata (RD automata). These machines would process distinctions into further distinctions in perpetuity. Certain circularities and certain characteristic patterns emerge that are consistent with those that are attributed to thought processes by a number of influential philosophies over the span of many centuries. In effect, we may be on the threshold of capturing the essence of perception and intelligence in computing machines.
- The concept of Panspermia relates to the hypothesis that the seeds of life are
 prevalent throughout the universe and that life on our planet was initiated
 when such seeds landed from outer space and began propagating
 themselves. Francis Crick (with Leslie Orgel) suggested in 1973 a theory of
 directed panspermia, in which seeds of life (such as DNA fragments) may
 have been purposely spread by an advanced extraterrestrial civilization.
 Critics, however, argued that this was implausible because space travel is
 damaging to life due to radiation exposure, cosmic rays, and stellar winds.
 However, the principles of intelligence described here permit us to introduce
 now the notion of tele-panspermia, which postulates panspermia guided by

means of coded fantomark patterns (or their streaks). According to this concept, diffusion of life does not necessarily require the physical transport of actual "seeds" via meteors, comets, and the like. Telepanspermia may be guided by means akin to pilot waves in Bohmian quantum mechanics. So, work on defining such guiding mechanisms in telepanspermia may converge with non-local hidden variable theories in fundamental physics.

Notes

[1] Encyclopædia Britannica Multimedia Edition, s.v. "naturalism" (Chicago: Encyclopædia Britannica, 2012).

[2] C. E. Shannon, "A Mathematical Theory of Communication," *Bell System Technical Journal* 27, (July & October 1948): 379–423 & 623–656.

[3] J. D. Isaacson, "Autonomic String-Manipulation System," US Patent 4,286,330, August 25, 1981, <u>http://www.isss.org/2001meet/2001paper/4286330.pdf</u>.

[4] CYBCOM, Cybernetics Discussion Group, https://hermes.gwu.edu/archives/cybcom.html.

[5] E. Ben-Jacob and Y. Shapira, "Meaning-Based Natural Intelligence vs. Information-Based Artificial Intelligence" (n.p., 2004), <u>http://star.tau.ac.il/~eshel/papers/meaning</u> <u>based.pdf</u>.

[6] As this went to press I obtained a preprint by Ranulph Glanville, current president of the American Society for Cybernetics, on the relationship between Radical Constructivism and Second-Order Cybernetics. See R. Glanville, "Radical constructivism and second order cybernetics", (JCHK, in press). A draft version can be found at www.bobkrone.com/node/220.

[7] E. Von Glaserfeld, *Radical Constructivism: A Way of Knowing and Learning* (London: Falmer Press, 1996), <u>http://www.questia.com/PM.qst?a=o&d=103919722</u>.

[8] http://pespmc1.vub.ac.be/CONSTRUC.html.

[9] J. D. Isaacson, "Steganogramic Representation of the Baryon Octet in Cellular Automata." (Archived in 45th ISSS Annual Meeting and Conference: International Society for the System Sciences, Proceedings, 2001). http://www.isss.org/2001meet/2001paper/stegano.pdf.

[10] http://map.gsfc.nasa.gov/.

[11] J. D. Isaacson, "The Intelligence Nexus in Space Exploration," *Online magazine of the Israel Physical Society*, 8 (2007). <u>http://physicaplus.org.il/zope/home/en/1128811288/isaacson_en</u>.

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About the Author: Joel Isaacson has pioneered in RD Cellular Automata since the 1960s. Recursive Distinctioning was rooted in studies relating to the analysis of digitized biomedical imagery. Dr. Isaacson utilized NASA's computing facilities at the Goddard Space Flight Center in Greenbelt, MD for the initial stages of this research. His research has been supported over the years by DARPA, SDIO, NASA, ONR, USDA and a good number of NIH institutes. Isaacson is Professor Emeritus of Computer Science, Southern Illinois University and Principal Investigator of IMI Corporation.





Editor's Note: One of my very fortunate professional and personal rewards has been the opportunity to be a colleague of Professor Isaacson beginning in 1980 when we shared a NASA Research Summer. He meets every criterion of scientific excellence. His first discoveries were at Goddard Space Flight Center in 1964. His patent was approved 25 August 1981, but he did not publicize it until 2006 because he continued to validate his discoveries and to have them confirmed by global information scientists. With this article Dr. Isaacson makes a huge contribution to Cosmos understanding. Mass and energy are well known. His discovery that our universe contains information and intelligence in a process that is basic also to human perception and cognition is a scientific knowledge paradigm shift. *Bob Krone, PhD.*

Philosophy for Space: Learning from the Past – Visions for the Future

By Dr. Bob Krone, Provost, Kepler Space Institute[1]



Age of Discovery World Map



Kepler Space Institute



The Solar System

What should be the philosophical foundation for the future of humans in Space? What beliefs and values will drive human Space settlements? What is the future for humankind if it remains on Cradle Earth? This essay provides 2012 answers to those questions. But, as the inventor of the essay form, Bordeaux Mayor Michel Montaigne (1533-1592), said, *"It's a short statement needing a far wider space to exhaust."*

Knowledge Roots

Philosophy is the study of knowledge, truth, existence, and reality. The word's origin is Greek, translating as "*love of wisdom*." Philosophers search for the meaning and purpose of life and the fundamentals on which those are validated. Values are the principles and things preferred by individuals and groupings of individuals. Beliefs are what humans determine to be true and right for themselves and for others. Visions are the thought projections of people for their own futures and for the entities they create. Faith is the combination of beliefs and hopes considered valid for the future. In religions, faith is acceptance of doctrines and teachings. Humankind is the term embracing the human race wherever found. "Civilization" for this essay is defined as human relations within a society, community, or Space settlement characterized by constructive civil behavior as opposed to destructive barbaric behavior.

The short title for this Philosophy proposed by the Kepler Space Institute is **REVERENCE FOR LIFE WITHIN ETHICAL CIVILIZATION.**[2]

Why Reverence for Life within Ethical Civilization?

- 1) Reverence for life is the foundational purpose that will sustain humankind in perpetuity.
- 2) Ethical civilization will be the environment facilitating that end.

3) The Policy Sciences hold the solutions for creating ethical and successful civilizations.

These are the three essential foundation blocks of *The Philosophy for the Space Age*. Building these three basics will produce the highest probability for successful Space exploration, development, and human settlements, plus the capture of Space resources for humankind's needs on Earth and in Space within *The Law of Space Abundance*. Failure to build any one of these building blocks will destine humankind to permitting mistakes and catastrophes similar to or worse than those that have plagued Earth's societies throughout history. This is global leadership's major challenge for the 21st Century.[3]

The essential characteristic of positive progress and survival for humankind will be the universal acceptance of ethical civilization as its vision. Ethics is the study of the moral principles that govern behavior. It defines civil and compassionate human interactions. The will to live and the affirmation of life account for humankind's expansion on Earth throughout history. That expansion has occurred on Earth in spite of catastrophic setbacks created by both nature and humans. In both philosophy and religion "Good" is characterized by actions reflecting reverence for life. "Evil" is characterized by destructive and barbaric actions that damage and/or kill people. Civilization advances best when members of a society experience harmonious material and spiritual progress for all aspects of their circumstances.

The evolution of prescriptions for reverence of life and ethical civilization to be basic societal values has proceeded in spasmodic ways in different societies, with religious thinkers and exceptional leaders, beginning independently in Greece, the Middle East, China, and India between the 8th Century and 6th Century BC. It almost disappeared during the Dark Ages, 500 to 1500 AD. The Age of Discovery, 1400 to 1600 AD, and the European Renaissance, the 14th to the 17th Century, spawned thinkers, scholars, artists, and rulers who valued discovery and material or spiritual progress. Later recorded history documents random belief in reverence for life and ethical practices within society, but no world-views of those subjects. The 19th and 20th Centuries barely survived the escalating destruction of war. Detailed discussions of that history are outside the scope of this essay. The primary scholarly justification used herein was written in Equatorial Africa, 1914-1917, by Dr. Albert Schweitzer. It was first published in 1923.[2]

Discovery, science, technology, and invention have been persistent drivers of progress for humankind throughout history. The motives and applications of those discoveries and inventions reflect variations of good and evil. They represent a positive reversal from pessimism toward optimism in the 16th Century. Christianity made the important change from antiquity's view of morality being that which is profitable and pleasurable to the belief that to be ethical and moral requires action promoting the welfare of others.

Another evolution of human thought was that individual action could produce gains while passive inaction stalled progress. Over time that characteristic has grown to the point where discovery and invention occur not by decades or years, not by months or weeks, but now in the 21st Century even within nano-seconds. Society is exponentially changing, making accurate predictions for the future less probable.

The tragedies of history have occurred when ethical and moral thinking and reverence for life have been replaced by motives of power, control, manipulation, greed, and genocide. The 21st Century has begun without the eradication of human actions that can cause catastrophic events. Science and technology have brought humankind to the place where human extinction has an increasing probability. When the ethical foundation is lacking, civilization collapses.

But is there a natural life-affirmation, support, or endorsement in nature that has installed in humankind the will to live, to survive, to expand, to learn, or to progress? History gives us strong evidence of a "Yes" answer to that question. Does humankind's belief in progress both cause and continue because of its achievements in discovery and invention? Is the satisfaction we feel from that action an important part of philosophy of life? Evidence supports more "Yes" answers.

What has been too often missing in decision cultures is the inclusion of an ethics and moral foundation. Earth suffered through a 20th Century of human catastrophes caused by other humans. The resources consumed could have been used to discover ways to prevent or ameliorate natural threats to humankind coming from our planet or from Space. Unfortunate choices were made that were void of **Reverence for Life within Ethical Civilization**.

Learning from the Age of Discovery

What lessons should we have learned from Portugal's Golden Age of Discovery, 1394 to 1560? Henry the Navigator, son of King John I, decided to break the Moorish hold on the African and Asian trade routes. That commenced 170 years of Portuguese explorers sailing the world. Ferdinand Magellan, Christopher Columbus, Vasco da Gama, Bartholomieu Dias, Pedro Álvares Cabral, and Gaspar and Miguel Corte Real brought riches, prestige, and power to Portugal by acquiring monopolies on much of the Eastern spice trade. Their ships returned home to Portugal silver, gold, spices, power, and influence.







On 31 May 2012, Mr. Bernardino Palma, Portuguese Age of Discovery Historian, spoke of the motives and results of these 170 years of world transformations, at Cabo de Roca (Cape Roca), on the Atlantic west coast of Portugal, where Portuguese and Spanish sailors were guided home by the lighthouse still standing today. The motives of Portuguese rulers were a mix of commerce, exploration, discovery, and colonialism. The wealth thus created funded those sailings plus Portugal's developments. His video statement can be found at http://www.youtube.com/watch?v=azC6DX2Jr g.

Mr. Palma also stated: "This Journal will be a stone's throwing in the water, creating ripples, making people think." The 30-second video illustration of that metaphor can be found at <u>http://www.youtube.com/watch?v=liRBb8yuYeg</u>.

Portuguese power and influence did not decline until the 18th Century. That decline occurred due to the competitive desire of other rulers to share in the world's wealth. Other factors in the decline were the rebellions of citizens in the countries colonized.

A hypothesis of this essay is that Portuguese, Spanish, British, and French colonial history would have been very different – and better – if the *Reverence of Life within Ethical Civilization* philosophy and policy had been adopted. A valuable lesson for 21st Century Space Age decision-makers is that failure to understand the benefits of that philosophy will stall or reverse humankind's progress. Albert Schweitzer ended his Chapter 11 of *Philosophy of Civilization* (1923) with the conclusion: "*Without ethical civilization our fate is sealed*."

Policy Sciences Provides Solutions

Are we being naively optimistic? How can **Reverence for Life within Ethical Civilization** be achieved in a world of diverse beliefs, values, conflicts, and visions? Doesn't the fact that it has never been universally adopted mean it is impossible? Kepler Space Institute's answer is "**No. That is not an inevitable conclusion. Our**

World is radically changed. Space holds many solutions." Ninety years after Albert Schweitzer's 1914 to 1917 writings in Africa were published <u>everything is different</u>. Today ideas need not take decades to reach the public. They happen today with the speed of light. Science and technology have begun the Space Age with humans experiencing Space for the last fifty years and now planning life in Earth orbit, on the Moon and on Mars. Humankind's view of Planet Earth has been transformed.[4] The Policy Sciences have captured intelligence for completely new governance systems. Jonas Salk described the way in 1973 with his book *The Survival of the Wisest*.[5]

Professor Yehezkel Dror, in the preface to his book *The Capacity to Govern: Report to the Club of Rome* (1994, 2001), states "*Radical redesign of governance is, therefore, required; otherwise, increasing social costs, even existence-threatening failures are unavoidable.*" I invited Professor Dror to write a chapter in *Beyond Earth: The Future of Humans in Space.* His Chapter 5, "*Governance for a Human Future in Space*" was his first extrapolation of his life's research and extensive writings into Space. He begins that chapter with the sentence "*New forms of governance are essential for engaging in moving humanity beyond Earth.*"[6] Dror describes humanity moving into a radically novel new epoch where living in Space is only one of its features. He sees that epoch as having a tremendous potential for better or worse.

Dror records that "which of those paths humankind follows will depend on the following required governance characteristics: 1) *Global; 2) Inspirational; 3) Long term perspectives and persistence; 4) Large scale mega-project resources and management; 5) Will and enforcement tools; 6) Raison d'Humanity values*". Readers of this essay are urged to study the works of Yehezkel Dror in detail. The position of Kepler Space Institute is that his works are essential components of the Philosophy for the Space Age. This is not simply an academic choice from a huge literature source. We believe that Yehezkel Dror is correct when he finished his Chapter 5 with his conviction that:

On all of these levels much attention needs to be given to governance, because without restructuring governance, the movement of humanity into Space will remain a dream or, even worse, may take the form of nightmares becoming a dismal reality.

It is a recognized fact that humanity is entering a radically new epoch in which, for the first time in history, it has the power to destroy itself by deliberate or unintended action. To prevent grievous harm resulting from this power and to use it for the better, radical improvements in critical future-shaping actors, processes, and institutions are essential, especially in the moral and cognitive qualities of rulers; and that fact is why we have included the phrase "*within Ethical Civilization*" in the Philosophy for the Space Age.

Why Will Space Be Different?

On October 3, 1961, President Dwight Eisenhower spoke to Faculty, Staff, and students of the Naval War College at Newport, Rhode Island. It was a confidential speech just after John F. Kennedy had become President on January 20, 1961. I was one of those students and obtained permission from the Naval War College and Ambassador John S. D. Eisenhower to publish his speech in the U.S. Naval Institute Proceedings of June 1971.[7] President Kennedy had announced on 25 May 1961, to the Congress, that the United States would send a man to the Moon and return him to Earth in this decade. A student asked Ike: "General, would you give us your opinion on the political and military significance of the race to the Moon?" Ike thought for a moment, then said: "Are the doors locked so no one can get out? I really believe that we don't have that many enemies on the Moon."

No nation has ever had any enemies in Space. The vacuum of any history of human conflict in Space is one important difference between the Space Age and all previous history on Earth. The world's best international cooperative invention, the International Space Station, crosses our heavens every 90 minutes.

There are three fundamental reasons why the Space Age began with Sputnik 1 on October 4, 1957 and has progressed for the past 55 years:

First, the urge for flight is part of our human nature. Perhaps it is in our genes, but from wherever it originates, it is undoubtedly our need to explore and our unquenchable curiosity about the universe that drives us to space.

Second, even if these urges were ignored, the continual improvement of the quality of life for the human race on Earth, and perhaps even our ultimate survival, may hinge on the success of human exploration and habitation of space.

Third, we are all aware that this is a critical time for the space movement and for all of us. Human society around the world is in turmoil and the prospects for our future are frightening. But we remain optimistic that we will overcome these challenges and we see clearly that our generation can use the opportunity presented by our outward expansion into the solar system to design a rewarding and exciting future for human collaboration and to capitalize on the lessons learned from the venture into space to redirect human history on Earth toward peace and cooperation.

On April 21, 2008 Astrophysicist Stephen Hawking called for an era of Space conquest stating:

Spreading out into Space will have an even greater effect than Christopher Columbus' discovery of the New World. It will completely change the future of the human race and maybe determine whether we have any future at all.

Kepler Space Institute concludes that the Philosophy for the Space Age should be "Reverence for Life within Ethical Civilization" and now launches The Journal of Space Philosophy.



Postscript: This essay was drafted on my flights from Washington DC to Lisbon, Portugal May 28 to June 7, 2012. That travel took place immediately after the Kepler Space Institute's participation in the International Space Development Conference (ISDC-2012) in Washington, May 25-27. The conference, sponsored by the National Space Society (www.nss.org), occurred as important advances in commercial space systems were occurring. The NSS is the most influential Space organization. The conference brought together over 900 global space development leaders and Space community professionals – 300 of them were students. The Conference was a progress milestone in the evolution of discovery and invention from The Age of Discovery (15th, 16th, and 17th Centuries) to the Space Age. The KSI Course, "*Philosophy for the Space Age*" will be a continuing higher education opportunity for Space Community scholars to advance the research that will facilitate the future of humans in Space being conducted within *"Reverence for Life within Ethical Civilization."*

My thanks to KSI President, Dr. Robert L. Frantz; Dean of the School of Psychology, Dr. Sherry Bell; Dean of Media and Communications, Walter Putnam; Director of Research, Dr. Terry Tang; Chief Scientist, Edward Kiker; Member of the Board, Joe Sobodowski; Space Law Professor, Dr. David Schrunk; Kids-to-Space Author and Teacher, Lonnie Schorer; Professor of Information Sciences, Dr. Joel Isaacson; Professor of Physics, Eshel Ben-Jacob; Founder, Aerospace Technology Working Group (ATWG), Dr. Kenneth J. Cox; The Space Show, Dr. David Livingston; Policy Science Scholar, Professor Yehezkel Dror; Janet's Planet, Janet Ivey; National Science Foundation, Dr. Paul J. Werbos; NSS-CEO Mark Hopkins; Evolutionary Theorist, John Stewart; Space Scientist Dr. Neville Marzwell; Kepler Member, Dan Shaw; Professor of Space Faith, Dr. (Pastor) Lawrence Downing; Overview Effect Professor, Frank White; Space Energy Professor, Dr. Feng Hsu; Economics of Space Professor, Dr. Kseniya Khovanova; Colonel, USAF(ret), Leo Thorsness; AstroLaw, George Robinson; Beyond Earth Author, Langdon Morris; Beyond Earth Author, Dr. Martin Schwab; Beyond Earth Author, Charles E. Smith; NASA Integrative Studies, Lynn Harper; Founder Ignite Foundation, Becky Cross; Kepler Charter Member, Al Dolan; Kepler Charter Member and this Journal's Associate Editor, Dr. Gordon Arthur; Apogee Space Press, Richard & Robert Godwin; Dr. Yitzhaq Hayut-Man; Author, Collin Skocik; Professor Lowry Burgess; Scientist Author, Howard Bloom; Professor of Space Settlements, Dr. John Wilkes; Manager Shuttle Mission Training, Thomas E. Dielgelman; Space Systems Development Manager, Richard E. Eckelkamp; Director of Spaceport Associates, Derek Webber; Lunar Commercial Development, Dr. Thomas L. Matula; Arcos Cielos Research Center, Dr. Elliott Maynard; Systems Engineering and Manager, Bruce Pittman; Virtual Orbiting Space Station (VOSS) Director, Kim Peart and Dr. Jennifer Bolton; Portuguese Age of Discovery Researcher, Mr. Bernardino Palma; and KSI Director of Technology, Alex Ssegujja for their reviews of the manuscript leading to this essay.

Bob Krone, PhD Provost, Kepler Space University October 15, 2012



Notes

[1] Dr. Bob Krone is Co-Founder and Provost of Kepler Space Institute, which is the Space Community's most recent higher education and research innovation, founded in 2009, and which is the stepping stone for the Kepler Space University. Bob Krone's resume and publications can be found at <u>www.bobkrone.com</u>. See, particularly, Bob Krone (ed.), *Beyond Earth: The Future of Humans in Space* (Burlington, ON: Apogee Space Press, 2006). This essay is not copyrighted. It can be freely reproduced with professional referencing.

[2] The author acknowledges profound respect for the life's work of two classic scholars: 1) Dr. Albert Schweitzer (1875-1965), the centenary whose publication of *The Philosophy of Civilization* will occur in February, 2023; and 2); Professor Yehezkel Dror (1928-present), the co-founder and primary scholar of *The Policy Sciences*. Kepler Space Institute, Inc. (KSI, Inc.) has accepted Albert Schweitzer's classic studies on Reverence for Life and Ethical Civilization as appropriately fundamental visions for the future of humans in Space. KSI, Inc. does not share, or endorse, some of social beliefs credited to Schweitzer in his later life.

[3] This formula for The Philosophy of The Space Age can be the launch pad for an infinite set of intellectual creations that define its execution in detail. For the purpose of this essay I focus on the Philosophy of Albert Schweitzer (1875-1965) on reverence for life and the Policy Sciences of Yehezkel Dror (1928-present) for guidance on governance. Philosophy and Policy Sciences encompass huge literature sources available to Space Community scholars. The purpose of this essay is to stimulate interest and to launch research. That will be done with general concepts and basic design, not with detailed justification.

[4] The best description of the worldview change due to the Space Age is by Frank White in his 1987 book, *The Overview Effect: Space Exploration and Human Evolution* (Boston, MA: Houghton-Mifflin, 1987).

[5] Jonas Salk, Survival of the Wisest (New York: Harper and Row, 1973). Dr. Salk, who gave us the solution for Polio, gives us the macro social solution for humankind. He states that human evolution is transforming from the Survival of the Fittest to the Survival of the Wisest in a manner similar to curves A and B of a bell-shaped curve. Human intellect and imagination will play the vital role for survival and evolution. Wisdom, as a new kind of strength, is a paramount necessity. Jonas saw individual and societal learning as the way to overcome barriers restricting the transformation to Survival of the Wisest. With this essay, Kepler Space Institute adds a new path to facilitate the evolution he prescribed in 1973.

[6] Yehezkel Dror, "*Governance for a Human Future in Space*," Chapter 5 in Krone, *Beyond Earth*, pp. 41-45. Bob Krone and Yehezkel Dror have been professional colleagues since 1969.

[7] "*Eisenhower at the Naval War College*," with a Foreword by Colonel Robert M. Krone, U.S. Air Force, *U.S. Naval Institute Proceedings* (June 1971): 18-24. See <u>www.bobkrone.com/node97</u> for Ike's address and answers to several questions. Many of his points are relevant to economic, political, social, and military issues today, including his explanation of his Military-Industrial Complex comment earlier that year.

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Deep Space: The Philosophy of the Overview Effect

By Frank White

A philosophy of space is presented that is based on the author's research into the Overview Effect, or experience of seeing the Earth from space and in space. The essay suggests that this philosophy should view the evolution of both humanity and the universe as the underlying, or "deep" purpose of space exploration.

When the shuttle *Challenger* exploded in 1986, the nation entered a period of intense soul-searching. We had become accustomed to these spacecraft routinely lifting off from Cape Canaveral and going into orbit for a week or more, then safely returning to Earth. The process seemed so routine that Christa McAuliffe, a schoolteacher, was on board, as the first "teacher in space." This mission was intended to herald a new era of ordinary citizens going into orbit and beyond.

The accident killed all the astronauts and also destroyed "the old space program" that had been born in the 1960s and had just entered a new phase with the shuttle. During the many conversations that took place on television at the time, one stood out. On "This Week with David Brinkley," the discussion turned to the *Challenger* and columnist George Will said to Tom Wolfe, author of *The Right Stuff*, "It seems we have justified space exploration in a very banal way; we have sold it on the basis that it produced nonstick frying pans and so on."

"Yes," Wolfe replied, "we have never had a philosophy of space exploration."[1]

In the introduction to *The Overview Effect: Space Exploration and Human Evolution*, I recounted this conversation and stated my intention to enunciate a philosophy of space exploration in the book. I wanted to discover a plausible "why" of the enterprise, placing far less emphasis on the "how." I also intended to articulate the larger purpose of space exploration beyond its utilitarian benefits to humanity.[2]

Did *The Overview Effect* fulfill its promise? I hope that it did, but it is ultimately not for me to determine if that is the case. In this paper, I would like to review the question and also go beyond it. To do so, we should start with first principles, and ask ourselves exactly what "philosophy" means, and what a philosophy of space exploration would therefore be.

I found the following definition(s) of philosophy in an online version of the Oxford Dictionary:

- [mass noun] the study of the fundamental nature of knowledge, reality, and existence, especially when considered as an academic discipline. See also natural philosophy.
 [count noun] a particular system of philosophical thought: the philosophies of Plato and Aristotle;
 the study of the theoretical basis of a particular branch of knowledge or experience: the philosophy of science.
- **2**a a theory or attitude that acts as a guiding principle for behavior: *don't expect anything and you won't be disappointed, that's my* philosophy.[3]

To some extent, I believe we are right to consider all of the above definitions of philosophy in this journal. At the same time, "the study of the theoretical basis for a particular branch of knowledge or experience" seems highly relevant. After all, aren't we talking about "a philosophy of space" or "a philosophy of space exploration?"

At the same time, it seems that (2a) above might be even closer to what we are considering in this journal. In other words, aren't we looking for a guiding principle for behavior as we explore the universe? And isn't that what the panel on television meant as they discussed the *Challenger* accident?

It seems to me that this is also the focus of Bob Krone's original essay on space philosophy. There, he considers a long-neglected aspect of space studies, i.e., the underlying ethical premise of the enterprise.

Insofar as the Overview Effect experience relates to space philosophy, let us look first at the experience itself.

When people leave the surface of the Earth and travel into Low Earth Orbit, to a space station, or the moon, they see the planet differently. My colleague at the Overview Institute, David Beaver, likes to emphasize that they not only see the Earth *from* space but also *in* space. He has also been a strong proponent that we describe what then happens as a change in world view.[4]

I agree with David, having written about this change in perspective in *The Overview Effect:*

Mental processes and views of life cannot be separated from physical location. Our "world view" as a conceptual framework depends quite literally on our view of the world from a physical place in the universe.[5] Clearly, our philosophical outlook depends on where we are, as individuals, and as a species, in the universe. Even more important is *where we think we are*. For thousands of years, humans believed that they lived on a flat surface that did not move, while the sun, moon, planets, and stars revolved around us. To our ancestors, the Earth seemed limitless. They could travel for thousands of miles and never come to the end of it, nor return back to where they began. And those journeys took weeks, months, or years.

