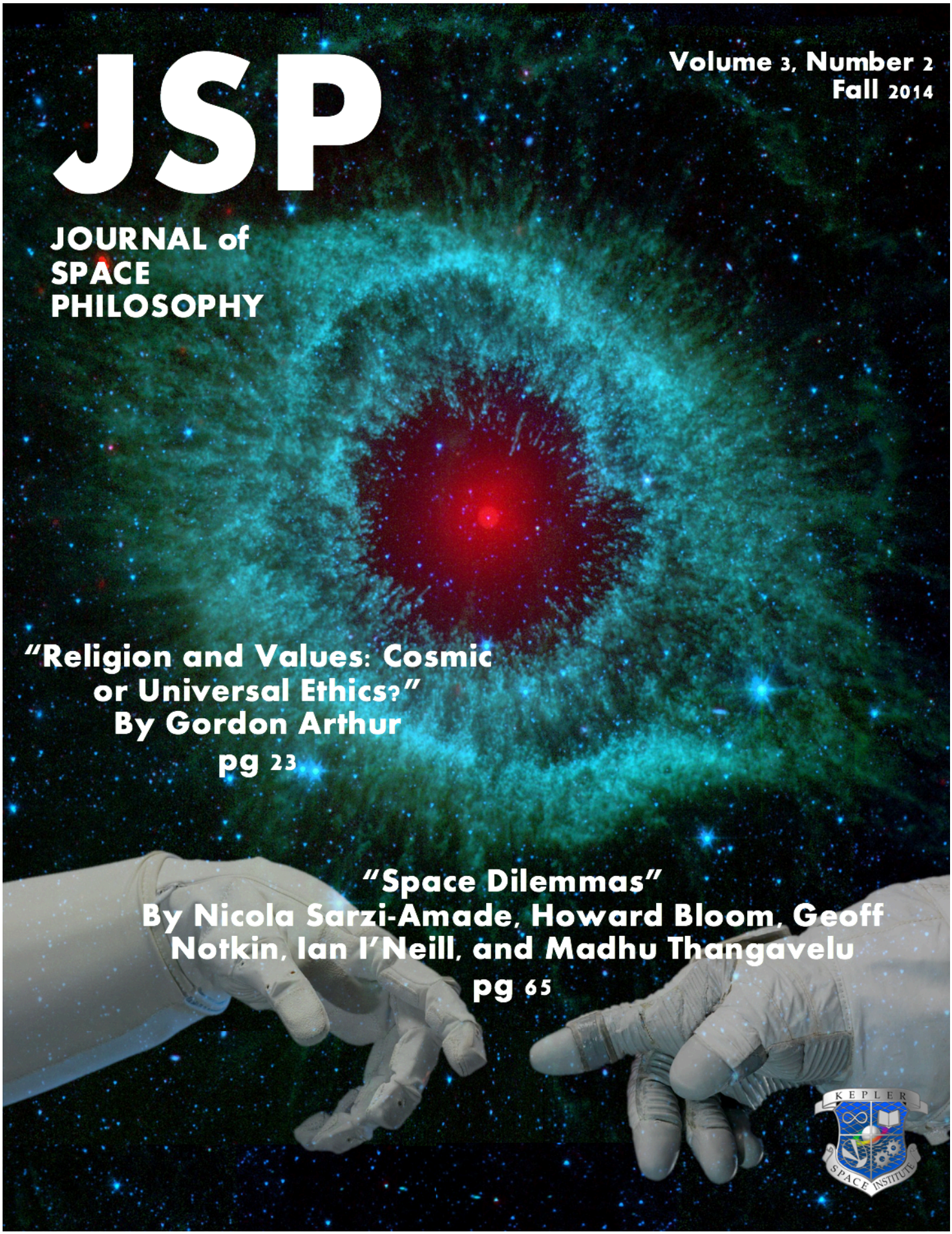
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KEPLER
SPACE INSTITUTE

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

Dedicated to every member of the Apollo Program

Edward B. Kiker, Apollo Engineer and KSI Co-Founder

Edward B. Kiker is general engineer for the Office of the Chief Scientist, Operational Support Office for the U.S. Army Space and Missile Defense Command/Army Forces Strategic Command in Colorado Springs, CO. He is responsible for new technologies that can be applied to space to keep the United States the pre-eminent space power.

He attended Harvard University in the Army ROTC program from 1966-70, with a major in lunar geology. He served from 1971-75 on active duty as an engineer officer in Alaska, Korea, and Fort Belvoir, VA. He served from 1975-79 as an armored cavalry Arctic scouts officer with the Alaska Army National Guard. His civilian service began in 1975 as a natural resources specialist at Fort Greely, AK, with LANDSAT satellite imagery work and environmental management. Between 1981 and 1984 he served as Alaska State Director, Project High Frontier, developing a notional national ballistic missile defense system and commercial space activity.

In 1987 Ed moved to the Army Space Institute, Fort Leavenworth, KS, where he wrote the first required operational capabilities plan and the organizational and operational plan for the functioning of the current ground-based missile defense system operated by the U.S. Army Space and Missile Defense Command. He was also the Army Training and Doctrine Command point of contact for the Space Exploration Initiative. He represented the Army Corps of Engineers at the Second International Fusion Energy Conference and at International Lunar Base Design Conferences in the United States and in Beatenberg, Switzerland.

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Preface

This is the fifth issue of the Journal of Space Philosophy, founded in the Fall of 2012. Articles from all issues can be downloaded free at www.bobkrone.com/node/120. Its contents range from philosophy to leadership and space science, with a particular emphasis on ethics and moral values.

The lead article explores Yezhekel Dror's new book, *Avant-Garde Politician: Leadership for a New Epoch*. It explains how Dror's ideas are relevant to the politics and leadership of the moment and the future. Other articles explore ethical aspects of human behavior, education, and jurisprudence.

This journal is peer-reviewed. Submissions, to BobKrone@aol.com, will be considered for publication from anyone on Earth or in Space. Views contained in articles are 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 hold copyrights of their material and professional accreditation is required.

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

Kepler Space Institute

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Access to the Journal of Space Philosophy and downloading of its articles is available at www.bobkrone.com/node/120. Anyone on Earth or in Space may submit his or her article to BobKrone@aol.com.

Kepler Space Institute

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

Press Release, September 9, 2014

Leadership for All Humanity Said to Be Key for Space Development

By Walter Putnam

The teachings of Israeli political scientist Yehezkel Dror, which call for leadership based on concern for the good of all humanity, hold the key to advancement of civilization into space, according to the next edition of the *Journal of Space Philosophy.*

Not only is political leadership essential for the success of the forthcoming space age, but Dror's conclusions in his latest book, *Avant-Garde Politician: Leaders for a New Epoch* (April 2014, Westphalia Press) provide the prescriptions for the type of leadership needed, Dr. Robert Krone writes in the fifth semi-annual installment of the online journal.

Dr. Krone, the president of Kepler Space Institute and the founder and senior editor of KSI's *Journal of Space Philosophy,* notes that "Dror does not use Space as a focus, but this article is specifying the future of humans in Space as an illustrative example."

"The Space environment has many features that make the Dror assumptions more achievable in Space than on Earth," Dr. Krone writes of the professor emeritus of political science at Hebrew University in Jerusalem.

Among those features: There is no history of human conflicts in space; and many of the major missions and projects achieved in space are international in scope.

"Dror's primary prescription for avant-garde leadership is to make the good of humanity a priority," Dr. Krone continues.

"Earth's historic demographics reveal no nation, society, or international entity giving humanity preference beyond the boundaries of that entity. Leaders are elected or created by swearing allegiance to people within those boundaries."

The article on Dror's book is one of ten scheduled for the Fall 2014 edition of the *Journal*, which debuted two years ago in the Fall of 2012.

In another essay, titled "Random Thoughts on Morals, Values; Good, Evil and Human Nature," the Rev. Lawrence G. Downing explores whether space societies will be more benign than human history would indicate.

"Does the past cast the mold for the future? No! However, and it is a huge HOWEVER, we cannot assume that good intentions and careful selection will assure a bright and peaceful future for those who inhabit Space," writes Downing, a Seventh-Day Adventist pastor for more than 40 years and a pioneer in the field of Space Faith.

He cautions that we can educate the young, embed our moral values and uphold the highest ethical practices, but "Suddenly, like a gale from some far place, without warning or reason, one of the carefully chosen ones with an enviable track record, for no apparent reason, goes off track and once more evil reigns."

Among other articles in the fall *Journal*, Lonnie Jones Schorer writes of "Education for Tomorrow's Space Developers"; Gordon Arthur discusses "Religion and Values: Cosmic or Universal Ethics?"; and legal scholar George S. Robinson extols on "Saving the Human Species and Its Evolving Descendants: The Role of Jurisprudence and Practitioners of Space Law in Safeguarding and Cultural Evolution of Humankind's Individual and Collective Essence."

There is an essay on "Defrosting Frozen Wisdom," by the late KSI co-founder Dr. Richard S. Kirby; and others titled "The Planet Moon Project," by David Schrunk, and "The Stars are in Our Reach," by William Mook.

A panel discussion on "Space Dilemmas" from the 2014 International Space Development Conference is re-created – featuring Nicola Sarzi-Amade, Howard Bloom, Geoff Notkin, Ian O'Neill, and Madhu Thangavelu; and Dr. Krone adds further reflection with "A Personal Philosophy."

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About Kepler Space Institute

By Walter Putnam

Kepler Space Institute (KSI) is a for-profit corporation in the State of Florida. It founded the *Journal of Space Philosophy* in 2009 and is in 2014 designing academic programs to be offered when the registration process in Florida is completed.

What We Believe

We believe in personalized education to meet the individual needs of all who enroll in Kepler Space Institute programs or courses. Members of our faculty have had long experience with traditional universities. We have learned what works and what does not.

We have experienced large campuses sub-optimized into competing departments bloated with bureaucracy. We have watched administration and tenured faculty salaries climb, forcing student tuition rates to rise. We have seen poor teaching ignored while unions focused on protecting jobs by firing the last hired younger teachers. We do not believe a huge campus with large overhead expenses is needed with today's technology. We have watched U.S. education quality decline by international standards. There is a linkage of less-educated Americans and jobs going to better-educated men and women overseas.

We believe that everyone has unique skills, needs and circumstances. A teach-all-the-same-way strategy fits no one. Standardization in the classroom eliminates teacher innovation and creativity and crushes student interest. Asian nations that have traditionally used standard and rote learning are changing to methods that encourage creativity and measure learning.

Excellence in education is a Pareto optimum where many are better off and no one is worse off. When education fails, everyone is worse off. We believe that anyone with Internet access should have educational opportunities. We believe each should learn at his or her own pace. We believe that requiring students to learn theory in isolation of any application to their needs wastes their time and resources. Learning should have immediate application. We believe that creative thinking, problem identification, and problem solving are priority educational goals.

We believe that today's open-source online learning platforms are as good as the high-priced ones that trap many universities with long contracts and sometimes with technology departments influencing academic curricula by controlling processes. Our reduced learning-management system costs permit us to keep tuition fees low and academics in control.

If you share these beliefs, join us. We believe we can help you accelerate your desired education.

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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 of Directors. He is the President of the United States Chapter of Space Renaissance International (SRI) and 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 45 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.

Letters to the Editor

We invite readers of the *Journal of Space Philosophy* to send us letters referencing any past publication, to suggest subjects for future publication, or to submit information from anywhere in the Global Space Community. ***Bob Krone and Gordon Arthur***.

Recursive Distinctioning Revisited

By Joel Isaacson, PhD, August 15, 2014.

Dear Editor,

In response to queries about earlier articles in JSP on recursive distinctioning I provide below a brief summary.

This work is rooted in a discovery of a fundamental natural process termed "Recursive Distinctioning" (or Recursive Distinguishing [RD]). RD has been shown to underlie a number of disparate disciplines, from the philosophy of mind to particle physics, with lots in between.

In re philosophy of mind, the most striking link is to the Hegelian dialectic. Among other things, the Hegelian dialectic is said to underlie patterns of thought processes.

In the physical sciences, it has been shown that patterns that emerge from the simplest RD process are identical to patterns of elementary particles, called baryons, described through their quark constituents.

Part of that work turned out to be related to the Pythagorean Tetractys, which is an ancient esoteric symbolism/principle followed by adherents of Pythagoras and believed to be fundamental to the make-up of the Universe.[1] (The Tetractys also plays a significant role in the Kabbalah.)

For how the Tetractys shows up autonomically in the development of the model of the baryon octet see: www.isss.org/2001meet/2001paper/stegano.pdf. See the discussion therein on page 3 and Figures 3 (page 12) and 4 (page 13).

In Figure 4, the basic elements of the Tetractys are 3x3 matrices of quarks that include the up, down and strange quarks, organized as follows:

u s d
s s s
d = u

[1] See en.wikipedia.org/wiki/Tetractys.

Each such matrix can be shown to subsume, by selecting 3 out 9 quarks, patterns of elementary particles, called baryons, including the neutron and the proton, which are the fundamental constituents of the nuclei of matter.

This 3x3 grouping can be thought of as a strangelet.[2] Strangelets relate to strange matter and, cosmologically, to strange stars. There is also a hypothesis in cosmology that strangelets relate to dark matter.

I have discussed elsewhere that RD that operates in streak mode may involve dark information and may be a universal mode of communication among diverse intelligent species in the universe.

Marc van Duijn discussed recently a possible connection between RD and certain intelligent behaviors in bacteria. Louis Kauffman has repeated numerous times that RD, in his view, underlies all mathematics.

There is strong indication that RD is a basis for many developments in many fields, including computing artifacts that mimic natural intelligence.

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About the Author: Joel Isaacson has pioneered in RD Cellular Automata since the 1960s. RD 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. Dr. Isaacson has made 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.

EDITORS' NOTES: Dr. Isaacson has published on his discoveries of autonomic string manipulating systems periodically since his patent of that discovery in 1981. He refers here to his article, "Nature's Cosmic Intelligence," published in Fall 2012 issue of the *Journal of Space Philosophy.* His reference to Marc van Duijn is to Dr. van Duijn's "Universal Principles of Biological Cognition," *Journal of Space Philosophy* 2, no. 2 (Fall

[2] See en.wikipedia.org/wiki/Strangelet.

2013), 15-26. Louis Kauffman is Dr. Louis H. Kauffman, Professor of Mathematics, University of Illinois at Chicago, who provided a postscript to the Marc van Duijn article, titled “Comment on Recursive Distinguishing.” ***Bob Krone and Gordon Arthur***.

Leadership Will Be Key: Applying Yehezkel Dror's *Avant-Garde Politician: Leaders for a New Epoch.*

By Bob Krone

Abstract
Professor Yehezkel Dror, the co-founder and leading scholar of the policy sciences, has written 15 books and hundreds of professional articles describing the weaknesses and failures of public policymaking and prescribing theories, models, and analyses for improvements. His 2014 book, *Avant-Garde Politician: Leaders for a New Epoch,* takes a long-term evolutionary time horizon and prescribes a radical new model for leadership to meet the challenges and to put priority on shaping the future of humanity. This article summarizes Dror's prescriptions with special emphasis on his required values, understandings, characteristics, talents, and skills for avant-garde leadership; then his hypothesis that Space offers a higher probability for the Dror Model to be achieved than does Earth.

Keywords: unprepared humanity, sleepwalking political leaders, institutional imperatives, raison d'humanity, metamorphosis, Avant-Garde Politician calling, personal resources and innermost philosophy, Law of Space Abundance, science's and technology's benefits and risks, national and international decision-making.

Introduction

Throughout human history, leadership has been the primary variable responsible for outcomes of good or evil, for the creation or extinction of societies, for progress or decline, for harmony or conflict, for the outcomes of war, for the advance of science and technology, for the influence of religions, resulting in happiness or tragedy. It will be the same for the outcomes of the human Space Epoch, which in 2014 has only a history of 57 years.

This *Journal of Space Philosophy* article makes four assumptions: (1) that political leadership will be the key – but not the only – variable in the successes or failures of the forthcoming Space Epoch; (2) that the improvement and survival of *homo sapiens* and its survival will largely be dependent on a successful Space Epoch; (3) that current global leadership, with a few exceptions, is insufficiently aware of the potential benefits of the Space Epoch; and (4) that the analysis and prescriptions of Professor Yehezkel Dror – making the good of humanity a priority – are critically important for the leadership of national and international decision clusters.[1]

[1] Yehezkel Dror's latest book, *Avant-Garde Politician: Leaders for a New Epoch* (Washington, DC: Westphalia Press, 2014) is the primary reference for this article. However, the life works of Professor Dror, beginning in the 1960s, are critically important to global public policy making decision makers. Dror is the co-founder and leading scholar for the policy sciences, originally proposed in the 1950s.

Leadership is the Key
Justifying assumption #1, above, is not required for this essay. Evidence for its validity can be found throughout the literature for the political, administrative, and management sciences and in literature throughout history.

The Future Space Epoch
Assumption #2 is not universally accepted in 2014. It can be found in the visions and missions of every major Space organization, including our Kepler Space Institute (KSI), which sponsors this Journal. As knowledge accumulates under the *Law of Space Abundance*,[2] as Earth's non-renewable resources decrease, as Earth's population increases, and as extra-terrestrial threats to Earth are better understood, disagreements with this assumption will disappear.

Current Global Leadership Awareness
As of 2014, only one head of state in history has had personal experience in the Space Sciences. That is Dr. A. P. J. Abdul Kalam (b. 1931), President of India, 2002 to 2007, "The People's President."

Dr. A. P. J. Abdul Kalam

Many heads of state have supported national and international funding for Space research and missions over the past half century. President John F. Kennedy's dramatic launching of the Apollo program to land men on the Moon remains the most celebrated. There are many global reasons for the world's decision makers giving priorities to needs other than Space exploration, development, and human settlements. Readers will be aware of them all. The unknown on which Space scientists, organizational leaders, managers, investors, and advocates dwell is: **Will the potential benefits of the Space Epoch be insufficiently known by leadership beyond the time when those benefits could be captured to solve Earth's and humanity's needs?**

Assumption #4, "that the analysis and prescriptions of Professor Yehezkel Dror – making the good of humanity a priority – are critically important for the

[2] The Law of Space Abundance was formulated by KSI leadership in 2009 after studying the extensive research into the resources in the Solar System and beyond. These resources may be suitable for Earth capture, application to the needs of humanity on Earth, and building human Space settlements. The Sun's energy is just the most dramatic resource. The Law is defined as *Space offers abundant resources for human needs*.

leadership of national and international decision clusters," is the focus for the remainder of this essay.

Readers should understand that the following too brief outlining of Dror prescriptions for avant-garde leaders for the future metamorphosing humanity – which he defines – are designed for Earth's new epoch.[3] Dror does not use Space as a focus, but this article uses the future of humans in Space as an illustrative example.[4] The Space environment has many features that make the Dror assumptions more achievable in Space than on Earth. There is no history of human conflict in Space to date, in spite of the movies in the *Star Wars* series becoming top money-makers by portraying it.[5] There is a vacuum of human settlement history in Space. International cooperation produced many of the major Space missions and projects. Dror's primary prescription for avant-garde leadership is to make the good of humanity a priority. Earth's historic demographics reveal no nation, society, or international entity giving humanity preference beyond the boundaries of that entity. Leaders are elected or created by swearing allegiance to people within those boundaries. Think of the legal, social, economic, and political leaps required for U.S. political leaders to transition to a governmental system that requires their decision makers to give priority to the needs of all humanity. We, in KSI, have a vision where planners for Space settlements reach that agreement and where the successes of those settlements over time become models for Earth-bound politicians.

What are Yehezkel Dror's Prescriptions?

Dror's book describes global leadership today as being unprepared for coping with future challenges. Political leaders have the responsibility to serve as the prime agency to deal with those challenges. But the vast majority of political leaders lack many essential qualities of the mind and are sleepwalkers as far as the future of humanity is concerned.