Their philosophy of life assumed an endless, flat Earth that was the center of the universe. It guided their behavior about everything, including their use of natural resources.

Eventually, humans came to realize, intellectually, that we lived on a planet revolving around the sun, and that we were not the center of everything. Our observational instruments and our minds have told us this and only a few holdouts believe the Earth to be flat or think that the sun revolves around it. Still, some 500 years after Copernicus, Kepler, and Galileo, the *direct experience* of most human beings in the 21st century is essentially unchanged from the first, third, or eleventh centuries.

Only some 500 people have left the surface of the Earth, traveled into orbit or to the moon, and experienced the reality of our situation. The Earth is not flat, it is not stationary, and the heavenly bodies do not revolve around it. The Earth is round and it is moving through the universe at a high rate of speed, all the while revolving around the sun with the other planets of the solar system.

Philosophically, we ought to be thinking like the crew of a natural spaceship, a team that is working together to survive and evolve into the universe, of which we are a small, but critical, part.

How would everything change if we began to think of ourselves as a seven billionmember team, a crew on a spacecraft? What if we expanded our thinking to include other sentient life as part of that team, and perhaps even beyond, to consider everything on the Earth as team members?

Would it reduce all conflict on the Earth? No, there are conflicts on teams and crews, disagreements about the best way to proceed in winning a game, a battle, or a trophy. However, the balance between cooperation and conflict might well be restored to something more appropriate to a species seeking to evolve and prosper.

As I have written in my latest book, *The New Camelot*, when we experience the Overview Effect by seeing the Earth *from* space, we see that the Earth is a whole system in which everything is interconnected and interdependent. When we experience the Overview Effect by seeing the Earth *in* space, we see that the Earth is itself part of another whole system, the solar system. From orbit, we see the unity of the Earth, while from the surface, we see its diversity. From orbit, we also see a new diversity lying beyond the unity of our home planet. Neither unity nor diversity is the complete picture.[6]

This unity/diversity paradigm is applicable to all levels of reality. As a number of other authors have pointed out, we can perceive everything as a holon, an entity that is a part and a whole simultaneously. This is the key spatial perspective. In addition, every holon is in a state of evolution. This is the critical temporal perspective, and we need an Overview perspective on time as well as space.[7]

Balance and evolution are at the heart of this conceptual framework. If there is too much diversity, or differentiation, the system may fall apart and cease to evolve. If there is too much unity, or homogenization, it may become stultified and, again, stop evolving.

If we are to understand the philosophy of the Overview Effect, then, we must understand the principle that our awareness of ourselves, the Earth, the solar system, and the universe changes with our physical perspective. This awareness then affects our knowledge of who we are and our behavior in relationship to our environment.

Returning to the definition of philosophy as "a theory or attitude that acts as a guiding principle for behavior," we can say that the Overview Effect points to the principle that one of the primary rationales for space exploration is that it transforms how we think, how we see ourselves—our world view. A second principle is that we, and our world view, will constantly evolve, and that this is both necessary and inevitable.

Another way to describe "space exploration" is to call it "evolution into the universe." As humanity begins to explore the larger environment beyond the Earth, we will evolve, and as we do so, the universe itself will also evolve because we are a part of it.

As I completed *The Overview Effect*, I felt that the philosophy I was seeking still eluded me, until a final thought occurred to me: if we seek that philosophy only from the selfcentered perspective of how space exploration will benefit humanity, it is incomplete. We will always be sliding back into some version of the "nonstick frying pans" paradigm. However, if we see ourselves as a holon, a part of a larger system (i.e., the Earth, the solar system, the galaxy, or the universe), then a more comprehensive philosophy emerges. We can ask ourselves not only how exploration benefits us but also how it might benefit those larger "overview systems" of which we are a part.

One of the most immediate results of the Overview Effect to date is that it has given impetus to the environmental movement. This has already produced a new "philosophy of Earth" that guides our behavior relative to the planet. We no longer see it as limitless, to be exploited continuously for our own needs. Increasingly, we see it as a limited whole system that must be treated with great care, for our own survival and for the planet's benefit.

Yet, there is more to it than that. We are also realizing that the various systems of which we are a part, through us, may be said to become aware of themselves. As James Lovelock, originator of the "Gaia hypothesis," said:

[Gaia] is now through us awake and aware of herself. She has seen the reflection of her fair face through the eyes of astronauts and the television cameras of orbiting spacecraft.[8]

Building on the work I have done concerning the Overview Effect and on Lovelock's suggestion that the Earth is a living system, I have posited the "*Cosma Hypothesis*." By this, I mean that the universe is also a living system with a degree of self-awareness. By definition, this must be so, since we are alive and conscious, and part of the universe. The question is whether, as we evolve, might our purpose be to help the universe become increasingly self-aware? Might our philosophy of space exploration, our guiding principle, be to transform not only our own world view but also that of the universe itself?[9]

Notes

[1] Frank White, *The Overview Effect: Space Exploration and Human Evolution,* (Boston: Houghton-Mifflin, 1987), xviii.

[2] Ibid.

[3] Oxford Dictionaries. April 2010, Oxford University Press, http://oxforddictionaries.com/definition/english/philosophy.

[4] David has written about this distinction in "The Overview Effect Will Change the World," which is available on the Overview Institute website, <u>www.overviewinstitute.org</u>.

[5] White, op cit., 3.

[6] Frank White, *The New Camelot* (Kindle Books, 2012), <u>http://www.amazon.com/The-New-Camelot-Volume-ebook/dp/B008WQ22RI/ref=sr_1_3?s=digital-text&ie=UTF8&qid=1347877707&sr=1-3&keywords=The+New+Camelot</u>

[7] For more on holons, see Jeffrey S. Stamps, *Holonomy: A Human Systems Theory,* (Seaside, CA: Intersystems Publications, 1980); Arthur Koestler, *The Ghost in the Machine* (London: Hutchinson, 1967). My colleagues at the Overview Institute, Kevin Kelley and Alex Howerton, have both written about the "Overview Effect of time." Their bios and links to their work can be found at the Institute's website, www.overviewinstitute.org

[8] White, The Overview Effect, 116.

[9] This idea is not original with me, though the term "Cosma Hypothesis" may be. I recently had a discussion about this very subject with Overview Institute colleagues David Beaver and Alex Howerton, who made the point that since we are part of the universe, and we are alive and aware, it must also be, to some extent, alive and aware.

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About the Author: Frank White is the author of *The Overview Effect: Space Exploration and Human Evolution*, first published in 1987 and re-issued in 1998. A member of the Harvard College Class of 1966, Frank graduated magna cum laude and was elected to Phi Beta Kappa. He attended Oxford University on a Rhodes Scholarship, earning an MPhil in 1969. He is the author or co-author of nine additional books, including *The SETI Factor*, *Decision: Earth*; *Think about Space* and *March of the Millennia* (both with Isaac Asimov), *The Ice Chronicles* (with Paul Mayewski), *Space Stories* (with Kenneth J. Cox and Robbie Davis-Floyd), and *The New Camelot*. He also contributed chapters on the Overview Effect to four recently published books on space exploration, *Return to the Moon, Beyond Earth, Living in Space*, and *Space Commerce*.



Editor's Notes: Frank White is one of America's pioneer Space philosophers. Launching *The Journal of Space Philosophy* with his wisdom was one of our prime criteria. Frank is a cofounder of the Overview Institute and the Kepler Space Institute is collaborating with TOI in a number of ways. We are proud to have him as a Member of the Board of Editors for this new Journal. *Bob Krone, PhD.*

Space Renaissance: Dawn of a New Age of Civilization

By Walter Putnam

A little more than 40 years ago, men walked on the moon for the first time. This achievement was a landmark for humanity – not only in that it demonstrated a vast technological ability, but also because it was that "*giant leap for mankind*" – as Neil Armstrong so eloquently put it – in an eternal quest for the stars.

Most of us grew up watching the space program – the first orbiting satellites, the Apollo program, the Space Shuttle, and the International Space Station. We became accustomed to constant "*leaps for mankind*" in technological achievement. We shared in the sorrows – the Challenger explosion, the loss of Columbia high over Texas – and we shared in the numerous heroic successes of our astronauts and the scientists and engineers who formed NASA.

With uncertainty in the future of the global economy, many are now beginning to feel that all those glory days are behind us. I have heard people lament the changes in direction of our policy of space exploration as though the adventure of discovery beyond the pull of Earth's gravity is all but over.

But actually, we are not at the end of the Space Age. We are still merely at the beginning. Current circumstances – mainly economic ones – might make it seem that we are unable to advance – or that major advancements might not come in our lifetime. But there are still a lot of things going on that demonstrate that humans are rapidly entering a new age of civilization that ultimately will take us beyond Earth and to the stars. All things considered, this new age is likely to be the kind of pivotal movement in history that occurred as Western civilization emerged from a state of decline through what became known as the Renaissance – literally the rebirth of civilization.

This new age we can call the Space Renaissance, because it comes at a time when humanity faces dire predicaments on Earth while possessing the technology to approach solutions through advancing into extraterrestrial space. And it will bring about vast changes in the way we think about ourselves – our science, our politics, our economics, even the social contracts that bind us together as human beings. It will alter, in fact, the way we regard mankind's position in the universe, in much the same way as the notion of Renaissance astronomer Copernicus more than 500 years ago that the Earth revolves around the Sun.

The Space Renaissance will both create such changes and be forged by them. As ideas advance into new technology and new endeavours, those developments will spawn new ideas. This is the way humans have always advanced – and are advancing even today.

There is no question – in my mind – that we are progressing rapidly toward a time that human beings will routinely travel through extraterrestrial space – tapping resources such as energy, minerals, and even water – not as an Earth civilization but as a Solar civilization. Not everyone might agree with that assessment. Some are simply too pessimistic to believe that mankind will be able to work together long enough to make it happen before destroying our planet. Others think it is too futuristic to contemplate – especially during a time when we are faced with widespread joblessness, rising debt, and mortgage foreclosures at home, along with wars and revolutions in the Middle East.

Although many of the ideas of space exploration and development seem spun from science fiction, in many respects they are not of the future but of the present. Consider this:

- Hundreds of people have already traveled in space.
- The International Space Station continues to operate, conducting experiments and research that have widespread implications not just for future space missions but also for developments here on Earth.
- Daily, we send and receive communications transmissions that are bounced off of manmade satellites.
- We have robots exploring other parts of our Solar System, including the surface of Mars, and devices such as the Hubble Space Telescope transmit images that provide ever increasing insights into the expanse of the Universe.

In short, we are already there – in space. And this is happening just 50 years after the first space missions that sent men into orbit. In many ways, it is akin to the explorations of the New World that occurred in the decades after Columbus first sailed across the Atlantic during the age of the Renaissance centuries ago.

Now, in the decades ahead many more changes are sure to follow. I see it as a natural progression of human civilization, just as the exploration and development of the New World led to new nations built on new ideas of human freedom and democracy that were unprecedented in human history.

And just as developments then called for new ideas – new ways of looking at mankind and our relationship to the planet – there will be new ways of considering our relationship with other human beings today. There will be a need for unprecedented international cooperation as we advance not just on the basis of national interests but of the interests of all humanity coexisting on one planet. The old economic models that competed during the last century as Capitalism and Communism will give way to new models that rely on extensive cooperation between governments and private enterprise. In many ways, this is already happening. Consider the recent trends in the U.S. Space Program, in which greater reliance is placed on other governments and private companies to propel our astronauts to new discoveries.

And in this latest development there are many opportunities opening up already to pave the way for the future of commercial space. I think this will accelerate as systems that have failed in their missions to achieve human success are replaced by new efforts based on the long-term goal of protecting planet Earth while reaching beyond the confines of its gravitational pull toward other worlds.

Already, there are companies involved in efforts to promote space tourism, in which those who can afford it pay huge sums to travel above our atmosphere. There are even those with dreams of building orbiting hotels from which those lucky few could observe the brilliance of our blue planet presumably while sitting poolside under a domed cover shielding its own Earth-like atmosphere and artificial gravity.

Others are looking ahead toward space colonization efforts, in which similar habitats could be constructed on the Moon, or Mars, or even on orbiting space stations. Some would even utilize the tons of space junk now stranded in Earth's orbit, constantly revolving around the planet, to build such structures.

Some scientists and engineers have aims to mine the surface of the Moon, or Mars, or perhaps asteroids, to supply resources that are growing scarcer on Earth, or which are more difficult to obtain without further damaging our planet's environment.

One of the most intriguing proposals involves space-based solar stations to garner the Sun's energy and relay it to Earth by microwaves or some other mode of transmission. Many experts are confident not only that this can be done in the not-too-distant future, but also that it will go a long way toward providing the bulk of our energy needs.

The bold plans of private companies such as Space X and Planetary Resources show that serious businessmen and venture capitalists are banking on the extraterrestrial future. And more are sure to follow.
Of course, there are signs that the pessimists might be right in one regard. There very well could be further setbacks. If they are severe enough, mankind's evolvement could be sidetracked for generations.

However, there is no question of the ultimate track upon which civilization ultimately will travel. We are still heading out there, toward the stars. The same ambitions that drove Europeans to discover and explore new worlds, and inspired inventors like the Wright brothers to keep pressing forward until man could take flight, and pushed the United States into the space race that landed men on the moon are still with us, driving us ever onward and outward.

We are now, and will continue to be propelled by a new energy and new ideas into a new age for civilization. Another Renaissance – A SPACE RENAISSANCE.

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Links

<u>www.keplerspaceuniversity.com</u> <u>www.romecollier.com</u> <u>www.amazon.com/The-Planet-Games-Rome-Collier/dp/145386797X</u> <u>www.lulu.com/shop/rome-collier/the-second-coming/paperback/product-14261371.htm</u>

About the Author: Walter Putnam is a veteran journalist and former Middle East correspondent who retired in 2009 after a career of more than 30 years with The Associated Press. He first developed a serious interest in space research and development while helping to cover Shuttle launches and landings for AP in Florida in the early 1980s, when he was the agency's Jacksonville correspondent. After his retirement, Walt became Kepler Space Institute's dean of media communications. In addition to serving on the KSI board, he is on the executive committee of Space Renaissance International and also is a member of the National Space Society. He also writes fiction under the pen name Rome Collier, including the short novels *The Second Coming* and *The Planet of Games*, which deal with a belief that human values are enduring because of their universal nature. Walt's wife of 43 years, Geni, a retired Delta Air Lines flight attendant, is an avid volunteer for KSI activities, helping out at space conventions on several occasions. They have three adult children, who all are involved in the arts in one form or another.



Editor's Notes: Kepler Space Institute has been blessed with the experience, talents, and dedication of Walt Putnam. Walt had a thirty-year career reporting globally for the Associated Press. He creates all of our press releases, including the one for this new Journal of Space Philosophy that this Fall 2012 Issue launches. Geni Putnam, Walt's wife, has volunteered her talents and time to KSI conventions and events throughout the United States. They are a high-value team of professionals. *Bob Krone, PhD.*

Space and the Art of Staying Human

By Lawrence G. Downing, DMin

The desire to travel beyond the confines of Earth has long been part of the human story. In ancient times writers reported conversations, arguments, sexual escapades, and violence that occurred among the beings that populated these undefined places outside our world. An examination of these ancient works provides context for current discussions relating to space travel and the possibility of populating these far-away places with Earth people.

When humans inhabit Space it is not reasonable to assume that the ills and frailities that plague us now will cease. Evil is an insidious and persistent force! It is therefore essential that those who inhabit Space make an intentional and determined effort to implement and perpetuate morals and values that assure a peaceful and productive society.

From time beyond time the thought of what lies beyond Earth has captivated human imagination. In both the Hebrew and Christian Scriptures the writers describe places and events that take the reader beyond Earth. The ancient writers record events that occurred in worlds far removed from ours with the same ease as we describe events next door. The inhabitants of these heavenly places, as described by the writers, were often, but not always, divine beings plagued by the same insecurities, jealousies, and frailties that afflict human kind.

In the *Book of Job* the author describes a time when the heavenly beings, or sons of God, came to present themselves before the Lord (Job 1:6). In the course of the Job narrative, Eliphaz, one of Job's interlocutors, asks, "Is not God high in the heavens? See the highest stars how lofty they are! Therefore you say, 'What does God know? Can he judge through the deep darkness? Thick clouds enwrap him, so that he does not see, and he walks on the dome of heaven'" (Job 22:12-14, NRSV). The Book of Job concludes with God as interlocutor asking Job a series of questions, including: "Can you bind the chains of the Pleiades, or loose the cords of Orion?" (Job 38:31, NRSV).

The second chapter of 2 Kings contains the account of the prophet Elijah ascending up to heaven by whirlwind aboard a chariot of fire and horses of fire (2 Kings 2:1-12). In the *Gospel of Mark*, the writer reports that Jesus, while speaking with his disciples after his resurrection from the dead, was taken up into heaven where he sat down at the right hand of God (Mark 16:19).

The author of New Testament book *The Acts of the Apostles* adds that as the disciples and Jesus talked, he was lifted up and a cloud took him out of their sight. Two men in white robes stood by them and assured the watching disciples that Jesus, the one who was taken from them up into heaven, would come in the same way as they had seen him go into heaven (Acts 1:9-11).

In the *Book of Revelation*, also known as *The Apocalypse of St. John*, the last book of the Christian Scriptures, the writer is transported into the heavens where he is shown events and given information that, on his return to Earth, he is to share with fellow believers.

These are but a few of the numerous writings from ancient times that document that we are not the first to be fascinated with the possibilities of what may lie beyond the observable universe. However, we are the first of our kind to create an intentional delivery system that allows us to touch the fringes of space and contemplate exploring that which is beyond. The challenges and questions associated with such ventures stagger the imagination! Not the least part of the puzzle relates to the question: how can those who journey beyond Earth create a society that will benefit all and how will that society be maintained? These questions and others like them transport us from the realms of science and verification into the fuzzy venues of philosophy, epistemology, morals, ethics, faith, and anthropology.

The *Journal of Space Philosophy* will, over time, address the above questions and others like them and will provide a venue for scholars, scientists, writers, theologians, and thinkers from all disciplines to address these and like questions. Dr. Bob Krone's article *Philosophy for Space: Lessons from the Past, Visions for the Future* is an example. In his article, published in this journal, can be found the Kepler Space Institute's Board of Directors' consensus statement that sets forth a fundamental premise for those who venture beyond Earth: Those who inhabit space will be responsible to implement, preserve, and perpetuate a value system and code of ethics consistent with the highest ideals espoused by the various faith traditions and others who seek good.

Dr. Krone and I have collaborated on teaching and publications since 1993. In 2009, Dr. Krone created a Think Tank with theologians representing diverse faith traditions. That Think Tank functioned for two years and resulted in an intellectually stimulating and exciting exchange of ideas. One assignment given the group was to create a written response to the question, *"How might one design a religious Faith acceptable and appropriate for humans settling in Space?"* The group's response reads:

There is within the human frame a powerful presence that we cannot measure, precisely define or empirically examine, but we recognize its existence and influence on our lives from the beginning of time. Numerous terms have been created in an attempt to identify this existence. The ancient religious traditions speak of soul, spirit, space and breath. Some suggest that by whatever term one may select to identify the presence that is an essence of our humanity, we confront a mystery. This Journal of Space Philosophy will simulate an Academy to reflect upon this power, explore how this understanding inspires, guides and challenges us as we set our minds on places beyond Earth.

It is not possible to predict with accuracy what life will be like for those who first establish a self-perpetuating presence outside our solar system. What we can predict, with some degree of accuracy, is that challenges will continue; some expected, others not. Likewise, we can expect human nature to evidence itself in the far-off places in a similar manner to that which we see on Earth. It is reasonable to assume that all of the emotional, physical, and spiritual aspects that are part of our humanity will transport intact with the first far-distant space travelers. There will be situations where greed dominates, violence breaks forth, and other maladies that impact our lives here will take place there. Likewise, we can expect to find acts of extreme kindness, unselfishness, care, and other positive human responses. We will continue to search our inner universe, as well as that which lies beyond. The existential questions will continue, perhaps even intensify: Why am I here? What is the meaning of my life? Why do I behave as I do? What happens when I die? The response to these questions, and others like them, will provide the framework upon which our ethical and moral value systems rest.

These components of our humanity serve to remind us of why it is essential that those who venture forth from Earth demonstrate a firm conviction and allegiance to a code of ethics and adhere to a value system that will assure that good triumphs over evil. There will be respect for those who practice a faith system that meets their spiritual and emotional needs and an assurance that people can live in accordance with their conscience, in so far as that belief promotes the good. These principles will not assure a successful sojourn, but without them, one can expect eventual failure.

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About the Author: Lawrence Downing, DMin, has been a pastor for the Seventh-day Adventist churches in the United States for more than forty years. He was an Adjunct Professor for both the School of Business and the School of Religion at La Sierra

University, Riverside, California, 1990 to 2006. His DMin is from Lancaster Theological Seminary. He is a co-author of 2006, *Beyond Earth: The Future of Humans in Space*. Access <u>www.bobkrone.com/vcat_details/24</u> to see the video interviews of Dr. Downing and Dr. Krone at the 2005 International Space Development Conference in Los Angeles.



Editor's Note: Dr. Lawrence Downing is a pioneer for the complex field of Space Faith. Our relationship since 1993 has been especially rewarding for me. My learning from Larry about Moral and Ethical Leadership continues. He walks his talk. It is an honor to include his article in this Issue #1 of *THE JOURNAL OF SPACE PHILOSOPHY*. *Bob Krone, PhD*.

The Astrosociological Imagination: The Challenge of Human Progress

By Stephanie Lynne Thorburn

Abstract

This paper offers an overview of *The Astrosociological Imagination*. The project addresses the vision of human progress conceived by the space advocacy movement and its ethical and methodological parameters. These humanist sociology papers explore the core themes inherent to the rhetorical promise of societal transformation offered in the Space Renaissance Initiative manifesto.

Key themes: Human progress, transformative studies, humanism, paradigmatic science, discourse analysis.

The Astrosociological Imagination comprises a collection of reflexive sociology papers on the Space Renaissance Initiative (SRI). The work shares some of the essentially humanist themes of C. Wright Mills's 1959 classic text *The Sociological Imagination*[1] and seeks to integrate social, personal and historical elements into a discourse analysis of the SRI. The work explores critically the conceptual precepts of Max Weber[2] on rationalisation in contemporary industrial society in relation to environmental and sociocultural developmental issues. The SRI is an organisation that challenges the parameters of our thinking in regard to human scientific, technological evolution and offers a pragmatic series of proposals.

At the inception of *The Astrosociological Imagination* anthology, the project was initially defined as a treatise on human progress, evaluating the mercurial and unconventional discourses of the SRI. Following an overview of related literature and appropriate methodological approaches, the research question evolved into an assessment of the rhetorical appeal of the Space Movement per se, as expressed via the Space Renaissance. A discourse analysis addressing the notion of technological and societal development outside the confines of Earth is an evocative brief for a thesis; the work is situated in a contemporary postmodern milieu. Three central strands emerge at the core of this discursive treatise on human survival and progress.

1. Ethical Dimensions

The manifesto of Space Renaissance can be considered as an extension of the remit of sustainable development philosophies beyond our own atmosphere. The SRI advocates space development through focusing on our resource crisis and a need for the establishment of radical, new energy solutions through initiatives including space-

based solar power and the problems of a growing population. The establishment of space colonies such as those theorised by Professor Gerard O'Neill[3] are justified by emphasising our vulnerability in context of recent Earth crises of anthropogenic and non-anthropogenic origin. Unlike conventional sustainable development theorists, the SRI does not ignore more fundamental equations and instead suggests a need for reassessment of economic and environmental issues through an avant-garde open world view, extending our concept of society from the parochial remit of Earth.

Ethical issues are paramount in assessing the social and ethical dimensions pertinent to sci-fi cyber space colonies. Contemporary schools of thought pertaining to existing political environmental theory offer an illuminating comparison. Theorists such as Bookchin[4] have proposed a form of radical social re-rationalisation. This working model seeks to maintain small scale social organisations on Earth, utilising more environmentally friendly technology, and is a system fundamentally based on the retention of a more ethical form of both instrumental and value-orientated rationality.

Historically, such small scale communities have not necessarily lead to a reduction of hierarchy or domination. In *The Roots of Modern Environmentalism*[5], David Pepper evaluates *The Ecologist's* "Blueprint for Survival," an important work that he notes has been translated into the fiction of "ecotopia".[6] This perspective places particular value on enhanced quality of life and greater harmony between man and nature. It is certainly a model of social re-rationalisation that would, in my view, resonate with the utopian visions of the SRI, considering its allied emphasis on improvements in quality of life, education, creativity, and the re-conceptualisation of community via an open world model.

A healthy caution is offered by Pepper in regard to the potential for fascist elements inherent within such models as Callenbach's Ecotopia, however. Whilst socialist traits can be found in the notion of decentralised production and the control of technology through the people, the antecedents for a form of anarchic social ecology are certainly a latent reality – it is debatable whether such regimes would result therefore in socialist utopia or fascist dystopia. In the context of space colonisation, social ethics are paramount. The SRI manifesto is, though, more radical than any form of social ecology that has been attempted on Earth and further is necessarily concerned with a redefinition of the stereotypical view of "technocentrism" in the context of human progress.[7]

2. Transdisciplinarity and Transformation.

Research into human progress and societal transformation via space advocacy is also a paradigmatic sphere. The raison d'être of this research is in essence a quest to foster a

meaningful dialogue between qualitative research sociology and the scientific community. The theoretical emphasis is orientated toward both postmodern and traditional sociological perspectives conveyed through the sociology of science. Societal expansion into space can be equated to human evolution as expressed via perceptual paradigmatic shifts. Thomas Kuhn's theory articulated in *The Structure of Scientific Revolutions*[8] regarding the non-linear evolution of science promises the possibility of alterations in our perceptions of "normal science" via paradigmatic revolutions. Despite advances in technology and science, the space advocacy movement still might be viewed as somewhat anomalous to present day constructs. Over time, whether one's personal views coincide with the goals of the SRI or affiliated groups such as the Paradigm Shift Institute, improvements in scientific theory and practice may ultimately result in space advocacy organisations becoming more established. It is the role of publications such as the *Journal of Space Philosophy* to document these changes in our perceptual and philosophical norms.

Methodological models integral to Socioastronomy are both interdisciplinary and fundamentally transdisciplinary in essence. Socioastronomy comprises an aggregation of specialised spheres drawing from sociology, philosophy, space policy and transformative studies. The goal of transdisciplinarity is not to replace the expertise of each discipline, but rather to approach challenging research questions via transcending many disciplines, encouraging a holistic viewpoint that recognises the complexity and diversity of knowledge when applied to problem solving within the academic community.[9]

3. Linear Progress in the Face of Human Adversity.

The transformative ambitions held by space advocacy groups such as the SRI are a response to some of the most frustrating problems humans face in developing new viable solutions to Earth's crises. The ambition of becoming an exo-society, namely a society that has evolved sufficiently ultimately to live within a lunar colony as theorised by O'Neill, would certainly demand a completely new cognitive perceptual schemata. The act of establishing a lunar colony is still considered socially to be beyond the remit of ordinary contemplation. The historical and discursive rhetoric of Space Renaissance as an organisation is seminal in conceiving of human progress not merely via advocating the advancement of science. The persistent appeal of its goals is achieved through a conceptual viewpoint advocating an apparently coherent form of linear progress, transposing the most precious elements of human history, culture, and knowledge since the Renaissance into a nascent unknown sphere beyond Earth, toward a new rebirth or Renaissance. Thus, civilisation and the human narrative continue through a combination of historically informed continuity and necessary radical change.[10]

The overarching discursive rhetoric of space advocacy per se is grounded in a progressive, existentialist construction of Earth and the Cosmos. The emphasis is on nurturing progress and shared human values, whilst also seeking to break with limiting epistemological elements of past philosophies from the 19th and 20th centuries. This fundamental manifesto for human advancement is novel, yet such an iconoclastic notion requires considered caution. I believe the goals of the SRI are worthy of our consideration as humankind endures significantly troubled times. Critics would naturally condemn the myopia of space advocacy and its naive preoccupation with expenditure on unrealistic budgets to develop the space industry and settlements as financially wasteful during an economic recession. Undoubtedly to stabilise our environmental and economic demise, we should evoke answers increasingly on the basis of significant scientific and social advancements to reach out for a viable range of complex, insightful solutions. Engaging with the nascent school of thought encapsulated by the Space Renaissance in connection to human progress requires ethical value neutrality and innovative hermeneutic research techniques.

Notes

[1] C. Wright Mills, The Sociological Imagination (New York: Oxford University Press, 1959).

[2] Max Weber, The Protestant Ethic and the Spirit of Capitalism (1905; Repr. London: Routledge Classics, 2001).

[3] G. K. O'Neill, The High Frontier: Human Colonies in Space (New York: William Morrow, 1977).

[4] Murray Bookchin, "What is Social Ecology," and "Rethinking Ethics, Nature and Society," in The Modern Crisis (Philadelphia: New Society/Black Rose Books, 1986).

[5] David Pepper, The Roots of Modern Environmentalism (London: Routledge, 1993), chapters 1, 2, and 7.

[6] "Blueprint for Survival," *The Ecologist* 2, no. 1 (September 14, 1972).

[7] Stephanie L. Thorburn, "The Astrosociological Imagination and the Space Renaissance Initiative: A Discourse Analytical Perspective," (literature review). American Chronicle, November 4, 2010, www.americanchronicle.com/articles/view/197380.

[8] Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962).

[9] R. Volckmann, "Creativity and Transdisciplinarity: An Interview with Alfonso Montuori," *Integral Review* 5, no. 2 (2009): 273-87.

[10] Stephanie L. Thorburn, "Nurturing Human Progress: Space Renaissance Congress 2011." *International Space Fellowship News*, August 4, 2011, <u>spacefellowship.com/news/art26356/nurturing-human-progress-space-renaissance-congress-2011.html</u>.

Further Reading

Adriano Autino, Patrick Q. Collins, Annie Bynum, Shaun Moss, Frank Stratford, Niklas Jarvstraat, Michael Martin-Smith, Martin Dudziak, Ken Ford, Dan Walt, Andrzej Kotarski, Arthur Woods, Vincent Werner, and Anton Volkonskiy. *The Space Renaissance Manifesto*, www.spacerenaissance.org/papers/The Space Renaissance Manifesto.pdf.

Adriano Autino, Patrick Q. Collins, and Alberto Cavallo. *Three Theses for the Space Renaissance* (Privately published, 2011).

Edward Goldsmith, Robert Allen, Michael Allaby, John Davoll, and Sam Lawrence, "Blueprint for Survival," *The Ecologist* 2, no. 1 (September 14, 1972).

R. Murphy, *Rationality and Nature: A Sociological Inquiry into a Changing Relationship* (Boulder, CO: West View Press, 1994), chapters 1-5 and 9.

G. K. O'Neill, "The Colonisation of Space." Physics Today 27, no. 9 (1974): 32-40.

Related Links

Socioastronomy homepage: <u>www.socioastronomy.webs.com</u> Space Renaissance International: <u>www.spacerenaissance.org</u>

Kindle publications: Stephanie Lynne Thorburn

Stephanie L. Thorburn, *The Astrosociological Imagination*, Kindle edition, 2012. See www.amazon.co.uk/Astrosociological-Imagination-Renaissance-Initiativeebook/dp/B007XUKSP2/ref=sr 1 4?s=digital-text&ie=UTF8&gid=1345629476&sr=1-4

Stephanie L. Thorburn, "Consciousness, Human Enigma & Parapsychology," Volume 1 from: *Human Enigma and the Human Sciences*. Kindle series 2012. Chapter 5 discusses the Space Renaissance, Prof. Gerard O'Neill, and the space advocacy

movement. See <u>www.amazon.co.uk/Consciousness-Enigma-Parapsychology-Volume-ebook/dp/B008Y11Y3Y/ref=ntt at ep dpt 1</u>

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About the Author: Stephanie Lynne Thorburn is a freelance writer, researcher and alternative therapist with an interest in holistic health. She writes features primarily focused on music and nascent areas of social science, including Sociology, especially Environmental Sociology and Parapsychology. She holds an MA in Sociology: Qualitative Research from Goldsmiths College, London, UK and a combined honours degree in Sociology Psychology from City University, London. Stephanie has undertaken a range of vocational diplomas including Graphic Arts (UKCHT), Parapsychology, and Computing with distinctions. She is a fellow of the Institute for Meridian Psychotherapy and Associated Complementary Therapies and is on the Board of Editors of the *Journal of Space Philosophy*.

Stephanie has freelanced extensively for press, especially the online news journal Los Angeles Chronicle and PR-Inside.com. She assisted on the Space Renaissance Initiative Board of Directors in 2010.

Over time, Stephanie Lynne has authored a series of music related eBooks, notably *Incendiary Soul*, a succinct biography of the Sales Brothers and *Blues Scholars*, a compendium eBook of her features on blues greats including Robert Johnson and John Lee Hooker. Ongoing academic works include her continuing postgraduate published papers, *The Astrosociological Imagination* and *Primordial Essences*, a book on creative arts and energy healing (recently a top-ranked text on Amazon KDP select). She edits her own avant-garde webzine "Nuance". Currently Stephanie Lynne is working on an independent research project via prior publication, utilising sociological discourse analytical methods. For up-to date news and publications, see www.stephaniethorburn.webs.com



Editor's Note: Kepler Space Institute welcomes Stephanie Lynne Thorburn as a young researcher and author who has been active in the Space Renaissance International (SRI). Her work for the sociological future of humans in Space is a valuable contribution to our Issue #1 of the Journal of Space Philosophy. *Bob Krone, PhD.*

The Philosophical Aesthetics of Space Culture and Arts

By Lowry Burgess

If we are to move human beings into outer space we are going to have to move their culture with them

Lowry Burgess, Fortune Magazine, September 2005

Zero gravity's effect is not what one would assume from conceptual thought or seeming reason. When I observe interactions in zero gravity, it has surprised me that zero gravity appears as an energy that flows through things causing them to live and grow out – to fan out with new potentialities! Zero gravity energy flows through and out and so doing pulls things inside out! It manifests as a vital energy, a grace that lives and moves. It is powerful in all its transformations – its disengagement and releasement requires new cultural and aesthetic relationships. It is demandingly vital

Lowry Burgess, the Space Arts Conference, Nordwijk, the Netherlands, 2003

Since the first humans looked upward to the vast and profoundly meaning-filled sky, reaching upward and beyond to the starry cosmos, we have pressed our archetypal feelings and ideas into that beautiful and receptive sky-surface that surrounds us all. When we look up, we look into the mirror of our utterly fundamental mind. Human perception and the understanding of the world, its nature and reason, has always been intimately connected to our sense of the cosmic matrix in which we all hover. The celestial sphere led and now leads to other worlds filled with life or death, gods or other life, from the future or the past and even beyond. Each generation's most imaginative intuitions concerning the meaning of human being are formed by its concept of the sky and cosmos. It is there in that overarching sky that mythic logic – the logic of the mind in framing the unknown – plays out and finds feeling-filled aesthetic forms that establish the ethos of each historic epoch.

The framing of a new cosmic mythos marks each distinct historical epoch. Each age's utopic aspirations are often first seen in outer-space, a place beyond, a heaven that impinges and drives all cultural frameworks. It is there, in that overarching sky, where that the mind finds initial forms that become the cultural frameworks of society – the arts and language, morals and ethics, science and technology, economics and politics. They all reach out to and are deeply grounded in the cosmos both above and below.

Now humanity is physically pressing outward beyond the Moon to Mars. While probing the deep space origins of the universe itself, we, here on Earth, are surrounded by a new manifestation of outer-space, the "Metasphere", created from all the projections and actions pressed into outer space for the past 60 years. The Metasphere is the recently emerging framework of space-monitoring and space-based information systems, the complex infrastructures, that are effecting a radically transformative view of Earth – its weather, ecology, geology, hydrology, health, finance/economy, defense, energy, exploration, communications, and imagining – a new Earth and sky. Indeed, we have seen the beginning of the Space Epoch.

In this new epoch, there is a profound need to engage the fuller participation of the arts and culture in space exploration to gain a deeper holistic imagination toward our new cosmos. It is there in outer-space that new spiritual and aesthetic ideas and values appear; new understandings of intimacy and love; new understandings of sorrow and risk expressing how that outer-space affects the inward space: the unfolding deeper understandings of life; new forms of expression - new names and words, languages and grammars; desires for happiness and freedom – longing, sorrow, and death; new notions of comfort and repose, even humor; new processes of art making, new forms of art; even imagining new forms of human life – an imagining in the new scales of nearly endless times and spaces, with new materials and energies, as well as extreme conditions. It can be assumed that many innovative artistic projects and creations will point to the territories of mind and reality at the edges of the possible and even far beyond. As in the past, artistic imagining will be crucial to future developments in science and religion, technology and engineering inspiring and motivating curiosity and knowledge creation in every field and discipline – all being essential to the realization of broad potentials for a better life,

These recent significant transformations of our world view require a new cultural aesthetics in which the contemporary sense of cosmos is embedded:

- 1. The new infinite cosmology—the open universe, infinity and even beyond...
- 2. Life as a universal presence—Mars, Europa, and almost everywhere...
- DNA—the new control of life forms, cloning, inside out reversals—DNA designed life—humans controlling DNA...
- 4. The computer combined with global communications systems, the instantaneous cyber-communications "metasphere"...
- 5. Brain re-forming chemistry altering mind/body relationships...
- 6. Internal and external robotics-the micro/macro machine...
- 7. Shared dream-culture, simultaneous within the communications metasphere—interactive telepresence and remote multi-sensing...

In a time of extraordinary global cultural tensions the global community needs to reach toward and express shared human feelings, feelings that all people have – and, in particular, those feelings associated with the universal surrounding of the sky and starry cosmos from which we derive our being. Not to address feeling-filled culture in outer space and particularly meaning creation there is to strangle the imagination's life-blood as it reaches out to our much-expanded cosmos – there searching for a new human destiny! Just as in many historic cosmic myths the creators gaze into the mirror of the cosmos to mirror their godly selves, so we gaze upward to the celestial mirror beneath which we are suspended – there to face our deep future. What do we see as the ultimate goal for human consciousness in the cosmos? To undertake such ontological and teleological exploration raises all the questions about those things that are most essentially human, engaging the utmost capacities of the human mind/body.

We do not know what the genome wishes to become in zero gravity. Certainly, most of the physical and mental structures that have evolved to enable the genome in gravity will become superfluous. What is life to become in the zero gravity garden? What does this imply for the evolution of such a gravity formed creature as us? In this reality the human body, with all its meaning and history, becomes enfolded and engulfed, swallowing all external society and nature in its gravitation – totally inverted and pulled inside-out in the "gravity garden" of release. Surely, within these evolving experiences reside deep emotions and feelings, a plenum for a newly emerging aesthetic framework for many artists and collaborators to articulate and develop in conjunction with the technologies and sciences, even that of the magneto-gravitational spectrum.

We are the creatures who make meaning. Imaginers/artists give initial intuitive form to those meanings that guide and give compass to being This provocative condition requires artistically original plots, narratives and choreographs – a new kinesthetic and dramaturgy. New artistic/poetic invention with the new technologies and techniques fashions and explores an expressive, intimate, synaesthetic/multi-sensory consciousness. It evolves within a vibrant mesh of actions and events pulled outward by tremendous anti-gravitational forces driven by the desire for Earth-released consciousness.

Various arts have accomplished those cosmic connections during the past 40 thousand years – an accumulation and record of the arts addressing the skies and heavens from the earthbound surface. This has led to a rich array of artifacts and sites in a vast assembly of evidence. In the middle of the last century a radical threshold was achieved – it became possible to displace the whole of humanity – mind, heart and body from the surface of the earth – to venture into cosmic space and time. From that moment a few artists have been engaged with this new context to unfold its broader meanings.

Projects known and unknown, public and private, have engendered broad creative thinking and aspirations toward outer space within the various arts communities.

In the past generation, the Space Arts community has grown from a few to hundreds of artists in the various arts disciplines from around the world who are now engaged in individual and collaborative space arts projects. Over the past 25 years, the community has gained momentum from a growing number of major exhibitions and conferences. During that time, Space Art has garnered the support for projects and residencies from major institutions, with foundations, and with space agencies, including NASA, the European Space Agency (ESA), and the Japanese Aerospace Exploration Agency (JAXA).

More specifically to the topology of the arts, Space Art can be considered as any art that connects and expands human consciousness and culture toward its cosmic context. These space arts (literature, poetry, music, dance, media art, conceptual art, performance art, visual arts, architecture, painting, sculpture, design, etc.) have included:

- Sky art
- · Celestial art on the ground as well as in space
- Microgravity art in numerous parabolic flights and in orbit
- Partial gravity art, double-G art on earth and in space
- Cosmic art art that addresses large cosmic structures, time-space constructions
- Henge Art that which creates a "hinge" between sky and earth: Celestial Architecture on the earth telescope observatories, the ancient henges, (e.g. the Pyramids, Stonehenge) Greek drama performed under the stars
- Science Fiction/Fantasy literature
- · Arts of re-perceiving earth from the perspective of space
- Art produced through the media of photography, film, video, radio astronomy, visual astronomy, X-ray, infrared including a radio/sonic arts
- Art actually in outer space produced after Sputnik Art that can only exist in the outer space environment

Since the landmark experiments in art, science and technology of the 1960s, there has emerged a stronger and more insightful understanding of both the meaning and necessity of informed mutual involvement between the arts, science, and technology. Increasingly, over the past 50 years, artists have found and are finding ways to contribute to scientific undertakings just as science and technology are informing artistic and humanistic practice particularly and in this case related to outer space. Sample areas of space arts recent experimentation include:

"The Body in Motion"

This theme-cluster is devoted to the sense of the OG/2G-body's unique physiology and kinesthesia (movement) leading to extraordinary development of a sense of new types of physicality in altered gravities. This theme would involve dancers, choreographers, physiologists, and gymnasts – arts that make this new physiology evident and present. It would also include artists with physical or perceptual handicaps.

"Mind Expansion"

This theme is devoted to the unique psycho-physiological or mental realities of multigravitational experiences – the new consciousness embedded in altered gravitational reality. This theme would involve artists, poets, teachers, psychologists, neurologists, philosophers, and theologians. It concerns itself with the manifestation of new larger meanings.

"Place Sensing"

This theme concerns itself with formulating and articulating the sense of Place in OG/2G experience – new orientations of mind/body in "space". Where am "I" and where is "it" – the sense of location without "pull" or with crushing confinement, both self and context producing a new "place". This theme would involve artists, architects, designers, topologists (mapping), etc.

"Zero Gravity – Multi-Gravity Socialization"

This theme is focused at the social interactions with others in hyperbolic flight, the unique motions, proximities, and unusual objectivities that inhabit social interactions in OG/XG experience involving artists, sociologists, social psychologists, and anthropologists.

"Communications in Virtual Space"

Earth to outer space communications linking the ground-based sites to micro-gravity disengagement in hyperbolic flights in an effort to open wider horizons for direct and indirect experiences. This nexus of disengagement and release is a precondition to the exploration of nascent aesthetic formulations that are inherent to zero gravity experience through the creation of live simulations and interactions between earth and space in virtual reality where live data is sonified and visualized with haptic interfaces in communicating and simulating new gravitational experiences to those on the ground.

In these interfaces, we can enter a more flowing relationship between the mind and sensorial physicality, a communicative, a "garden" constituting its own forms, structures and contents. Traditional images and words, music and sounds, gestures and touch, do not live comfortably in this disengaged, zero gravity reality. They want to be more dynamic, more rapid, more explorative, and more inquisitive; they want to be more democratic, more synaesthetic, more polyvalent, more free-associative. This new framework demands a de-gestalting and fragmentation – then a re-assembly on another plane of consciousness. It requires entirely new image formulations – dynamic, hieroglyphic, and synaesthetic in nature – all in a mutual "inter-relational" mesh filled with new aesthetic meanings to be formed by artistic creative effort.

In the more formal fields of philosophical aesthetics the new presence of outer-space presents such open and commanding territory for the further development of new aesthetic philosophy and theory presenting deep challenges to all of 20th Century's aesthetic thought, whether in the phenomenology of perception (Merleau-Ponty), existentialist philosophy and aesthetics (Heidegger and Sartre), anthropological and structuralist thought (Levi-Strauss), linguistic thought (Wittgenstein and Chomsky) or deconstructualist, post-Freudian polymorphic, desire driven thought (Deluze, Guattari, Baudrillard, and Foucault) and particularly for the evolution of the inherency of an aesthetics of justice and freedom (from Hegel through Derrida's last writings) – also to theological aesthetics (de Chardin and von Balthazar). In every condition of aesthetic thought we are confronted by such new situations in outer-space, with our relation to presence of life-forms strewn everywhere, that the Earth-bound condition for our mind is now truly unlocked and unbound. New aesthetic frameworks are required for the processes of expanded understanding of human existence.

To turn toward the more immediate, at the end of a Space Arts Conference in Paris in 2003, a group of core participants agreed to plan and convene a meeting devoted to the further development of the field of Space Art. This led to a subsequent Space Arts conference held February 2004 on the West Coast Campus of Carnegie Mellon at the NASA Ames Research Center in Mountain View, CA. The Workshop on "Space Artists' Residencies and Collaborations" was organized by the Studio for Creative Inquiry at Carnegie Mellon University, the Zero Gravity Arts Consortium, the Center for Science Education at Space Sciences Laboratory, University of California at Berkeley, and more than 40 artists and scientists attended. An outcome of the Conference was a document titled "The Common Ground of Creativity," which outlined a working agenda and proposal for the Space Arts Community.

As in the recent 2012 "Astrobiotic" Conference, sponsored by NASA at SETI, we have witnessed the upsurge of cross-disciplinary relationships, workshops, conferences, and

exhibitions increasing, as well as scholarly articles and chapters of books that address the complex relationship in areas as diverse as space exploration, nanotechnology, bioethics. Fostering the future of culture and the arts in outer space calls for networks of university, institutional, and space agency support in the United States, Europe, China, and India and more immediately expanding the cultural potentials of the International Space Station. Also, "Ground-to-zero-gravity linkages" need to be explored in a variety of settings and conditions involving new communications technologies to build broader cultural participation.

Organizationally, we require an aesthetic, a feeling-filled basis for a cultural membrane that links, interconnects, and integrates an extraordinary plenum and potential for human creativity and freedom by the creation and activation of networked groups, institutions, facilities scattered around the world. These extraordinary creative potentials call upon the world's Space Community: its space agencies, research, academic and artistic institutions to extend a deep hospitality to the arts and humanities within the scientific, technological and technical frameworks that exist – to engage in an imagining with and for the whole of humankind such that the vast potentials we see will be enabled among us all by the generous and loving spirit that our life so deeply requires.

Weightlessness comes on abruptly. I soared as if I were inside a soap bubble – Like an infant in the womb of my Spacecraft, Still a child of my mother Earth. Miroslav Hermaszewski

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About the Author: Professor Lowry Burgess is a Distinguished Fellow at the Studio for Creative Inquiry, Center for the Arts and Society, College of Fine Arts, Carnegie Mellon University. He created the first official art payload taken into Space by NASA in 1989 and is a pioneer of the Space Art movement which in 2012 has hundreds of global artists. After destruction of the Buddhas in Bamiyan, Afghanistan in 2001, he authored the worldwide endorsed *"Toronto Manifesto: The Right to Human Memory"*. His artworks are in museums in the United States, Europe, Canada, and Japan and created curricula in higher education for the arts and humanities. Lowry has received awards from nine of the world's leading Arts and Letters Foundation, including the Leonardo da Vinci Space Art Award from the National Space Society. His 1987 book, *Burgess: The*

Quiet Axis, which won the Imperishable Gold Award from Le Devoir, Montreal is at Amazon.



Bob Krone photo of Lowry at the Kepler Space Institute Convention, Hilton Head, South Carolina, March 2012.

Editor's Notes: The Kepler Space Team has been privileged to benefit from Lowry Burgess's participation for years and considers his long career of pioneering and entrepreneurial work in Space Art and Culture to be critically important to both the philosophy and the development for the future of humans in Space. We are proud to include Lowry's original article, *"The Philosophical Aesthetics of Space Culture and Arts"*, in this first issue of *The Journal of Space Philosophy*. Kepler Space Institute (KSI) is committed to retaining permanently in its vision the following recommendation of Professor Lowry Burgess:

"Organizationally, we require an aesthetic, a feeling-filled basis for a cultural membrane that links, interconnects, and integrates an extraordinary plenum and potential for human creativity and freedom by the creation and activation of networked groups, institutions, facilities scattered around the world. These extraordinary creative potentials call upon the world's Space Community: its space agencies, research, academic and artistic institutions to extend a deep hospitality to the arts and humanities within the scientific, technological and technical frameworks that exist – to engage in an imagining with and for the whole of humankind such that the vast potentials we see will be enabled among us all by the generous and loving spirit that our life so deeply requires." Lowry Burgess, *Journal of Space Philosophy*, October 15, 2012. *Bob Krone, PhD*.

Space Philosophy: Conflict, Migration, Mutation, Adaptation, Evolution, and Circumventing Armageddon

By George S. Robinson

"Philosophy" offers a series of methodologies to examine fully the yet-to-be-empirically defined properties of existence, particularly as these unknowns impact behavior characteristics of *Homo sapiens sapiens*, of modern humans, both individually and collectively. Religions throughout human history are excellent examples of formulating transitory behavioral values of humankind to accommodate the empirically unknown at any given time. As noted by American biochemist, Isaac Asimov, "We create nothing ourselves, we simply discover deeper applications of natural laws and make use of them in the presence or absence of wisdom." Ah, were there time and space for critical definitions, all within context, for an all too brief philosophical "musing."

Clearly, there are numerous "philosophic perspectives" regarding why modern humans feel or believe they are compelled to move into, that is, migrate to and settle, off-Earth in near and ultimately deep space. The focus for the instant "musing" is on the current physical movement of representatives of humankind off-Earth; to explore, migrate, settle... explore, migrate, settle, *ad infinitum*; hopefully to continue the ever evolving odyssey of understanding and putting into an empirically-based personal and collective perspective the "What," "Why," and ultimately the "Who" of Creation.

But as noted, "philosophy" is a multifaceted discipline, that is, a methodology and, indeed, a series of methodologies to satisfy a multitude of interests, curiosities, and queries. One approach to identifying the nature, the role, of philosophy is to consider it a tool for seeking "wisdom or enlightenment." Here, however, there is a clear contradiction in this rather popular definition, namely that the objective of *wisdom* must flow from *enlightenment*, but the former does not necessarily result from the latter.

Another traditional objective of philosophy as a discipline of inquiry, discovery, and assessment, is the enablement of meeting adversity with equanimity or balance and evenness of mind. In a more archaic sense, philosophy is considered the "father of all physical sciences." Nevertheless, in a rather curious sense, philosophy has been considered to embrace the sciences and liberal arts, but "exclusive of medicine, law, and theology."

Philosophy also has been defined as a discipline embracing as its core certain elements of logic, aesthetics, ethics, metaphysics, and epistemology. It is a universally recognized discipline, or seemingly unique methodology, involving the search for a

general understanding of *values* and *reality*, chiefly by speculative rather than observational means. But how can one be reasonably "speculative" without first developing at least some "fruits" of observation? These definitions, then, cover just about every amorphous facet of "space," assuming that term refers to human activities "off-Earth" and their ultimate intended objectives.

Defining "space" is a bit more demanding and speculative than generally understood. Empty space, that is, interstitial space, is actually *something*. It is real enough to move, bend, and be moved about. Space is, in fact, the most abundant "thing." It might be said rather quaintly that space makes sense of "something that is nothing," since space becomes something in the form of energy without mass.