The book's major conclusion is that leadership will be the key. Furthermore, continued sleepwalking by political leaders on critical issues ensures there will be disasters. The

[3] Yehezkel Dror has included Space in his work, however. See his "Governance for a Human Future in Space," Chapter 5 in Bob Krone, ed., *Beyond Earth: The Future of Humans in Space* (Toronto, ON: Apogee Books, 2006), 41-45.

[4] Dror does reference Space exploration as an important form of creativity in his 2014 book (70); under grand policy conjectures (184), he includes in his list, "Allocation of large resources to select 'big science' projects and space exploration"; at 188 he includes in his rise and decline paradigm section the possibility of "much space exploration and establishment of human settlements in the Solar System, with suitable enhancement of explorers and settlers to make them fit conditions different from Earth, up to perhaps, advancing with time towards human-machine-merging Cyborgs"; and at 236, in his theses on history section, #46, "Even more awesome is the likelihood of synthesizing life, first in the forms of cells that can replicate and evolve, but progressively to more complex self-evolving creatures. If successful, such endeavor will in some respects raise humanity to the level of a Creator, doing deliberately what happened somehow on earth long ago. It is hard to image more total a transformation of humanity than acquiring the capacity to destroy itself, change its basic features, and create new forms of life. The only exception would be contact with extra-terrestrial sentinel beings, but this is extremely unlikely in the foreseeable future and perhaps for all of the lifespan of humanity, however long. But should this occur the implications are inconceivable."

[5] This does not mean that conflict will not arise in the future.

solution takes two major approaches: (1) a radically novel *human constitution* and (2) creating an equally novel political leadership, given the term *Avant-Garde Politician*.

There are three existential imperatives for a human constitution being the authority for avant-garde leadership:

A. Absolute priority should be given to assuring the long-term survival of the human species and to preventing serious harm to large parts of it.
B. The species-changing inhibition imperative. Production, diffusion, and use of species-changing knowledge and technologies and human enhancement should be rigorously controlled on a global scale.
C. The human flourishing imperative. Strenuous efforts should be made to advance long-term pluralistic flourishing of the human species and its parts, while also taking care of the pressing short-term human needs.

The following are avant-garde leadership values, understandings, characteristics, talents and skills:

1. Have a leadership calling-related inner philosophy that is freely chosen and that dominates the whole of life.[6]
2. Have moral, cognitive, and volitional qualities adequate for coping with rapidly changing challenges.
3. Have a realistic comprehension of humans and humanity.
4. Understand that your legacy for the future will be your positive impact on historic processes.
5. Have both ethical basics and utilitarian skills giving priority to bona fide efforts for the needs of humanity and measures needed to advance them.
6. Understand the potential future dangers of technology to humanity as well as its blessings.
7. Have studied past and present leaders' successes and failures to cope with serious problems.
8. Analyze and forecast the implications of continuing and increasing change in society, including global long-term political issues.
9. Be an agent to prevent science from providing an immature humanity with instruments to destroy itself.
10. Have a capability for research and evaluation of desirable scenarios for the future and for disastrous scenarios as well as knowledge of the political feasibility domains for decision clusters addressing those scenarios.

[6] This aspect of Yehezkel Dror's model for avant-garde leadership, innermost philosophy, is the subject of Chapter 19 in his 2014 book. The chapter details the components of an innermost philosophy necessary for successful leadership. It was this chapter that made me realize that I had never done the self-examination to document my own innermost philosophy. So I did. It is in this issue of the *Journal of Space Philosophy* titled *A Personal Philosophy* (71-89).

11. Operate from the understanding that Earth's global problems are increasing, that history has no evidence of solution capabilities for those problems, and that some kind of radically innovative global regime will eventually be necessary. The unknown is whether current and near future global leaders can cooperate to create strong global governance institutions that can move progress toward the desirable scenarios. If that movement fails, the quality of life for Earth's humanity will decrease and conflicts will result in human catastrophes, ethnic genocides, and an increased probability of human-produced human extinction.
12. The preparation and training for people choosing avant-garde leadership as a career will need lifelong formal and real-world learning to a degree that has not previously existed.

Some Concluding Thoughts

Professor Dror has given the world in 2014 a brilliantly assembled study aimed directly at the elusive goal of shaping the future of humanity by leadership with radically different visions and capabilities than found currently. Governance to achieve positive transitions would be a "circumscribed global leviathan."[7] He describes the uncertain and difficult path for those wishing to become avant-garde leaders and ends with "humanity needs you, is calling for you, and relies on you."

After 45 years of being mentored by Yehezkel Dror, of being a professional colleague, and of using his 15 books in higher education, I can share with readers my observation about the evolution of his teaching and thinking. He has provided the world the apex of sophisticated knowledge and insights on public policy making. If you read only this 2014 book, you might make the judgment that Yehezkel Dror must be an academic idealist. That would be farthest from the truth.

Over his career he has taught, written, and consulted from deep insights into the weaknesses and failures of public policy making at all levels and in all cultures. He has explicated the dangers of advancement in science and technology that raise the possibility of human extinction, combined with existing social and political pathologies that raise the probability of that happening. He often reached pessimistic conclusions while documenting the evidence.

I am going to give readers my personal view and Professor Dror can comment on it in the Spring 2015 issue of this journal. I believe that as Yehezkel Dror applied his superior research skills to what he observed in the second half of the 20th Century and as the 21st Century began, he reached the conclusions you will find in *Avant-Garde Politician: Leaders for a New Epoch.* Time is not on humanity's side: without drastic changes in global leadership that will stop the Four Horsemen of the Apocalypse, I doubt that his pessimistic conclusions will change. He is providing a model and hoping for a miracle.

[7] See Chapter 2 of Dror, *Avant-Garde Politician*.

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About the Authors. **Yehezkel Dror** is a Professor of Political Science Emeritus, at the Hebrew University of Jerusalem. As a former senior staff member of the RAND Corporation, advisor to political leaders in Israel and many other countries, and Founding President of the Jewish People Policy Institute, Dror has first-hand experience with the ways the world is ruled. He has published 15 books in ten languages.

Bob Krone is President of the Kepler Space Institute and Editor-in-Chief of the *Journal of Space Philosophy*.

Editor's Notes: The subject of good leadership, particularly good political leadership, is always worthy of academic scrutiny and Yekhekel Dror has done us all a service by examining it. Bob Krone has also done us a service by bringing it to the attention of our readers. It is a regrettable, if not surprising, fact that politicians rarely plan beyond one or two election cycles. Anything that encourages leaders to take a longer-term and more sustainable view in forward planning should be applauded. ***Gordon Arthur***.

Education for Tomorrow's Space Travelers and Developers

By Lonnie Jones Schorer

Abstract
As the propellants of an advancing, enlightened society, risk and exploration have been symbolic of the American way. Standardization in the U.S. education system and collective homogenization of effort are leading students to be risk averse. We are all responsible for teaching our children. To prepare our future space travelers and entrepreneurs for a fast-paced, competitive future in a global economy, we must reevaluate our no-child-left-behind, lowest-common-denominator approach and support those who are intellectually predisposed to risk. A step in this direction would be to synthesize liberal arts and technical preparation in a single *liberal arts-tech degree* – a synthesis that would allow our pioneers to understand the mechanics as well as the context of their commitment. We must imagine, discover, learn, test our limits, and explore. These are inherent rights. To continue to foster mediocrity and stifle individualism is to stall in complacency and wither as a society. This is the greatest risk of all.

Keywords: trends in education, risk averse, benefits of failure, commitment to individual or collective risk, academic comparisons, STEM, experiential learning, liberal arts-tech degree, contact addiction, internal guidance system.

RISK and EXPLORATION go hand in hand in a precarious balancing act, aiming for success while courting failure. Together they are the propellants of an advancing, enlightened society. Education can introduce students to both, via books, learning, and a process that fosters curiosity.

Risk and exploration are not reckless or inherently extreme. They do not have to be physical, but can be conceptual and intellectual. Humans are curious and seek to know and understand. There are different levels and kinds of risks that we live with and accept every day, such as crossing the street, driving, and flying. We seem to accept the risks with which we can identify, while rejecting those with which we have no real life experience.

Teachers say that today's students are risk averse – afraid of failure. This applies to both sexes, although parents and teachers plead: "Please inspire our girls to try. They're afraid even to try." It is not about courage. Students just choose to 'succeed' by playing it safe. In today's pressure of testing and standards, failing – as defined by school systems' evaluation structures – is not acceptable. No child should be left behind. Everyone should receive a trophy. No one's feelings should be hurt. No one loses. In the homogenization and leveling of expectations, we have lost individuality of spirit and the personal pursuit of challenges – the essence of the American way. For the greater good and advancement of society and human knowledge, this is a monumental failure of a different kind.

No one teaches the benefits of failure. By always setting children up for success without letting them work through the process and handle consequences, an opportunity to learn via experience is missed. Failure can be a great teacher, motivator, and eventual confidence builder. One remembers the "D" that showed up on a report card and the extra effort that went into trying harder. Learning to persevere and develop problem-solving and decision-making ability, learning how to overcome adversity and take responsibility for one's choices rather than relying on the 'blame game', learning poise under duress. All are crucial components in character development, development that is stunted if education shields students from the reality that real-world engagement is not necessarily equal and fair. The fact that everyone deserves to have the same opportunities in a school system does not mean that all will achieve and excel – or even pass, in spite of the safety nets.

That there are those willing to commit to individual or collective risk as pioneers is key, both for the advancement of civilization and, more immediately, for the education of our future space travelers and developers. Some people choose the byways to enjoy the scenery and to discover what is around the corner, while others stick to the highways. It is the ones who do not know what is around the corner, but see the unknown as an opportunity and go anyway that will lead us to a new kind of future. Many of those who have succeeded brilliantly were education dropouts who never took the highway. Unable to predict or calculate the outcome, with innate strength they charted their own path with purpose, tethered to a vision and a belief system supported by faith. One cannot just study and learn this. Some seek the stimulation of difficult challenges. It is in their spirit and attitude and DNA. This is not to say that one is either born with this drive or not. The incubation period is education and all that it provides to inspire and awaken young minds.

For young children, education is where we must begin. With the realization that we are falling behind other nations in technical areas, teachers are stretched to the limits by revised standards, national testing, new curricula, local budgets, and social dynamics. Often directed by policy makers without being consulted for input based on their own experience and expertise, teachers are then charged with finding the drivers to encourage and light the spark in students, many of whom give up on their dreams as early as fifth grade! Imagination is our only limit and when dreams disappear, the path blurs. STEM – science, technology, engineering, and math – is the current education buzz term. Are STEM and testing the ultimate answers or are they only part of a puzzling equation?

Parents who uproot and come to the United States to give their children a better education get that it takes hard work. They expect and demand the most from their children, stressing the academics and leaving sports, music, dance, and other enrichment programs for last. When meeting parents during sales of *Kids to Space* books, it was often the parents of Indian and Asian heritage who bought the books. We learned that Smithsonian's Air and Space Museum reduced the shop's book collection in favor of teddy bears and bling as visitors tended to buy trinkets instead of books for their children.

In some societies, students are not allowed to raise their hands or ask questions. In others, no one is allowed to be better than anyone else. No grades are given. One apologizes for winning, discounting preparation and practice and chalking it up to luck or chance. In the United States we want our students to be well rounded. They are encouraged to work hard in school, play a sport, practice a musical instrument, be a scout, walk the dog, do community service, and generally try their best. Colleges consider the entire range of activities. School systems vary in their facilities, their budgets, and the quality of education offered. It then seems a consequence that with standards and evaluation systems that now apply to all, individual effort – at the heart of the American society – is being squelched rather than fostered. Of course we are falling behind when measured against other countries! The comparison is not equal as our children do more than focus on academic pursuits. Where is the study that evaluates them as total human beings, the whole package? We do need to reevaluate and find more ways to acknowledge and accelerate our best and brightest, those who show the most potential and are being held back by the system. Conscious of becoming global citizens, we are moving our educational system to become more like Europe's, at the risk of losing what makes us unique among nations.

In the education scheme, what is a parent's responsibility? Parents are often confused and fail to voice their opinions. They let school districts proceed with changes, hesitant to speak up in fear their children will be targeted. More dialogue and interaction are needed between decision makers and parents so that expectations match. A bored student who has lost interest is often the result of applying the same standards to all. The lowest common denominator is an unrealistic measure of students' abilities and potential. Expect less = get less.

It seems all kids love science. Their eyes light up because it is all around us and is taught via hands-on activities and experiential learning. Science is an open door to knowledge. So why, with no flexibility to choose, are kids being pigeonholed? In some school districts, students take half a year of science and half a year of social studies. What if students want to take a full year of science? Science could be incorporated in subjects such as writing, math, art, geology, and economics.

Creative problem solving and engaging students via integrated project learning captures their attention much faster than paragraphs and problems in a textbook. Some corporations partner with schools, giving students opportunities to divide time between company operations and the classroom. This integrated approach is beneficial for a multitude of reasons.

A liberal arts education exposes students to the humanities via literature, history, art, philosophy, languages, culture, and sciences. It opens doors, introduces possibilities, and develops questioning minds, laying a solid foundation that enriches further pursuits. One graduates with a major, but without a rigid specialty. With a broad background, one has the flexibility to choose a path. Engineering and architecture schools give students training in specific areas, allowing them to enter the job market with confidence based on skills they have learned. Does either type of education train one to be a risk taker?

U.S. Navy SEALs and other military personnel get that kind of training, but that is not how we want to raise our kids. How then? And in the process, how much risk is tolerable?

There is another kind of education – things we learned when running through the forests and fields, riding our bikes at breakneck speed, wading to catch tadpoles, and inventing games. It was earth knowledge, coupled with physical agility and a problem solving sense of self-preservation. The only direction: "Be home by 6:00 for dinner." No one knew where we were. It was up to us to take care of ourselves and use our own judgment in evaluating risks. And then for our children, the world became a bit more cautious. "Where are you going? Who is going with you? Okay. Be home by 6:00 for dinner." Now, the world has become more threatening and kids have less personal freedom to explore and discover. One looked to buy a small house with a big yard so the dog and the kids would have a place to play. Now one buys a big house with a small yard. Kids cannot play outside unsupervised and adults do not have time for yard work. The days of physical fitness, in being one with nature, and coming home by 6:00 are over. In many schools, art and gym have been eliminated so that students will have more time for 'real' subjects. How shortsighted we are in danger of becoming. We cannot return to the simple society of the 50s, but we can develop some new education strategies to give students a more realistic preparation for the future. One teacher offers yoga lessons to help her students handle stress.

Our physical earth-oneness is being replaced by the expansion of social media. There is a new psychological condition called *contact addiction*. Kids feel pressure to be in touch at all times. It is a once-removed touch, via keyboards rather than face to face, that can foster depression, peer pressure, suicidal thoughts, and a world outside a parent's purview. Online games are a solitary, introverted type of play, replacing time spent exploring outdoors. While these games can aid hand-eye coordination and while students have answers at their fingertips, they are missing the physical activity and creativity that foster healthy bodies and minds. While they are sitting in their chairs, we come up with explanations for obesity and aggressive behaviors.

Perhaps with the export of manufacturing, we have lost the workforce that depends on technical knowledge. To rethink our place in the global economy, bring manufacturing back home, and prepare our youth for a fast-paced future, U.S. education needs to reassess its course and construct a new balance – **a liberal arts-tech degree** – where one graduates with all the benefits of a liberal arts background and is also trained in a technical field. Those who graduate with one kind of degree often go back to graduate school, finding they need the balance. Technology will continue to play a greater part in the development of a more intelligent and informed world than ever before. The explorers who go off to other planets, the engineers who develop the equipment and the methods to do so, and the backers who finance the vision need to have both kinds of education in order to understand not only the mechanics, but also the context of their commitment.

At the core of understanding the meaning of life's journey is the spiritual part of our being. Faith, trust, appreciation, curiosity, oneness with the universe, and the strength to find beauty and inspiration in the rigors and toughness of a challenge are things we grapple with and learn. Parochial schools include religious studies in their curriculum. Other students learn ethics, beliefs, and values from their parents, at a place of worship, or on their own. Paying attention to and developing one's internal guidance system is as important a part of one's existence as all the education and facts learned in school. Political correctness bans the Lord's Prayer in schools and prohibits one from wearing a cross. Whatever the tangible symbols of our spiritual convictions may be, no one can strip us of our inner spirit, ability, and choice to risk and explore.

We are all responsible for teaching our children to be self-reliant, resourceful, and less risk averse. Risk is at the core of survival. Not to risk and explore, not to discover and learn, not to meet the unexpected, not to test our limits and learn from new frontiers in the name of science or another purpose is to stall in complacency and wither as a society. That is the greatest risk of all.

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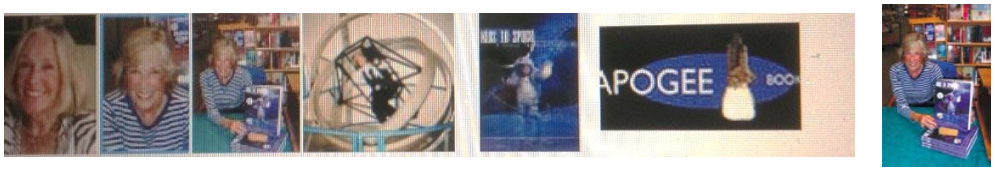
About the Author: Lonnie Jones Schorer, author of the *Kids to Space* series, has a BA in Russian and a Master's Degree in Architecture, which helped launch her on a career of travel, adventure, and accomplishment. She has lived in Thailand, Turkey, Italy, Norway, and the former USSR, supporting husband David's State Department career. In her own parallel career, she has worked with UNESCO world heritage programs. Lonnie is a private pilot, a board member of the Explorers Club Washington Group, an alumni board member of Connecticut College, and a member of the International Group for Historic Aircraft Recovery's (TIGHAR) Amelia Earhart team. She is the Director of Global Space Travelers, a subsidiary of ShareSpace, with Dr. Buzz Aldrin and works with NOAA to locate sunken USN ships. Lonnie headed the design for the 43,000-ton *World of ResidenSea,* which has been touring the world with residents in luxury homes since 2002. Lonnie views the cruise ship industry as a model for future Space travel.



Editors' Notes: Lonnie Jones Schorer has been a revered colleague of the Kepler Space Institute Team going back to its founding in Dr. Kenneth Cox's Aerospace Technology Working Group (ATWG) in 1989. She is the modern Amelia Earhart and always modest about her amazing talents and achievements. In this article of the *Journal of Space Philosophy*, Lonnie shares her own convictions about the curiosity, adventuring spirit, and risk characteristics of humans that account for humanity's progress. ***Bob Krone and Gordon Arthur***.

Religion and Values: Cosmic or Universal Ethics?[1]

By Gordon Arthur

Abstract
In this paper, I examine the global ethics produced by the Swiss ecumenical theologian, Hans Küng, and subsequently adopted at the World Parliament of Religions in Chicago in 1993. I then explore the critique of this document by the American Jesuit scholar, Vernon Ruland. Next, I examine an objection to this programme made by Zhai Zhenming, who is a philosopher at Zhongshan University in south-eastern China and appears to be an atheist. Finally, I explain how I think this relates to the view expressed by Bob Krone in the inaugural issue of this journal that "the Philosophy for the Space Age should be 'Reverence for Life within Ethical Civilization'."[2] In the process, I hope to explore the basis for an agreed ethic that can be used as a foundation for moral behaviour and to clarify whether this basis can better be developed as a global (or perhaps better, cosmic) ethic or a universal ethic.

Keywords: cosmic ethic, global ethic, universal ethic, Hans Küng, World Parliament of Religions.