Sir Isaac Newton speculated that space is the framework in which all physical existence takes place. Put somewhat differently, Newton considered space to be a benchmark for all physical existence... all physical activity. But many decades later, Albert Einstein presented the philosophic community with a space theory update, that is, space and time form a unity concept. He characterized space-time, or "spacetime" to emphasize the interwoven inseparability, much like the stretching and bending of fabric in response to a form of energy he referred to as gravity. And spacetime, as a theory or expression of reality, opens up an entirely new way of looking at and thinking about the universe(s).

Nevertheless, even if the underlying philosophic construct or methodology is seeking "wisdom," the concept and articulation of "wisdom" is still empirically premised; just not yet known in that capacity beyond decisions based upon the genome/genetic code and gene sequencing survival imperative of an individual biotic specimen, a society, civilization, or an entire species. Certainly, subhuman simians and certain of the cetaceans, for example, manifest characteristics of "wisdom" in various aspects of decision-making... a kind of segue nexus between and among relatively current humankind members, past and present, on the bush of evolution.

When using a philosophic methodology to try to understand the interactive roles of humankind and outer space, it is essential to keep in mind that *Homo sapiens sapiens* is an integral... but not necessarily the most critical... component in the overall scheme of evolution, that is, an interactive biological and biotechnological agent in the entire planetary biosphere of Earth. But the species is just a component, and a transitory one at that. No species has yet lived forever... yet.

We tend too often in analyzing and assessing human nature, essence, and soul, to raise ourselves perhaps much too far above our biochemical and biophysical origins and underpinnings that give direction to our behavioral dictates. And, interestingly, when

humans, like any other form of animal or plant life, artificially inseminate specimens to create new species or subspecies for a variety of reasons, often in a fashion to perpetuate and "evolve" further the new species or subspecies, it is difficult to determine whether humans are creating and perpetuating non-natural genetic codings, or whether the original non-human specimen is using *Homo sapiens sapiens* to perpetuate new survival-oriented genetic characteristics of the object specimen. The extent of the interactive nature and interdependence of all life forms truly *is* extraordinarily complex.

The extent of complexity in the animal kingdom becomes even more challenging, particularly in the context of saving endangered and threatened species... even in the hominid world. A good example might be the extant resurrection of the genetic coding of *Homo neanderthalensis*... or *Homo sapiens neanderthalensis*, since recent DNA studies at the Max Planck Institute indicate a certain sharing of genetic coding through cross-breeding. In other words, who or what species is really manipulating the design engineering of whom or what for survival purposes? Who or what is pushing the evolution of humankind into transhumans and, say, post humans of quasi-artificial intelligence *in extremis* for survival in space... off-Earth? And is the effort intended to help ensure continuing the sentient odyssey of discovering and understanding the empirical foundations of Creation and, perhaps, the Creator?

Lest the jurisprudence and implementing positive laws be overlooked as critically significant components of evolution, it must be kept in mind, also, that "the law" is transitory and empirically premised. In other words, "law" may be considered experimental articulations seeking the most effective way to perpetuate and evolve cultures in societies of modern humans into a more adaptable species for a changing environment or ecotone; for survival both on Earth and in space through the critical biological dictates of migration and interdependent survival adjustment activity.

Despite ongoing speculation in certain arenas of scientific inquiry, whatever aspect of various philosophic methodologies is adopted in assessing the critical component of humankind's survival through migration off-Earth, evolution must be defined in part and very simplistically as the constant cycling and re-cycling of atoms and their subatomic components, that is, energy in the form of organized information... right down to the smallest theoretical unit of energy on the Planck scale. So, philosophy, not unreasonably, may be characterized as a methodology of inquiry serving as the nexus between scientific empiricism and what constitutes human nature, essence, or soul.

It is up to each individual within the limits of his/her/its physical capacities... and it also is up to the societies in which the individual resides... to define and determine the objective and purpose of human nature beyond some amorphous concept of curiosity relied upon to justify many space programs and projects. In this respect, "curiosity" is a manifestation of "research" driving or determining the need or motivation for migration. It is more than basic research, that is, the seeking of knowledge *solely* for the sake of knowledge. It is *directed* research that relies on the fruits of basic research.

As previously noted, philosophy and its many ephemeral definitions constitute a series of methodologies often serving different purposes and/or objectives for "musing" about the nature or essence of humans. In order to be an effective methodology, it cannot disfranchise any empirically derived aspect of *all* data from scientific methodology, that is, basic and directed or applied research data. Also as previously alluded to, "humanism," reflected in ever-evolving religions, is the constantly transitioning substitute for ignorance in the absence of empirical or quantifiable components of human nature, and existence, and, indeed, of all creation. It can be viewed or thought of as organized traits of "faith" in a rationale for Creation.

Despite ongoing speculation in certain areas of the scientific community, it is still reasonable in the instant discussion to assert that no particles of matter or other forms of energy reflecting organized information have been created or destroyed since the beginning of all Creation. There has been, and continues to be, a pattern of creation and re-creation of existing energy and matter. In this context, and at some point in the future of *Homo sapiens sapiens,* it will be possible to garner a fairly complete understanding of how some of the protohominid predecessors of humans survived and also why and how some of them became extinct. In the process of reaching this understanding, a result of philosophic inquiry and assessment, more will be learned about the genesis of *Homo sapiens sapiens* and, hopefully, its future in order to prepare more effectively and rationally the species and its biotechnological descendants or envoys for the next step in their survival, or the survival of their evolving essence and unique nature in outer space.

Philosophical "musings"... questioning and assessing *what is* in a given context, *what ought to be*, and what more likely *will be*... will result in a fair grasp of the whether, what, how, and why of humankind's evolution and the likelihood of humankind essence survival... or extinction. Nothing is forever... except, perhaps, if "what is" is recognized and accepted at the outset of humankind's ongoing evolution, perhaps mutation, corresponding adaptation, and ongoing survival, as the continuing reliance on the "philosophical" methodology in use while searching for the *what* and *why* of Creation.

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About the Author: Dr. George S. Robinson, III is one of the most distinguished Space Law experts in the world. His book, book chapter and professional article publications – over 100 – are found throughout the aerospace and Space literature and continue in 2012. He served as International Relations Specialist for NASA, legal counsel to the FAA, and legal counsel at the Smithsonian Institution in Washington, DC. He serves on numerous Boards of Directors for science research. Dr. Robinson was a strong supporter of the Aerospace Technology Working Group that was the forum from which Kepler Space Institute and University emerged. He provided the Publication Agreement for Authors of this Journal of Space Philosophy.



Editor's Note: I have had the privilege of knowing, working with and learning from Dr. Robinson for two decades. He is a national treasure for both knowledge of the Law and for creative thinking about the legal and philosophical needs for humans as they move off-world. It's an honor to have him contributing to the first issue of our Journal of Space Philosophy. *Bob Krone, PhD.*

Facing the 21st Century's challenges by the Tools of Astronautic Humanism

By Adriano V. Autino

Abstract

The aim of this paper is to introduce the basic concepts of Astronautic Humanism, a new philosophic current whose roots began a century ago with Konstantin Tsiolkosky and his famous sentence "*Earth is the cradle of man, but one cannot live his whole life in a cradle*".

Just a couple of years ago, when the SRI founders started discussing the possibility of a *space renaissance* spreading around the world, critics said action, science, and technology are needed for humans to expand into space – not words. We went ahead at our pace, developing the discussion about *astronautic humanism* as a means of fostering a new Copernican revolution. In fact, the general perception of the world is limited to the boundaries of our mother planet. Scientific and technological means for human expansion into space are fully within our range. What is missing is a political orientation and a public awareness of the urgency of space.

After estimating the improved feasibility of this philosophic re-foundation, the paper defines astronautic humanism and points out similarities and differences between this discipline and classic humanism, in both of which the human being is the focus. With an awareness that our mother planet cannot be enough forever for a growing civilization, human life is re-evaluated, facing the current challenges of civilization and other philosophical currents that place a priority on freezing the natural environment as it is. Growth is analyzed from different points of view. If we want the civilization to keep on advancing, growth is a must. The Solar System can provide a platform a thousand-fold greater than the one needed by seven billion people. Being humanists, we need an open world philosophy, expanding the concept of "home" to the whole Solar System.

The paper's last section discusses the cosmic evolutionary destiny of our species. The concept of the whole Solar System as a living organism is proposed: Gaia is not a solitary oasis in a desert, and our task as a species is to help intelligent life spread in the universe, more than being a passive "guardian" of it on a single planet.

See Adriano Autino's complete paper at <u>www.spacerenaissance.org/papers/Facing-the-</u>21st-Century-Civilization-Challenges-by-the-Tools-of-Astronautic-Humanism.pdf

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About the Author: Adriano Vittorio Autino is the president of the Space Renaissance International (<u>www.spacerenaissance.org</u>), a cultural association founded in 2010. Adriano

was born in Moncrivello, Vercelli (Italy) in 1949. He grew up and studied in Turin, where he graduated in Electronics in 1969 and attended the Faculty of Computer Sciences with success, but soon abandoned it in favor of his professional career. Adriano is now an entrepreneur in the field of Information Technology and Automation (see www.ase-Itd.co.uk). Professionally committed to guality and maturity of the design processes, he personally designed software for project life cycle management. He also writes and actively participates in research on the evolution of methodological standards, with the aim of simplifying and rationalizing them. In 1989 he reviewed, for a small newspaper, the book The Nuclear Dilemma by Prof. Carlo Rubbia: it was the beginning of his reflections on human development vs. the finite resources of planet Earth. He wrote an essay, entitled "The World is Over." In 1993-94, Adriano conceived the project of a magazine called "Technologies of the Frontier," which began a discussion with scholars from other countries around the concepts of the space option and global options for the continuation of civilization. A new language begun taking shape and the participants started discussing neo-humanism and astro-humanism, recalling authors such as Gerard O'Neill, Krafft Ehricke, Constantin Tsiolkowsky, and other forerunners, as a scientific and philosophical movement. In 1998, the concept of the Greater Earth was born. Since 1997, Autino has participated in the IAF (International Astronautical Federation) congresses, presenting his papers on the themes of human expansion into outer space. In 2001, following the terrifying tsunami that swept Southeast Asia causing hundreds of thousands of deaths, he felt the need to react, philosophically, against creeping nihilism, countering an optimistic view of the world to the closed catastrophic visions and the decline of civilization: "Our Earth is not sick: She's Pregnant!" In 2008, during the second international convention of Technologies of the Frontier at Belgirate (Italy), titled "A New Renaissance: Colonizing the Moon and the Near Earth Asteroids", the concept of a space renaissance saw the light of day. During 2009, the Space Renaissance Initiative developed, and in 2010 the Space Renaissance International was founded.



Adriano coauthored the book Three Thesis for the Space Renaissance (www.lulu.com/commerce/index.php?fBuyContent=10003567).

In 2008, he published La Terra non e' malata: e' incinta! (Earth is not sick: She's pregnant!) in Italian.

He is author of *The Copernican Evidence – Requirements for a Space Age Philosophy* (www.spacefuture.com/archive/the_copernican_evidence_requirements_for_a_space_age_philosophy.shtml) and coauthor of *What the Growth of a Space Tourism Industry Could Contribute to Employment, Economic Growth, Environmental Protection, Education, Culture, and World Peace* (www.spacefuture.com/archive/what the growth of a space_tourism industry could co ptribute to employment, economic growth, environmental protection, environmental protection, environmental protection, evidence

ntribute to employment economic growth environmental protection education culture and world peace.shtml).

Listen to Adriano on the *The Space Show* (<u>www.thespaceshow.com/detail.asp?q=265</u>) hosted by Dr. David Livingston.

Read his LinkedIn profile (<u>it.linkedin.com/in/adrianoautino</u>). Visit his Facebook page (<u>facebook.com/adriano.autino</u>). Follow his Twitter feed (<u>twitter.com/adrianoautino</u>)

Editor's Note: Adriano Autino's leadership of the Space Renaissance International (SRI) organization brought collaboration with our Kepler Space Institute beginning in 2010. It was very important for this Journal of Space Philosophy that Adriano's work over the past decade had produced an excellent collection of Space Philosophy. Inviting him to contribute to this Issue #1 was logical and beneficial. KSI leadership welcomes him as a Member of the Board of Editors for the Journal and look forward to continued collaboration. *Bob Krone, PhD.*

A Stellar Revolution

By Kim Peart

The Arab spring revealed how determined action by ordinary people can reshape national governments. Is there a lesson here that can be applied to our future beyond Earth?

Anyone with a good knowledge of the post-Apollo era will appreciate that in the 1970s, if the political will had been on fire, the United States could have launched a future beyond Earth that would have built the foundation of a stellar civilization.

The key action would have been to build solar power stations in space, to access the unlimited energy-well of our star. With this energy industry could have been launched in space, orbital space settlements constructed, robot explorers dispatched to the stars and planning begun for the first stellar migration.

Instead of building a celestial future, the human focus has been entirely on digging and drilling ever deeper into the belly of the Earth for energy and as a consequence, so much fossil carbon has been released into the biosphere, that it is now changing the Earth. The health of our amazing global civilization may now be at risk, along with the spectre of humanity being permanently trapped on this planet.

With depleted terrestrial resources, we may not get a second chance at star-faring and when the next giant mountain from space comes calling, that may be lights out for our species.

As leading economies struggle to maintain growth in the continuing global economic crisis, their attention will be more tightly focused on solving Earthly problems and less on entertaining space adventures. Unfortunately, this will be the completely wrong response and direction in which to be heading.

All current economic and environmental strife could have been entirely avoided if we had begun building the highway beyond Earth in the 1970s and by now, there might also be no poverty to speak of on Earth. This is because, by accessing unlimited stellar energy to process celestial resources, the wealth of human society would be increased without bound.

Though the cost of building the foundation of a stellar civilization would be high, it can be appreciated that a line in space development would be reached where there would be no further cost to Earth. I have described this as the Liberty Line,[1] beyond which the return on the investment would be infinite, from across the Solar System and among the stars.

Facing the night of our own demise through decades-long delay on serious space investment, if we keep trudging down the same low road, where will we end? We need to lift our game and rally the human spirit to stake a claim on the stars.

It is fantastic that Planetary Resources are looking to access near-Earth asteroids, but will this be enough to secure our future beyond Earth, before we lose the chance completely?

Rather than looking to a few business leaders to solve Earth's problems, should we, the citizens of this planet, awaken to the lost opportunities of the post-Apollo era and begin a drum-roll around the world to reach to the stars to save our Earth and get back to the future that we have all been denied?

If our cosmic survival matters to you, if you want a future for your children and grandchildren, then take the time out to understand our predicament and prepare to get angry. We should all be very angry that we have been frog-marched into a survival predicament.

Zen Gardner has the following image on his web site: http://www.zengardner.com/the-venus-transit-and-the-lost-civilizations-of-earth/



It is a metaphor for the birth of the Stellar Revolution.

The Arab Spring began in Tunisia when a young man was denied the ability to earn an income and, totally humiliated, committed suicide. His desperate act sparked an uprising that has rolled through the Middle East and still continues. People who once felt

helpless in the face of overwhelming power found their voice and demanded change.

We can also awaken to our survival plight, find our voice, and begin demanding change. Why shouldn't the resources of this planet be directed toward building the foundation of a stellar civilization, beginning with solar power stations in space?

There is now a unique way to mobilise a global campaign, by using an extension of the Internet called the virtual world, where using an avatar, people can meet, communicate, plan local actions and prepare global strategies. There has never been an opportunity like this in human history, to mobilise globally and act locally, toward becoming a celestial society.

There may need to be a movement of ten million and more empowered individuals demanding action, if we wish to change the current stagnation into space mobilisation. With survival on the line, simply advocating space futures may not be enough. There will be a need for determined people to put their shoulder to the wheel of this future and get it moving, raising funds for research and development and driving investment opportunities toward creating our stellar civilization.

The future is in our hands. If we will awaken and act, we can be the shapers of history and through visionary action, determine that humanities future history is written.

Notes

[1] "Creating A Solar Civilization," 2006, revised in 2012 (www.islandearth.com.au).

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About the Author: Kim Peart first became engaged with space advocacy with the L5 Society in 1976, wrote his vision for space futures with "Creating a Solar Civilization" in 2006 and is currently the director of Space Pioneers. In March 2012, working with research scientist Dr Jennifer Bolton, Kim identified a way to build a working model of an orbital space settlement in the virtual world, called the VOSS (Virtual Orbital Space Settlement), which will allow any number of people to be involved in a space-like virtual environment. The VOSS is located above their island called Sprite in the virtual world called InWorldz, where interested people can participate in the virtual space program planning globally for local action toward building our future among the stars (www.islandearth.com.au).



Editor's Notes: Kim Peart, who has pioneered virtual Space simulation and education from Australia, gives us the "*Why*" for human Space settlements leading to a Stellar Revolution. Then he opens readers to his years of research to build the world's first Virtual Orbiting Space Settlement (VOSS). I encourage you all to join him, Dr. Bolton, and his group of enthusiasts, via InWorldZ on the VOSS (<u>www.islandearth.com.au</u>). You will find Kepler Space Institute's classroom there when you send your avatar on your simulated adventure. The Journal of Space Philosophy is proud to have Kim Peart on our Board of Editors. *Bob Krone, PhD.*

The Philosophy of Kids for Space

By Lonnie Jones Schorer and Janet Ivey

An essential part of opening new frontiers is getting people interested and involved in the incremental steps of the planning process. Although there is historic precedent, we cannot just round people up and ship them off to new worlds. A period of education, preparation, and planning, as well as the desire to go, is an essential prerequisite. But a harsh evaluation, expressed by students ages 5-18, is that they do not feel they have a part in the planning process for the opening of the space frontier. They assume that exploring and accessing space is the exclusive prerogative of an elite few. To lay the groundwork and make the space frontier a tangible reality for future generations of space travelers, those who may be tomorrow's space pioneers should already be involved in contributing their visions so that they will understand and believe in pursuing the goals. If they become aware that there will be opportunities and that not everyone involved will be a rocket scientist, when the time comes to establish space communities, a broad spectrum of the populace, representing all trades and professions, will already be educated and prepared to participate.

Younger children's imaginative and futuristic visions of space are more inspired by Star Trek, Star Wars, Space Jam, the Jetsons, Phil of the Future, Daul's *Charlie and the Great Glass Elevator*, Scholastic's *Magic School Bus*, Battlestar Galactica, and a wide selection of other-worldly video games than by the daring accomplishments of the Gemini and Apollo missions that took place long before they were born. Space, for elementary school students, is an innovative, sci-fi, warp speed fantasy, filled with aliens, galactic wars, laser beams, and interstellar, intergalactic travel via teleportation and faster-than-speed-of-light starships.

Fantasy to reality, how do we impact students' perspectives and offer them the tools and competency to walk through the doors of opportunity? Classroom lectures impart information. Is any of it transformational? Do students remember what they heard? Which educational approach best involves and prepares students for a committed future? *Janet's Planet takes Kids to Space* supports a hands-on, experiential learning approach to education. Ideas can drive dreams, but without structured groundwork based on real life experience, most young students have no idea how to integrate and apply what they've learned in order to push boundaries beyond the requirements of a standard curriculum.

Academia vs. Vocational: For years, brainy kids have been put on a college track, while those with lesser testing scores are encouraged to pursue a vocational track. Both tracks end up in the workplace.

- The Battelle Corporation exemplifies a corporation that combines the best elements of both tracks. Battelle partners with communities and supports strategies to engage kids in hands-on STEM projects. The teaching goal is to prepare kids for success.
- Two fourth grade teachers in MA have students set up a business plan to facilitate smooth running of the classroom. Students "rent" their desks, learn about overhead costs, keep personal ledgers of debits and credits, and take on the roles of marketing, banking and sales managers. Chances are these students will never forget business lessons learned in fourth grade!
- In March, the Kepler Space Institute (KSI) held a *Kids to Space* workshop. Student educational backgrounds were varied, from Montessori and public schools to Boys and Girls Club and subsidized housing groups. On a common plane provided by a hands-on activity that called upon imagination, students cooperated and excelled. And, hopefully they learned that the future is not the prerogative of an elite few.

So how do we inspire students to become active participants in their tomorrow?

First we must look at how we currently approach science and give it context, give it meaning, give it a hands on relevancy that makes science significant.

Too often, the way science is taught obliterates any chance of inspiring students to sit up in their chairs and say, "*Wow, that's science?*" We rob science education of life when we focus solely on results and seek to train students to solve problems and recite facts without transporting them beyond their desktops.

Science is the process that takes us from confusion to understanding in a manner that is precise and reliable. To be able to follow the steps of the scientific method and ultimately come to conclusions that have validity and meaning is one of the most important of life's experiences.

We have seen children's eyes light up as I have told them about the solar system and microgravity. After one presentation about the solar system a second grader asked me, "*Did we really go into space today*?" My hope is that something of the majesty of the solar system felt real and vibrant to him. I pray he went home and did his homework.

For us, science is a language of hope and inspiration, the greatest of all adventure stories; we need to communicate the drama of science within a framework that ignites imagination and instills connection to life, to the world, and to the cosmos.

So how do we get kids to dream beyond their desktops? We teach the WHY before teaching the little what. We teach context because CONTEXT leads to CURIOSITY.

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About the Authors

Lonnie Jones Schorer: Lonnie Schorer has a BA in Russian and a Master's of Architecture degree. While living overseas and in the United States in support of her husband's State Department career, she raised three children, worked as staffer for the Lillehammer and Atlanta Olympics, founded a UNESCO World Heritage Site graduate program in Norway, and was head of design for a new concept 43,000-ton residential ship, the *World of ResidenSea*. As a pilot and member of the Explorers Club, her interest in flight and space led to classroom and workshop programs to encourage students to pursue STEM careers.



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Editor's Note: Dynamic and exciting people make life richer. When they are educators of children it makes them very special. Lonnie Schorer and Janet Ivey listen to children and encourage them to become engaged for their own futures via curiosity and scientific inquiry into the wonders and adventures of Space. Over the past eight years Lonnie Schorer has written outstanding children's Space science textbooks for kids and educators. It's impossible to enumerate all of Lonnie's talents and achievements; very simply, I consider her to be the 21st Century Amelia Earhart. It's an honor to have her as a member of our Journal of Space Philosophy Board of Editors.

Janet Ivey is an entertainment treasure of Nashville. She is teacher and science mentor through her *Janet's Planet* TV program which airs nationwide on more than 100 public television stations. Encouraging kids to stand in their magnificence by investigating and understanding the world around them is one of many reasons that so many admire Janet's work

Together Lonnie and Janet are attempting to put Newton's 2nd law of motion into action by creating momentum in math, science, engineering, and space education through accelerating the mass and velocity of learning with innovative approaches. *Bob Krone, PhD.*

Planet Moon Philosophy

By David G. Schrunk

Humankind is now poised to undertake the largest and most promising venture in history: the global exploration, development, and human settlement of the Moon. The transformation of the Moon into an inhabited sister planet of the Earth (the "Planet Moon Project") will establish a link between our ever-growing scientific expertise and the unlimited resources of space.[1] When that link is secured, the following will be realized: (1) the Earth will be supplied with an abundance – an over-abundance – of energy and material resources, thus dramatically improving the living standards and quality of life for all people, (2) large scale operations (e.g., planetary engineering projects) will be conducted in space, (3) every region of the solar system will be explored in depth, and (4) the first missions to the stars will be initiated.

The Moon is the logical site for the next stage of large-scale space exploration and development. We now have the ability and cultural maturity to transform the Moon, in a peaceful and responsible manner, into an inhabited sister planet of the Earth and thus reap the benefits of becoming a multi-world species and eventual masters of the solar system. All that remains is to define goals, set timetables, and apply our technological, financial, and cultural expertise to the accomplishment of this significant next step in the emergence of humankind as a true spacefaring civilization.

Lunar Resources

Over the past several decades, both manned and unmanned scientific missions have yielded information on the structure and resources of the Moon. The lunar regolith has been found to contain an abundance of elements, such as iron, silicon, titanium, aluminum, and oxygen, and concentrations of water and organic compounds have been discovered in the north and south polar regions. In addition to these resources, the Moon receives a reliable, unlimited, and unobstructed source of energy in the form of sunlight. Thus the Moon has virtually all of the materials and energy needed to support large-scale industrial operations and human settlements and the next critical phase of lunar development, in-situ resource utilization (ISRU), is ready to begin.

First Lunar Base

Within this second decade of the 21st century, several nations and commercial enterprises will deliver tele-operated and semi-autonomous robotic devices to the surface of the Moon. These robots, which will include solar cell and additive (3-D) manufacturing devices, will be the first elements of an unmanned industrial base that excavates, transports, and processes indigenous lunar regolith materials into useful

products, such as solar cells, building materials, replacement tools, and other needed items on the Moon.

The site for the first unmanned base will likely be on the Earth-facing side of the south polar region of the Moon. There are several promising sites in the south polar region, such as the summit of Mons Malapert,[1] that always have the Earth in view for continuous telecommunications and that receive over 300 days of sunlight per year for the generation of solar electric power. A base in the south polar region will have access to increased concentrations of water and organic compounds that will be useful for industrial operations and eventual human habitation. The tall peaks and deep depressions of this region also offer the opportunity for the placement of long line-of-sight telecommunication links and power beaming facilities.

After a "critical mass" of manufacturing equipment (ovens, crucibles, drills, lathes, 3-D fabricators, etc.) has been transported to the first base, lunar regolith resources will be used as feedstock for the production of virtually all of the products that are necessary for the construction of infrastructure elements and human habitats.[1, 2] For example, lunar iron and aluminum will be used to create pipes, panels, wires, wheels, and structural beams, and lunar silicon will be used for the production of photovoltaic (solar) cells, transistors, fiber-optic cables, mirrors, and lenses. Oxygen and other light elements that are not needed for unmanned activities will be recovered from lunar mining and manufacturing operations and stored for later agricultural and human habitation applications. While the relative abundance of elements on the Moon is not ideal, sufficient quantities are present to build a substantial infrastructure that will support scientific exploration and permanent human settlements.

Of significance, the growth of the unmanned lunar base will be <u>exponential</u>. For example, robotic devices will be used for the construction of solar panels. As more solar panels are added to the lunar electric grid, the increase in electrical power will be used by additive (3-D) manufacturing devices to make more solar-panel manufacturing machines that then make more solar panels, etc. Since abundant, reliable electrical power is the key to large-scale development, priority will initially be given to the fabrication of solar cells from lunar materials. The generation of electric power on the Moon from the first lunar-made solar photovoltaic cell will be a milestone in space exploration because it will prove unequivocally that human enterprises can be selfsupporting in space.

Circumferential Infrastructure Networks

In one likely scenario the first elements of the lunar electric power grid will be delivered from Earth to the summit of Mons Malapert and configured into an electric power grid.

The grid will then be extended, by the creation of more solar panels from lunar regolith materials, in east and west directions from the lunar base to create a <u>circumferential</u> <u>electric grid</u> around the Moon at 85° south latitude.[1] The advantage of a circumferential solar-powered electric grid is that 50% of the solar panels will always be in sunlight, thus delivering continuous electric power to the grid, and new equipment that is delivered to the Moon from the Earth can simply be plugged into the fully functioning electric power system.

The construction of the lunar electric power system will give rise to the need for an efficient surface transportation system that can deliver raw materials, tools, building materials, and, eventually, people between manufacturing facilities and construction sites. To meet these needs, a railroad system will be created. The "lunar railroad" will be an effective, efficient, and simple (mostly automated) logistic system on the Moon and it will avoid most of the problems of lunar dust accumulation that plague off-road vehicles. Rails for the railroad can be made from lunar iron, for example, and used to create a simple two-track rail line from the first base to other areas in the south polar region, including the geographic south pole. A "southern rail line" will greatly increase the ability to carry out exploratory missions and will facilitate the growth of all lunar projects.

The challenge of building the circumferential rail system (beginning with tele-operated robotic devices) will be similar to the challenge of building the solar-powered electric grid and both construction projects can thus be undertaken simultaneously. Since communication systems and pipelines for the transport of fluids and for thermal management will be needed on the Moon, these infrastructure elements will also be constructed in parallel with the railroad and electric power networks. Eventually the rail line and other utilities will be extended northward to the mare/equatorial regions and then to the north pole, thus creating an infrastructure network that encompasses the global structure of the Moon. The circumferential utilities network of the south polar region is depicted in Figure 1.



Figure 1. Circumferential Utilities Network at the Lunar South Pole. The initial lunar railroad, solar power, communication, and pipeline networks will be placed around the circumference of the Moon at the South Pole. These networks will then be extended to form a global lunar utilities network (Illustration from Schrunk et al.[1]).

Power levels in the circumferential grid will increase to the multi-megawatt range as construction of the utility infrastructure continues and experiments will be conducted with the first microwave beaming of electric power from the Moon to the Earth. With continued growth, it will become possible to supply the Earth with terawatt levels (one terawatt = one trillion watts) of clean, reliable, low-cost solar electric power. Lunar development will thus contribute to increased living standards on Earth and to the "greening" of Earth's biosphere through the decreased need for and usage of fossil and fission fuels and by the use of excess power to clean up toxic wastes and increase supplies of potable water by desalinating ocean water, etc.

Return of Humans to the Moon

Within a decade after the first unmanned base has been established, humans will return to the Moon on short-duration missions (60-90 days) to service and maintain complex

machinery and to supervise operations. Work will also commence with the development of reusable rocket systems and with orbiting stations in "figure 8" Earth-Moon orbits that ferry people between the Earth and the Moon.[1] When a reliable lunar electric power system is in place and pressurized underground habitats (for protection from radiation, temperature extremes, micrometeorites, and lunar dust) have been constructed, regenerative life support systems and agricultural modules will be delivered to the lunar base. Humans will then return to the Moon for longer periods and all aspects of lunar industrial and settlement activities will be expanded.

By the middle of the 21st century, thousands of people will be able to live permanently in each of several large underground malls that have Earth-like living conditions, including luxuriant vegetation and large lakes of water (Figure 2). Given the growing range of lunar activities, including tourism, a broad cross section of humanity will participate in creative and economic pursuits on the Moon. Sculptors, artisans, athletes, and musicians will join entrepreneurs, technicians, and scientists in the unique conditions of "Planet Moon" to create a rich, diverse, and desirable cultural environment for people to work, live, and even retire. The Moon can become a human laboratory for meeting the challenges and hazards of off-world existence. This knowledge, learning, and experience can then be transferred to the exploration and settlement of other sites in the solar system, such as Mars.



Figure 2. Underground Mall on the Moon. Underground malls on the Moon will support large populations in Earth-like conditions (Illustration from Schrunk et al.[1]).

When humans permanently inhabit the Moon, within the next two to four decades, they will explore mountain ranges, mares, craters, and rilles, as well as lava tubes that have been sealed for billions of years. By then the Moon will be our principal platform for making astronomical observations. Thousands of lunar-made telescopes will be placed at regular intervals around the Moon in a coordinated network so that objects of interest in the universe, including the Earth and the Sun, may be observed continuously at all wavelengths of the electromagnetic spectrum under ideal viewing conditions.

Planet Moon

With proper planning and execution, the "Planet Moon Project" will reflect our highest aspirations and provide significant benefits for the people of the Earth. It will involve international cooperation and draw upon the expertise of governments, entrepreneurs, investor-based commercial enterprises, and non-profit institutions, such as universities and foundations. It will provide large scale, high-value employment for the people of every nation and will contribute to advances in all scientific disciplines. As experience

with lunar operations increases, the scientific and industrial capability of the Moon will approach parity with the Earth, perhaps within three to five decades after the founding of the first unmanned base.[2]

A wide range of research projects will use the unique conditions of the Moon to advance knowledge in such areas as materials science, power beaming, superconductivity, and bioscience. Advances in existing technologies will accelerate the phased development of the Moon and it may be expected that new, as-yet-unimagined innovations will greatly enhance our evolution into a spacefaring species. A magnetic levitation rail system will provide high-speed access to population centers of the Moon (Figure 3), and abundant supplies of solar electric power will be beamed from the Moon to the Earth and other locations in space by the lunar power system.[1]

Space Exploration

The evolution of the Moon into a permanently inhabited planet will lead to a fundamental change in the roles of the Earth and the Moon in the exploration and utilization of space. It is natural for present-day Earth-bound peoples to regard space missions only in terms of Earth-based programs (e.g., the construction and launch of robotic missions to Mars). But as humans establish a permanent human/industrial presence on the Moon, Earth-centered thinking will give way to the realization that the Moon will be humankind's principal base for the exploration of space.



Figure 3. Mag-Lev Train. A magnetic levitation rail system will provide high speed transportation on the Moon (Illustration from Schrunk et al.[1])

Thousands of spacecraft will be manufactured on the Moon and launched by electromagnetic "mass drivers" to all points of interest in the solar system and, eventually, to nearby star systems. Mass drivers on the lunar surface will also operate "in reverse" to recover spacecraft, including manned spacecraft, from lunar orbit. The Moon will thus become a "spacecraft carrier," analogous to an aircraft carrier, that uses mass drivers to launch and recover spacecraft to and from cis-lunar space (Figure 4). Communication, power, transportation, and life-support systems that have been manufactured on the Moon will be launched, by mass drivers to Mars and other locations in space in support of the exploration and human settlement of the solar system. Solar power satellites will be manufactured on the Moon and launched into orbits around Earth and Mars to supply those planetary bodies with an abundance of beamed electric power.



Figure 4. Mass Driver on the Moon. Electromagnetic mass drivers will launch and recover spacecraft to and from cis-lunar space thus eliminating the need for rockets on the Moon (Illustration from Schrunk et al.[1])

Also, solar sails, made from lunar aluminum (Figure 5) will likely become a predominant form of solar system transportation in space later in the 21st century.[1] Solar sails are highly efficient, because the source of their energy is sunlight; the sails only need to be positioned in proper alignment with the sun to produce the thrust that propels them from one part of the solar system to another. The pressure of sunlight on a sail decreases in proportion to the distance of the sail from the sun and for this reason solar sails have much greater performance in the inner solar system (Mercury - Venus - Earth - Mars) than in the outer solar system. Another advantage of solar sails is that laser beams can be used to augment their propulsion. A laser located on the Moon could be used to add propulsive forces to a solar sailing ship and thus decrease the transit time for high-priority missions such as the transportation of astronauts from the Earth-Moon system to Mars.



Figure 5. Solar Sail Transport of Asteroid. Fleets of solar sails made from lunar aluminum will ply the reaches of the solar system on cargo and research missions (Illustration from Schrunk et al.[1])

Asteroids and "burned out" comets in Earth's orbital vicinity, especially those that pose a threat of collision with the Earth or the Moon, will be moved out of harm's way (e.g., by solar sails) and mined for their hydrocarbons, water, metals, and other constituents. These resources will then be delivered to the Earth, Moon, and cis-lunar locations as needed. Eventually the lunar-based manufacturing system will gain access to resources throughout the solar system.[1, 2]

Optimistic Forecast

The transformation of the Moon into an inhabited and fully autonomous sister planet of the Earth before the end of this century might seem to be an overly optimistic goal. However it is well within our reach, for several reasons. First, virtually all of the aforementioned technologies already exist – it is just a matter of going to the Moon and applying the knowledge and technology that already exists. Second, the "nominal" rate of growth of scientific knowledge and technology is exponential, and ongoing, spectacular scientific/technological advances can be expected in fields such as computers, robotics, and nanotechnology.[3] Third, raw materials for the manufacturing base of the Moon will come from the solar system, whose resource base is many orders of magnitude greater than those of the Earth. Metzger et al.[2] estimate that the placement of a 41-metric-ton lunar industrial base on the Moon will grow, exponentially, over a period of a "few decades," to reach an industrial capacity that is <u>millions of times greater than those of the Earth</u>.

Endless Frontiers

The desire to explore and settle new lands is a defining characteristic of the human species; to remain in a state of ignorance of any aspect of the physical universe, when the means to end that ignorance are available, is completely contrary to human nature. It is inevitable, therefore, that, in the coming decades, we will undertake the global exploration and settlement of the Moon and become a multi-world species. The present, limited "closed Earth" mindset related to overpopulation, intransigent poverty, and the depletion of Earth's resources will then give way to a much grander "open space" vision of broad-scale advances for all humankind based upon access to the unlimited resources of space and the opening of endless frontiers.

Notes

[1] D. Schrunk, B. Cooper, B. Sharpe, and M. Thangavelu, *The Moon: Resources, Future Development, and Colonization*, 2nd ed. (New York: Wiley-Praxis, 2007).

[2] P. Metzger, A. Muscatello, R. Mueller, and J. Mantovani, "Affordable, Rapid Bootstrapping of Space Industry and Solar System Civilization," *Journal of Aerospace Engineering*, April 2, 2012 (doi: 10.1061/(ASCE)AS.1943-5525.0000236).

[3] Ray Kurzweil, *The Singularity is Near: When Humans Transcend Biology* (New York: Penguin, 2005).

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About the Author: David G. Schrunk is an aerospace engineer and medical doctor with board certifications in the medical specialties of nuclear medicine and diagnostic radiology. Dr. Schrunk retired from the practice of medicine and now dedicates his time to his two passions: the future exploration and human development of the Moon and the science of laws. He has authored many scientific papers on lunar development issues and is a co-author of the book, *The Moon: Resources, Future Development, and Colonization*, published by Wiley-Praxis in 1999. The second edition of the "*Moonbook*" was released by Springer-Praxis in 2007. Dr. Schrunk founded the Quality of Laws Institute in 1995 and authored the book, *THE END OF CHAOS: Quality Laws and the Ascendancy of Democracy*, published in 2005 by the Quality of Laws Press. Dr. Schrunk lives in Poway, California with his wife, Sijia, son, Erik, and daughter, Brigitte.



Editor's Notes: Dr. David Schrunk is the only medical doctor, aerospace engineer, Space scientist and author, and Founder of Quality Laws Institute in the world. And he is a Kepler Space Institute Faculty Member and Member of the Board of Editors for this Journal of Space Philosophy. It has been a special privilege to share Kepler Space events and work with him. He is a remarkable intellectual and innovative thinker. I first met Dr. Schrunk when invited to lunch with three of his Lunar Industry and research professionals at Torrey Pines, California on 15 December 2009. His capabilities and achievements have been educating me ever since. I videoed Dr. Schrunk, author Dr Phillip Harris (see his *"Humanity's Destiny is Offworld"* article in this Issue #1), Dr. Thomas Matula, and Transorbital Corporation President, Dennis Laurie, at that

luncheon. You can see and hear them each making a short statement about the critical importance of the Moon to the future of human Space exploration, development and settlement at www.bobkrone.com/node/222.

Ultimate Priorities for Space and Space Science

By Paul J. Werbos[1] National Science Foundation (NSF)

1. Introduction

What does serious philosophy have to tell us about the ultimate goals we should be pursuing in space and in space science? That depends of course on what school of philosophy one belongs to.

Personally, I do not believe that any of the well-known traditional schools of philosophy are robust and coherent enough to engage fully with the difficult concrete choices we are facing either in science or with space, short of some extension. It is easy for a mouse, without using any words or philosophy at all, to make sane and rational decisions about the small things he/she sees in everyday life – but there are levels of technology and large-scale reality that are beyond the abilities of the mouse. We humans, with ordinary philosophies and rules of thumb, can use words to do better than the mouse, but the full possibilities and challenges of space and science require that we expand our full awareness much more than what the everyday tools offer. In Heidegger's term, we need to expand our "Being."

This paper begins by reviewing a new synthesis of philosophy, which does not violate what we already knew even before we started using words, but which provides a foundation for understanding the important choices before us with space and science, in connection with each other. It will begin with what should be a universal kind of new synthesis, which may be called "the philosophy of sanity and integrity." But then, it is unavoidable that different life experience legitimately leads different people to different specifics. Section 3 reviews more specific concepts about the soul and the concrete nature of life, with which I would not expect all sane people to agree, but which many of us believe are an essential aspect of the challenges we are facing. To give this a name, I hereby call it the "symbiotic noosphere hypothesis" (SNH). Because I derive my views about the goals for space and science in space from these first principles, I will discuss them in two steps – first, a simple discussion in section 2, which should be universally acceptable, and then a more detailed discussion in section 3, for those who are prepared to go further.

Because I am analyzing these issues from first principles, I will not adhere to any of the ideological groupings popular today; thus at points in section 3, some will

find me a bit too mystical for their taste, while at other points many will find me to be an extreme realist to an extent that violates today's mainstream. I just call it the way I see it.

2. The Philosophy of Sanity and Integrity

This section is a simplified and compressed version of a much more rigorous and complete treatment published earlier in 2012.[2]

Society and nature impose many constraints on our actions and choices. Nevertheless, ethical philosophy begins with the big questions: "What should each of us, as a free person, do to make choices, to what end, in the face of whatever realities we must cope with? What is really, ultimately most important? What is the purpose of life?" (Of course, many bureaucratic decision making processes end up putting money and time into things that are of no ultimate importance whatsoever and they badly need people to keep asking these kinds of questions.)

It is impossible for valid logic to deduce a sentence of the form "I should do X" or "X is good," starting from axioms that do not already say what is good or what should be done. But logic and science can, in principle, give us answers to the questions: *"What would I do if I were wise? What strategy and values would fully satisfy ME if I considered all aspects of what I am facing?"* It is possible because the word "I" appears in the question. At some level, it is a question about the self, about our own ultimate feelings.

The existentialists are certainly right that when we are confronted with formalistic systems of ethical logic and ideology, we should always feel free to laugh and say "I will do whatever I feel like." But what DO we feel like? What kinds of consequences would we want to avoid and what would we want to achieve?

Our minds began with a substantial degree of consciousness and intelligence, even before we started using words. Like von Neumann and Aristotle (but with far more recent development and detail), I would argue that we are born with an innate sense of "utility" or "*telos*," a nonverbal feeling about what we like and what we don't like, including even some sense of the gradient of what we like.

Some schools of philosophy argue that we should base our actions on an objective effort to maximize some kind of value or utility measure over time in a completely objective and scientific manner. Others argue that we should go by our feelings in various ways, which may range anywhere from existential

wildness to strict Confucian piety. The philosophy of sanity and integrity says that we should strive to do both, by unifying the two approaches and developing the most effective possible "partnership" or unity of the nonverbal and verbal self and that mathematical thinking is even more important than words in doing full justice to the objective side. A truly sane person will never say things in words that look really silly when you translate them into a concrete image of what they mean in direct reality.

As an example, some formalistic policy analysts have asked: *"Why should we have humans in space, in the long term? Isn't the environment of space cleaner and neater without humans anyway? What is their value to the world economy?"* In exactly the same way, similar thinkers could ask: *"Who needs humans on earth either? Isn't it cleaner and neater to just eliminate them?*" But a sane human would remember that we really do ultimately care about life itself, for its own sake. (I do regret that the term "prolife" has been so badly abused and distorted by folks with political agendas, but the original concept is pretty fundamental.)

A sane human might well enjoy the episode of Star Trek where the Borg princess displays her strange brown and ugly world to the human she has captured, and says: "Don't you appreciate the beauty of my world?" In the end, the human was true to his own inner nature and made an esthetic judgment that it wasn't quite so beautiful after all. That kind of very fundamental esthetic judgment is basically all we have to fall back on and it does take a major effort to calibrate our esthetic judgments through imagination and analysis as we think about possibilities so far removed from our past experience.

This year, I have posted a simplified blog version of some of the key aspects of the full cultivation of sanity.[3]

Of course, science can help us understand our feelings of what we like and what we don't like, and we can easily see that survival of life is very central to what is inborn in our brains. A sane policy towards space would certainly include a strong focus on two overriding value measures:

(1) The future of human life in space, for its own sake. This can be operationalized as maximizing the probability of humans achieving the economically sustainable settlement of space. That is a very tricky optimization problem [4-6].

(2) The net value activities in space can yield to human life and happiness on earth.

In a way, (1) represents the top core mission of NASA, while (2) reflects the fact that all agencies should try to leverage the unique capabilities that result from their core mission to benefit the world in other ways, so long as they do not dilute their core mission or reach beyond what they are especially competent to do.

3. The Symbiotic Noosphere Hypothesis (SNH)

Bernard Shaw once said (in his *Revolutionist's Handbook*): "A man who is not ever a socialist before the age of 26 lacks a heart. A man who remains one after 26 lacks a brain." There are different organs involved, but I have similar feelings about the issue of the soul.

Most of us remember Carl Sagan's words: *"Extraordinary claims require extraordinary justification.*" This is basically just a popularized version of what we can learn from Ockham's Razor, a fundamental principle of epistemology, learning, and inference which has grown in importance over time even in hard-core engineering [7-9]. When I was young, I agreed with Hebb that all claims about the existence of a "soul" apart from the body, and about the paranormal, fail to pass Sagan's test. It seems that we live in a completely four-dimensional universe, without any real room for such things. The logic of that view is quite strong, and quite respectable. Up to a point.

But in my own life, direct experience compelled me quite forcibly to reconsider that viewpoint. It reached a crucial mass in 1967,[10] when an overwhelming "veridical" event forced me to admit that "there is at least a 50% probability that something really weird is going on here, and that I need to reconsider my assumptions." Years later, I was relieved to learn that about 70% of PhDs in their most productive years had also felt compelled,[11] by personal experience, to reconsider their assumptions about what is going on here. An honest dialogue about space and the future requires that we make room both for the 70%, and for the 30%. It is interesting that Heisenberg, Schrodinger, and de Broglie showed strong interest in outright mysticism; some folks I know would say "Oh, they just kept believing what their parents believed," but is that a realistic way of describing how those three people formed their views, even compared with folks like Sagan?

In my own case, it was particularly unpleasant to have to adjust to a new viewpoint in 1967, since I had worked hard to develop a sufficient model of

intelligence in the brain which I felt would be enough to fully explain "consciousness" and human emotions without any need for the concept of "soul."[12] And I certainly would not be crazy enough to spin the bottle randomly across all the thousands of contradictory religious scriptures to be found all over the earth and randomly pick one to believe on faith. Above all, I felt I needed more empirical evidence to understand better what is going on and I also felt I needed to go back to physics, to understand better what kinds of phenomena might help make sense of what seemed quite weird. I made an effort to scour through cultures from all over the earth, from yoga to the Sufis to China to Western mysticism, to look for specific experiments or exercises I could do in my own life, to help me form my own more scientifically-grounded understanding; for example, for a few years, I followed the Rosicrucian stream of exercises,[13] which I found quite useful.

At the end of the day, I am still overwhelmed by my ignorance of what is really out there, beyond the real horizon of what any human really knows. But with >90% probability, I conclude that the "invisible connections" between people and other creatures on earth are far too strong to be ephemeral things or byproducts of things like pineal glands and electromagnetic connection or even quantum mechanical resonance. I would view us humans as kinds of symbiotic life, part "body" and part "soul," where our "soul" is our local piece of a large living system, evolved as part of the ecology of the larger universe or cosmos, involving fields and forces (like dark energy?) with which human science has yet to cope. This living system essentially corresponds to what some have called the "noosphere" or "Gaia" or even "pi." The basic reality here was captured reasonably well by Teilhard de Chardin, who stressed that our noosphere here on earth is basically an immature state of a consciousness with much greater future potential than most of us can fathom as yet. Only an immature state could have such a strange combination of incredible power and incredible awkwardness and confusion at the same time.

In my view, full sanity opens us up to the full range of human experience and feeling and does impel us to make this kind of adjustment. As Jesus once said, we let "the scales fall from our eyes," and we do develop our full talents as best we can. After this adjustment, sanity impels us to pay equal attention to "utility inputs" or primal feelings both from body and from soul. We work for a kind of Parteo optimal balance between satisfying feelings from our body (which already include things like concern for our children and such) and feelings from our soul, as given in the old concept of "the Alchemical marriage." Since our soul is essentially an immature organism, its primary imperative is to learn and to grow,

not only locally ("our own individual soul") but in conjunction with the larger system to which it is connected. Both the Rosicrucian school and the "mindfulness" school of Tibetan Buddhism have asserted that "this world is essentially just a school." The vivid concrete details in [14] and [15] give an interesting picture of how this works.

A year ago I asked Whitton: "If you say the world is a school, what is the curriculum? What do we have to learn, and what should we be preparing for?" He allowed me to peek at his new book, which goes into that question in some detail, based on his empirical work in psychiatry. Much of his story, like that of Roberts, stresses the need to pay deeper attention to specific people around us, people to whom we have invisible connections, and engage our whole selves in improving those relations. But it seems to me that our souls, like neurons in a large network, have both short-range and long-range connections. The ratio between these varies from person to person. The natural path is to maintain a balance over time between four kinds of inner work:

(1) Direct work on the understanding within our own individual soul, ranging from the kind of exercises the serious mystics use to expand their understanding, to hard core mathematical science, integrating the two when possible but not forcing unification-by-sheer-guesswork;

(2) Work on direct personal relations, as stressed by Roberts and (to some extent) Whitton;

(3) Building and exercising our spiritual connection to the earth and nature as a whole, ranging from the world economy to the global natural environment, transcending and connecting the "lobes within the noosphere" like the worlds of Islam, Christendom, modern science, Marxism and so on. (I find the Quakers to be especially useful as a venue for this kind of spiritual work.)

(4) Work on strengthening our connection and understanding to the larger cosmos from which we come.

What about the differences between different people along these four spiritual dimensions, all valid? Here I would like to make an analogy to another collection of "three imperatives," which I find important in my daily work. All knowledge workers have a fundamental need to be productive in three areas – to input (to get data and information and views of others), to process (to think and analyze for themselves, to arrive at new insights), and to output (to communicate). If any

of these is zero, the person contributes nothing to society as a knowledge worker. (This is true for soul as well as for body.) Yet some people are better at communication than at generating new ideas. Some people, like myself, are far better at the processing stage than at the communications level. The proper, rational strategy is for people to build connections to other people with complementary strengths and weaknesses; even though I am not as good at communication, I can at least explain some basic ideas to people who are better at communicating (like you?), and the network as a whole can work well that way. It is essential that people with strengths in one area have full respect for people with strengths in other areas, to make this work.

In a similar way, people in the noosphere, like neurons in a brain, will have a mix of connections, but together we should all respect the need to maintain a balance overall between all four primary imperatives of the soul.

The first imperative of the soul clearly calls for more work really to understand the universe we live in. Better understanding of the real laws of physics of the greater cosmos is a key part of that. Nothing I have said here contradicts the key position of Albert Einstein that we can explain everything that has ever been seen in life or in physics as the emergent result of hard core mathematical laws operating on objective reality [16-18]. However, we have a whole lot more work to do to get there. If we reduce the cost of access to space, as we would need to do to make human settlement feasible or to make energy from space potentially competitive in the energy markets of earth in any case, we also open the door to doing whole new types of physics experiments in space as well. As we start to explore ever more serious possibilities of new larger-scale sources of nuclear energy, experiments in space become ever more important to assuring the safety of probing that realm. Of course, astrophysics and physics are closely connected; both offer many possibilities of breakthroughs of enormous importance, if we take a bolder approach to admitting and exploring how much we do not yet know, and developing the infrastructure necessary to perform a richer variety of experiments. Perhaps in time we will even develop the kind of understanding which also helps us better understand the soul itself.

The first imperative also supports certain aspects of astrobiology, which are very fundamental and mathematical in nature. Humans have just begun to explore a few alternatives to traditional DNA, but we are very very far from understanding the full range of possibilities for life in a wide variety of possible environments. I am also hoping that Planetary Resources will pick up on a technology that NASA lost during the period of Griffiths' new deal, the technology for constellation

imaging of the universe exploiting quantum Twiss interferometry to let us "see" signs of life on continents of planets within 1,000 light years of earth.

The second imperative of the soul says more about how we approach space than about the specifics. For example, when politicians choose to fund programs that create dumb jobs, using people like trolls to reproduce ancient designs from the Apollo days, this is not healthy. A more productive corporate culture[19] is important and it needs to be enhanced to recognize how people in this system are spiritual beings themselves whose full development and expression as intelligent humans is an important value in itself. Values like free speech, dialogue, and diversity need to be strengthened as they apply to individual human beings and not just corporations.