Cosmic Ethics and Universal Ethics

First I must explain the difference between a cosmic ethic and a universal ethic. A cosmic ethic, based on an agreement on certain principles governing behaviour by people everywhere, is an ethic that can be used everywhere in the world or in space. A universal ethic, by contrast, is an ethic that is based on practical reasoning and it can be applied in many situations. This is what the ancient Greek philosophers were trying to produce; yet Plato's ethics are different from Aristotle's and both are different from either Stoic or Epicurean ethics. Thus, while a cosmic ethic may also be a universal ethic, it need not be. Similarly, universal ethics may not be cosmic in scope. With this in mind, let us begin with Hans Küng.

Hans Küng

Küng's first major attempt to produce a global ethic came in his 1990 book, *Global Responsibility: In Search of a New World Ethic*.[3] In it, he identifies five basic commands that hold in all the world's religions. These are *do not kill*, *do not lie*, *do not steal*, *do not practise immorality*, and *have respect for parents and love for children*. While these may seem rather general commandments, Küng applies them very broadly, applying the prohibition on stealing to a variety of forms of corruption, for example. He sees them as protection against unprincipled libertinism, but is also clear that they must not be applied legalistically. Instead, he seeks a middle way, which avoids either extreme. He also

[1] This is a revised version of a paper entitled "Religion and Worldwide Values: Global or Universal Ethics?" presented at a symposium on globalization at Seattle Pacific University on May 19, 2007. However, the principles explored in this paper apply equally well to humanity in space.
[2] Bob Krone, "Philosophy for Space: Learning from the Past – Visions for the Future," *Journal of Space Philosophy* 1, no. 1 (Fall 2012): 23.
[3] (London: SCM, 1990).

points out that ethics is neither a form of dogma nor a set of tactics: what is moral is not just what is good or right in the abstract, but what is good or right in the particular circumstances surrounding a moral choice. He summarises these ideas in the Golden Rule: negatively, do not do to others what you would not want them to do to you and positively, treat others as you would like to be treated. However, Küng also points out that religions have often failed to live up to their principles, citing such problems as the prohibition of contraception by the Roman Catholic Church (we might add the problem of authoritarian forms of leadership in some Protestant Churches), the treatment of women, dissidents, and non-Muslims by Islamic extremists, and the continuing support for the caste system in some sections of Hinduism.

Küng distils six requirements for a global ethics of the twenty-first century:

> Freedom is required, but so is justice: all must have equal rights and responsibilities and live in solidarity with each other.
>
> Equality is needed, but also plurality: a way must be found to a reconciled multiplicity of cultures, traditions, and peoples worldwide.
>
> Brotherhood is needed, but also sisterhood: a way must be found to a renewed community in which women and men bear equal shares of responsibility and in which each can freely contribute his or her gifts, insights, values, and experiences.
>
> Coexistence is needed, but also peace: a way must be found to a society in which peacemaking as a means of resolving conflicts is given a much higher priority than it is now.
>
> Productivity is needed, but also solidarity with the environment: humanity must learn to live in balance with other creatures and to stop damaging the environment.
>
> Toleration is needed, but also ecumenism: divisions within the religions need to be overcome, religious freedom needs to be permitted, and mistrust and enmity between religious groups need to be overcome.
>
> These requirements, however, are the moral minimum. Documents such as the Torah, the Sermon on the Mount, and the Quran offer a maximal ethic, which can never be replaced by such a declaration.[4]

By 1993, these six principles had been reduced to four and they were endorsed by the Assembly of Religious Leaders at the second Parliament of the World's Religions.

[4] Ibid., Chapter VI. In this section I am developing Küng's argument slightly, as in 1990 his language was not as inclusive as it might have been and there is also evidence of a certain Eurocentricity in his argument.

Principle 1 is a commitment to a culture of non-violence and a respect for life. This has its roots in the commandment, *do not kill*, but it is expressed in the positive form, *have respect for life*. All have the right to life; no one has the right to torture, injure, or kill anyone else. No one has the right to discriminate against minorities. Conflicts must be resolved without violence and in a framework of justice and this applies to states as well as individuals. Those with political power must work within a just world order to find the most peaceful and non-violent solution available. Human life must be protected, but so must animal and plant life. In an interdependent world, we cannot afford to destroy the natural world: we must live in harmony with it. When it comes to moral behaviour, everyone must learn that violence is not a viable way to settle differences with others. Only in this way can a culture of non-violence be developed.

Principle 2 is a commitment to a culture of solidarity and a just economic order. This has its roots in the commandment, *do not steal*, but it is expressed in the positive form, *deal honestly and fairly*. No one has the right to rob or dispossess anyone of anything. No one may use his or her possessions without concern for the needs of society and the Earth. Extremes of poverty amid great wealth, ruthlessly accumulated, must be avoided, as these conditions are fertile breeding grounds for envy, rebellion, and deadly hatred, often leading to a vicious circle of violence and counter-violence. The only solution to this is a just economic order, in which the worldwide debt crisis is resolved and consumption of resources is restrained wherever it is not socially beneficial. Instead, we must utilise economic and political power in service to humanity. Rather than misusing it in ruthless battles for domination, we must cultivate mutual respect and consideration to reach a reasonable balance of interests and we must value a sense of moderation and modesty instead of an unquenchable greed. When it comes to moral behaviour, everyone must learn that property, even if it is limited, carries responsibilities as well as rights and that its uses should serve the common good as well as the interests of its owner. Only in this way can a just economic order be developed.

Principle 3 is a commitment to a culture of tolerance and a life of truthfulness. This has its roots in the commandment, *do not lie*, but it is expressed in the positive form, *speak and act truthfully*. No person or institution has the right to lie to others. This is especially true for those who work in the mass media, artists, writers and scientists, politicians, and representatives of religions, who have a duty to respect human dignity, to observe proper ethical standards, and to refrain from deliberate distortions of the truth, intruding into the privacy of others, manipulation, or stirring up prejudice or hatred. However, we must not confuse freedom with arbitrariness or pluralism with indifference to the truth. We must cultivate truthfulness in all our relationships and we must constantly seek and serve the truth with sincerity, avoiding half-truths and opportunism. When it comes to moral behaviour, everyone must learn to be truthful and to exercise critical judgement to discern when opinions are presented as facts, interests are concealed, or the truth is exaggerated or distorted.

Principle 4 is a commitment to a culture of equal rights and partnership between men and women. This has its roots in the commandment, *do not commit sexual immorality*, but it is expressed in the positive form, *respect and love one another*. No one has the

right to degrade others, treating them as mere sex objects, or to lead them into or hold them in sexual dependency. No one should face sexual exploitation or discrimination. The relationship between men and women should be rooted in love, not patronising behaviour or exploitation. Human fulfilment is not the same as sexual pleasure and sexuality should express and reinforce a loving relationship lived by equal partners. The social institution of marriage provides security for the whole family and all societies are encouraged to develop economic and social conditions in which marriage can flourish. Children are entitled to access to education and there should be no exploitation, either of children by parents or parents by children. When it comes to moral behaviour, everyone must learn that sexuality is creative and affirming, not a negative, destructive, or exploitative force. It can only be effective in shaping community when partners accept the responsibilities of caring for each other's happiness.[5]

Vernon Ruland

In his *Conscience Across Borders: An Ethics of Global Rights and Religious Pluralism*,[6] Vernon Ruland discusses Küng's ethic and the Parliament in his chapter on human rights and religious pluralism. He tells us that the Assembly of Religious Leaders at the Parliament of the World's Religions was given Küng's draft along with a set of procedures that allowed a week's discussion of the text, but no changes to it. This immediately prompted questions as to whether the draft was being imposed, why Küng was selected as the author of the text, whom he had consulted in drawing it up, and how the other religious leaders had been selected.[7] Ruland tells us that Farid Esack, a Muslim scholar-activist specialising in South Africa, objected to the strict pacifism of the text, which he saw as a rejection of self-defence, even for oppressed people, and a recurring emphasis on what he saw as privatised reformation, in which changes in individuals must precede changes in socio-economic structures, rather than occurring simultaneously. All these objections seem to me (and to Ruland) to be well founded. Ruland adds that some of his students saw the text as a distillation of religious moral imperatives into a few platitudes, sometimes merely rehashing the UN Bill of Rights. It avoids tough issues such as the rights of unborn humans and the restrictions in some Churches on women's ministry.

Despite these problems, Ruland is broadly supportive of Küng's position. Ruland points out that Küng has issued rebuttals of the claims against him and has argued that ethics do not simply list rights, but include moral ideals and duties. While the UN Bill of Rights is addressed to sovereign nation-states and their citizens, the global ethic is addressed to the religious and ethical leaders of the world and their adherents. Küng believes that the ethic underpins the Bill of Rights and that the religious traditions must play their part in ensuring the Bill of Rights is not violated.

Ruland particularly praises three features of the global ethic. First, he sees it as a clear, accurate summary of the moral common ground already shared by the major religious

[5] See www.cpwr.org/resource/ethic.pdf.
[6] (San Francisco: University of San Francisco, 2002).
[7] I would suspect Küng was chosen because at the time he had done the work and published it and no one else had published anything similar.

traditions. He sees the ethic as being uncovered within these traditions, not imposed from outside, and spelled out in a graphic context of current drug peddling, torture, sexual abuse, destruction of the environment, and world debt. It identifies an ethical agenda for the future while declaring an ethical consensus rooted in the past, centred on the golden rule, now expressed as *treat every human being humanely*. A human being must always be the subject of rights and not an object of commercialisation for the benefit of the economy, politicians, the media, research institutes, or businesses.

Second, Ruland praises its forthright distinction between minimal and maximal ethics. He points out that some zealous moral humanists have tried to inflate the UN Bill of Rights into a comprehensive secular ethics, something it was never intended to be, and approves the fact that the text rules out such an interpretation. Küng's guiding principle, he tells us, was to avoid matters on which there is no consensus, while still expressing the consequences of the ethical maxims clearly and concretely, even if this made uncomfortable reading for certain religious communities.

Third, Ruland commends the ethic's ability to spark self-criticism within the religious traditions and thereby to induce them to admit their own failings without making exclusive claims to the moral high ground. The most harmful failing, he tells us, is to dismiss other religions as of little value, stirring up prejudice, hatred, and enmity towards other religious communities. The global ethic, he adds, counteracts relativism without replacing it with absolutism and he sees its main value in moderating these extremes. It says to relativists that absolute values exist and to absolutists that no one group has a monopoly on the truth.

Zhai Zhenming

Zhai Zhenming, by contrast, is rather less sympathetic to Küng. His concern is twofold. First, he is concerned that Chinese ethicists in particular are confusing a global ethic with a universal ethic. He is less aware of this in the West, although there is in fact some evidence of just such a confusion in Ruland's work. Second, he is concerned to demonstrate that an appeal to religion as a ground for ethics leads either to dogmatism or to relativism, despite the assertions to the contrary of those involved in framing the global ethic.

Zhai points out that philosophers have traditionally believed that human rationality is a possible ground for a final verdict in moral matters. Given a collection of alleged moral rules, the valid ones can be separated from invalid ones by the methodical use of reason. Universal ethics are not a matter of consensus, Zhai tells us, but a matter of self-evident necessity. Yet the fact remains that when people make supposedly universal ethical claims, they often fail to reach universal agreement.

Does this mean that it is impossible to reach a universal ethic? Zhai does not think so, but he accepts that there is, at this stage, no agreed universal ethic. Despite this lack of agreement, he believes the problems of a global ethic are even worse. Since it is based on a supposed consensus of views, arrived at through inductive investigation rather than rational deduction, it is more subjective than a universal ethic and its writers must

assume in advance that they know what is good and what is evil before the deductive process begins. Zhai suggests that if such a consensus already exists, there is no need to make the declaration and if it does not, making the declaration will not bring it about. Nevertheless, he does find the enterprise commendable, even if he does not agree with all its content. However, he neglects the possibility that the consensus has existed for some time, but that the friction and strife between different religious groups has resulted in a lack of communication and therefore a lack of awareness among their adherents of their shared values, a situation I believe to be the case.[8]

Zhai's main objection, however, is that the ethic treats its principles as commands of God. He accepts the global ethic's call for honesty and applies it in the Socratic sense, that if there is insufficient reason to believe something, we should acknowledge our ignorance. From this he concludes that since in his view there are no rational grounds for believing in God, the global ethic is intellectually dishonest, as the rule of honesty appears to conflict with faith-based religious practice. Had the framers of the ethic been atheists this charge might have had some merit, but since they, along with philosophers from Anselm to Plantinga, believed they had adequate rational grounds for asserting the existence of God, it seems unjust. Furthermore, Socrates was not an atheist, even though he was condemned for impiety, so it is unlikely he would recognise this use of his maxim.

Zhai adds that if things are good because God commands them, God's power and freedom are established, but not God's benevolence and if God commands things because they are good, God cannot be the final explanation of the source of goodness and value. In either event, God, and therefore religion, cannot account for the possible validity of an ethic. However, the same dilemma arises whenever an extra-rational authority is advanced as the ground of an ethic, be it the sage king, tradition, the written text, or the legal system: there are many possible sources of authority. This multiplicity of sources seems to lead either to dogmatism or to relativism. To pick one authority and disregard the others would be dogmatism: this ethic is correct and the others are not. To acknowledge that more than one authority has validity would be relativism: this ethic is correct for me; other ethics may be correct for others. Thus, Zhai concludes, while a global ethic such as the one we have discussed may promote a better world order, it cannot form the basis for a universal ethic.[9]

However, this charge can be turned. Since there are a variety of alleged universal ethics, all derived from supposedly objective reason, those seeking to live ethically must either pick one of the existing ethics or develop their own. If Zhai's charge is correct, it would seem to follow that since there is more than one ethic available, to pick one ethic and disregard the others would also be dogmatism and to acknowledge that more than one ethic has validity would also be relativism, which leaves him in the same boat as the rest of us: our intellectual foundations, even if well-founded, are not totally secure. We might also note that both Plato and Aristotle offered rational grounds for disposing

[8] When dealing with a universal ethic, however, he does allow the possibility that such an ethic has been developed, but not recognised.
[9] See philosophy.zsu.edu.cn/info_Show.asp?ArticleID=336.

of disabled babies,[10] a position that would be considered both irrational and morally repugnant today. This indicates that even secular ethics are not simply based on reason, but take into account other factors as well and so religious grounds for a system of ethics are not logically ruled out. Nevertheless, Zhai seems correct that to establish a system of ethics solely on the basis of a popular consensus, without any rational underpinning, would be inadequate.

Reverence for Life within Ethical Civilization

Krone's philosophy of reverence for life within ethical civilization has three components:

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.[11]

This article is relevant to the first two components. Reverence for life is clearly at the heart of Küng's ethic and it is also clearly designed to bring about ethical civilization. The main question is to what extent does it provide a foundation for doing so?

Küng's fourth requirement and first principle, coexistence and peace and non-violence and a respect for life respectively, explicitly address Component 1, but they do not appear to take full account of the reality that not everyone is interested in peace. Consequently, as Esack pointed out, there may be circumstances where one may be forced to choose between defending oneself against an aggressor or risking being killed. A more developed form of this requirement and principle might encourage the creation of circumstances in which the economic cost of such aggression would outweigh any possible benefits and thereby discourage those who might otherwise resort to war.

Achieving this would also entail substantial progress towards Küng's second principle and fifth requirement: solidarity between people and a just economic order (productivity and solidarity). Such an economic order, in my opinion, will need to be based on something other than capitalism or socialism in anything like their current forms. I would further submit that a move from cost- to value-based economics (which is likely to involve some radical changes in priorities) will be an essential part of achieving this.

The other four requirements (freedom and justice; equality and plurality; brotherhood and sisterhood; toleration and ecumenism) and the third and fourth principles (a culture of tolerance and a life of truthfulness; equal rights and partnership between men and women) are more obviously relevant to Component 2.

[10] See Plato, *Republic* (London: Penguin, 1987), Book V, Section 2 and Aristotle, *Politics* (Cambridge: Cambridge University Press, 1996), Book VII, Section 16.
[11] Krone, "Philosophy for Space," 17-18.

Some seem to be two sides of the same coin (it is not clear how one can have freedom without justice, brotherhood without sisterhood, or equal rights without partnership) and all seek to advance ethical civilization and to balance the rights and responsibilities of everyone in a commendable manner.

It is perhaps less obvious what is necessary to bring them about, but this may become clearer if progress towards peace and economic justice can be achieved. However, Küng's ethic creates a favourable impression, despite its shortcomings, and it seems to be a good foundation for a cosmic ethic.

Conclusion

It seems to me that Vernon Ruland's assessment of Küng's ethic is pretty close to the mark. While I do not share Küng's strict pacifism, I applaud the both/and thinking his work expresses, which is in marked contrast to the either/or thinking that so often characterises Western thought. I do not, however, share the assessment of Ruland's students that the text contains mere platitudes. It may not be very precise, but I think it has substance nevertheless and that it can provide a solid agenda for moral behaviour, an agenda the text explicitly spells out. While I strongly disagree with much of what Zhai Zhenming says, I acknowledge his point that a popular consensus is inadequate grounding for a universal ethic and I think the same point can be applied to a global or cosmic ethic. I think that Küng's work provides a good foundation for a cosmic ethic, but that it also needs to be developed into a universal ethic. This will involve a deeper analysis of the reasons for the moral consensus behind the ethic and it is likely to take some time. This work still needs to be done, but once it is completed, I think Küng's work will be greatly strengthened by it. If his global ethic can be made universal, it is also likely to command a wider consensus than would be expected of a purely religious ethic.

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About the Author: Gordon Arthur is the author of *Law, Liberty and Church: Authority and Justice in the Major Churches in England* (Aldershot, Ashgate, 2006); "The Development of Canonical Jurisprudence in the Roman Catholic Church and the Church of England", *Ecclesiology* 4 (2008): 308-25, and *On Frustrated Vocation* (Ilford: FeedARead, 2012) He gained a BSc in Physics from Birmingham University in 1984, an MA in Philosophy of Religion from King's College, London in 1998, and a PhD in theology, also from King's College, London in 2004. Gordon is Associate Editor of the *Journal of Space Philosophy*.

Editor's Notes: I thank my *Journal of Space Philosophy* colleague, Dr. Gordon Arthur for this excellent research into Cosmic Ethics and Universal Ethics and its link to our 2012 Kepler Space Institute proposal for a Space Philosophy. Dr. Arthur has been an active member of our Space Faith Team of theologians working on the hypothesis that general agreement for Space Philosophy and a code of ethical behaviour can be created as part of Space settlement planning. ***Bob Krone*****.**

Random Thoughts on Morals, Values; Good, Evil and Human Nature

By Lawrence G. Downing, DMin

Abstract
What behaviors can we expect from those who colonize space? Will humans have advanced to the point where conflict and violence have been diminished from Earth? The stories and myths that have since ancient times described the behavior of the beings who inhabit the heavens tell of violence, duplicity, sexuality, and death. Ethics and morality take a minority position. Contemporary science-fiction writers populate their stories with behaviors not unlike those found among the gods who inhabited what we call Space. It is a hope that those who colonize Space will live by a high moral and ethical standard. The evidence to substantiate this hope is slim to non-existent. It is not realistic to expect a change in geography to modify behavior. Human behavior is a complex combination of genetics, environment, and experience. We cannot, through testing or interview, ensure that specific behavior traits will be continued from one time period or one situation to another. People change, and not always for the better.

Keywords: behavior, ethics, morality, myths, genetics, environment, experience, change.

Humans, since the beginning of recorded history, have demonstrated a fascination with the possibility that life and the physical accruements associated with life exist in places removed from Earth. For example the writer of the Book of Hebrews, a book in the Newer Testament, said of the patriarch Abraham that he looked for a city that had foundations whose builder and maker is God (Hebrews 11:10). This city was a heavenly city, not one of Earth.

The various books associated with the prophet Ezra take the reader to “heavenly” places where Ezra encounters all manner of un-earthly beings and views sights not found on planet Earth.