The third imperative really works its way back to the second imperative of section 2. For example, the third imperative provides greater weight to something economists have been telling us already, that global education (with just as much support for female intellectual spiritual development as male) is one of the very highest overall priorities here. If space technology can be used as part of a new international effort to lower the kind of Internet access required for the poorest billion on earth to enhance their education and connect with humanity as a whole, this could be enormously important both for world economy and for the spirit. Some have argued that Internet tools like twitter degrade the level of intelligence and spiritual connection; however, it is clear that tools like video Skype enable people in different continents to attune more deeply with each other, even at a spiritual level, in a way which is hugely important to the third imperative.

And of course, the fourth imperative points squarely out to the larger universe from which we came, on the deepest spiritual level.

Notes

[1] The views herein represent no one's official views, but the chapter was written on US government time.

[2] P. Werbos, "Neural Networks and the Experience and Cultivation of Mind," *Neural Networks* 32 (August 2012).

[3] drpauljohn.blogspot.com/2012/07/kung-fu-style-mind-discipline.html

[4] P. Werbos, "Strategic Thinking for Space Settlements," in R. Krone (ed.), *Beyond Earth* (Apogee Books, 2006).

[5] P. Werbos, "Reminiscences on the End of the Hope for Primates in Space," *Actual Problems of Aviation and Aerospace Systems* (an International Russian-American scientific Journal) 1, no. 34 (2012). The paper is available in open access, by clicking on the title in English or in Russian at www.kcn.ru/tat en/science/ans/journals/rasj.html.

[6] P. Werbos, "Towards a Rational Strategy for the Human Settlement of Space," *Futures* 41, no. 8 (October 2009).

[7] Donald O. Hebb, Organization of Behavior (New York: Wiley, 1949).

[8] P. Werbos, *Mathematical foundations of prediction under complexity*, Erdos Lecture series, 2011, <u>www.werbos.com/Neural/Erdos talk Werbos final.pdf</u>.

[9] P. Werbos, "An approach to the realistic explanation of quantum mechanics," *Nuovo Cimento Letters* 8, no. 2 (1973): 105-09.

[10] P. Werbos, "Space, Ideology and the Soul: A Personal Journey," in R. Krone (ed.), *Beyond Earth*.

[11] Andrew M. Greeley and William C. McCready, "Are we a nation of mystics?" *New York Times Magazine*, Jan. 26, 1975. Reprinted in *Consciousness, Brain, States of Awareness and Mysticism*, ed. D. Goleman and R. J. Davidson (New York: Harper and Row, 1975), 175-83.

[12] P. Werbos, "Intelligence in the Brain: A theory of how it works and how to build it," *Neural Networks* 22, no. 3 (April 2009): 200-12. Related material is posted at <u>www.werbos.com/Mind.htm</u>.

[13] P. Werbos, "Rebuilding the Bridge between Science and Mysticism," *Rose-Croix* 9 (2012), <u>www.rosecroixjournal.org.</u>

[14] Jane Roberts, *The Oversoul Seven Trilogy: The Education of Oversoul Seven, The Further Education of Oversoul Seven, Oversoul Seven and the Museum of Time* (San Rafael, CA: Amber-Allen, 2011).

[15] Joel Whitton and Joe Fisher, *Life between Life* (New York: Warner Books, 1989).

[16] P. Werbos "A Three Step Program for Return to Reality," *Problems of Nonlinear Analysis in Engineering Systems*, an International IFNA-ANS Journal. 18 (2012): 1-23.

[17] Paul J. Werbos, "Solitons for Describing 3-D Physical Reality: The Current Frontier," in *Chaos, CNN, Memristors and Beyond*, ed. Andrew Adamatzky and Guanrong Chen (Hackensack, NJ: World Scientific, 2012). See also www.scribd.com/doc/95547363/How-to-Quantize-June2012.

[18] P. Werbos, "Bell's Theorem, Many Worlds and Backwards-Time Physics: Not Just a Matter of Interpretation," *International Journal of Theoretical Physics* 47, no. 11 (2008): 2862-74, <u>arxiv.org/abs/0801.1234</u>.

[19] Neal M. Ashkanasy, Celeste P. M. Wilderom and Mark F. Peterson, *The Handbook of Organizational Culture and Climate* (Washington DC: Sage, 2011).

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About the Author: Paul Werbos, PhD, has had major program responsibilities in the U.S. Government, scientific and engineering research organizations, and the National Science Foundation (NSF) since his graduation from Harvard University with a PhD in 1974. His NSF responsibilities, beginning in 1988, have been in Domestic Nuclear Detection, Energy, Power, Adaptive Systems, Robotics, and Science-Engineering and Society. His broad background in science, technology, and engineering has propelled him into a leading professional role as a Fellow in IEEE and an award winner within the International Neural Network Society (INNS). His research and writings have made important contributions to energy, to learning, to sustainability and to study of the Universe and Space.



Editor's Notes: One of the benefits of membership in the Lifeboat Foundation, a major international forum for scientists and scholars, is that Paul Werbos continually shares his wisdom, logic, and experience. He has two valuable chapters in *Beyond Earth: The Future of Humans in Space* (Apogee Space Press, 2006) and gives us here his thoughts on Space Philosophy, using the human soul as a major metaphor. We look forward to Dr. Werbos's future articles as The Journal of Space Philosophy progresses and are honored to have him as a member of the Journal of Space Philosophy Board of Editors. *Bob Krone, PhD.*

Fusing the Sun, the Sword and the Academy for Human Independence from Gravity, the Bank, and the State

By Martin Schwab, PhD

Seventeen thinkers are presented to help the reader consider a new abundance-based economic precept that is offered for consideration by the author. Knowledge accumulation through ambitious human space migration into the solar system replaces the scarcity-based social invention of capital itself. It is given in the article that the latter impedes the former. The thinkers, briefly introduced for reflection on the new precept, include Anderson, Bacon, Bataille, Biden, Boulding, Fuller, Hampshire, Hardin and the Meadows's, Hume, Jefferson, Marx, Smith, Spinoza, Umpleby, and Xenos.

Intellectually, we know that money is not a fixed force of nature but we address all of our problems as if it was. Money is merely a social invention that has been in a constant state of reinvention since the agricultural revolution. Money as we know and use it within the scarcity-based systems of present-day capitalism and socialism has always been a nagging obstacle in general, but particularly so in regard to enabling human space exploration. Only barter would be worse. What then might be better?

The human family needs a new abundance-based economic precept in which knowledge accumulation replaces the social invention of capital itself.[1] Such a transformation might be enabled by harnessing the abundant solar energy that can be collected in space and transmitted to Earth or anywhere humans plan to live in our solar system. Instead of trying to fit the abundant nature of space-based solar power into the status quo of scarcity-based economics, we could retrofit our economic systems to allow space-based solar power to change everything. In this way, technical solutions to global political dilemmas, such as energy for seawater desalination, could be expedited, resulting in greater global social cohesion and opportunities for continual social promotion. Government services, defined as entitlements within capitalism and socialism, become basic inputs into a wider process of human expansion into and management of solar system abundance for all.

What makes humans distinct from other animals is that we can change our social structures, economics in this case. If we so choose, we can go from exchanging units of scarcity to interchanging all human talent in true free enterprise, as distinct from global capitalism. Xenos shows that the root of the scarcity-based economic social invention that now governs the world is not ancient and certainly not a universal force of nature around which all economic thought must orbit. Xenos lays blame for this false "postulate of scarcity" squarely on Adam Smith and David Hume, who represent what he calls

"classical realism."[2] By contrast, Hampshire shows that Spinoza saw that true freedom of the individual is not associated with accumulation of personal property, the value of which is determined by its scarcity, but by a reflective state of perceiving an abundant universe, requiring a cultivated desire for solitude.[3] Bataille offers a different perspective on abundance, but one that also does not assume material scarcity as the basis for human affairs. For Bataille, solar superabundance on Earth and its surplus energy are expended on the non-procreative sexual act, human-to-human killing, eating meat, and ostentatious consumption patterns.[4] Boulding was a notable figure in the field of evolutionary economics. His words below from his later years capture the essence of the field:

In its largest sense, evolutionary economics is simply an attempt to look at an economic system, whether of the whole world or of its parts, as a continuing process in space and time. Each economy is then seen as a segment of the larger evolutionary process of the universe in space and time.[5]

Boulding allowed for economic abundance based on knowledge abundance. That knowledge always increases and never decreases save for global catastrophe.[6] Boulding's concept of knowledge as capital can be extrapolated to finding one's individual purpose and identity within the human family. As global leaders and technocrats prepare to extend our reach further into the solar system, this family is configured as a dysfunctional community of nation-states and corporations. This reaching can become understood as a new currency – that which makes the world go around. Instead of defining success as how much money is in individual 401(k) accounts at times of death, in the paradigm that this introduction presents, measures of individual success might be quantified around such intrinsic metrics:

How much was done by an individual and/or team in a given time period to help track and when necessary use space sentinel satellites to divert Earth-crossing orbits of asteroids that would otherwise hit Earth in the long-term future?

Who showed up to help figure out the best way to direct solar power from space to a new settlement on Mars or a selected moon of Jupiter, Saturn, Uranus, Neptune, or Pluto?

Who was selected to settle a region of Mars or a Jovian moon?

Who helped a child who wants to stay on Earth find her purpose?

Recalling Bacon's reflection on the ideal relationship between the academy, foreign intelligence, and the state in *New Atlantis* (1624), our world's great universities, our Houses of Solomon, now have the unrealized potential through the Internet to collaborate systematically with each other and the rest of our world through community colleges in free thought, for free – a realization of Jefferson's vision for the University of Virginia to ensure an enlightened populace.[7] In this same regard, cross-enrollment among global public universities might also temper our military-derived hardware, software, and organizational structures for the duties that await us beyond low Earth orbit. *E Pluribus Unum for our vulnerable globe*, not just to unite nations without a sustaining cause that can lead to a binding culture.

The human family is capable of defending itself from the enveloping dynamics of a brutal universe, such as supervolcanoes originating within Earth, pandemics of disease spreading across Earth, and potentially hazardous asteroids crossing low Earth orbit. Hardin and the Meadows assumed a closed global environmental system, as did Marx and Smith in economics.[8] An open system assumes an energy source that for all practical human purposes is inexhaustible, the primary example being radiant energy from stars, including the sun. Umpleby defines an open system as "an entity with a boundary that is not closed. It receives inputs and produces outputs."[9] Prospects for collaborative power among all humans are considered here in the same spirit as Fuller, who charges, in agreement with Boulding's knowledge-based economic abundance, that *"know-what and know-how wealth' potential based on energy abundance of the universe [is] 'obscured from public knowledge' by 'money-makers and their economists.*"[10]

This introductory article in the inaugural issue of this new journal has sought to outline and invite new modes of contemplation. As humans, we would do well to rethink scarcity, perception, and identity across space and time so that new realities can be better constructed through free thought.

Research Question

What skills do bankers and bureaucrats have beyond their professions to advance human space migration?

Notes

[1] See Chris Anderson, "The Tragically Neglected Economics of Abundance," *The Long Tail,* March 6, 2005, accessed August 16, 2012, <u>longtail.typepad.com/the long tail/2005/03/the tragically .html</u>.

[2] Nicholas Xenos, "Liberalism and the Postulate of Scarcity," *Political Theory* 15, no. 2 (May 1987): 225, accessed August 16, 2012,

www.jstor.org/discover/10.2307/191676?uid=3739840&uid=2&uid=4&uid=3739256&sid =21101135144321. See also Xenos, *Scarcity and Modernity* (New York: Routledge, 1989), accessed August 16, 2012,

books.google.com/books?id=YBYoAQAAMAAJ&dq=Nicholas%20Xenos%2C%20Scarci ty%20and%20Modernity%20%28New%20York%3A%20Routledge%2C%201989%29.& source=gbs_book_other_versions.

[3] Stuart Hampshire, *Spinoza and Spinozism* (Oxford: Oxford University Press, 2005), *xv-xvii, liv-lv, lviii,* 76-77, 168-173, accessed August 16, 2012,

books.google.com/books?id=ZGLF2m3MO_gC&printsec=frontcover&dq=Stuart+Hamps hire,+Spinoza+and+Spinozism+%28Oxford:+Oxford+University+Press,+2005&source= bl&ots=hRHeZ-irhL&siq=BS6aQSwWS6t1FoZnC8hr5TZvi-

<u>o&hl=en&sa=X&ei=630sULnAAYjdyAHEx4GoCA&ved=0CDMQ6AEwAA#v=onepage&q</u> =Stuart%20Hampshire%2C%20Spinoza%20and%20Spinozism%20%28Oxford%3A%2 0Oxford%20University%20Press%2C%202005&f=false.

[4] Georges Bataille, *The Accursed Share, vol. 1: Consumption*, trans. Robert Hurley (New York: Zone Books, 1988), 12, 23, 28, 32, 38, 63, accessed August 16, 2012, <u>books.google.com/books?id=DdTrAAAAMAAJ&dq=Nicholas%20Xenos%2C%20Scarcit</u> <u>y%20and%20Modernity%20%28New%20York%3A%20Routledge%2C%201989%29.&</u> <u>source=gbs_similarbooks</u>.

[5] Kenneth E. Boulding, "What is Evolutionary Economics?" *Journal of Evolutionary Economics* 1, no. 1 (1991): 9-17, accessed August 16, 2012, www.springerlink.com/content/x3r4q56465q0504v/?MUD=MP.

[6] See Kenneth E. Boulding, "The Economics of Knowledge and the Knowledge of Economics," *American Economic Review* 16 (May 1966): 1-13, accessed August 16, 2012, <u>seminaritaifa.org/descarregues/Institucionalistes/Boulding.pdf</u>.

[7] See Dr. Jill Biden, Op-Ed., "Harnessing Community Colleges," *Philadelphia Inquirer*, Monday, February 28, 2011, accessed August 16, 2012, <u>www.whitehouse.gov/the-</u> <u>press-office/2011/02/28/op-ed-dr-jill-biden-philadelphia-inquirer-harnessing-community-</u> <u>colleges</u>.

[8] See Garrett Hardin, "The Tragedy of the Commons," *Science* 162 (1968): 1243-1248, accessed August 16, 2012, <u>www.sciencemag.org/content/162/3859/1243.full</u>.

[9] See S. Umpleby, "Open System," in F. Heylighen, C. Joslyn, and V. Turchin (eds.), *Principia Cybernetica Web* (Brussels: Principia Cybernetica, n.d.), accessed August 16, 2012, <u>pespmc1.vub.ac.be/Asc/OPEN_SYSTE.html</u>.

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[10] R. Buckminster Fuller, *Operating Manual for Spaceship Earth* (New York: E. P. Dutton, 1963), accessed August 16, 2012, books.google.com/books?id=DCAhAQAAIAAJ&dq=R.%20Buckminster%20Fuller%2C% 20Operating%20Manual%20for%20Spaceship%20Earth%20%28New%20York%3A%2 0E.P.%20Dutton%2C%201963&source=gbs_similarbooks. Retrieved August 16, 2012.

Self-cited in Fuller, *Critical Path* (New York: St. Martin's Press, 1981), 198-99, accessed August 16, 2012,

books.google.com/books?id=2rPqFvn3nocC&pg=PA392&lpg=PA392&dq=R.+Buckmins ter+Fuller,+Operating+Manual+for+Spaceship+Earth+%28New+York:+E.P.+Dutton,+19 63&source=bl&ots=rfbryJ6CsI&sig=n2Bt1xo9gBJZ_e38IUmOY6IxWrg&hl=en&sa=X&ei = olsUOSEEqWtygH7uIDABA&ved=0CGMQ6wEwBw#v=onepage&q=R.%20Buckmins ter%20Fuller%2C%20Operating%20Manual%20for%20Spaceship%20Earth%20%28N ew%20York%3A%20E.P.%20Dutton%2C%201963&f=false.

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<u>Editor's Note</u>: Dr. Martin Schwab was an active member of the Aerospace Technology Working Group (ATWG), founded by Dr. Ken Cox. He was a contributor to those

meetings every six months and became an important co-author in ATWG's first book, *Beyond Earth: The Future of Humans in Space* (2006). His successful PhD Degree program at the University of Hawaii, graduating in 2012, propelled him into the younger ranks of the professional global Space Community. It's a pleasure to have him a contributor to our Issue #1; and to have him as a member of our Journal's Board of Editors. *Bob Krone, PhD.*

Human Migration into Space is a Biological Imperative

By Sherry E. Bell, PhD and Colonel M.V. "Coyote" Smith, USAF, PhD, Chief Future Scientist of the Air Force

Disclaimer: The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any agency of the U.S. government.

Abstract

This article examines the possibility that humans might be biologically driven to expand their presence to settlements beyond Earth.

I'm very fond of quoting my friend Larry Niven: "The dinosaurs became extinct because they didn't have a space program. And if we become extinct because we don't have a space program, it'll serve us right!"

- Sir Arthur C. Clarke, 2001[1]

Now, with our technology, we are beginning to expand our habitat into space. Despite the cost, despite the risks, we are going into space. Perhaps only a handful of humans will live and work in space, at first. But what they accomplish will make life better and safer for all those who remain on Earth. Humans are moving into space. It's in our genes. That's not science fiction, not anymore. - Ben Bova, 2012[2]

A Biological Imperative

From the origins of life on Earth up to the present, all biological forms that have survived have done so in part because they shared an inborn ability and a biological imperative to propagate their genes into the future. Those that did this successfully in the face of either sudden or gradual environmental stressors are alive today. Those that failed to do so died out, which includes over ninety-nine percent of all species that ever existed on Earth. Although recent arrivals on the evolutionary timescale, humans have succeeded in a grand fashion and have become the dominant species on the planet. However, like all other life forms, humans must follow the maxim "adapt, leave, or die."

Every species on Earth that has succeeded up to now has done so in part because it expanded its numbers and inhabited every nook and cranny in which it could thrive. By so doing, it increased its odds of long-term survival. Humans, for example, have spread across the globe and now live on much of the habitable area of the planet. However, as

population pressures grow, resources are consumed, and the biosphere becomes increasingly polluted, there will be limits to the degree of adaption to environmental stressors that individuals can tolerate. Indeed, cataclysmic stressors, such as massive asteroid or comet impacts, eruptions of super volcanoes, or other natural disasters could render Earth uninhabitable by humans. It is time for a portion of humankind to exercise the second option—to leave. The long-term survival of our species demands that we move into space.[2]

Human Migration

Human migration (derived from the Latin *migratio*) is physical movement by humans from one geographical area to another. Throughout the last few decades we have seen an acceleration of this phenomenon as populations are tending to migrate to the Northern Hemisphere. However, human migration is an old story.

Mitochondrial DNA evidence indicates that 200,000 years ago the earliest known ancestors of modern humans lived in East Africa. The first wave of humans migrated out of Africa, traveled as far as Israel, and then died off. A second group migrated out of Africa around 70,000 years ago. They are the ancestors of all non-African humans living today. Some of them, following the coastlines along southern Asia, reached Australia around 50,000 years ago. It is believed that from this same group, "an inland migration from Asia seeded Europe between 40,000 and 30,000 years ago."[3] Some of them migrated into Central Asia and Southeast Asia. The descendants of those people eventually reached Japan and Siberia. Although it is not yet known exactly when humans crossed the Bering land bridge into the Americas, genetic evidence places the date at between 20,000 and 15,000 years ago.[3]

Although the state of genetic research has not yet reached the point where the gene or genes responsible for compelling people to be exploratory have been identified, it is likely that people who have this genetic predisposition will be the first to venture into space. Eugene Linden, the author of "The Ragged Edge," told a New York Times reporter that some of the lust for going to space may come from a primal animal drive to do something no one else can imitate, something, he says, that is "meant to show reproductive robustness on the part of the male."[4]

Each of the early migrations required adaptation to new environmental stressors. The task was not always easy and failure resulting in death was often the result. Numerous failed settlements dot the East Coast of the Americas, thereby illustrating how difficult the objective was for Europeans during the 17th Century. Ghost towns abound in the American West and demonstrate that adaptation was no easier for many people as late

as the 19th Century. However, enough settlers succeeded that they thrived, expanded, and continue to grow as the human population booms beyond seven billion.

Why Migrate?

Although it is not yet possible to determine the reason humans began to migrate from their birthplace in Africa, it is likely they mimic some of the ones currently in practice. Today, people migrate for a variety of reasons, including inadequate food supply, violent conflicts, economic opportunity, family growth and overcrowding, and natural disasters such as floods, droughts, volcanoes, and tsunamis.

Mark Hopkins, the leader of the National Space Society, which is the premier Space Settlement organization on the planet said,

The vast majority of the resources of the solar system in terms of materials and energy lie in space rather than on the Earth. For example, the sun produces one to ten trillion times the amount of energy currently consumed by the human race. It is only a matter of time before these resources are used for the dramatic betterment of humanity.[5]

Adventures and explorers—high stakes risk takers—will likely be among the first to venture off world. This form of migration pressure cannot be easily measured. "Humans have an innate desire to explore and colonize new territories. Even when not driven by hunger, politics or economics, humans migrate."[6]

It is clear that migration and/or leaving can be a viable alternative to adapting to environmental stressors—and is certainly preferable to death or living in misery. Human migration can be as large-scale as refugees fleeing a war zone or as small-scale as an adult child leaving home when living under his or her parents' rules becomes unbearable. It can also involve seeking greater opportunities, such as the motivation for the migration of humans during the Gold Rushes in American history.

Where to next?

Where is the next place humans will migrate? Dennis Wingo, the author of *Moonrush*[7] and Robert Zubrin, founder of the Mars Society,[8] have suggested the next place will be the Moon or Mars, or some other place in space. Perhaps they will live on space stations or on space faring vehicles, as Gerard O'Neill suggested over two decades ago.[9]

Gary Barnhard, one of the leading minds on the planet and a former Executive Director of the National Space Society, said,

Opening the frontier of space for our civilization is the real overarching choice before us. There is no greater enterprise. It is the ultimate game changer. It is the difference between life as we know it rising to the challenges the universe puts before us, or abject resignation as a species to being an inconsequential aberration whose time will soon pass. Let us find a way past the hyperbole and get on with building the interplanetary railroad to the stars. It is up to us to not wait for the future, but to make it![10]

In space there is ample room for people to live. As the population on Earth increases, this issue is becoming ever more important. Violent conflicts continue to be a problem. Some form of a natural disaster will someday engulf the planet, although when remains a mystery.

How will we get there?

Until recently, only governments had the resources to take humans into space. However, beginning in the 1990s, spending from the commercial sector began to outpace government investment in space. Now, in the early part of the 21st Century, private entrepreneurs are becoming involved. A number of private companies are building spacecraft that are capable of taking humans off of the Earth.

In 2002, Elon Musk founded the Space Exploration Technologies Corporation. The overarching goal of the company is to "revolutionize space transportation and ultimately make it possible for people to live on other planets."[11] In June, 2012, Mars One, a private company led by Bas Lansdorp, announced its objective to establish a permanent human colony on Mars by 2023. The plan involves using existing technologies and readily available materials.[12] Robert Zubrin and the fellow members of the Mars Society have a plan for a humans-to-Mars mission. The plan calls for the use of existing launch technology and using in-situ resources to sustain the mission.[13]

Already interest in space tourism is gaining in popularity. Entrepreneurs such as Eric Anderson of Space Adventures and Sir Richard Branson of Virgin Galactic are offering space tourism adventures. Space Adventures has already sent seven tourists into space. One of the clients, Charles Simonyi, went on two different occasions.[14] Virgin Galactic has sold over 500 tickets to tourists and is steadily booking more.[15] On September 07, 2012, the New York Times ran an article titled, "Space Tourism Is Here! Wealthy Adventurers Wanted."[4] Art Dula's company, Excalibur Almaz is currently in the process of offering trips to the Moon. Dula points out that his venture is not about space tourism. He says, "The people are not tourists. This is much more about private expedition members—conducting expeditions that will go further into space than anyone has before."[16] Taken together it appears human settlement of space is inevitable, and is in fact in the early stages of being developed.

Summary and Conclusion

For millennia humans have migrated. The reasons for venturing forth are myriad and range from seeking food to seeking adventure. Because migration stems from the biological imperative to survive, it is certain that humans will exhibit the same pattern of behavior in the future as they have in the past.

The prospect of a mass extinction event is ever present. Wars are being fought. Overpopulation is a problem we will soon face.

Humans now have the means and opportunity to travel to space. Several private citizens have already experienced this adventure.

Companies are offering short forays into space and already over 500 intrepid souls have signed up to take one of the trips. One company is offering an adventure for explorers. Their objective is to take people around the Moon and back.

Plans to colonize the Moon and Mars are in place and will soon be implemented. It is only a matter of time before humans establish colonies in space.

To "adapt, leave, or die" are the choices all species on Earth are faced with. For millennia humans have survived by leaving. It is a biological imperative for humans to migrate into space. The very survival of the species depends upon it.

Notes

[1] Arthur C. Clarke, "Meeting of the Minds: Buzz Aldrin Visits Arthur C. Clarke" (Interview by Andrew Chaikin, February 27, 2001), <u>www.clarkefoundation.org/sample-page/sir-arthurs-quotations/</u> (accessed_September 30, 2012).

[2] Ben Bova, "70th World Science Fiction Convention," *Naples News*, September 23, 2012, <u>www.naplesnews.com/news/2012/sep/23/ben-bova-70th-world-science-fiction-convention/</u> (accessed September 29, 2012).

[3] "Human Journey," *National Geographic*, March 2006 [Map supplement], <u>ngm.nationalgeographic.com/ngm/0603/feature2/map.html</u> (accessed September 30, 2012)

[4] Jesse McKinley, "Space Tourism Is Here! Wealthy Adventurers Wanted," *New York Times*, September 7, 2012, <u>travel.nytimes.com/2012/09/09/travel/space-tourism-is-here-wealthy-adventurers-wanted.html?pagewanted=all</u> (accessed September 29, 2012).

[5] Mark Hopkins, Personal communication, October 1, 2012.

[6] E. Grabianowski, "How Human Migration Works," *How Stuff Works*, December 27, 2007), <u>science.howstuffworks.com/environmental/life/evolution/human-migration.htm</u> (accessed September 29, 2012).

[7] Dennis Wingo, *Moonrush: Improving Life on Earth with the Moon's Resources* (Burlington, ON: Apogee Space Press, 2004).

[8] Robert Zubrin, *The Case for Mars: The Plan to Settle the Red Planet and Why We Must* (New York: Free Press, 2011).

[9] Gerard O'Neill, The High Frontier (New York: Bantam Books, 1977).

[10] Gary Barnhard, Personal communication, October 1, 2012.

[11] Space Exploration Technologies Corp. "Company Overview," <u>www.spacex.com/company.php</u> (accessed September 29, 2012).

[12] Mars One, "Mission and Vision," <u>mars-one.com/en/mission/mission-and-vision</u> (accessed September 29, 2012).

[13] The Mars Society, "Mars Direct (Summary)," <u>www.marssociety.org/home/about/mars-direct</u> (accessed September 29, 2012).

[14] Space Adventures, "Vision," <u>www.spaceadventures.com/index.cfm?fuseaction=Our_Vision.welcome</u> (accessed September 29, 2012).
[15] Virgin Galactic, "Welcome," <u>www.virgingalactic.com</u> (accessed September 29, 2012).

[16] B. Rooney, "Fly Me to the Moon," *Wall Street Journal*, June 20, 2012, <u>blogs.wsj.com/tech-europe/2012/06/20/fly-me-to-the-moon/</u> (accessed September 30, 2012).

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Editor's Notes: Dr. Sherry Bell has been a dedicated Kepler Team Member since the first discussions occurred to form the Kepler Space Institute and University in 2006. Her edited book, *Living in Space, 2009,* has placed her in the professional Space scholar category. Kepler Space Institute was honored to have Dr.(Colonel) Coyote Smith be a presenter at our First Convention at Hilton Head Island in March of 2012, and to be a contributor to the Journal of Space Philosophy. *Bob Krone, PhD.*

Humanity's Destiny Is Offworld

By Philip Robert Harris, PhD

The opening of a new, high frontier will challenge the best in us. The new lands waiting to be built in space will give us new freedom to search for better governments, social systems, and ways of life, so that our efforts during the decades ahead enable our children to find a world richer in opportunity. Dr. Gerard K. O'Neil, author of *The High Frontier – Human Colonies in Space*.

Transforming Space Visions into Realities

Human dreams and ideas span time, often taking centuries before being transformed into worthwhile activities. Some of our forebears dimly perceived the spectacular achievements this generation has witnessed since the dawn of the Space Age. Today one's philosophy of life should have at its core going beyond Earth to settle space and use its resources. Hopefully my book, *Space Enterprise*, will provide readers with insights into the challenges that lie ahead in exploring and settling offworld. That process will lead to a higher state of consciousness for our species.

In the future, our descendants may remember the 21st century primarily for proving that humanity is not Earth-bound and is able to live and work in a microgravity environment. The last five decades may be viewed as a watershed period for commercial space and living aloft. It may be seen as a period when nations shifted from space competition to cooperation, from a space race to forming joint ventures for international macroprojects. The satellite industry not only turned our world into a global village by its communication capabilities, but also demonstrated that it could be a profitable enterprise. Furthermore, orbital imaging and sensing has shown myriad practical applications on Earth, even in protecting our planet's environment. The Russian space station Mir became a platform for true international cooperation by agreements which brought aboard Europeans, Japanese, and even Americans. Today, the International Space Station expands the opportunities for some 16 national partners to practice synergy. Now spacefaring nations have much to gain in forming partnerships in joint lunar missions, particularly toward the goal of returning humans to the Moon permanently by year 2025. Perhaps this Vision for Space *Exploration* was best expressed over twenty years ago in these prophetic words:

To lead the exploration and development of the space frontier, advancing science, technology, and enterprise, by building institutions and systems that make accessible vast new resources and support human settlements beyond Earth orbit, from the highlands of the Moon to the plains of Mars.[1]

Actually to implement such lofty goals requires global *transformational leadership* in both the public and the private sectors now and in the centuries ahead. The business community at large, not just aerospace and communication satellite companies, must lead in the creation of a space ethos that supports an enlarged and well-funded space program, both in the public and private sectors. Yes, space is a place for fulfilling dreams, as well as for acquiring knowledge and promoting free enterprise.[2]

But how? Specifically, as our case in point, how can America further capitalize upon its \$20 billion investment in the Apollo lunar landings? How can all nations get payback on their total space expenditures, especially through the *utilization of spacebased resources*? Some innovative answers may be gleaned from the reports and recommendations of various space studies previously cited in the above ten chapters. Apart from the technical and economic insights, especially for the establishment of a lunar base, these studies include proposals for:

- building public consensus and financial support for the space program;
- initiatives within the private sector to foster the peaceful use of space by its exploration and industrialization;
- legislation that would transform a nation's space agency, as well as its policies and procedures so as to facilitate private space enterprise;
- promotion of educational and research endeavors that prepare the next generation of spacefarers for offworld challenges!

At this juncture, the justification for peaceful and commercial development of space resources is more human and scientific than economic or political. The rationale for moving forward on the space frontier has to do with discoveries that maintain technological excellence, security, and leadership in a knowledge culture.[3] Space undertakings should aim at benefiting the Earth's peoples, especially in the Third World, by technology transfer within the twin planet economies of Earth-Space. Our aspirations should be to actualize our potential by extending human presence permanently into our universe. One proposal from Kim Peart of far-away Tasmania is worthy of implementation – namely, the formation of a *Solar Peace Corps* to take a proactive role to ensure peace and security within our solar system, especially through utilization of the Sun's energy and system's resources. The aim is to connect Earth's children to the wealth of a solar economy.

A space philosophy has to be translated into actions! For those readers who internalize the principal message of this article, here are three dimensions of a personal action plan to participate toward creation of a *spacefaring civilization*:

1. National, Regional, and Global Convocations on Space Enterprises

Individuals and organizations can raise the public's awareness by sponsoring space enterprise conferences at both the local and world levels. Although this can be accomplished in actual group meetings, the best prospects for raising public consciousness on the necessity of space exploration and development may be the Internet and international television. Think back to the global media encounters sponsored by rock stars, environmentalists, and others with a humanitarian cause. Suppose supporters were to promote a *Global Space Day* that included international television and computer exchanges about humanity's future beyond Earth. The primary objective would be to further understanding and consensus on improving the quality of life for this planet's inhabitants by peaceful, commercial exploration and use of space-based resources. The second purpose would be to help earthkind appreciate the importance of human migration to the Moon. The impact on world citizens would be greater than present space gatherings among only the professional elite. It is the masses of our planetary inhabitants who need education about the necessity for our moving beyond Earth

2. Alternative Funding of Space Enterprises

New options must be pursued for financing space ventures, other than through taxes and annual governmental budget allocations. That traditional public sector approach will not obtain the \$700 billion which the National Commission on Space estimated is required over the next five decades to open up the space frontier. Nor will the \$500 million needed to build a lunar base be secured by the usual financial methods. Where are funds of that magnitude to come from, especially with huge national deficits and legislative spending restrictions? The history of both the Shuttle and the Space Station to date has been that of government cut-backs which undermined NASA designs and safety in mission planning.

Creating a space ethos implies getting the masses of citizens involved, in some manner or other, in space venture. In a democratic, free enterprise society, what better way to accomplish this than as a "space financial investor"? Innovative ways for space financing must be sought that provide citizens and entrepreneurs with financial incentives, like tax rebates, sale of bonds, or opportunities for private equity funds. To capitalize upon the enormous public interest and good will generated by the space program in the past fifty years, *alternative* or supplementary funding possibilities should be explored, including the authorization of stock sales in limited R&D technological space partnerships or trading companies. Recall that back in the *Sputnik* days, the COMSAT offering on the stock exchange was oversubscribed by the public.

Public lotteries to support scientific exploration and civilizing ventures in newlyopened frontiers are part of national experiences. Since the 15th century, European countries have used the lottery device to raise capital for public works. In 1612, the English used this means to support the Jamestown settlement. In the New World, the colonists and first citizens of the American republic employed this mechanism to fund the establishment of higher education, including Harvard, Kings College (Columbia), Dartmouth, Yale, and other universities. In the 19th century, Americans again used lotteries to open up the Western frontier. During the present decade in the United States, for instance, lotteries have become popular again within states to fund public services, particularly education. Today, many foreign countries, such as Australia and Mexico, successfully utilize lotteries or games of chance as a means of raising money to accomplish social goals.

If income produced from new funding sources is to alleviate the tax burden of central governments relative to space expenditures, the investment scope must be vastly broadened. That is what underlies the proposal to establish space authorities, such as a *Lunar Economic Development Authority*. More creative methods of external financing of space enterprise will occur with the formation of innovative institutions for that purpose. With the proper *space ethos* in a country, extraterrestrial endeavors would be perceived as a primary national interest and asset. The public generally does not fully appreciate the handsome paybacks that resulted from previous space investments. To ensure citizen involvement in underwriting civilian space ventures, more research is needed both by government and universities on this subject.

Were more private space capitalization encouraged, then public policy makers and world leaders would be challenged to cooperate in setting disbursement objectives for the money so raised. The public is more likely to contribute enthusiastically by purchasing space bonds, stocks, or lottery tickets if the initial funds raised were devoted exclusively or primarily to offworld economic, international, and scientific use, in preference to "star wars" type activities. For example, the initial target might be in the area of *space transportation systems*. That is, to build the space "highway" for the first few hundred kilometers up into Lower Earth Orbit, the most difficult part of interplanetary travel. Global participation in financing joint space ventures could provide advanced aerospace planes and reusable launch vehicles capable of operating in geosynchronous orbit or beyond.... Just as the Conestoga wagons and railroad opened up Western resources to the nation, so will these less expensive space vehicles bring resources from orbit back to benefit the home planet.

There already exist basic constituencies to enhance the success of alternative forms of space promotion and financing, such as among:

- 3,000,000 members of fifty space advocacy groups worldwide who have an estimated aggregate budget today of more than \$30 million;
- millions of space media fans, from Star Trek television viewers and other numerous motion pictures like 2001 and Apollo 13, to the worldwide audience who witness the satellite televising of space feats or watch television productions, such as Disney's Plymouth series about the first lunar community;

 the millions of people who make up the global space community – aerospace workers and contractors, astronomers and engineers, professors and students, etc.

Before his death, Gerard O'Neill, the visionary scientist, predicted that it would be private capital that would eventually finance space industrialization and colonization. The continued internationalization of space activities will attract global investment

3. Reorganization of National Aeronautics and Space Agencies

The emergence of a new work culture based on a knowledge call for the organizational renewal of varied space administrations within the spacefaring nations. Not only do they need to cooperate more effectively on planning joint ventures, but there may also be a need now for creation of a Global Space Administration, Authority, or Agency. Such an entity could coordinate the combined efforts of both the public and private sectors in space development worldwide. Such an international institution might prevent overlapping missions, facilitate cost savings, and concentrate efforts on space macroprojects with the best prospects for ROI. With a modernized charter, this space clearinghouse and research center might obtain more creative financing and planning of space activities, particularly with reference to space technology transfer, as well as attracting more venture capital and licensing space trading corporations. In past centuries, great trading corporations were formed by rulers and/or private investors to facilitate exploration and commerce in unknown or foreign lands. The 21st century may replicate this approach by international space trading entities, comparable to existing multinational communication satellite corporations.

Citizen involvement in any of the above three strategies would contribute to humanity's offworld progress. Michael Simon, when president of International Space Enterprises, maintained that government and industry should do more real joint space venturing together. This engineer and entrepreneur made a case for space commercialization and lunar development. Within a free enterprise, government would encourage the private sector to greater responsibility and risk by:

- incentives for taxpayers who invest in space enterprise;
- policies promoting innovative space entrepreneurialism;
- mechanisms for improving space market responsiveness;
- opportunities for achieving large-scale commercial benefits;
- initiatives that encourage synergy among companies, universities, and government entities engaged in working together to apply space research and transfer technology.

Perhaps Simon best stated the case for investment in space development in his volume, *Keeping the Dream Alive*:

The era in which we live presents humanity with three great challenges: to live in peace, to bring economic prosperity to all people, and to offer tomorrow's generations an exciting future of physical and spiritual growth. During its relatively brief existence, the Space Program has emerged as a central force in our quest to meet all of these challenges. By breaching the bonds of our home planet, we have taken the tentative early steps to become an advanced interplanetary civilization. The impact of the embryonic space age on our lives, already great, will expand and intensify in the years to come, as our horizons become as limitless as the Universe itself.[4]

The UN has already designated those who go aloft as humanity's *envoys*, as illustrated in Exhibit 1. In creating a spacefaring civilization, these words of Robinson and White highlight the global paradigm shift under way:

Our embryonic envoys have been essential intelligence agents for greater understanding of this survival vision—a total view. Through our efforts to propagate our envoys into the cosmos, through their own personal preparation and adjustments, and also through our remote biotechnological reception of their new transglobal outlook, our envoys have helped us begin to understand the systematic, dynamic, multidimensional, and continuous nature of the cosmos.[5]



Exhibit 1 Orbital Envoys of Humankind

Exhibit 1 – Orbital Envoys of Humankind. Every spacefarer represents the human family offworld, whether worker, tourist, or settler. The hopes of our species in the future depend on their performance aloft. And they are expanded by our robotic creations in space. *Source:* NASA Headquarters.

Exercising Transformational Leadership

Since our species is in transition to space-based living, this necessitates profound changes in sociology, biology, philosophy, government, and law. Space technological advances are the drivers of a wholly new offworld environment and creation of a space culture. Thoughtful citizens concerned about humanity's destiny want to participate in the process, beginning with the formulation of a space ethos. But it also requires a new type of leadership which has been characterized as *transformational*.

Transformational leaders, according to Tichy and DeVanna, recognize the need for changes, such as have been examined here in *Space Enterprise - Living and Working Offworld*.[6] Furthermore, such leaders create and communicate the vision of these desired changes so that a critical mass of people find them acceptable. Then, this leadership personally mobilizes commitment into foresighted strategies which are converted into actualities. So, too, can transformational leadership renew the space program worldwide, restructure space agencies, and refinance space undertakings. Transformational leadership can promote synergy among spacefaring nations, as in joint transnational human missions to the Moon, Mars, and Venus before the end of this century.

When humans are engaged in such missions of long duration, Bormanis and Logsdon and their colleagues remind us that a whole range of space policy issues need to be addressed, such as:

- (1) the uniqueness of the space environment;
- (2) the selection, composition, and interactions of space crews;
- (3) space inhabitants as microsocieties with standards, laws, ethics, and values;
- (4) the medical and scientific experimentation under way in orbit;
- (5) the spacefarer's survival and quality of life, including communication and privacy rights, health care, pregnancy, deviant acts, death and risk management;
- (6) the space explorer's environmental responsibilities relative to contamination, management of waste and debris, and other such ecology issues.[7]

The exercise of authentic global leadership within all segments of both the public and private sectors could transform citizen goodwill into a space ethos that permeates our lives toward opening up the high frontier. When the majority of the world's population perceives the economic and human advantage to be gained there, then energies will be directed into its development and settlement. As astrophysicist and author David Brin reminds us, *science* and its child, *technology*, are cooperative endeavors requiring knowledge to be shared, especially when applied beyond Earth.[8] The message of this book is simply that space is the place where *human emergence* can truly occur, as implied in exhibit 2![9]



Exhibit 2 Human Emergence in Space

Exhibit 2 – Human Emergence in Space. It is your author's conclusion in his latest book, *Toward Human Emergence,* that humans can only actualize their potential as a species offworld (<u>www.hrdpress.com</u>). *Source:* The above illustrations are from the Foundation for the Future (<u>www.futurefoundation.org</u>).

Recent research has provided insight into swarm or collective intelligence – the selforganizing swarm behavior so evident in all living creatures. When it occurs, there is a movement in concert, as demonstrated among flocks of swarming birds. This will happen to human beings when our collective intelligence perceives the movement of ever larger groups into outer space. But for now there is the gradual gathering of information and experience regarding living and prospering offworld. Only by moving beyond our home planet can our potential as a species be actualized and true human emergence occur, as Exhibit 3 indicates. That goal should be at the core of your space philosophy!



Exhibit 3 Living and Working Offworld

Exhibit 3 – Living and Working Offworld. By year 2025, we expect humans to be back on the Moon permanently, engaged in activities like the above. *Source:* John Frassanito & Associates.

For travelers, it is not enough to see the horizon alone. We must make sure of what is beyond the horizon, and go there together.

- Kemal Ataturk

A Spacefarer's Credo

When we fly around the Earth at eight kilometers a second, 400 kilometers up, we see our Earth as a whole planet. We observe the oceans, forests, mountains, cities,

and roads—we absolutely do not see the borders between nations. The time has come for all people of the Earth to work together to build a bright future. Let's start!

- Yuri Romaneko, October 10, 1989—Cosmonaut with the then record aloft of 420 days, including 326 days in an orbital environment!

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Notes

[1] National Commission on Space, *Pioneering the Space Frontier* (New York: Bantam Books, 1986), 2.

[2] E. S. Wibbeke, *Global Business Leadership* (Oxford: Routledge, 2009); R. T. Moran, P. R. Harris, and S. V. Moran, *Managing Cultural Differences*, 8th ed. (Oxford: Routledge, 2007).

[3] P. R. Harris, *Managing the Knowledge Culture* (Amherst, MA: Human Resource Development Press, 2005).

[4] M. C. Simon, *Keeping the Dream Alive* (San Diego: Earth-Space Operations Press, 1987).

[5] G. S. Robinson and J. M. White, *Envoys of Mankind* (Washington, DC: Smithsonian Institution Press, 1986).

[6] N. M. Tichy and M. A. DeVanna, *The Transformational Leader* (New York: John Wiley, 1986).

[7] A. Bormanis and J. M. Logsdon (eds.), *Emerging Policy Issues for Long-Duration Human Exploration* (Washington, DC: Space Policy Institute/George Washington University, 1992).

[8] E. C. Hargrove, (ed.) *Beyond Spaceship Earth – Environmental Ethics in the Solar System* (San Francisco: The Sierra Club, 1986).

[9] P. R. Harris, *Toward Human Emergence* (Amherst, MA: Human Resource Development Press, 2009).

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seven decades of creative professional work. The latest is *Developing High Performance Leaders* (Oxford, Routledge, 2012, <u>www.routledge.com</u>). For further information, visit his website: <u>www.wix.com/philharris/drphiliprharris</u>.



Editor's Note: This summary of Phil Harris's space philosophy is the outcome of his research as a Faculty Fellow at a NASA Summer Study on strategic planning for a lunar base. The five volumes of proceedings are entitled *Space Resources,* published in 1992 by the U.S. Government Printing Office. Volume 4 on *Social Concerns* is largely Phil's contribution. These publications of SP-509 are now available from <u>www.univelt.com</u>. Kepler Space Institute is proud to include Phil Harris's *"Humanity's Destiny is Offworld"* article in our first issue of The Journal of Space Philosophy. I videoed Dr. Harris, Dr. Thomas Matula, Dr. David Schrunk (see his article *"Planet Moon Philosophy"* in this JSP Issue) and Transorbital Corporation President, Dennis Laurie, at a luncheon at Torre Pines, California on 15 December 2009. You can see and hear them each making a short statement about the critical importance of the Moon to the future of human Space exploration, development and settlement at <u>www.bobkrone.com/node/222</u>. *Bob Krone, PhD*.

Chinese Space Achievements and Philosophy: Known and Inferred

By Terry Tang

KNOWN: Chinese Space Achievements[1]

In 2012, China considers Space as a significant symbol of the nation's strength. In 2006, China celebrated the 50th Anniversary of its Aerospace Industry and published goals to combine and streamline military and civilian research organizations to promote its scientific development. China's stated purposes for its goals were (1) to unveil the development of China's space program to the world and (2) to enhance international Space cooperation in order to develop its economy and realize modernization. The government stated that the exploration and utilization of outer Space should be for peaceful purposes. Expenditures on Space programs have increased from US\$1.5 billion in 2007 to US\$2.24 billion in 2010. Indications are that China is now accelerating investment in a satellite-based navigation system, human spaceflight, and Space Based Solar Power.

China's Space programs have developed through four stages beginning in 1956: (1) Pioneering (1956-1968), (2) Development (1968-1978), (3) Revitalization (1978-1992), and (4) Cooperation (1992-present). China's first satellite was launched in 1970 (Dong Fang Hong). In 2003, Shenzhou 5 achieved Earth orbit with Chinese astronaut Yang Liwei. China's first Lunar probe was successful in 2007 and its first Space Laboratory, Tiangong-1, successfully launched in 2011.

By 2012, China had a comprehensive system for Space development demonstrated by the launching of a spacecraft with three Chinese astronauts, one woman and two men, who returned safely to Earth after spending 13 days on a mission that made the *People's Republic of China the third nation ever to dock a manned spacecraft to another craft in orbit.* The *Shenzhou 9 space capsule landing was broadcast live on CCTV television June 29, 2012.* The mission, which included successful displays of manual and automatic docking, represented an important leap forward for China's space program's aim to construct a space station in orbit by the year 2020.

China's Traditional Philosophy [2] - Forecast for the Space Age [4]

The written language, the foundation for all later Chinese culture, was well developed by 1500 BC, when its literary history flourished. Famous Chinese orators were rare, but famous calligraphers were legion, reflecting a greater interest in the written word than the spoken. Because each Chinese ideograph carries from its cultural past its own distinct connotations, the acceptance of Chinese writing by others meant to an extent

their acceptance of Chinese cultural and moral values as well. Conversely, the Chinese script was a major barrier to the free entry of foreign ideas and values into Chinese culture, because such ideas and values could enter into Chinese consciousness only through the filter of the ideographs, with consequences of frequent failures and distortions of communication.

Of interest to us here are the social and political consequences. The high prestige of the written language and the difficulty of mastering it gave the scholar in China a status unequal in other societies existing during those times. The Chinese ruling elite were not nobles, priests, generals, or industrial or commercial magnates, but were scholar-officials, men educated from childhood in the Confucian classics who became members of officialdom through successful civil service examinations, which were written and humanistic in the context of maintaining a social harmony hierarchy with a Mandate from Heaven political bureaucracy.

Confucius was essentially interested in the problems of this world rather than the origins of life or the prospects of after-life. He was interested in the affairs of men that could bring tranquility with an ethics of moral education in proper social behaviors and ceremonies for stabilizing man's relationship with man. Such ceremonies were for respecting a social hierarchy among men on Earth and to countless spiritual entities in the Heavens, including those of ancestors and of mythology. This defines Confucianism as a philosophy and not a religion whose rituals are for expressing a relationship between a human and his or her God(s).

By contrast, Taoism emphasized man's relationship with nature, a mystical philosophy. A third major philosophy, Legalism, argued that man was evil by nature and therefore, should be controlled by a totalitarian government with a system of rewards and punishments. The fourth major philosophy, Buddhism, is concerned about achieving enlightenment. It tacitly accepts the Theory of Evolution, because no major principles of Buddhism contradict it. Questions about the eternity or infinity of the Universe at large are counted among the 14 unanswerable questions which the Buddha maintained were counterproductive areas of speculation. In comparison with other civilizations, China's history is notable for not identifying any prophet, priest, clergy, or spiritual leader whose activities led to significant nationally historic consequences.

China's Acceptance of Western Philosophy [3] - Forecast for the Space Age [4] By the 1900s, traditional Chinese values idealized concepts like harmony, rule by precept and moral persuasion, and the central social idea of devotion and loyalty within the family circle. The Western emphasis on institutions, the rule of law, and individual rights were feared as socially divisive and politically subversive, but China's illiteracy, poverty, economic backwardness and the failures and humiliation of China's national and international position motivated Chinese intellectuals to question China's cultural traditions.

The New Cultural Movement urged its followers to question all the old values and study every new idea available to them as the prerequisites to political change. *Their most immediate and significant achievement was replacing the difficult classical language with the vernacular as the common written medium in their new journals and schools.*

The *New Culture Movement* (simplified Chinese: 新文化运动; traditional Chinese: 新文 化運動; pinyin: *Xīn Wénhuà Yùndòng*) of the mid 1910s and 1920s sprang from the disillusionment with traditional Chinese culture following the failure of the Chinese Republic, founded in 1912, to address China's problems. It began as a revolt against Confucianism and called for the creation of a new Chinese culture based on global and western standards, especially democracy and science.

Younger followers took up their call for (1) vernacular literature, (2) an end to the patriarchal family in favor of individual freedom and woman's liberation, (3) the view that China is a nation among nations and not a uniquely Confucian culture, (4) re-examination of Confucian texts and ancient classics using modern textual and critical methods known as the Doubting Antiquity School, (5) Democratic and egalitarian values, and (6) *an orientation to the future rather than the past.*

(The Romanization [using Latin alphabet for writing Chinese] method is pinyin in the PRC. Historically the British used the Wade method (1867), the French and others including Yale University (1953) had their own Romanization of the Chinese language.)

Soon the full scope of Western intellectual tradition and political thought from the Greek Classics to the Renaissance and on to contemporary thought was translated and understood within a century. Science and democracy became godlike to the movement's leaders, who influenced China to declare war on Germany in 1917, expecting that with peace would come a new era of national self-determination and an end to China's unequal treaties with other governments.

The 1919 Versailles Peace Treaty provoked a massive Chinese nationalist protest with two significant consequences: the West and Japan could not be trusted and China's intellectual leaders began to look elsewhere for a solution to China's problems: Russia.

Marxist theory rose triumphant out of the Russian revolution and many Chinese nationalists compared China's situation to that of Tsarist Russia and looked to Marxism

as a possible guide. Scientific truth proclaimed in Marxism was appealing because it condemned all old traditions, those of the East as well as those of the West.

Augmenting Marxism's claim of scientific truth was Lenin's philosophical questions concerning the relation between understanding the world and changing it. Lenin argued that there can be no impartial social science as long as class struggles continue. His centrality of class analysis by sociology, a science, and documented by history created the conditions for forming a disciplined revolutionary political party in China.

In 1921, a few Chinese intellectuals founded the Chinese Communist Party (CCP or CP), organizing themselves as a revolutionary group with a better chance of ousting warlords and uniting China.

Aristotle's *Nichomachean Ethics* offered guidance in its Chapter 1, *"Every art and every scientific inquiry, and similarly every action and purpose, may be said to aim at some good."* Aristotle proceeds to separating different goals into a hierarchy and claims that Politics is the most comprehensive of the Practical Sciences, because its aim is the creation of the best possible conditions under which citizens can enjoy life. "Because politics can best serve the community by achieving the greatest good for all citizens, individual needs must naturally be subordinate to the common good."