In the ancient accounts of life and events that occur in un-earthly places, conflict, war, expulsion, and death are frequent. In the Mesopotamian *Gilgamesh Epic*, the conflict among the various gods is graphic and violent. The Greek pantheon is populated by numerous vicious gods who vent their spleen upon unsuspecting humans. St. John, in his Apocalypse, gives an account and result of a war in heaven that resulted in Jehovah casting out Satan along with a third of the angels who supported him. A peaceable kingdom is also described in this book, but conflict is in the majority.

Contemporary writers are no gentler than the ancients when it comes to their accounts of how the inhabitants of space behave one to the other. Movies that depict a quiescent society populated by people who demonstrate care and concern for each other are not big draws to the big screen. *Flash Gordon*, *Star Trek*, the *Star Wars* franchise, and countless other sci-fi productions are not built around characters who practice peace.

The heroes do not usually carry an olive branch. Boogymen and monsters are the norm for space citizens.

Who, then, is the more correct in the description the societies that may one day populate space? Will those who propose communities built on principles of mutual respect and care achieve their ends or will the sci-fi scenarios prove more predictive? What will be the determinants that set the course one way or the other?

The biblical writers examined the human family and, as a general trend, came to negative conclusions. The prophet Isaiah looked at his fellow Israelites and said, “Your righteousness is as filthy rags” (Isaiah 64:6). The Apostle Paul, centuries after Isaiah, made a similar inventory and concluded that there is no one righteous, not even one, (Romans 3:10).

It is no surprise that “feel good” individuals take little comfort in the biblical writers’ evaluations of humanity. Were they able to witness present events, the holocaust, ethnic cleansing, and genocide around the world, their verdicts would lend further credibility to the ancients’ pessimistic views of humanity. Are we, then, never to free ourselves from the evils that have so often proven descriptive of human nature? Does the past cast the mold for the future? No! However, and it is a huge HOWEVER, we cannot assume that good intentions and careful selection will assure a bright and peaceful future for those who inhabit Space.

Human nature is far too complex to allow us the luxury of devising a test or norm that will assure that Space communities will not be infected with maladies similar to those that now impact society. Genetics, environment, and human will are powerful forces that we cannot predict with accuracy or control.

We may educate the young to understand and practice morality. We may embed our moral values in every thinking person’s brain and may uphold the highest ethical practices. Suddenly, like a gale from some far place, without warning or reason, one of the carefully chosen ones with an enviable track record, for no apparent reason, goes off track and once more evil reigns.

Are we then to eschew our best efforts and let nature take its course? Never! Ideals and goals are vital to a proposed Space community. Integrity will always have a place as will honesty and peaceful relationships. Be not fooled, nor be surprised, when evil once more lifts its despicable head. Such event will generate response and the circle begins again. The geography may change, the processes, not. We can still dream and, despite set-back, allow hope to arise again from the ashes of our human frailties. We acknowledge there is no magic formula to assure tranquility. We can still hope!

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About the Author: Lawrence G. 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 *Beyond Earth*: *The Future of Humans in Space* (Toronto, ON: Apogee Press, 2006). Access www.bobkrone.com/vcat_details/24 to see the video interviews of Dr. Downing and Dr. Krone at the 2006 International Space Development Conference in Los Angeles. He is Kepler Space Institute's Professor of Space Faith. His article, "*Space and the Art of Staying Human"* is in the Fall 2012 issue of the *Journal of Space Philosophy*.

Editors' Notes: Dr. Lawrence Downing is a pioneer for the complex field of Space Faith. He has stated *that* "*Faith is the base upon which the world's religions build; and faith can only exist when the doctrines/teachings are sustained by the values of those who support and promote the group or movement*." In this short essay he writes about one of the major Space questions – *"Can humans settling in Space leave their pathologies and evils on Earth?"* ***Bob Krone and Gordon Arthur***.

Saving the Human Species and Its Evolving Descendants: The Role of Jurisprudence and Practitioners of Space Law in Safeguarding and Cultivating the Evolution of Human*kind's* Individual and Collective "Essences"

By George S. Robinson

Abstract
Space migration and off-Earth settlement are increasingly recognized as critical to survival of *Homo sapiens sapiens* and its evolving *trans*human and post-human descendants. Space jurisprudents and space law practitioners responsible for formulating and implementing the everyday positive laws relating to human*kind*'s space migration must recognize the empirically premised biochemistry directing the potential for such migration. The ensuing discussion addresses how such migration might best be financed and managed by a unifying globalization of the undertaking, perhaps in a unique *cybernetic*/*cybernation* fashion implemented by *cypersona* as a potential means to minimize the debilitating and frequently destructive impact on human*kind*'s space migration caused by unrelated Earth-indigent geopolitical issues and activities. The role of space law, itself, must be recognized as empirically premised and critical to facilitating such migration, particularly since the key operative phrase, with which all lawyers are familiar, is "time is of the essence." But time, in the context of space migration, also is critical to the ongoing survival and evolution of the as yet empirically undefined "essence" unique to each individual and to its collective species. Failure of survival and evolution of the human*kind* species and its individual and collective "essence" is not an option.

Keywords: critical, migration, cyberspace, essence, survival, extinction.

Both domestic and internationally collaborative uses of outer space resource capabilities need to be addressed in a managed context that is beginning to shift in certain respects to a comprehensive global regulation of those resources and their exploitation, both by governments and the private sector. In this context, it also is essential to have a driving underlying philosophic construct recognized and accepted globally for pursuing various types of space activities; specifically, human space migration and directly related research and development pursuits critical to species survival.[1]

[1] McGill University's Institute of Air and Space Law in Montreal, Canada, held its second Manfred Lachs International Conference on Global Space Governance in May 2014. Since 1999, asserts the Institute, "when the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) was held, the international community has not addressed comprehensively the issue of global space governance. Meanwhile, numerous developments have occurred in the world in general, and the space sector in particular, that have serious implications for the current and future conduct of space activities by all states. Space lies at the nexus of security, strategic stability and scientific, as well as technological, advancement." See http://www.mcgill.ca/iasl/ manfred-lachs-conference-2014.

Space *jurisprudents* as well as space law practitioners responsible for formulating and implementing the everyday positive laws must recognize the biochemical underpinnings of human*kind*'s biological characteristics directing in various ways the opportunity potential for space migration, dispersal, settlement, perhaps mutation, evolution, adjustment, and adaptation necessary for the survival of modern human*kind* i.e., *homo sapiens sapiens,* or contemporary humans, and their evolving descendants. The underlying philosophic construct for implementing these opportunities individually and collectively, shared by all cultures, all societies, and all civilizations, is species and ultimately species*kind* survival,[2] the latter of which include the objects of transhumanism and post humanism.[3] Interestingly, and leaving aside the rather ephemeral characteristics embodied in the theory of intelligent design[4] that imply, if not assert directly, that modern humans are the *intended* (by whom or what?) result of biochemical evolution, perhaps the current representatives of modern humans have already unknowingly met their first extraterrestrials in the form of transitioning offspring, i.e., their own transhuman and post human sons and daughters, grandsons and granddaughters, *ad infinitum*. The substantive underpinnings of this view relate

[2] For an interesting publication recognizing prominent members of the NASA-established and completely independent Space Propulsion Synergy Team (SPST), i.e., addressing the primary importance of human space migration to be the survival of the species, *see* John W. Robinson, "The Justification for Human Space Development and Habitation Beyond Low Earth Orbit: An Invitation for an Open National and International Dialogue," *Space and Evolution*, http://www.eaglehill.us/programs/journals/spaevo/SPAEVO.shtml.

[3] "Transhumanism" is considered by some experts to be an international and intellectual movement with the eventual goal of transforming the human condition by developing and making widely available technologies to enhance significantly the human intellectual, physical, and psychological capacities to enhance the potential benefits and minimize the dangers of emerging technologies that could overcome fundamental human limitations. It also focuses on the "ethical" matters involved in developing and using such technologies. For definitions and descriptions of what currently is considered transhuman, and also post human in a biojuridical context, see G. Robinson, "Space Law for Humankind, Transhumans, and Post Humans: Need for a Unique Theory of Natural Law Principles?" *Annals of Air and Space Law* (2008): 645-712. Post-humans have been defined in various ways, both positive and negative. In certain respects, there is a fear that the definition of human will change radically into describing a totally independent species, perhaps a biotechnologically integrated cyborg that replaces humans in significant, if not all, respects. However, if ongoing research into the proprioceptive or sixth sense of human psychoneurophysiology focuses on a refined form of thought transference that "programs" a post human, will such a post human really be an independent entity? Certain machinery already has characteristics that define biochemical processes and certain characteristics of self-replication by nanobots have already been observed. Or will the concept of separate and distinct human "independence" result from physical interaction with the environment, much like humans, from the point of conception or even before in the development of the gene coding and sequencing, etc., of the sperm and egg throughout the "life" of the individual? Perhaps, more importantly, will human*kind* be replaced totally by biotechnological or even completely technological machines? Either way, the concept is negative, based upon the prevailing view in many quarters that humans are the pinnacle of secular and humanistic evolution, never intended to be surpassed. Query: What happens to *Homo sapiens sapiens* when biotechnological evolution stops?

[4] Intelligent Design Theory does not deny that the so-called Darwinian theory of evolution has occurred, but it does point out that the theory fails to explain the first cause as well as the biological complexity of human evolution. The theory of Intelligent Design does not advocate a literal interpretation of the Bible; nor is it affiliated with any single religion. Nevertheless, many of its most vocal proponents are conservative Christians. *See*, generally, the History of the Intelligent Design Theory, at http://connection.ebscohost. com/science/intelligent-design/history-intelligent-design-theory.

empirically based cultural institutions, such as "the law," to the migration, dispersal, and settlement dictates in a synthetic and alien life-support system; and also to the evolutionary principles of biochemistry and physics underlying organic life and its evolution as they are presently understood.

The human*kind* species is now at the point where *ultimate* survivalism is dependent upon, first, space migration financed/managed by unifying *globalization* of the undertaking, and then, perhaps, second, a *trans*global organizational structure. Such a relatively unique organization might be formulated as a type of private-sector, quasi-sovereign cybernation[5] or cybercorporation, with no or very little unrelated geopolitical constraints imposed by earth-indigent governments. The sole objective of such an entity would be, perhaps, responsibility for facilitating the migration of human*kind* off-earth, primarily relying on efficiently managed private-sector entrepreneurial principles. Towards this end, such an approach might start with pursuing an assessment of the potential for ongoing space migration and habitation through reliance on cyberspace components, including cyberpersona, necessary for a quasi-sovereign private sector cyberspace management entity, the sole objective of which, once again, is systematically to implement and enhance space migration and settlement. While there are existing, and frustrating, attempts by Earth-indigent lawmakers and enforcement authorities to control cyberspace and oversee cyberspace activities carried out by cyberpersona who or that implement and manage these activities, there remain (1) the functional frustration of trying to assert effective *jurisdiction* and applications of earth-indigent laws over cyberspace activities and cyberpersona and (2) the problem of effective *enforcement* of those laws over cyberpersona and cybernation activities.

For the moment, the future of the U.S. component of a global space governance undertaking may well rest in a greater collaborative effort, perhaps starting, for example, with the United States, Canada, China, India, Russia, certain members of the European Union (or more specifically of a reoriented European Space Agency), certain Latin American and African countries, and various relevant international alliances or coalitions. This type of space migration implementation relationship might serve as the *incipient* step toward what may be required for global governance of space activities embracing a universally recognized dictate underlying human*kind* space migration as the next step for species and species*kind* survival as its underlying, motivating

[5] For this discussion, "cybernation" can be defined as an arena a bit more "ethereal" than the traditional definition of a functional control over an industrial operation or task through processing of information with a computer. It has evolved into an environment in which social and business interactions take place, often involving the creation of a cyberpersona, or a personality considered to have a distinct individuality from its creator/user. Etymologically, it is a blending of the words "cybernetic" and "automation." The concept of the cyberpersona self, and how this is influenced by emerging cybernetic technologies, are subjects of research in fields such as psychology and sociology. The online "disinhibition effect" is a classic example, referring to a concept of unwise and uninhibited behavior on the Internet, arising as a result of perceived anonymity and audience gratification. Words in a cybernetic/cyberspace context, such as cybercorporation, cybercrime, cyberterrorism, cyberbullying, and the like, are fairly self-explanatory regarding the general subject matter.

construct. Again, perhaps the next step would be a *trans*global cybercorporation or even a quasi-sovereign cybernation.

The potential for such collaboration can be seen in the coming together of many nations, despite unrelated, conflicting national and international interests, to realize the International Space Station; the relative momentary threat notwithstanding by Russian president Vladimir Putin to deny the current U.S. dependency on the critical Russian manned space transportation system serving the International Space Station.[6] Nevertheless, it is important to visualize nations coming together in a global context and pragmatically focused fashion to create a highly functional and *unique* management infrastructure for sustaining the underlying construct of species survival through *accelerated* space migration.

Finally, an interesting quote seems to reflect rather succinctly the spanning of generations as well as disciplines and professions, including those of former U.S. NASA Administrator Michael Griffin, who on a number of occasions asserted "a single-planet species will not survive." The following quotation appeared in an issue of *Space News* approximately six months ago:

> Manned space travel has the capability of uniting people across a world fractured by economic inequality and religious divide. The Americans and Russians did it successfully at the height of the cold war.
>
> In truth we have little choice. Our craved resources are finite. Our population is booming. We may escape the Malthusian trap by growing affluence. We may not. Why take the risk? Manned space is insurance against both Earth-bound and existential unpredictability. After all, as Larry

[6] In an e-mail communication to the author sent by Lewis L. Peach, Jr., retired NASA Director of Advanced Programs, the space migration issues evolving from President Putin's unrelated *quid pro quo* threat to cancel U.S. manned access to the International Space Station (as a response to sanctions imposed on Russia resulting from that nation's military movement into and annexation of Crimea and the Ukraine) were addressed in part as follows:

> This issue and concern is a very serious threat to the US HSF [Human Space Flight] program and our continued access to ISS [International Space Station]. This crisis is directly traceable to the current Administration's space policy and the actions it directed NASA to undertake. By shutting down the space shuttle, and Constellation, without alternative US HSF access, either in this country or with our ISS partners, save for Russia, they have placed "all hope" on the maturing of a commercial HSF capability that does not yet exist. Many of us urged that NASA be allowed to retain at least a limited space shuttle manifest to resupply the ISS and facilitate crew rotations until an alternate capability was validated and available to assume the job . No reasonable engineer, risk manager, policy advisor with a strategic view of national space assets and capabilities, would have allowed this circumstance to have occurred." [Reprinted here with the permission of Dr. Lewis Peach, Jr.]

Further, in a May 5, 2014 Commentary Editorial of *SpaceNews* at p. 18, this concern was re-emphasized in a U.S. space program context, i.e., "Don't Punish the Space Industry – U.S. Sanctions on Russia Threaten Several Activities."

> Niven said, "The dinosaurs became extinct because they didn't have a space program."
>
> At a time of crippling austerity and welfare cuts, democratic governments find the cost of manned space travel difficult to justify to a recession-weary electorate.[7]

An analysis of the numbers, however, tells a surprisingly different story. In 2006, when the U.S. space shuttle program was still operating, $7 billion was spent on human spaceflight. In the same year, Americans bought more than $154 billion worth of alcohol. Further,

> In contrast, the total amount spent on manned space [was] dwarfed by the amount taxpayers have had to delve into to bail out failed financial institutions since 2008. Would it not be better for the renowned mathematical minds of Wall Street and the City of London to be diverted to solving the issues involving space travel and thereby secure the survival of the human race rather than creating even more complex financial instruments of mass destruction?

And, finally,

> The last counterargument is utility, especially human vs. robotic exploration. The utility of robots is somewhat harder to address empirically. Robotic space programs are cheaper, less risky and currently can go farther. To answer it, we must return to the core argument for manned space travel: To inflame the imagination, to unite the people of the world in a common purpose and ultimately secure the future of mankind.

Once again, this means survival of the modern human species and its *trans*human and post-human descendants. Interestingly, as noted above, this is a quote from an article by Harry Corlett, a 15-year-old student at Winchester College in the United Kingdom. Out of the mouths of babes !

Hopefully, the legal issues inherent in these observations will be addressed directly by the many disciplines in which space law practitioners participate directly, sooner rather than later. In the general context of species survival through exploration, migration, and settlement off-earth, the key operative phrase with which space-related legal practitioners are all familiar is "time is of the essence." Time is relative, of course, but in terms of survival of human*kind*'s "essence,"[8] a sentient phenomenon of which our

[7] Harry Corlett, *SpaceNews*, March 3, 2014.

[8] The word "essence" has many similarly relevant definitions, slightly altered to address a variety of contexts in which it is used: For example, it can be defined as the intrinsic or indispensable properties that serve to characterize or identify something; the most important ingredient; the crucial element, or the inherent, unchanging nature of a thing or class of things. With respect to the characterization of "essence" in the context of human*kind* individuals and societies of those individuals, attempts to understand and describe the concept have enjoyed, and continue to enjoy, long and tortuous pragmatic as well as

understanding continues to be refined as underlying quantifiable empirical data becomes available, time, measured by the passage of events, truly is critical truly is of the essence, so to speak.

While the concept of intelligent design is often offered as the underlying genesis of all biological evolution in which *homo sapiens sapiens* modern man is the ultimate result, it perhaps finds its real justification in defining human*kind*'s essence, however that term is defined incrementally over time, as the ultimate objective of all known biological and biotechnological evolution. This is particularly true given the disruptive physical violence of the universe and the self-destructive biological dictates of human*kind,* itself. In this context, then, it must be decided whether space jurisprudence and implementing laws, both reflecting levels of interactive energy in the form of organized information, will be used by representatives of the legal profession, not as legal mechanics, but as essential jurisprudential design engineers critical for facilitating human*kind*'s space migration, evolution, and ongoing adaptation and the survival of human*kind*'s essence and its evolution. It is a global, and ultimately *trans*global, species*kind* undertaking. Failure is not an option certainly for evolving human*kind*.

Despite the fact that failure of human*kind*'s evolution even the extinction of countless millions of its predecessors of the nature seen on the bush of evolution over the past 3½ billion years is not considered an option; should such a failure occur, an opening door may occur for other species to evolve and fine-tune their own individual and species/subspecies collective essences on one of the seemingly, and *possibly*, endless branches on the evolutionary bush. But then, the element of time, i.e., the passage of energy-based events, as a component of biochemical evolution, is the subject of other forthcoming events adding to an empirical definition of evolution and, indeed, existence.

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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 2013. 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

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academic histories not just to the present, but also with respect to the evolution of human*kind*'s "essence" into the future. For attempts to define "essence" in the context of *Homo sapiens sapiens* and its societal cultures, see generally, www.thefreedictionary.com/essence. For the most part, attempts to understand and define human*kind*'s essence have followed a long and frequently painful path addressing relationships between and among empirical and spiritual characteristics of human "nature." For the purposes of the present discussion, the author relies on a definition based upon the empirical consequences of the sentient or abstract perception capabilities of modern humans (including those evolving in early stages as biotechnologically integrated, pre-post humans), their protohominid ancestors, and a variety of certain species in the lower orders of the Animal Kingdom.

supporter of the Aerospace Technology Working Group, which was the forum from which Kepler Space Institute and University emerged.

Editors' Notes: We, in Kepler Space Institute, 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 is an honor to have him contributing, once again, to the *Journal of Space Philosophy*. ***Bob Krone and Gordon Arthur***.

Defrosting Frozen Wisdom

By Richard Kirby

Introduction and Editing by Gordon Arthur

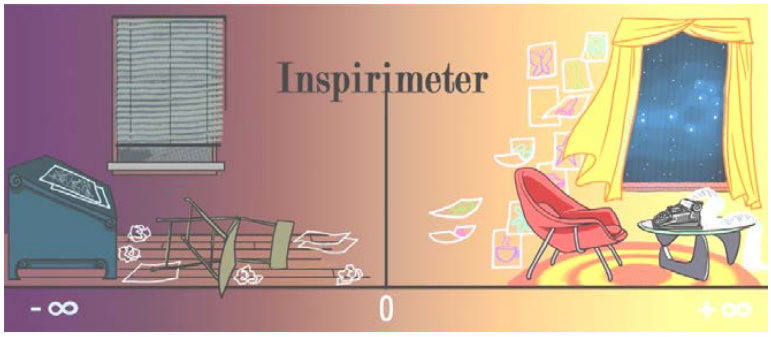
Abstract
This article explores some of the thinking of Richard Kirby, who coined the term defrosting frozen wisdom for searching for past wisdom in hibernation and applying it to the present and the future. It gives an introduction to his work and then gives some extracts from his final book, *The People's Astronomy*.

Keywords: Richard Kirby, defrosting frozen wisdom, *The People's Astronomy*.

Introduction

This article tells part of the story of a unique man who was a model for inspirational leadership for the good of humanity. Richard Kirby became interested in space in 1961, when at the age of 11, he heard of Yuri Gagarin, Alan Shepard, and John Glenn going into orbit to begin the Space Age. On January 1, 2009, he founded the Kepler Space Institute and then later that year, he compiled *The People's Astronomy* over three days. The story ended with his death on September 24, 2009.

The following collage, which Kirby created as a visual aid, is entitled *The Inspirimeter*:



It illustrates Richard Kirby's favoured track of human progress on Earth and into space. As a scholar, astronomer, and minister, Kirby brought his vision of the Solar System and the stars to young and old on Earth with this small book. Like Stephen Hawking's *A Brief History of Time* (1998), *The People's Astronomy* addresses the question, "Why should we go to space?"

Since they first emerged, humans have wanted to fly. The Greek myth of Daedalus's flight from prison to the Sun may be the first such story. Recorded history, science fiction, and the entertainment world continually focus on humans leaving Earth for good or evil.

Dr. Kirby, with KSI co-founder Edward Kiker, picked Johannes Kepler (1571-1630) to represent the Institute, which he hoped would develop into a university, because Kepler was the first to calculate the laws of planetary motion and his laws are still used today to calculate satellite orbits.

So why are Kirby's thoughts so important for the Space Age and why is the title of this article "Defrosting Frozen Wisdom?" Forty-two professionals who have dedicated their lives to flying and to space over the last 50 years since John Glenn orbited the Earth have collaborated in writing *Beyond Earth: The Future of Humans in Space*.[1] It is filled with both theory and detailed explanations for *how* and *why* humans will settle in space. It was this book that motivated Kirby to bring his life's thinking together for people everywhere. "Defrosting frozen wisdom" was Kirby's term for searching past wisdom in hibernation and applying it to the present and the future.

As Bob Krone observed in his introduction to the book, the ultimate answer to "why go?" is a desire for improved human evolution and even human survival:

> Human space exploration and development will bring huge positive changes to our Earth and to the cultures, politics, and societies on Earth.[2]

Richard Kirby's ideas about these changes are visible in the extracts of *The People's Astronomer* that follow this introduction.

> Working with Richard Kirby takes one on a path through forests of paradigms. He was one of Earth's most innovative thinkers.[3]

KSI's environment is "a sea of global problems—for many of which we believe Space resources have solutions."[4]

> Whether you are an astronaut, a fourth grader, a "Woman of the Stars," a teacher, a pilot, an artist or musician, in government, industry or non-profit work, and regardless of where on this planet you live, you will find your personal hopes, optimism and capabilities expanding as you envision a better future through *The People's Astronomy*.[5]

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> **The Story of the Space Age – So Far: The Second and Third Ages of Space**
> The phrase *the space age* was invented by a journalist in the same way the phrase *the atomic age* was invented: it described the most prominent

[1] Edited by Bob Krone (Toronto: Apogee Space Press, 2006).
[2] viii. The text can be found at www.bobkrone.com/node/206.
[3] Ibid.
[4] Ibid.
[5] Ibid.

achievement of the age. The space age is a human concept for human beings. It is not a description of something external in time. It is just a viewpoint. It served its purpose well. It took us essentially from Sputnik 1 to the present moment. More recently, a Congressman spoke of the second space age, when space is seen not for military purposes but for economic purposes; of movement from the public sector to the private. With our social quantum theory, we see a third possibility, and that is what I would call the third space age, somewhat like the Third Age of Middle Earth of *The Lord of the Rings*, the age of the people. This is not about representatives, either public or private, owning the stars, the vast reaches of heaven, and delivering the goods in a diluted form. It is about all the people becoming citizens of the cosmos, here and now, with a new attitude of freedom that comes from imbibing the vast potential of outer space to magnify the available resources for everybody.[6]

Astronomical Wealth Creation and Solutions to Economic Problems of Justice, Finance, Debt, Credit, and Employment

The heavens offer everything we need here and now, without our going any further into space to deliver the solution to our economic problems. The first solution is to banish forever the idea of economics as the allocation of scarce goods among competing wants.

No wonder economics was called the dismal science by many. We in the third space age go back to the time of Aristotle, who coined the word *economics*. It came from two simple words in Greek: *oikos nomos*, the law of the management of the home.

Werner von Braun, the rocket scientist, famously said, “Earth is the cradle of humanity but one does not remain in the cradle.” To grow up is to become a citizen of the stars and to contain within oneself the vast horizons of heaven, to be inspired by it and to replace the idea of economic science or monetary economics or political economy with the idea of infinite abundance. The gift of space is the vista of abundance.[7]

Government Gets Inspired by the StarLight: From Village to UNESCO and Back

The light of the stars has been an inspiration to countless people. Whether it is a particular planet like Venus, also known as Hesperus or Vesper, that causes people to meditate on the rhythms of life, or the planet Jupiter which has given us words like jovial, or whether it is the Milky Way, or whether it is the pattern of the constellations or the position of the North Star, or the precession of the equinoxes, or the regularity of Halley’s Comet, these are sources of inspiration. In our work in social quantum theory at the Stuart C. Dodd Institute, over the last ten to fifteen years, we

[6] Ibid., 2.
[7] Ibid., 6.

> have tried to answer the question, "what is an inspired group?" Here is the great gift of the space age to us. Rather than to inspire a person we are now calling for communities like think tanks, but also schools and ultimately villages, cities and nations in the light of the stars our destiny, and our heritage to become starlit communities; embracing abundance rather than scarcity, so that government, by the people and for the people, is also government by the light of the stars for the people.[8]
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> **Schools of the Stars: Kepler Space Institute and Educational Institutions under the Hypercosmical Reality**
>
> Kepler Space Institute is the first specific school of the stars. We anticipate that all schools should really become star schools, perhaps modeled on an orrery, a model of a solar system, rather than more conventional methods. We are at the very beginning of orbiting schools, of satellite schools, occupied by teachers, I mean, of schools on Mars. But we do not have to wait to leave the planet now. We have done that. What we need is to live as Spinoza the philosopher said, *sub specie æternitatis,* under, as it were, the imagery, the gaze, the attitude and the content of the eternal, another image of heaven. The eternal is the beyond time as well as the beyond earth. If we are beyond time then we are infinite in our resourcefulness. So our schools of the stars are not schools where we learn the old reading, writing, and arithmetic. They are schools where we learn social skills, they are schools where we learn about our own body functions, they are schools where we are equipped for a marvelous enjoyment of the journey through life as space citizens. This is tomorrow's school today.[9]

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About the Authors: Richard Kirby was the co-founder in January 2009 and first President of the Kepler Space Institute. He was a mentor for Dr. Gordon Arthur, editor of this article. Kirby was a cosmic theologian and astronomical chaplain. His most important publications were *The Person in Psychology* and *Individual Differences*, both written with John Radford; *Christians in the World of Computers* with Parker Rossman; and *The Mission of Mysticism*. Kirby also co-wrote *Temples of Tomorrow* with Earl Brewer; *The Leadership of Civilization Building* with Richard J. Spady; and *Nurturing Civilization Building* with Barbara Gilles. His PhD thesis at King's College, London in 1992 was on the theological definition of cosmic order. Kirby took the ordination course at General Theological Seminary in New York from 1982 to 1985, graduating with an MDiv, and worked in various Church ministries on both sides of the Atlantic for the next 10 years. While finishing his PhD in Christian doctrine and history, he developed a

[8] Ibid., 47.
[9] Ibid., 58.

theological think tank that became known as the Stuart C. Dodd Institute for Social Innovation. In 1988, Kirby co-founded the World Network of Religious Futurists. He became its chairman in 1993 and served in this capacity for 12 years, after which he became the organization's chaplain. In 2001 he formed the chaplaincy program for the World Future Society.

Gordon Arthur is the author of *Law, Liberty and Church: Authority and Justice in the Major Churches in England* (Aldershot, Ashgate, 2006); "The Development of Canonical Jurisprudence in the Roman Catholic Church and the Church of England", *Ecclesiology* 4 (2008): 308-25, and *On Frustrated Vocation* (Ilford: FeedARead, 2012) He gained a BSc in Physics from Birmingham University in 1984, an MA in Philosophy of Religion from King's College, London in 1998, and a PhD in theology, also from King's College, London in 2004. Gordon is Associate Editor of the *Journal of Space Philosophy*.

Editor's Notes: This is a special article for the *Journal of Space Philosophy* by two professionals who were present at the beginning of Kepler Space Institute. Richard Kirby and Gordon Arthur were the ones who said in late 2008, "We are launching on January 1, 2009. Rich Kirby and I were communicating by e-mail and phone almost daily through 2008 and 2009 until his unfortunate death on 24 September 2009. Only three hours before his death I was recording his spontaneous talk on the phone on the subject of "The Acceleration of Excellence." His delivery was his normal eloquence with no hint of problems. Three hours later Al Dolan called me to advise that he had been taken by a neurological seizure. Dr. Gordon Arthur was a Rich Kirby protégé who moved from England to Canada in 2006. Gordon is the professional editor responsible for the quality you see in all the issues of the *Journal of Space Philosophy*.
Bob Krone.

The Planet Moon Project[1]

By David G. Schrunk[2]

Abstract
The resources of humankind are now sufficiently advanced to support the global human exploration and development of the Moon. This article discusses the "Planet Moon Project," which portrays a vision to transform the Moon into an inhabited sister planet of the Earth in the 21st century. Beginning with small-scale, tele-operated in-situ resource utilization (ISRU) projects, electric power, communication, and transportation networks will be manufactured on the Moon from lunar resources. These infrastructure networks will be field-tested and commissioned in the South Polar Region of the Moon and permanent human outposts will then be established. Through several phases of development, the utility networks will grow and the number of permanently inhabited bases will increase to include all areas of interest on the Moon. With long-term planning and prudent international coordination of resources, the responsible and beneficial conversion of the Moon into an inhabited sister planet of the Earth will thus become possible.

Keywords: moon, space exploration, in-situ resource utilization, mass drivers, solar sails, space manufacturing, lunar railroad, tele-operated robots, solar power

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.[3] When that link is secured, the following will be realized:

1) the survival of humankind, as a multi-world species will be assured;
2) 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 of all people;
3) large-scale operations (e.g., planetary engineering projects) will be conducted in space independent of Earth resources;
4) every region of interest in the solar system will be explored in depth; and
5) the first missions to the stars will be initiated.

The Moon is nearby – in orbit around the Earth – and is the logical site for the next stage of large-scale space exploration and development. We (humankind) now have the

[1] Excerpted from David Schrunk, B. Cooper, B. Sharpe, and M. Thangavelu, *The Moon: Resources, Future Development, and Colonization* (New York: Wiley-Praxis, 1999). Second ed. published by Praxis-Springer, 2007.
[2] David Schrunk can be reached at docscilaw@aol.com.
[3] Schrunk et al., *The Moon*; Bob Krone, "The Law of Space Abundance," presented at the KSI-NSS Hilton Head Conference, March, 2012.

technological capability for transforming the Moon, in a peaceful and responsible manner, into an inhabited sister planet of the Earth and thus reaping 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 space development.

Lunar Resources

Over the past several decades, both manned and unmanned scientific missions have yielded knowledge of 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. Concentrations of hydrogen (in the form of water ice) 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 virtually unobstructed source of energy in the form of sunlight. Thus the Moon has virtually all of the materials and energy needed to establish large-scale industrial operations on the Moon and to support permanent human settlements.

First Lunar Base

Within this second decade of the 21st century, several nations and commercial enterprises will deliver tele-operated and autonomous robotic devices to the surface of the Moon. As experience is gained with cooperation and coordination of lunar missions, the first unmanned base on the Moon will be established, most likely in the South Polar Region of the Moon. A base in the South Polar Region will have access to water and other volatiles (in cold traps) 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. A promising site for the first base in the South Polar Region is the summit of Mons Malapert,[4] which always has the Earth in view for continuous telecommunications and receives over 250 days of sunlight per year for the generation of solar electric power.

After a critical mass of manufacturing equipment (ovens, crucibles, drills, lathes, 3-D printers, etc.) has been transported to the first base, lunar regolith resources will be used as feedstock for the production of virtually all of the tools and other products that are necessary for the construction of infrastructure elements and human.[5] 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. Excess 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

[4] Schrunk et al., *The Moon*.

[5] Schrunk et al., *The Moon*; P. Metzger, A. Muscatello, R. Mueller, and J. Mantovani, "Affordable, Rapid Bootstrapping of Space Industry and Solar System Civilization," *Journal of Aerospace Engineering* 26 (April 2, 2012): 18-29. doi:10.1061/(ASCE)AS.1943-5525.0000236.

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 exponential. 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 available electrical power will be used by additive manufacturing devices (3-D printers) to make more solar-panel manufacturing machines that can 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 self-supporting 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 circumferential electric grid around the Moon at a latitude of approximately 85° south.[6] 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 tools and equipment that are 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 bases, 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 could 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 will be similar to the challenge of building the solar-powered electric grid. 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 from the South Pole to the mare/equatorial regions and then to the North Pole, thus creating an infrastructure network that encompasses the global structure of the Moon. A

[6] Schrunk et al., *The Moon*.

notional circumferential utilities network of the South Polar Region is depicted in Figure 1.

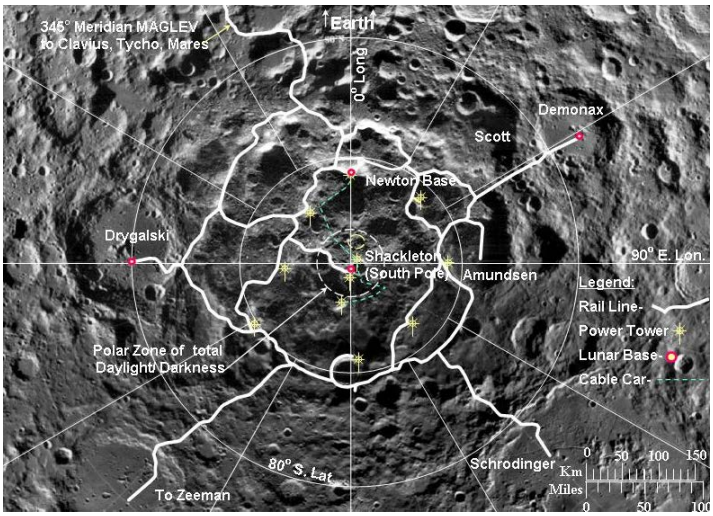

Figure 1: Circumferential utilities network at the lunar South Pole. The initial transportation, solar power, communication, and pipeline networks will be placed around the circumference of the Moon at the South Pole. These networks will then be extended to form a global lunar utilities network. Newton Bas is located at the summit of Mons Malapert.[7]

Power levels in the circumferential grid will increase to the multi-megawatt range as construction of the electric utility continues and experiments will be conducted with the first beaming of microwave and laser power from the Moon to the Earth and other locations in space. 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, either directly from the Moon or from lunar-made solar power satellites in Earth orbit. 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, by the use of excess power to clean up toxic wastes, and by the desalination of ocean water to increase potable water supplies, etc.

Return of Humans to the Moon

Within a decade of the establishment of the first unmanned base, humans will return to the Moon on short-duration missions (60-90 days) to service and maintain complex machinery and to supervise scientific and construction projects. 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.[8] When a reliable lunar electric power system is in place and pressurized underground habitats (for protection from radiation, temperature extremes, micrometeorites, and lunar dust)

[7] Source: Schrunk et al., *The Moon*.
[8] Schrunk et al., *The Moon*.

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 the Planet Moon to create a rich, diverse, and desirable cultural environment for people to work, live, and even retire in. 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.

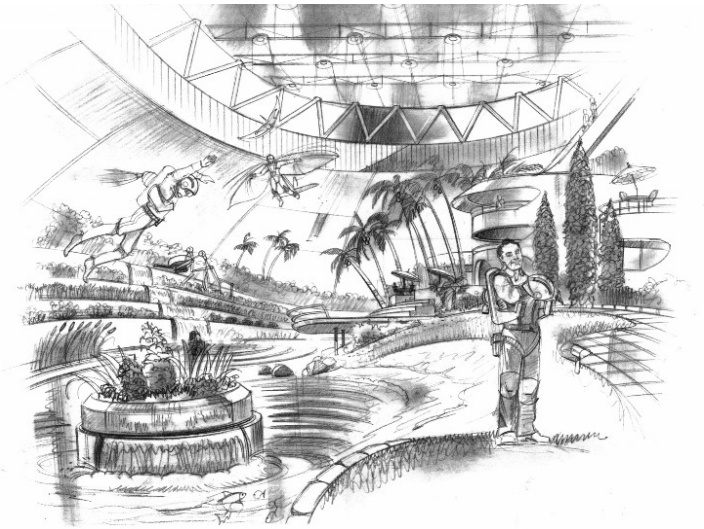

Figure 2: Underground mall on the Moon. Underground malls on the Moon will support large populations in Earth-like conditions.[9]

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.

[9] Source: Schrunk et al., *The Moon*.

The 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 high-value employment on a large scale for the people of every nation and will contribute to advances in all scientific disciplines. 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 civilization. A magnetic levitation rail system will provide high-speed access to population centers of the Moon (Figure 3).

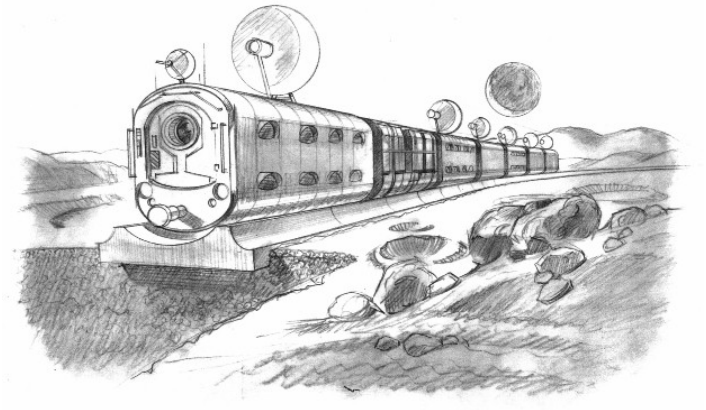

Figure 3: Mag-Lev Train. A magnetic levitation rail system will provide high-speed transportation on the Moon.[10]

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.

Thousands of spacecraft (satellites, probes, landers) will be manufactured on the Moon annually 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 cargos, 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-

[10] Source: Schrunk et al., *The Moon*.

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.