Mao Tse-Tung was an inspiring orator and calligrapher who became a great leader. In 1949, The Chinese People's Political Consultative Conference accepted what he called the "people's democratic dictatorship" to impose a reversal of class relationships that had existed under warlords and later, the Nationalists. Mao looked to the Soviet Union as a model for developing China's philosophical foundation and political and military institutions. At the top of the ruling hierarchy is the Central Committee, which is elected by each national congress. The Central Committee, in turn, chooses the powerful Political Bureau.

The National People's Congress (simplified Chinese: <u>全国人民代表大会</u>; traditional Chinese: <u>全國人民代表大會</u>; pinyin: <u>Quánguó Rénmín Dàibiǎo Dàhuì</u>, abbreviated NPC, is currently the highest state body and with 2,987 members is the largest parliament in the world. In theory, the NPC is vested with great lawmaking powers. However, for most of its existence it has acted as a nearly powerless legislature, ratifying decisions that have already been made by the CP, the executive branch of government.

China's first Five Year Plan was announced at the National People's Congress in 1955. The heavy industrial complex the Japanese had left in Manchuria was the foundation for carrying out the plan, which succeeded. Two more plans of a five year span were launched. To accelerate industrial, economic, and agrarian growth, a new body of technologists and scientists were educated with its Communist Party (CP) relying on the "wisdom of the masses" least it should succumb to bureaucratization.

Mao attended the 40th Anniversary of the Russian Revolution (1957) in Moscow and witnessed Soviet Space accomplishments. Although China's Space programs began in 1956, Mao knew China was far behind and understood the importance of catching up if he wanted to maintain his *Mandate from Heaven*.

As a Chinese scholar, intellectual and calligrapher, Mao knew the actual classical calligraphy (which my computer here in the USA is not readily able to print, but the computer I had access to in Hong Kong in April 2012 could) ideogram for *Qi* or the assumed equivalent in meaning, pinyin, *Chee*, meaning something like, "*Plugging into Cosmic Power*." In this sense, denotation by calligraphy, by ideogram, or by pinyin each had its own connotations.

All languages are reflections of the emotional, spiritual, and intellectual character of the person and peoples who use them. The older, more structured, and more exclusive a society and its language, the more words it has that have deep cultural implications. China is a quintessential example of a country in which "cultural code words" have a vital role in the lives of its people.

An ideogram is like, "a picture with 1,000 words." In this sense, denotation by ideogram, by calligraphy and by "Romanization," each has its own connotations. The ideogram for *Qi*, for example, in pinyin is *Chee* and in British Wade is "Chi."

The British word, "Mandarin," derived from a Portuguese word, may be in the dustbin of history, because it is being replaced by *Putonghua* or referred to as "the common people's language" in China. Millions of persons in China continue to use other Chinese spoken languages, such as Cantonese, Shanghaiese, Fukienese, Hokkien, Hakka, and Chin Chow. All of these have the same written ideograms or calligraphy "characters," but have different pinyin Romanizations and pronunciations.

INFERRED: Forecasted for the Space Age [4]

The PRC uses this history and concurrent philosophies as antecedents for guiding its CP's dictatorship of subordinate social administrative agencies, including its agency for Space exploration. A National People's Congress is to convene near the end of 2012 or the beginning of 2013. After its conclusion, new policies from the CP will guide the direction of PRC's Space exploration beyond that which has already been stated, to construct a space station in orbit by the year 2020.

The CP knows hypotheses such as those involving Social/Cultural/Human Evolution. It knows the Whorf hypothesis, which states the language of a cultural group determines its thoughts and perceptions. In other words, differences in the language applied to events lead to different ways of thinking about those events. Others argue that it may be the different conceptualizations of the event that lead to the differences in labels.

A CP commission concluded in 1956 that the Russian Cyrillic alphabet would not be as useful as the Latin alphabet, because the Latin was more widely employed globally. The pinyin system of Romanization was then developed.

Regardless of the arguments, however, the CP concluded that knowing English is important for the PRC. In 1982, it made English the main foreign language in education. Current estimates for the number of English learners in China range from 300 to 500 million. Chinglish, a hybrid of Chinese and English, is becoming pervasive in present-day China on public notices in parks and at tourist sites, on shop names and in their slogans, in product advertisements, and increasingly in literature.

Perhaps China's educational mission statement for its Space Exploration philosophy is, *"Learn from others who may and can help.*"

The lessons of history from 1800 to the present cause some to wonder if Evolution could offer guidance towards understanding past philosophical, superstitious, religious, and political errors that enabled humiliating domination by European, American, and Japanese colonialism only currently rectified as demonstrated by China's hosting the 2008 Summer Olympics. *Perhaps the PRC's philosophy and policies for its Space Mission Endeavors are the similar to those for hosting the 2008 Olympics?*

Perhaps its Space Mission leaders are striving to create a healthy space platform involving all nations cooperating on innovations for many goals so that many will benefit, that is, by collaborating on political and economic objectives and inviting the citizens of our one world who want to explore Space together to work together using a common language.

PRC has mandated that all public signs be in both Chinese calligraphy and English by specific target dates for specific locations, namely 2013 for the Guangzhou and other southern areas, although perhaps all of Beijing's public major highway signs are already bilingual because of its hosting of the 2008 Summer Olympics.

PRC also mandated that all students in public schools study English for a minimum of two years and has encouraged students to travel abroad for learning the STEM curriculum: Science, Technology, Engineering, and Mathematics. Biology is a subcategory of Science and the biological sciences use Darwinian Evolution Theory for guiding PRC studies.

Linguists have studied the evolution of language and can see how language has changed over time. Using English as an example shows English evolving over time from Old English (also known as Anglo-Saxon – Beowulf is a good example of this) to Middle English to Modern English. Reading Geoffrey Chaucer's *Canterbury Tales* written in Middle English illustrates how over the last two hundred years English has split into three major branches: British English, American English, and Australian English.

Over time these three branches may evolve further and further apart from each other. Perhaps Chinglish will become the fourth branch of English, as more and more persons speak both English and Chinese. But with the expansion of the Internet and international communication, such branches of English may form a synthesis with the languages of many nations for the creation of an *International English*, the concept of a global means of communication in numerous dialects also referred to as *Global English*, or *Globish* (en.wikipedia.org/wiki/International English).

The Oxford English Dictionary defines the <u>noun</u> and <u>adjective</u> Chinglish, *n. and a. colloq.* (freq. *depreciative*). Brit. /'tʃɪŋglɪʃ/, U.S. /'tʃɪŋ(g)lɪʃ/. Forms: 19– Chinglish, 19– Chenglish [rare]. [Blend of Chinese *n.* and English *n.* A. *n.* A mixture of Chinese and English; esp. a variety of English used by speakers of Chinese or in a bilingual Chinese and English context, typically incorporating some Chinese vocabulary or constructions, or English terms specific to a Chinese context. Also: the vocabulary of, or an individual word from, such a variety. Cf. Singlish n.2 B *adj.* Of or relating to Chinglish; expressed in Chinglish. This dictionary cites the earliest recorded usage of *Chinglish* (noted as a jocular term) in 1957 and of *Chinese English* in 1857.

Having a global, universal, transparent language is important for world peace and understanding as well as for Space exploration. Having such a language is forecasted as a necessary condition for The Space Age of world peace, trust, prosperity, and infinite human possibilities.

Notes

[1] The information in this section of the article has its primary source in the recently published Aerospace Technology Workshop book by Langdon Morris and Kenneth J.

Cox, Ph.D. (eds.), *International Cooperation for the Development of Space* (ATWG, 2012), particularly Chapter 10, Le Wang, "Current Status and Future Developments in China's Space Program," 209-42.

[2] The information in this section has as its primary source *Dictionary of World History* (London: Brockhampton Press, 1997), 123-28; Horizon Book Division, *The Horizon History of China* (New York: American Heritage Publishing, 1969), 10-42; Brian Shaw and John Must, *China the Great Unknown* (Richmond Hill: ON: Mediavision, 1971), 5-83.

[3] The information in this section has as its primary source the references listed above and Henry C. Fenn (ed.), *Chinese Characters Easily Confused* (New Haven, CT: Yale University Press, 1953); David Lane, *Leninism: A Sociological Interpretation* (Cambridge: Cambridge University Press, 1981); Boye DeMente, *The Chinese Have a Word for It*, (New York: McGraw-Hill, 1996); Terry Tang, Research on thinking in Hong Kong. *Chung Chi Bulletin* (in English & Chinese) 54 (1973): 21 and 29; Terry Tang, Preface to the Chinese edition of Woodworth and Schlosberg's Experimental Psychology. *International Journal of Psychology* 9 (1974): 321-26; Terry Tang, A preface to experimental psychology in China. *Psychologia* 18 (1975): 37-41; Terry Tang, *Autonomic & Cognitive Indices of Semantic Conditioning & Generalization* (PhD Dissertation, University of Southern California, 1973).

[4] The information in this section has its primary source the references listed above and personal notes 6/7-8/3/1973 I took of faculty discussions at Beijing, Guangzhou, Shanghai Normal and other universities in China and personal notes 4/7-29/2012 of discussions I had in the above locations and in Hong Kong.

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About the Author: Terry Tang, PhD, is the director of Research for Kepler Space Institute. He is a Life Member, American Psychological Association, licensed psychologist with National Provider Identifier and a consultant in clinical and medical, research and forensic psychology. He has 35+ years working in three California State Hospitals, two Veterans Administration Hospitals, and three private hospitals. Faculty memberships were in Human Factors, University of Southern California Study Centers in California, Asia and Marshall Islands and in Experimental & General Psychology, Chinese University of Hong Kong, Ohlone College, and Pepperdine University. He was Researcher III, California Department of Corrections; Researcher, Public Systems Research Institute, USC, and Medical Advisor, Office of Hearings & Appeals, Social Security Administration.



Editor's Notes: Terry Tang and I have enjoyed professional and personal collegiality since 1978 when we were both on the University of Southern California Faculty and teaching in the Pacific. From the Mountain Provinces of the Philippines to the International Space Development Conference 2010 in Chicago, we have shared experiences and ideas. Terry's Chinese heritage and education, continuing through his visit to the Mainland in 2012, and his position as Director of Research for Kepler Space Institute, made him perfect to author this article in our Journal of Space Philosophy. *Bob Krone, PhD.*

The Silence of a Renewable Energy

By Daniel Fuentes

Human Observation of Space has produced enigmas, mysteries, and answers on an evolutionary path to a common denominator: intuition. In the story by Edgar Allan Poe *Mystery of Marie Roget*, the detective Auguste Dupin talks of *"transforming chance in a matter of absolute calculation"*.

We ponder the capacity of beauty and behavior and emotional involvement in our holistic personal world. We wonder why hidden reality exists in harmonious relations between different parties. The arrangement of the leaves in plants or the geometrical arrangements in the structure of galaxies, for example, create awareness and focus for the future consciousness of the new reality.

Our emotional status progresses to live an aureate moment and find the theme for a renewable energy. The need of welfare and the situation of shared ethics must be synchronized. Creativity and consciousness proceed in silence. Biologists, architects, engineers, physicists, musicians, perfumers, educators, economists... have created to convey the secrets of nature and communicate key development in sync with the five senses of the humankind.

Dreams must embrace concepts to make them self-identity elements. My ultimate dream gave birth to a new habitat where biomimetic knowledge and communication are advancing to hatch into a new awareness of language. Targeting and mainstreaming the secrets of nature will be at service of an innovative future in harmony with the planet's existence.

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About the Author: Daniel Fuentes is an entrepreneur and creative designer in Barcelona, Spain. He is a graduate of the School of Engineering and Design Elisava. (Barcelona) with a specialty in Graphic Design; the 2008 Co-Founder of First Consciences L., a company promoting Biomimetrics Engines Renewable Energy. In 2009 he was a co-Founder of UNIGUR S.L., designing software for the Biomimetic connection. In 2004 Daniel founded the 1st Symposium Universe of Creativity in Barcelona. Daniel has been an Account Executive and studied Graphic Design in Olot (Girona). 1993-1995.



Editor's Note: Daniel Fuentes brings his creative career to Space with his merger of science and art through Biometrics, which is the study of the structure and function of biological systems as models for the design and engineering of materials and machines. Biometrics was a nephew of General Systems Theory, L. von Bertalanffy being credited with its founding and scholarly beginnings. The assumption of both, now fully validated, is that learning for one system can occur from comparing it with other seemingly quite different systems – like humans and machines. Daniel brings his short conceptual essay to us from Europe where the notion of *system* is as old as European philosophy. It was Aristotle who stated "*The whole is more than the sum of its parts.*" Space exploration could never have begun without the history of systems thinking. But, I must acknowledge my bias from a career of teaching graduate Systems Management. *Bob Krone, PhD*.

Research Questions and Hypotheses

By Bob Krone, Provost, Kepler Space Institute

Beginning in 2004 with the building of the book, *Beyond Earth: The Future of Humans in Space,* edited by Bob Krone (Apogee Space Press, 2006), the Kepler Team of professionals has been identifying research questions needing answers for success in the forthcoming Space Epoch. There are multiple known challenges linked to the permanent move of humans to space and an infinite number of now unknown others that will be identified in the future.

Since Kepler space Institute (KSI) and its follow-on Kepler Space University (KSU) will have a strong research focus, hypotheses are one output of research. They provide expectations for the future. Hypotheses have four possible outcomes: (1) future events and research may validate them; (2) they may prove them to be invalid; (3) they may discover some mix of truth in the projection; or (4) insufficient evidence may be found to state any findings or conclusions.

The research questions and hypotheses in this article, listed alphabetically by subject, cover a large array of science, engineering, management, governance, policy, and human factors subjects. But they represent only a small illustrative set of what lies ahead. Authors and readers of *The Journal of Space Philosophy* will make additions to this list in perpetuity.

1. Bacteria

* <u>Hypothesis</u>. Bacteria will be inside the human settlement bubble in space. These bacteria will be used for recycling, for the production of new materials from substances to be brought from the external environment, for supporting the life of other organisms, to keep our immune system in shape, and for all other functions of bacteria to sustain life on Earth. **Dr. Eshel Ben-Jacob**

2. Breakthroughs

* <u>Hypothesis</u>. A breakthrough is not a function of what is known, but a function of the domains in which it is known. We can know the future of space in a domain of ideas and science, we can know it in a domain of experience and action, and we can know it in a domain of adventure, risk, and myth. All those domains will be needed for the major human move to space. **Dr. Charles E. Smith**

3. Challenge

* <u>Research Question</u>. How do we solve the greatest challenges of human life, which are the mysteries of the universe that tempt us from without, but also the mysteries of ourselves, which lie within the human consciousness, human knowledge, and human compassion? Langdon Morris

4. Children Today – Tomorrow's Space People

* <u>Research Question</u>. A harsh evaluation by today's youth is that they do not feel they have a part in the planning process for opening the space frontier. How should we go about giving them a voice and involving them in the planning process now? Lonnie Schorer

* <u>Research Question</u>. Is a child's sense of wonder a valuable asset in our quest for answers about the Universe? Lonnie Schorer

* <u>Research Question</u>. Would it be feasible to utilize Satellite Space Technology to create Virtual Field Trips for kids as a way to stimulate interest in Space Technology for schoolchildren everywhere in the world? We already have the technology to do this in Orbital Space, on the Moon, and on Mars. **Dr. Elliott Maynard**

* <u>Research Question</u>. In an effort to integrate children into the vast expanse of knowledge that has been generated since the golden age of human space pioneering in the 1960s, how can more experienced generations best share the "great unknowns" of deep space pioneering with more newly arrived generations? **Dr. Martin Schwab**

5. Debris in Space

* <u>Research Question</u>. The accumulation of debris in space is an increasing problem with potential damage to space operations. How can international research and specific plans be created to deal with this problem? **Dr. Feng Hsu**

6. Education

* <u>Research Question</u>. What private-public education and human capital development model can successfully integrate the international resources and interest of government, industry, and academe that will be involved with the future space enterprise?

* <u>Research Question</u>. What emerging telecommunications and information system technologies will transform space-related education and human capital development worldwide?

* <u>Research Question</u>. What economic and financial structure will be needed to support and sustain the private-public education and human capital development model developed for the future space enterprise?

Dr. Michael J. Wiskerchen

7. Energy

* <u>Hypothesis</u>. The permanent solution to earth's energy needs has begun with biofuels conversion for vehicles and will be finally resolved by a mix of solar energy from space with alternatives to oil-based energy sources on earth. Howard Bloom

8. Evolution

* <u>Hypothesis</u>. Some kind of movement of humanity into space is inevitable. But this great step is likely to be far more successful and meaningful if it is guided and energized by awareness of the wider evolutionary trajectories that will eventually determine the significance of humanity in the universe. John Stewart

9. Genetics

* <u>Research Question</u>. How do we determine and accomplish needed human genetic intervention or manipulation to insure the survival of humankind off earth? Lynn Harper

10. Governance

* Research Question. What can be learned from historic shifts of epochs?

* <u>Research Question</u>. What widespread wishful thinking hinders realistic steps towards human settlement of space, such as trust that goodwill, civil society, and business interests can be relied upon to do most of the job.

* <u>Research Question</u>. What are the most critical characteristics of governance essential for human settlement of space?

* Research Question. How can those critical characteristics be realistically realized?

* <u>Research Question</u>. What can be done to prepare the ground for moving humanity beyond earth before a suitable governance system emerges? Professor Yehezkel Dror

11. Gravity and Humans in Space

* <u>Research Question</u>. How will the brain and its psychology adapt to microgravity and hypergravity? **Dr. Sherry E. Bell**

12. Human Survival

* <u>Research Question</u>. How can human civilization best integrate our global systems of government, business, academia, and faith to ensure human survival and the generation of knowledge, prosperity, and spiritual well-being across our solar system over the next twenty generations? **Dr. Martin Schwab**

13. Intelligence

* <u>Research Question</u>. Development of an information theory that is extendable to fantomark-coded messages and streaks would be crucial, as it would facilitating the invention of superior intelligent artifacts; could this hold a key to communication with extraterrestrial modes of intelligence and eventually help us understand our cosmic ancestry and the relationship between implicate and explicate orders, as envisioned by David Bohm? **Dr. Joel Isaacson**

14. International Cooperation

* <u>Research Question</u>. What aspects of the human psyche in general pose the greatest problems for creating a successful worldwide society based on mutual responsibility, enthusiasm, cooperation, and commitment to the general welfare of all participants and how do we successfully ensure they do not continue to prevent a fully functional worldwide society capable of cooperative existence?

* <u>Research Question</u>. How can we stop the destruction of war that has been draining the world and all people of its resources for millennia so that we can collaborate to achieve those things we naturally desire as part of our heritage in the Cosmos?

* <u>Research Question</u>. How do we deal with imminent earth climatic changes which could devastate a significant portion of its land and populations of humans and wildlife so that we can fulfill our future heritage in a cooperative collaboration of international peace?

Michael Hannon

15. Law

* <u>Research Question</u>. What is the most effective formulation of a transnational public and/or private corporation business entity to exercise independence and sovereignty to identify, recover, and commercially exploit space resources for the benefit of all humankind?

* <u>Research Question</u>. How do we formulate a legal operating relationship between international/transglobal military entities (administration/protection) and private entrepreneurs operating in space? This might be an appropriate variation of the English charters of the late sixteenth century (e.g. Virginia Company, Hudson's Bay Company, or East India Company).

* <u>Research Question</u>. How do we formulate curricula for engineering students and graduate science students that will teach them routine and full involvement with global space law and economics, such as that being developed at the Georgia Tech engineering department?

* <u>Research Question</u>. How do we establish a globally effective legal infrastructure to encourage and protect the process of obtaining "informed public consent" for all space activities that are designed to allow broad human interaction or interference with extraterrestrial life, consistent with applicable principles of metalaw?

* <u>Research Question</u>. How do we create a new jurisprudence allowing independent personhood and legal accountability of transhumans, telepresences, and advanced artificially intelligent biorobotics functioning in near and deep space? **Dr. George S. Robinson**

16. Leadership

* <u>Research Question</u>. How do we train people to balance order, control, and results focus in a context of what is good for humanity locally and at large? **Dr. Charles E. Smith**

17. Militaries in Space

* <u>Research Question</u>. What missions in outer space (besides planetary defense) are best suited for the military systems of our world, which can create political accord among the major world powers?

* <u>Research Question</u>. Could a negotiation framework at the presidential level be initiated by the United States to allow *small, annual, incremental, and reciprocal* transfers in terms of percentages from military budgets to an international civil space pioneering and defense budget or private fund?

Dr. Martin Schwab

18. Moon

* <u>Hypothesis</u>. In 2013, the 56th anniversary of the commencement of the civil space age will take place, as will the 407th anniversary of the founding of Jamestown, the first permanent "*New World*" English colony in America in 1607. 2013 commences the second half-century of the civil space age and will also mark the beginning of a program

to create the first city on the Moon with the initiation of the permanent expansion of the World's human civilization beyond the Earth. Thomas F. Rogers

19. Music and Arts

* <u>Hypothesis</u>. Music and Arts programs throughout the world will increasingly establish programs or departments that focus the creative energy of youth toward music and the arts for humans in space. **Dr. Bob Krone.**

20. Nature's Cosmic Intelligence

<u>*Hypothesis</u>. One of our latest thoughts regarding Article 7, "Nature's Cosmic Intelligence," is the following syllogism:

- * IF nature's Cosmic RD-based Intelligence is universal, autonomous and not created by humans, e.g. like gravity;
- * AND human capabilities to harness it for good or evil are unknown in 2012;
- * THEN the human challenge is to understand it better to determine if influence for the GOOD can occur.

Joel Isaacson, PhD & Bob Krone, PhD

21. New Frontier

* <u>Research Question</u>. How do we create a new sense of purpose, a new set of goals, a new frontier to move once again with might and majesty, with a sense of zest that makes life worth living, through the world in which we live? One of the most challenging frontiers left to us hangs above our heads. Howard Bloom

22. Popular Support for Space

* <u>Hypothesis</u>. Only when regular citizens recognize the far-reaching humanitarian advantages or can personally experience the technological advantages of the space program will a national or international space policy have broad support. Dr. David Livingston

23. Quality Sciences and Space Sciences

* <u>Hypothesis</u>. Quality Control and Management has been a continual emphasis for space missions. A formal merging of Quality Sciences and Space Sciences will occur for Human-to-Space Migration. **Dr. Bob Krone**

24. Risk, Safety, Reliability

* <u>Research Question</u>. What R&D efforts into accident theories are needed to understand better the complexities in accident propagations and how phenomenological events that often cause catastrophic system failure occur?

* <u>Research Question</u>. What R&D efforts are needed to understand the influences of human dynamics on the development and evolution of man-machine interfaced technological systems and how do the factors of human elements play a key role in the safety risk of all technological systems?

* <u>Research Question</u>. Does absolute safety exist for manned space vehicle systems? Is it possible to eliminate accident by design? What are the design philosophies and strategies that can achieve such goals?

* <u>Research Question.</u> How do we systematically model, understand, and control the interactive complexities that pose great threats to the safety of socio-technical systems? **Dr. Feng Hsu**

25. Self-Destruction

* <u>Research Question</u>. The views of some past and current global leaders indicate that while military relationships continue to dominate the political agenda on Earth, the lure of human space pioneering can still deliver us from our dangerous propensity for self-destruction. How can global society now build upon this concept? **Dr. Martin Schwab**

26. Spaceflight Systems

* <u>Hypothesis</u>. NASA and global space entities should never again be confined to SINGLE and static human spaceflight architectures. If greater budgetary and capital investments were demanded, exponential increases in the quality of human life would occur, based on proven records of success. **Dr. Martin Schwab**

27. Space Trips for Peace

* <u>Hypothesis</u>. Space Trips for Peace would create crews composed of members from nations marginally friendly, hostile, or even at war with each other. Space, new to civilization and without territorial boundaries or national sovereignties, would be the ideal frontier for demonstrating that people of all cultural beliefs and religious backgrounds are able to set aside differences and work harmoniously for goals mutually considered good. Astronaut Buzz Aldrin and Thomas F. Rogers

28. Win-Win Global Consciousness

* <u>Hypothesis</u>. Both research and the search of human experience will be necessary to bring win-win benefits of space to the mainstream global consciousness. **Dr. Elliott Maynard**

29. X-Prizes

* <u>Research Question</u>. How have, and could, X-Prizes, positively impact the future of exploration and development of space? Howard Bloom

Readers of the Journal of Space Philosophy are urged to e-mail their research questions and hypotheses to <u>BobKrone@aol.com</u>

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5.

BLOOM, Howard K., Author, Scientist, Founder Space Development Group, Publicist, Author on human evolution. Photo by Luigi Novi.

For Bio Info: www.en.wikipedia.org/wiki/Howard Bloom.



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For Bio Info: Google Jennifer Bolton.



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For Bio Info: See this Journal Issue, Article 13.



CLEMENTS, Douglas H., MD, American Board of Opthalmology, "Improving Human Vision for Space Exploration and settlement".

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DOWNING, Lawrence G., DMin, Senior Pastor, Space Faith and Spirituality pioneer, University Professor, Director, White Memorial Medical Center, Los Angeles, California.

For Bio Info: See this Journal Issue, Article 11.



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For Bio Info: See this Journal Article 14.

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For Bio Info: See this Journal Issue, Article 17.



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For Bio Info: See this Journal Issue, Article 18.



SCHWAB, Martin, PhD, International Space Author, KSI Faculty, Aerospace Technology Working Group.





SCOTT, Winston E., American Astronaut, Vice President for Development, Florida Institute of Technology.

For Bio Info: www.en.wikipedia.org/wiki/Winston E.Scott.



29.

TANG, Terry, PhD, KSI Director of Research.

For Bio Info: See this Journal Issue, Article 24.


"The greatest use of a life is to spend it for something positive that outlasts it."
Dr. Max T. Krone, Dean, Institute of the Arts, University of Southern California and Founder, Idyllwild School of Music and the Arts, 1950 Journal of Space Philosophy 1, no. 1 (Fall 2012)