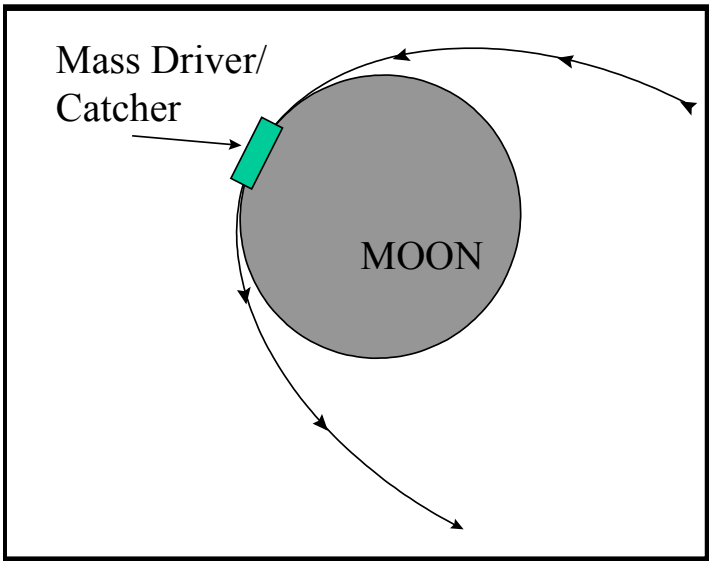

Figure 4: Mass driver on the Moon. Electromagnetic mass drivers will launch and recover spacecraft to and from cis-lunar space, thus eliminating the need for rockets on the Moon.[11]

Also, solar sails, made from lunar aluminum (Figure 5), will likely become a predominant form of solar system transportation in space. 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. Another advantage of solar sails is that laser beams can be used to augment their propulsion. Power augmentation lasers located on the Moon could thus be used to add propulsive forces to solar sailing ships and decrease transit times for high priority missions such as the transportation of astronauts from the Earth-Moon system to Mars.

[11] Source: Schrunk et al., *The Moon*.

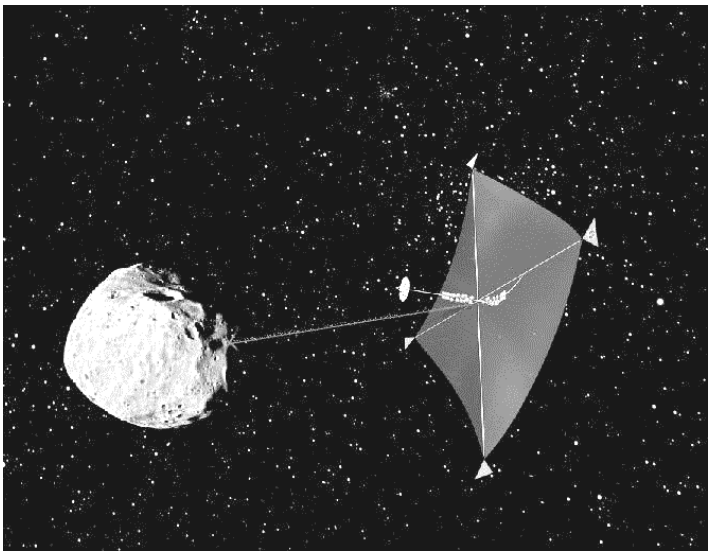

Figure 5: Solar sail transport of asteroid. Fleets of solar sails made from lunar aluminum will ply the reaches of the solar system on cargo and research missions.[12]

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.[13]

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, manufacturing, and nanotechnology.[14] 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 that of the Earth. Metzger et al. 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 millions of times greater than that of the Earth – and will draw on solar system resources that are billions of times greater

[12] Source: Schrunk et al., *The Moon*.
[13] Schrunk et al., *The Moon*; Krone, "Law of Space Abundance"; Metzger et al., "Affordable, Rapid Bootstrapping"; Ray Kurzweil, *The Singularity is Near: When Humans Transcend Biology* (New York: Penguin Books, 2005).
[14] Metzger et al., "Affordable, Rapid Bootstrapping"; Kurzweil, *The Singularity is Near*.

than those of the Earth.[15] In other words, for all practical purposes, the return on investment in the Planet Moon Project will be infinite.

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.

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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. His Science Laws movement has now founded the First Annual Science Laws Convention in San Diego, California, November 2014. Dr. Schrunk lives in Poway, California with his wife, Sijia, son, Erik, and daughter, Brigitte.

Editors' Notes: Dr. David Schrunk is the only medical doctor, aerospace engineer, Space scientist, and author in the world. And he is a Kepler Space Institute 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. Bob Krone 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. Bob videoed Dr. Schrunk, author Dr. Phillip Harris

[15] Metzger et al., "Affordable, Rapid Bootstrapping."

(see his “Humanity’s Destiny is Offworld” article in the *Journal of Space Philosophy* 1, no. 1 [Fall 2012]: 111-21), 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. ***Bob Krone and Gordon Arthur***.

The Stars are In Our Reach

By William Mook

The announcement that a new, very earth-like planet has been found[1] is quite exciting. It prompts me to share some big ideas that require several textbooks to support fully. However, in this article I can only give a brief outline to support the larger vision;

It is time to understand that:

1. squeezed photons can be made to interact so as to produce positrons and electrons efficiently;
2. positrons and electrons form a Bose-Einstein condensate, a superfluid, that is a new molecule, positronium;
3. positronium (Ps) may be stored indefinitely in appropriately structured crystals and manipulated with appropriate nano-scale structures;
4. the superfluid density can exceed that of iron (8 kg/l);
5. the open-lattice crystalline structure to control Ps approaches that of aerogel (800 µg/l);
6. spintronics is an extension of electronics that manipulates electron spin in addition to bulk properties of current;
7. controlled re-combination of Ps elements via 'polarized' Ps pairs creates a controlled beam of polarized gamma rays via conservation of momentum;
8. inverting the photon-squeezing process expands gamma rays to longer wavelengths where they may be further processed.

While these steps are done at present only on the laboratory scale, and not very efficiently in some cases, the physics is clear and also the result: we can make anti-matter powered photon rockets.

We are at the same stage as Goddard was when he did his calculation that showed you could put a ton of flash powder on the moon and observe it with a telescope on Earth.

Figure 1: Goddard in 1916, 1926, and 1940.

[1] www.skyandtelescope.com/astronomy-news/exoplanets/earth-like-planet-found-yet/.

Goddard was inspired by Constantin Tsiolkovsky's rocket equation, first published in English in 1909, and worked ceaselessly at building rockets the rest of his life.

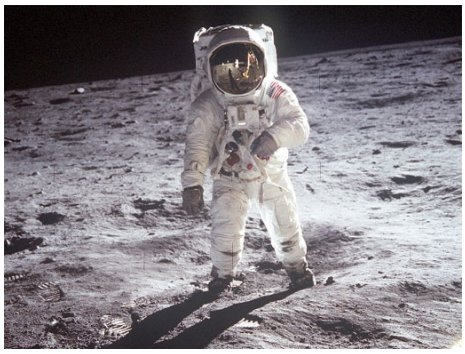

Figure 2: Neil Armstrong on the Moon, 1969.

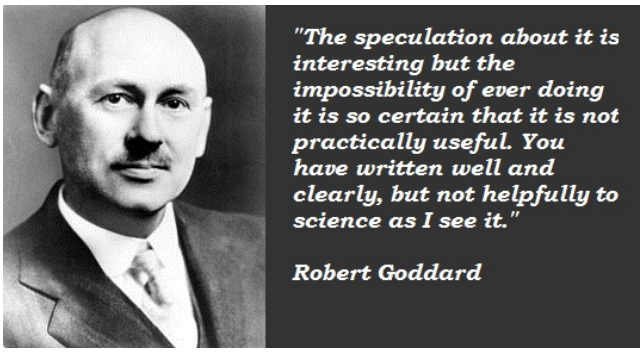

Figure 3: *Popular Astronomy*'s response in 1907 to Goddard's paper on the possibility of navigating interplanetary space.

Sixty years after Tsiolkovsky published his equation in English, 53 years after Goddard conceived of sending a rocket to the moon, humanity sends payloads to the moon.

Now, Rindler has re-worked the rocket equation for relativistic flight.

Tsiolkovsky's original equation is

$$V_f/V_e = LN(m_0/m_1)$$

where V_f = final velocity, V_e = exhaust velocity, m_0 = initial mass, m_1 = final mass.

Rindler's equation for relativistic rockets (propelled by Ps-driven photon rockets) is

$$V_f/c = Tanh(LN(m_0/m_1))$$

Where V_f = final velocity, c = speed of light, m_0 = initial mass, m_1 = final mass.

With a 10,000 to 1 mass ratio possible with the aerogel-containing Ps system, we have

$$V_f/c = Tanh(LN(10,000)) = 0.99999998 = 99.999998\% \text{ light speed.}$$

A two-impulse system has the square root of this mass ratio to carry out the two impulses so, can travel and stop where we're going.

$$V_f/c = Tanh(LN(100)) = 0.99980002 = 99.98\% \text{ light speed.}$$

A four-impulse system takes the fourth root of the original mass ratio, so can travel out and back again.

$V_f/c = Tanh(LN(10)) = 0.98019202 = 98\%$ light speed.

Star Ship

Consider a bullet tank with spherical end caps that is 2,653 meters long and 640 meters in diameter. It has a cylindrical area that is 2,012.5 m x 2,012.5 m totaling 4.05 million sq. m., or 1,000 acres in area. Studies by Gerard K. O'Neill, NASA, and Stanford University in the 1970s and early 1980s before O'Neill's death indicated that this pressure vessel is on the small side of what is possible. The total mass of a vessel that is spun at a rate of once every 36 seconds to reproduce Earth-normal acceleration inside is 7.5 metric tons per square meter of surface area when equipped for long-term human habitation. A total of 40 million tonnes – including end caps.

A spherical tank of crystalline material holding 8 tonnes of Ps per cubic meter and massing 800 μg per cubic meter is now considered.

The tank has a volume of 137.25 million cubic meters. It therefore holds 1.098 billion metric tons of positronium and masses less than 110,000 metric tons. Combined with the habitat just described, the system has a mass ratio of 28.45 to 1.

Not only can a massive solar pumped laser be built to create the immense amounts of Ps needed for this trip in reasonable amounts of time, but that laser will also be capable of generating a beam to accelerate the ship without using any of its stored positronium.

The same 640 m diameter emitter that operates at the tail end of the star ship to propel it using Ps can also be made to reflect energy beamed to the ship to produce a propulsive effect as well. Dr. Young Bae, formerly with US AFRL and currently founder and President of Bae Aerospace, has demonstrated a unique method of using conjugate optics to recycle photons efficiently. This makes what he calls a photonic thruster that permits efficient propulsion at low speeds while more traditional laser light sails proposed by Robert Forward are used at higher speeds. At extreme relativistic speeds, Ps is used.

In this instance, the laser energy accelerates the ship at 0.2 g until it reaches 0.5 c in 30 months. It then uses stored Ps to continue to accelerate until 98% light speed is attained. This takes another 30 months ship time. At speed, every 10 weeks aboard ship is 1 year star time. Spending 50 years aboard ship permits travel to a distance of 250 light years. Five years prior to arriving at one's destination the ship slows at 0.2 g to arrive at its destination.

Within 250 light years of Earth there are 3.5 million stars. Of these 263,257 are G-type stars like the sun. By 2020, the Gaia Spacecraft will have mapped over 1 billion stars – all stars out to a distance of 1,645 light years. About 75 million of these stars will be G-type stars, like the sun.

Aboard the habitation vessel, a 98% outward g-force produced by rotation, combined with a 20% longitudinal g-force produced during acceleration yields 100.0% g-force

tilted at an angle of 11.53 degrees from vertical during boost. During cruise with no boost or on orbit with no boost, the outward g-force normal to the cylindrical surface is maintained at 98% Earth normal.

The same technology that makes photonic drives and very powerful lasers possible by stretching gamma rays produced by controlled Ps decay is also used to mimic the spectrum of the sun on the interior of the ship. At peak sunlight on Earth 1,000 W/m^2 is present. So too on the interior surface light is produced to mimic Earth conditions at noon on a sunny day. This requires a 4 GW light bulb. This bulb is large by conventional standards, small by the standards of the drive system. A diurnal 24-hour cycle leaves us with 250 W/m^2 average output – or 1 GW continuous load, requiring 86.4 trillion joules per day to be maintained. This requires less than 1 gram of Ps per day and totals 350 kg per century.

So, only 1 tonne of Ps of the over 1 billion tonnes described is sufficient for most non-propulsive needs for centuries.

Interplanetary navigation – even at high-speed constant-g boost – requires less than 0.3% of the stored Ps over the same period.

Dr. Mark Roth has demonstrated suspended animation and this may be considered a solved problem for our purposes. Its use aboard the star ship described here allows rotation of crews and passengers, so that they may spend only a few months or years aboard ship in a conscious state, whilst engaged in a trip lasting decades or centuries.

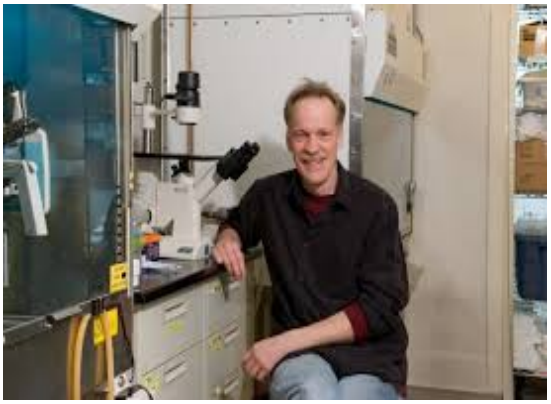

Figure 4: Mark Roth.

Figure 5: Suspended animation capsules.

This seems like a fantastic vision of the future. Perhaps it is out of place in a world that is short of energy and resources; a world that converts less than 4 tonnes per year of matter to energy through a wide range of chemical processes. A billion tons of Ps, even produced with perfect efficiency, would take 250 million years of our current energy output to produce, even if we did nothing else.

Figure 6: Suspended animation.

Of course, all this says is that we will not be using current techniques to produce the Ps for this trip.

Star Ship Supply Chain

And that is the point. A U.S. President once said of the moon program, "We go to the moon and do the other things, not because they are easy, but because they are hard."[2] By doing these hard things, we develop skills that turn hard problems into easy work with the solutions we create.

IBM has recently, in 2013, completed the IBM Jeopardy Challenge, proving that computers can now pass the Turing Test. Vik Olliver and Adrian Bowyer built the world's first self-replicating machine system in 2005.

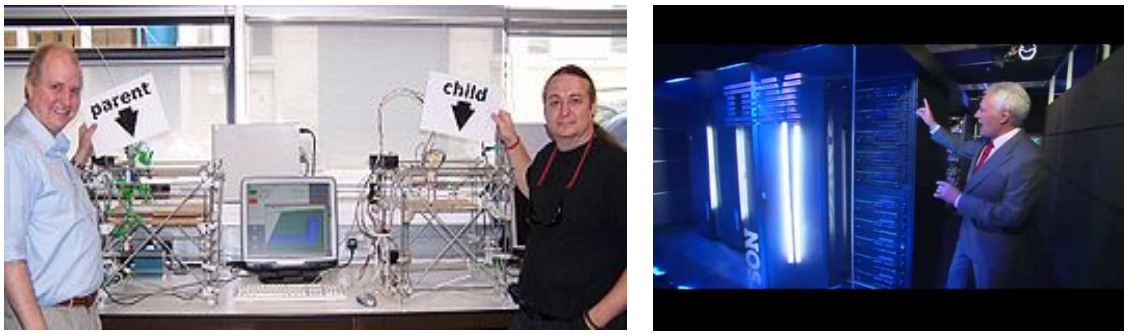

Figure 7: The first self-replicating machine system.

We can use an artificially intelligent self-replicating machine system that operates on the surface of the sun to build and fuel our star ships. These machines will extract metals from the solar atmosphere to replicate. They will use abundant solar energy to fill crystals made on the sun with Ps.

[2] John F. Kennedy, "Address at Rice University on the Nation's Space Effort," September 12, 1962.

Practical Steps and Processes

Solar Panels on the Solar Surface

Let us consider a 1-square-meter solar collector of this type, deposited on the sun. First, would it even be possible for something to survive in material form on the sun? Well consider a sheet of glass like material that is 91% transparent. Exposed to 63.6 MW, each square meter would absorb 5.73 MW and rise to a temperature where it would radiate that energy from two square meters (front and back). Stephan Boltzmann tells us what this temperature is: 2,665 K. Well within the capacity of many materials to withstand. Similarly, if we create a nearly perfectly efficient solar collector that converts the incident energy into Ps and stores it, it need not get too hot. In a similar way, if the sun's hydrogen and helium are reflected efficiently from the surface, whilst the heavier species of elements are admitted and then cooled, these too can be dealt with.

Since the technology that makes laser propulsion and photon rockets possible for star travel involves the same processes and the same energies or higher, construction of this type of solar panel is the path toward star travel.

Analysis of the photosphere and above, the energy and materials available at the solar surface, permits a square meter of Ps-storing solar panel to self-replicate every nine seconds. Since the solar surface totals 6.08 square exameters (6.08×10^{18} m^2), a single square meter grows to cover the entire solar surface in

$$t = t_0 * LN(6.08 \times 10^{18})/LN(2) = 9 * 62.4 = 561.6 \text{ seconds}$$

Of course, moving from the point of impact to the opposite side of the solar disk in this time requires moving at 7,781 km/sec on average. In actual practice, and digital modelling shows this, speeds approach five times that. This requires substantial amounts of energy to achieve. An optimized model would likely take something on the order of 10 hours to complete this task.

So, 10 hours after the arrival of the first well-engineered solar surface panel, the sun turns off! That seems like a side effect we must consider more carefully to avoid.

Controlled Star

One solution would be that such a collector, equipped with an autostereoscopic display on the backside, made of the same array of photonic elements that made photon rockets possible, would also be capable of converting the entire solar disk into a large photonic emitter: a single optical element with a radius of 695,500 km – emitting wavelengths as short as 200 nm efficiently. The Rayleigh criterion for such an optical element says a 200 nm laser beam emitted from it would diverge at a rate of 3.32 meters per light year of range! An Airy disk of 640 m diameter could be formed at a distance of 197.2 light years!

An array of emitters on the surface of the sun, operating on the back side of the solar panel array just described, would also reproduce conditions on worlds around the solar system and even nearby stars, so that the sun would still be visible and appear to be

operating as always, even though 99.9999% of the energy the sun now wastes into space, is captured and converted to positronium molecules stable in a crystalline lattice. Further, the sun is surrounded by nanomachinery that extracts and converts the metals in its atmosphere to usable forms of machinery, in addition to the Ps energy source.

Since self-replicating machinery is a problem solved back in 2005, we can see that all that must be done to make these sorts of vision a reality is to perfect the steps needed to create a square centimeter of a self-replicating positronium-storing, solar collector capable of operating on the solar surface. Such a collector would be capable of operating in a variety of modes that make construction of the spacecraft and its propulsion system, including fuel supply, possible.

The sun, properly equipped, produces 4.3 million metric tons of Ps per second along with many millions of tons of other material, which can be fabricated into anything we describe to the network of panels. Furthermore, the energy in part runs a vast computing and information network that can be tapped to solve problems.

Diaspora

The rate of Ps production allows one ship of the type just described to be sent from Sol every 255 seconds: a total of 123,500 ships per year. Of course, using the laser beam trick to accelerate each to 0.5 light speed and supplying our local needs for energy and materiel reduces this number by about half to 5,000 ships per month, since supporting acceleration of ships with laser beams reduces Ps production and since Ps use on Earth and within the solar system reduces the amount available for use on star ships.

At 2,500 persons per ship, this is 150 million persons leaving the solar system per year. This is 2.1% of the world's 7.12 billion people. This reduces population on Earth despite unconstrained population growth. Due to time dilation and suspended animation, replication in transit does not occur efficiently. If we started in 2015 with this program, by 2057 – the 100th anniversary of Sputnik – we would have only 3.2 billion people on Earth, the same number that were on Earth in 1957 when the space age started with the launching of Sputnik.

The 263,257 G-type stars within 250 light years of Earth will be filled at a rate of 60,000 star ships per year. Licensing travel to the most distant G-type stars in this sphere first, and rolling back 1 light year per year, creates an interesting situation; namely, one where everyone arrives at their destination at precisely the same time! This means all the star colonies will start out at exactly the same time with the same population. The only difference is that later departures will have the advantage of higher technologies developed in the interval between the more distant departures and the one closest in. This creates a sort of natural dispersion of skills and capabilities.

The average number of people per star is 48,000 to 60,000, arriving in 20 to 25 star ships of the type described above over a 65-year period. This will take only 65 years, because at our current population level, we will run out of people to send. Starting today with 7.12 billion of us and dispatching 150 million explorers per year to G-type stars

within 250 light years in this way reduces the number of people on Earth to 221.6 million by 2080 AD. So, sometime between 2057 AD, with 3.2 billion on Earth, and 2080 AD, with 221.6 million on Earth, we expect the demand for star travel to subside. With that, licensing would be liberalized, allowing free access to all and to any star system thereafter up to population growth numbers, of about 1.14% – or with 221.6 million on Earth, 2.52 million per year. Using the type of star ship just described, population per ship drops from 2,500 to 42, which changes payload and production rate hardly at all. After 2080, there will be nearly 7 billion of us, in this scenario, in hibernation, in transit to the stars, for another 195 years. After that, we will encase a quarter million more G2-type stars and begin building large artificial worlds with the material and energy made available with the technology we create today.

With similar advances in ageing research,[3] many of us will be alive then to see it.

If we act now.

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About William Mook, PE: Bill Mook has innovative science and technology ideas for more subjects than anyone you have met. Those subjects range from the rocket history to sustained industrial futures in Space. He approaches his subjects from a mix of engineering knowledge through financial analysis and imbeds them in philosophical rationale as a foundation to support his statement *"The heavens will open to humanity."* He has had management and fiscal responsibility on Fortune 500 R&D teams and provided analytic work for the White House during both the Clinton and Bush Administrations. He holds patents for ground-breaking product developments. He is a member of the Board of Editors for the *Journal of Space Philosophy*.

Editors' Notes: From his office in New Zealand, Bill Mook propels readers farther and faster through Space with science and technology theory than they have ever been before. Bill's imagination for projecting humans in the heavens is a valuable addition to the Global Space Community. See, also, his previous article in the Fall 2013 issue of the *Journal of Space Philosophy*. ***Bob Krone and Gordon Arthur***.

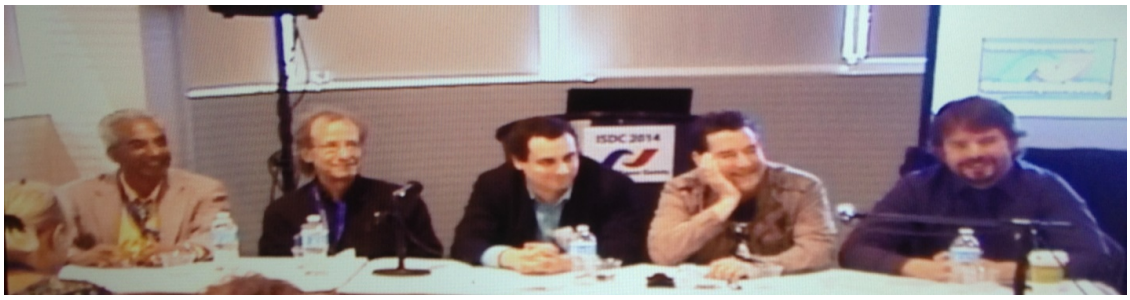
[3] www.ted.com/talks/aubrey_de_grey_says_we_can_avoid_aging.

Space Dilemmas

By Nicola Sarzi-Amade, Howard Bloom, Geoff Notkin, Ian O'Neill, and Madhu Thangavelu.

The Setting

The 33rd International Space Development Conference, Sponsored by the National Space Society (NSS), was held at Los Angeles, May 15-18, 2014. It continued the NSS's valuable series of major Space knowledge-sharing events. The Kepler Space Institute (KSI) played a significant role in the planning and conduct of the convention. Dr. Sherry Bell, Board Member of KSI and long-time leader in the NSS, was a spark plug before and during the conference. She joined Bob Krone in planning the final panel, Sunday morning, titled "Space Dilemmas." Ian O'Neill, Discovery News TV Host, acted as the chair. One of his dilemmas was "the unsolved Space debris problem". Dr. Nicola Sarzi-Amade had done an outstanding job of chairing the Convention Planning Committee. His dilemma was "profitability." University of Southern California Space Engineering and systems design Professor, Madhu Thangavelu, joined the panel with three dilemmas: "extra-territorial destinations," "human-machine logic mix," and the need for space nomenclature standardization. Howard Bloom, scientist, space development leader, and author cites "capturing public imagination" as his dilemma. Geoff Notkin cites "deep space industries and meteorite mining: can we mine useful materials in space?" All five leading Space experts brought a combination of science, technology, humanity, and humor to the panel.



Madhu **Howard** **Nicola** **Geoff** **Ian**

The Kepler Space Institute takes pride in capturing the essence of their presentations for this Fall 2014 issue of the *Journal of Space Philosophy* and thanks the National Space Society for its video coverage of the two-hour panel, which captured knowledge that would otherwise have been lost. ***Bob Krone and Gordon Arthur***.

Space Dilemma – Is Space Profitable? Dr. Nicola Sarzi-Amade.

> I chose to talk about the dilemma: *Is space profitable?* because I have an interest in possibly starting my own space company at some point in the future. The reason why I ask myself if space is profitable is that by looking at the current picture of the space arena it seems that only wealthy people can start a successful space company. So, probably I can re-state my

space dilemma in the following way: “Can a space entrepreneur be financially successful, without having to already be a billionaire?” Why is this question important? Not just because I want to possibly run a company myself in the future, but also because the answer to this question can effectively determine if space is going to be a prominent part of everybody’s lives in the future.

If only billionaires can start a space company and make it successful, then the only hope is that there will always be billionaires who like space and want to invest in it. Otherwise, the only way to develop space will be to find a new type of business model that has not been used before. Will the future situation be better than today? Even though today only rich people can take the risk of starting a space company, can this change in the future and how will it happen? And when will it happen? Well, let us take a look at the present before we can make predictions for the future. Today, which private space companies have been started, are run, or a backed by very wealthy individuals? The few that come to mind immediately are:

SpaceX – Elon Musk
Virgin Galactic – Richard Branson
Blue Origin – Jeff Bezos
Stratolaunch – Paul Allen
Bigelow Aerospace – Robert Bigelow
Inspiration Mars – Dennis Tito

Their companies seem to be starting on a very positive note, although some of these companies still have to prove that they are going to be successful. Even for very wealthy people, getting into the space business is not an easy endeavor. It might take many years to start making money out of a space company. As a consequence, it is also harder to find investors because the return on investment can take many years to materialize. Until a steady income is guaranteed, these wealthy founders actually lose some of their money and they need to invest more of their own money. They say “Do you want to make a modest fortune in space? Start with a big fortune.”

The reasoning I have made so far mostly refers to the NewSpace companies that are planning to involve a crew (or passengers) in their programs, be it suborbital or orbital. That is where the difficulty really is. The most promising, and most near-term opportunity, is space tourism. After the flight of Dennis Tito in 2001, a whole new world opened up. The space tourism companies that were started in following years have had a solid ground to build upon. The other major event was the 2004 Ansari X Prize that enabled the subsequent creation of Virgin Galactic. These efforts are proceeding well and many commercial spaceports are being

created all over the world. A viable, self-sustaining space tourism industry is expected to be created within the next five years.

Is it easy to make money in space? Not at all. Space is a difficult market to crack. On the other hand, when it is cracked, it can be hugely profitable. Think at all the money that can be obtained from mining asteroids. Once that market is up and running, it will be very thriving and very profitable. The challenge is to get there.

Humanity needs a multi-planet society in the Solar System. International cooperation will be a unifying factor.

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Space Dilemma: Howard Bloom

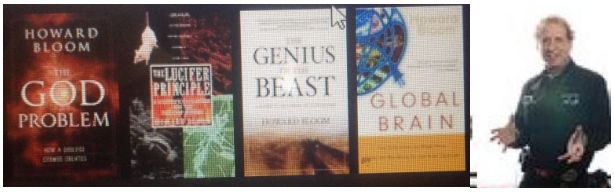
In an e-mail of April 28, 2014 to Bob Krone, Howard Bloom wrote, "*Bob, Space's biggest obstacle its biggest dilemma, its biggest challenge, is to capture the public imagination, to get Westerners as passionate in wanting their Space as they were in 1981 when the public cry was 'I want my MTV'."*

Howard had typically insightful and original comments throughout the two hours. For instance:

The sports world gives us the best example for Space of the benefits of competition within a peaceful context. Competition makes magic! NASA has suppressed the whole subject of conflict between astronauts so we do not know enough about interpersonal conflict for Space travelers.

Every catastrophe is also an opportunity.

I do not doubt there is intelligence in Space; but is there any here on Earth?



Howard's Books

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Space Dilemma: Geoff Notkin

The dilemma of space colonization is huge. Reality TV thrives on fake drama and personal conflicts where somebody wins and others lose. It is the wrong model for space settlements. The military discipline and culture are much better suited for people living and working in harmony.

Earth's youth, like the ones who presented their studies at this conference, will have to address the whole package of dilemmas for space colonization.

How do we solve the international cooperation dilemma for the future of space? Nationalism and corrupt corporations feed that dilemma.

Costs are a dilemma. Space travel should be affordable for everyone.

What entertainment should be provided on long space flights?

We should all be happy that we live in a time when these fascinating and exciting dilemmas exit.

Geoff's Expertise

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Space Dilemmas: Ian O'Neill

Human factors will be the most significant dilemmas for Space travelers and settlers. Those adventures will be different and the greatest experiment humans have ever tried.

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Space Dilemma: Madhu Thangavelu

Here are some dilemmas to consider, Bob:

1. What is the next human extraterrestrial destination? Why? And who will be the next person to set foot there?

The Moon is the next logical and practical destination because it is close by and exhibits all the environmental characteristics of an ideal extraterrestrial destination. Every report from the space agencies, the National Research Council, and independent committees has said this over and over. If we can learn to live and thrive on the Moon, which is just three days away from home (without constant supplies from Earth), we will be ready to settle the rest of the solar system. Once we hone the technologies and tools for permanent lunar settlements, Mars and other destinations in our solar system will become easy to settle permanently.

2. Who will return to the Moon and when?

I think a series of missions by a private entity will be the next sensation to orbit and then land on the Moon. First, a lunar orbital round trip by a space adventure company, followed by lunar landing. Which nation has the technology, the means and muscle to do this? Private space companies in the United States! They will completely circumvent the policy boondoggles that have slowed the progress of spacefaring nations to a crawl and their reams of memoranda of understanding and all the intrigue and cloak and dagger of behind-the-scenes governmental horse trading and dilemmas will be swept up in the trash heap of history.

3. The Philosophy of Man or the Logic of Machine; which way does the arc bend today?

Terms like artificial intelligence, self-organized criticality in swarms of rudimentary machines (stigmergy?), are based on machine logic. While machines are able to assist in sorting and making sense of large piles of data, the human brain and the workings of the human mind are clearly far superior in the process of creativity. Human explorers can appreciate and do things without being instructed or prompted. See how geologists work.

Robotic agents, employing machine logic, need continual input from mission controllers (humans). And, Or, If, Then based logic is at the heart of machine logic. Humans reason through emotional and social intelligence, via experiences, and seek new horizons by the power and freedom of sheer curiosity, paying attention to peripheral details, connecting the dots in subtle relationships to realize new visions, seizing serendipity when it occurs, always looking for opportunities to expand the realm of human experience through empirical world processes.

The day computers start to compose music like Chopin, or write poetry like Longfellow, Wordsworth, or Nash or write plays like Shakespeare,

Shaw, Miller, the day when they ask us "Why?" is when we can really say that machine logic has arrived on the same playing field. It does not seem that we are in that era yet at all. So, I think the mind and works of humanity continually trump machine logic today.

Are there things in life processes that make us think and act the way we do? Self-preservation and procreation, perhaps? I think some answers lie hidden in the riddle of life. When a machine shuts down by itself to dream or catch a breath, or demands a break to take a walk in the park or playfully to kick and toss sand dollars or pick up and examine seashells in the beach sand (for inspiration), that is when I think machine logic will start to show emergence of human intelligence, when they might merge with the human predicament. The Turing test is a joke (Marvin Minsky). When will we emulate or create a machine that can pen a verse with rhyme and rhythm/meter like Frost's "Whose Woods these are ?" I am waiting.

4. What's in a name? Space Mission Nomenclature
ISS – International Space Station – is not international. How can a select group of partners who constitute a small percentage of the human population claim that ISS is a truly international effort? How can we leave out China and India in such a global endeavor, especially since both of those nations have their own prestigious space agencies and projects?

Madhu also cited the dilemma of the inability to extrapolate technology more than twenty to thirty years due to the exponential progress in many sciences.

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Editors' Notes: Space exploration, development and settlement have presented dilemmas ever since humans gazed with wonder at the stars. Science, technology, creative management, and international cooperation have increasingly solved dilemmas over the past sixty years – but this is a subject that will never disappear. The dilemma on which this panel spent the most time was *how do we make it international?* That is also the subject of the feature article of this issue, "Leadership Will Be Key: Applying Yehezkel Dror's Avant-Garde Politician: Leadership for a New Epoch" (12-17).

Kepler Space Institute thanks **Nicola Sarzi-Amade, Howard Bloom, Geoff Notkin, Ian O'Neill, and Madhu Thangavelu** for committing their Sunday morning time to share their important Space dilemmas with ISDC 2014 participants and now with the global Space community via this article. Readers are encouraged to submit their own thoughts on Space Dilemmas to BobKrone@aol.com. ***Bob Krone and Gordon Arthur***.

A Personal Philosophy

By Bob Krone

Dedicated to Mae Sue Krone, whose love, guidance,
and partnership nurtured its evolution

Abstract
After a life of diverse professional activities, including earning a doctor of philosophy degree and editing the *Journal of Space Philosophy*, Bob Krone decides to describe the origins and evolution of his own values and philosophy.

Keywords: values, learning, self-examination, teaching, leadership, academics, systems, space, philosophy, humanity.

Introduction

Michel Montaigne (1533-1592) is credited with inventing the essay form with his classic work *Essais* (1st Edition, 1580). He lived and reworked his essays in a French rural retreat after being the Mayor of Bordeaux from 1581-1585. Since then, essays have traditionally been short statements feeling their way towards expression of what needs a far wider space to exhaust. Using the Montaigne essay style here, I have not provided specific references for statements throughout this article. Interested readers can find my complete resume/curriculum vitae at www.bobkrone.com/node/103.

Every human being has a personal life philosophy. It was formed by a complex lifetime mix of genetics, environment, and learning over time. A small percentage of humans have explicitly documented their own philosophy as an analysis of their own value systems, or to understand the values, sources, and influences on their beliefs over time. My definition of *values* – created during my doctoral studies at UCLA – is "Values are principles or things preferred." That is different from the economic definition of value, which is usually oriented toward quantitative worth. Philosophy and values are not synonymous, but have many commonalities. Philosophy is oriented toward total life meaning, while values form the components of that totality.

Most people's personal philosophy is created and evolves from experiences and just living, not from conscious reflection and design. Is that not the best way to develop philosophy? For some, it may be. But the belief I bring to this article is that individual, family, group, organization, agency, business, society, national, international, and human existence would improve with wiser and more explicit self-examination of values and philosophy. There is value in knowing answers to the questions: *What do I believe?* and *How should my beliefs impact my behavior*?

Dr. Paul R. Cone was my mentor for two university faculty appointments – the University of Southern California in 1975 and La Sierra University, Riverside, California in 1992. Paul was a wise, compassionate, and brilliant leader in both academics and business. One of the many lessons I learned from Paul Cone he had condensed into

one sentence: "If there is a vacuum and you care, then act." I founded the *Journal of Space Philosophy* in 2012 because there was no such professional journal within the global Space Community and I cared.

Recently, I realized that I have a personal vacuum. In spite of earning a doctorate of philosophy, of thinking, studying, researching, and writing about philosophy, and of founding a professional philosophy journal, I had never attempted to document my own personal philosophy. If I were asked, "What is your personal philosophy?" an adequate verbal reply would have been unlikely.

It was the latest book of another of my mentors, Professor Yehezkel Dror, that made me realize that I should care about that vacuum. Dr. Dror, the co-founder of the policy sciences in the 1960s and their leading scholar, teacher, and author since then, includes in his 2014 book, *Avant-Garde Politician: Leaders for a New Epoch*,[1] Chapter 19, "Innermost Philosophy". Dr. Dror provides 18 main facets that are important for the innermost philosophy of avant-garde political leaders. I recommend that everyone in any political leadership responsibility role read that chapter. But, most of Dror's guidelines are relevant for *everyone* who is in any leadership role.

So, is there any purpose for this article other than filling my personal vacuum? In this year of 2014, I am 84 years old. I conjecture that if I had done this self-examination at ages 20, 30, 40, 50, 60, and 70, I would have been better able to adapt my personal and professional life to a set of values and a consciously formed philosophy which I considered good. Thinking and conscious design seem preferable to random evolution, although I grant that reaching a capability for self-examination is an important criterion for doing so. It may well be that reaching seniority has its thinking benefits.

The process of identifying eight decades of evolving learning, beliefs, values, and philosophy was, in itself, a unique personal learning experience. The best metaphor I have for that process is Frank White's *Overview Effect* research and writings for the new perspective of Earth by astronauts in Space.[2] I believe it is impossible for anyone to explicate their own set of values and philosophy fully. That complete set puts boundaries around our findings and conclusions and even attempts at objective analysis will be like putting your toes into a moving stream to test the waters. But part of my own learning experience from this effort is the conclusion that investigating personal philosophy is valuable research. I recommend readers consider that for their own lives.

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[1] (Washington, DC: Westphalia Press, 2014).

[2] Frank White is a senior Space community scholar and philosopher as well as a member of the Board of Editors for this *Journal of Space Philosophy*. He 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*.

My Philosophy Sources over Time

Readers may want to skip this section as being marginally applicable to their lives. But for my personal philosophy, the people and events I summarize here were critically important. As this personal philosophy recording proceeded, from the initial idea to completion, I continually ran into the need for decisions on scope and details. I came to realize the truth that every person and every event in my life had some influence on who I am. The task then became to identify the critically important people and events to avoid turning this essay into a long and boring book.

An interesting question for readers is: "To what degree is personal philosophy pre-determined by early life?" which stimulates the follow-on question of "How can personal philosophy be changed after it is initially formed?" I will leave answers to those questions to the medical and psychological experts. For my analysis, I have divided my life into three separate phases.

Phase I: Genetics and Youth (1930-1948)

My first sources were genetic. My parents, Dr. Max T. Krone (1901-1970) and Harriet Beach Krone Spencer (1900-1996), were Americans who placed education, learning, goal setting, achievement, and family as cardinal values. From age six I also had two step-parents who were important influences and teachers for me. Step-mother Beatrice Perham Krone (1900-2000) was an internationally known music educator who co-founded with my Father, Max Krone, the Idyllwild School of Music and the Arts (ISOMATA) in the San Jacinto Mountains of California in 1950. At age 20 and in my BA (Cinematography) studies at the University of Southern California, I was a student in the first class of that school. I have remained involved to 2014 and have spoken and written on the Max and Bee Krone philosophy that influenced me and propelled that school, now titled *Idyllwild Arts*, to 65 years of success in the arts education world.[3]

My fourth parent was step-father Victor E. Spencer (1893-1984), a soils research scientist at the University of Nevada in Reno. From him, and the Spencer Family members, I learned the importance of research, reliability, honesty, responsibility, humility, humor, hard work, and sacrifice for family and friends.

My young life through junior high and high school was stable in Reno, Nevada. I made a friend, Ed Hancock, in Northside Junior High, in 1943. That rare friendship has remained until today. We were both Boy Scouts during World War II. Ed and I hiked, camped and worked on merit badges, and collected items for the Eisenhower war effort. I can still cite the Scout Oath: "A Scout is trustworthy, loyal, helpful, friendly, courteous, kind, obedient, cheerful, thrifty, brave, clean, reverent." I did not appreciate at the time the high value of those virtues. Ed and I have remained buddies, adventure travel companions, and collaborative educators. See (1) Ed's daughter, Leslie Donovan's *Letter to the Editor* for the Spring 2014 issue of the *Journal of Space Philosophy*;[4] (2) The Interview of Edward L. Hancock in the 2010 *Nevada Review*;[5] and (3) Eduard L.

[3] See www.idyllwildarts.com.
[4] *Journal of Space Philosophy* 3, no. 1 (Spring 2014): 10-11, www.bobkrone.com/node/120.
[5] *Nevada Review* 2, no. 1 (Spring 2010): 10-126.

Hancock's Autobiographical Essay.[6] Being the captain of the Reno High Basketball Team for two years gave me my first exposure to leadership. I must have learned something about social interactions, because I and my girlfriend, Jean Rivera, were voted "the most popular boy and girl" in our senior year of 1948.

Those were my early years of genetic and environmental sources for learning and adapting to life – 1930 to 1948. I do not remember concentrating on those inputs. I was merely the fortunate recipient of the genetics, philosophies, and experience of intelligent, honest, and successful family seniors and good friends who were also fortunate in their genetics and youth.

Phase I: Summary Learning

My early life philosophy was formed entirely by my genetics and environment. It took years more of living and learning to begin to understand how fortunate I was to be born in the United States and protected by intelligent and healthy parents in a stable home and educational environment. The package of values I implicitly absorbed in those years was all positive and it put no negative constraints and many goals into my later development.

Phase II: Military, Academics, and International (1948-1976)

My personal philosophy sources for the next 28 years came from a combination of formal education and the U.S. Air Force. Those two sources were continually intertwined as the Air Force taught me to fly its fighter jets—the T-33, F-84F, F-86A, F-100, T-39 and F-105's—which took me around the world, into continual cultural and ethnic learning environments, taught me about personal risk, and exposed me to the huge satisfactions of flying powerful single-pilot machines and the agonies of losing friends. The Air Force sponsored my enrollment in my master's degree, my PhD, the Naval War College Command and Staff School, and the Industrial College of the Armed Forces major education programs, while progressively assigning me to a 23-year series of assignments with increasing challenges, responsibilities, and rewards. I would not change a day of that living and learning experience.

After my 1952 graduation from the University of Southern California with a BA in Cinematography and a commission as 2nd Lieutenant from the USC Air Force ROTC Program, my Air Force flying training occurred from January to December 1953. My first assignment was to Turner AFB, Albany, Georgia, where a positive lifetime association began. Lieutenant Leo Thorsness and his wife, Gaylee Thorsness, moved into the house across the street in 1954. Between 1954 and 1957, Leo and I flew the T-33 jet trainer, the F-84F Thunderchief, and F-100 Supersabre jets throughout the contiguous United States, Alaska, Puerto Rico, and Europe. This began an association that has lasted 60 years. We both later flew combat in Vietnam. Leo survived over six years of torture and abuse as a prisoner of war in Hanoi, returned in 1973, was awarded the Medal of Honor by President Nixon, was elected to be a Senator of the State of Washington, became an aerospace executive, and served as President of the Medal of Honor Society, 2010 to 2012.

[6] http://bobkrone.com/pub_cat_details/61.

Leo was a major influence for the progression of my personal philosophy. Aside from having the knowledge and skills required to be a superb fighter pilot and jet squadron commander, Leo's personal philosophy accounted for his survival as a member of America's longest incarcerated POW group in its history. He summarized his philosophy's components in his book *Surviving Hell: A POW's Journey*,[7] as "Family, Faith, Fun, Friends, Flying the American Dream, Responsibility." Those were Leo's mental foundations. Before his captivity in 1967, I had always enjoyed Leo's sense of humor. After his release from Hanoi in 1973, it amazed me that his six-and-a-half years of isolation, torture, and abuse had not changed that sense of humor. Leo credits his personal values and philosophy for his surviving hell.

Leo gave a unique and memorable three-minute talk at the 2011 International Space Development Conference (ISDC-2011) at Huntsville, Alabama on May 11, 2011. He told the story of how the American Hanoi POWs first learned that America had landed astronauts on the Moon – fourteen months after Neil Armstrong and Buzz Aldrin did it on July 20, 1969 with the Apollo 11 Mission. You can access that short talk at http://www.youtube.com/watch?v=tDjDKc1LaGU&feature=youtu.be. Leo describes

> The joy and patriotism of the POWs on receiving the news as "The second most important message of our imprisonment, after the message in 1973 that we were going home."

Combat military flying is a unique environment for learning and self-evaluation. When life or death is the outcome, other issues seem trivial. Air Force jet flying, where there is one pilot per airplane, has distinct differences from other forms of combat. Teamwork is just as important as in ground combat or multi-crew airplanes. But being solely responsible for the missions of supersonic machines, and doing it in collaboration with other pilots having the same responsibilities, requires a unique set of skills. That uniqueness is difficult to explain to others, but accounts for old fighter pilots being compelled to attend reunions. Bill Hosmer, a former Air Force Thunderbird Team member, retired USAF Colonel, and Wing Commander, who flew the F-105 in the first mission over North Vietnam on March 2, 1965, captured the feeling at the funeral of pilot colleague Robert V. "Boris" Baird on July 5, 2014, with the comment: "Our group was annealed by the fires from those days in the cockpits over North Vietnam and has stayed in close contact ever since."[8]

One personal military story held an important lesson for me. Air Force Colonel Sabre Sams was the wing commander in Thailand when our 469th Tactical Fighter Squadron was flying F-105 Thunderchiefs over North Vietnam. April 24, 1966 was one of our worst days. Our squadron commander, Lieutenant Colonel Bill Cooper, and Lieutenant Jerry Driscoll were both shot down near Hanoi. That night Colonel Sams told me: "I'm making you the 469th Commander because you have the right combination of brains and guts." That remains the most meaningful officer-effectiveness report of my 23-year

[7] (New York: Encounter Books, 2008), 15-17.
[8] E-mail from John Morrisey, Colonel, USAF (Ret) to Bob Krone, July 6, 2014.

Air Force career. It also added combat leadership to my experience and evolving personal philosophy.

Aviation artist Brian Bateman, and his wife, Louise, happened to be our neighbors in Fallbrook, California when Sue and I moved there from San Bernardino in 2003. He decided to create this painting depicting my 100th Mission over North Vietnam, which happened on 6 June 1966:

Figure 1: Bob Krone's 100th mission over North Vietnam.

I include it in this essay for several reasons. The Air Force's 100-mission tour for pilots was a huge factor for the air war over North Vietnam. Its history was recorded in a permanent exhibition at the National Museum of the Air Force in Dayton Ohio. I helped senior curator Jeff Dufford and his staff in their nine-year project to build that exhibit in one of the museum's hangars. Brian Bateman completed the painting in time for it to be his donation to the Museum during the formal opening ceremony for the exhibit on March 18, 2009.[9] My personal 100 missions and my leadership in the 469th Tactical Fighter Squadron flying the F-105 Thunderchief were, on reflection, major building blocks to my life at age 35. The painting represents for me the aesthetics of flying rather than the conflicts of war.

A previous year's Air Force assignment, 1958-1959, was my most concentrated learning experience to that time. Lieutenant General Robert M. Lee chose me to be his aide de camp for his assignment as the Chief of Staff, United Nations Command, Republic of Korea. He and I were both unaccompanied by families there for 13 months. We lived together in quarters on the Yongson Military Reservation in Seoul. My main job was to coordinate his schedule with the military commanders and units of the United

[9] Readers can view the Museum's 100-mission exhibit at www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=13848. Reference to my 100 missions is at www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=13854.

Nations Command – representing the United States, the Republic of Korea, the British Commonwealth, South Africa, India, Norway, Sweden, the Netherlands, New Zealand, the Philippines, Australia, Belgium, Canada, Colombia, Ethiopia, Greece, Luxembourg, France, Turkey, and Thailand – who had sent forces to combat armies of the Democratic People's Republic of Korea which had invaded the South on June 25, 1950. Agreement to end the war and divide the country at the 38th Parallel had occurred in 1953, five years before our arrival. Those dispersed units were stationed throughout South Korea. It was a 24/7 assignment with one of America's distinguished military commanders – and was my first major international learning experience. Realizing the importance of my opportunity, I kept my first diary of events and people. The later value of that diary justified the special effort required to create it.

There are many more stories relevant for my Phase II period, 1948 to 1976. My application for Air Force-sponsored doctoral studies under the Air Force Institute of Technology (AFIT) was approved beginning in 1968 – two years after my combat flying over North Vietnam. I chose the University of California at Los Angeles (UCLA) Political Science and Policy Sciences PhD program. The main reason for that choice was that Dr. Bernard Brodie, an American senior military strategy scholar, was on that faculty. He became my dissertation committee chair, approving my *NATO Nuclear Policymaking* dissertation in May 1972.

My promotion to colonel also occurred in 1968, which made me the senior Air Force officer of the 105 who were then enrolled in UCLA studies. Also on the campus was a large Air Force ROTC program that was being frequently protested by student groups as "loving war." Air Force leadership tasked me to be the commencement speaker for the summer 1970 class of ROTC graduates, who would be commissioned as Second Lieutenants along with earning their bachelor degrees. UCLA and the UC Berkeley campus had very active anti-Vietnam War faculty and student protest groups. The war had been underway for six years in 1970 and the American public was seriously divided over its conduct. I concluded that I had an important responsibility for the commencement speech. I titled it "The Power and Politics of Lieutenancy," which gave the impression of being an oxymoron to those familiar with the military rank and authority structure. The message of the talk was: *That you graduates will have positive influence on decision making – even as lieutenants – if you follow three timeless keys for success: (1) careful preparation; (2) sustained performance excellence; and (3) a positive values orientation within your "cone of confusion."*

The Air Force leadership published the talk in its monthly *Air Force Policy Letters for Commanders*, January 1971. Forty years later, on December 26, 2011, I got a phone voice message at my home in Fallbrook, California about a commencement talk I had completely forgotten. The CEO of Smart Fleet, Inc. and Fleet Engineering, Inc., Joseph Sobodowski left the message. In 1971, Air Force Technical Sergeant Joseph Sobodowski was a Master Instructor at Chanute Air Force Base in Illinois. He was also the staff person who received information coming in to the base and designated its distribution to commanders and offices throughout the base. He did that by the titles of the documents and rarely read the items himself. But the title "The Power and Politics of

Lieutenancy" caught his attention and he read the article. He later stated: "Its words are indelibly written in my mind and in my spirit." He credited the article with being important for his own business successes and as part of his 33-year teaching career: "It not only impacted me but has touched the lives of people in my sphere of influence."[10] In 2012, Joseph Sobodowski joined our Board of Directors of Kepler Space Institute.

The experience toward the end of my Air Force career created permanent global world-wide political-military values. I was selected in the spring of 1971 to be the Chief of the Nuclear Policy Section at NATO Headquarters in Mons, Belgium. I held that job for three years, from 1971-74, representing General Andrew Goodpaster, Supreme Allied Commander Europe (SACEUR) in the Nuclear Planning Group (NPG). I was in charge of an international group of officers and met weekly in Brussels, when civilian and military representatives of the eleven NATO nations met as the top policy making group for nuclear matters within NATO. Twice a year the NPG met at national capitols of those eleven nations, when the defense ministers led the delegation and NATO nuclear policymaking occurred. I had departed UCLA as an "all but dissertation" PhD candidate, then wrote my dissertation, titled *NATO Nuclear Policymaking*, while on the job in Mons. That complex project was facilitated within the top security classification of NATO by the fact that in 1971 I created the first unclassified briefing on nuclear policy and briefed it continually to NATO visitors. It was a tricky balancing act, because the manuscript had to be approved by General Goodpaster before going to my PhD committee, headed by Bernard Brodie. I was precluded from having anything security-classified in the dissertation by NATO, but the UCLA Committee was eager for operational details, which I could not disclose. The solution that worked was to describe the history and process and significance of NATO's nuclear planning. It worked and became the first higher education dissertation on the subject.[11]

The combination of researching and writing the dissertation with living the process as a participant was the ideal personal learning experience on one of the world's top issues. The issue will never disappear. It actually gets more intense attention as the possibilities of nuclear war exterminating the human race increase over time. Those lessons learned are burned into my personal philosophy. One of the most important lessons learned during that 1971-74 period – which was an intense Cold War time – was that nuclear weapons became one of the reasons that the Cold War never advanced to World War III.

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[10] See Bob Krone and Joseph Sobodowski, "Timeless Keys to Success: A USAF Forty Year Special Case," *Pro Leadership* 1, no. 1, (February 2013): 5-7 at www.assegid.com/Proleadership/documents/PROLeadershipMagazine-V1I1.pdf. The 1970 speech at UCLA is at www.bobkrone.com/node/221.

[11] In 1974, Professors John P. Lovell and Philip S. Kronenberg published their book, *New Civil-Military Relations: The Agonies of Adjustment to Post Vietnam Realities,* (New Brunswick, NJ: Transaction, 1974), with my Chapter 9, "NATO Nuclear Policymaking" at 193-228. It can be found at www.bobkrone.com/sites/default/files/bobkrone_publication/New%20Civil-Military%20Relations.pdf. Dr. Phil Kroneneberg and I had shared the University of Pittsburgh Masters of Public and International Degree Program in 1964 and 1965. His wife, Dr. Renee Loeffler, Sue Krone, Phil, and I have enjoyed decades of rewarding relationships and mutual learning.

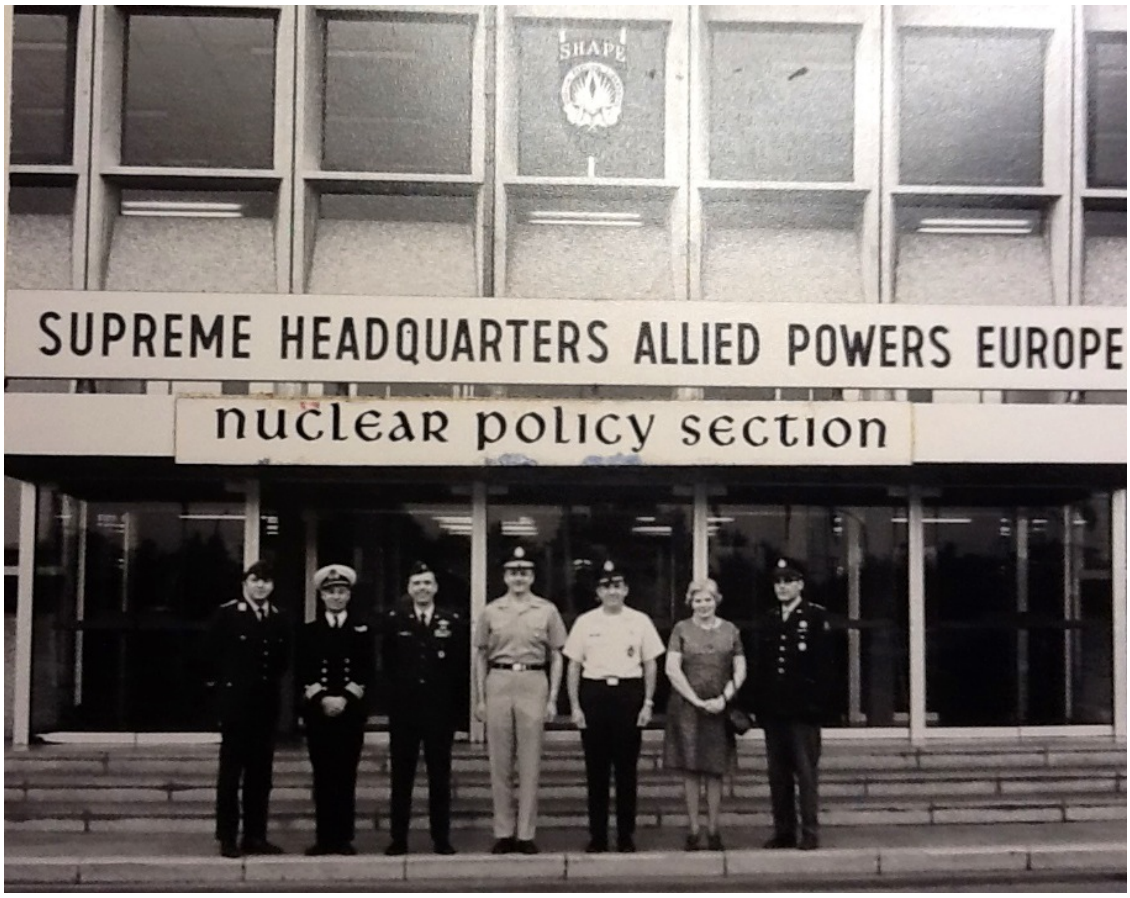

Figure 2: The nuclear policy section, NATO headquarters, Mons, Belgium, 1971-1974.

In closing this Phase II period for the growth of my personal philosophy, I want to recognize the important role of Caryl-Bence "Bencey" Bryan, my wife from 1952 to 1976, and our daughter, Kathleen "Kat" Krone, born at Turner AFB, Georgia, June 17, 1954. Bencey was 19 years old and I was 22 years old when we married in June 1952 in Los Angeles, right after my graduation from USC and being commissioned as a 2nd Lieutenant in the Air Force. Reflecting now on our 23 years of marriage, I realize that we never fully knew or discussed our respective needs. Bencey did her best to adapt to my continually changing Air Force career assignments. My focus remained steadily on successive goal orientations. Our series of separations, always followed by the next move, created progressive problems that ended the marriage in early 1976. Daughter, Kat, was 22 then and productively started on her own education and career.

Phase II Lessons Learned

I do not believe my fundamental personal philosophy acquired in Phase I, 1930 to 1948, was altered in this next phase to 1976. My Air Force career combined with advanced formal education put me in touch with multiple arenas producing experiential learning as I was maturing emotionally. Readers can see by the

stories above that my Air Force career was the driving force. It produced my belief that leadership is the package of skills that creates inspiration in others. It was aided and tempered by a master's degree in Public and International Affairs at Pittsburgh University and my doctorate in Political Science and Policy Sciences at UCLA. My professors at those universities, and my continual interaction with military leaders and colleagues, had major impacts. Learning advanced research tools gave me the ability to judge my associations through "right-and-wrong standards." I believe those standards served me well for my decisions regarding what should be the components of my personal philosophy. In other words, Phase II moved me well beyond the subconscious acquisition of values to a position where intellectual analysis could select the values that continued to build my personal philosophy.

Phase III, Sue and Eight Sciences (1976-2014)

The years 1976 to the present have had three major influences: First, and most important, has been the personal and professional partnership of Mae Sue Harper Parker Krone. I have dedicated this essay to her. She has been the most important positive influence in my life. It would take a book to describe the positive impacts of my 40 years with her, her two sons Robert Patrick "Bob" Parker, daughter-in-law Amy Parker, Donald Clyde "Don" Parker, and daughter-in-law Marti Manser. Sue has been the matron of her large and extended family, all of whom are intelligent and talented people, positively impacting my life. Second has been the academic world. I have been privileged to be a faculty member for teaching and administration, on a global scale, from bachelor's to doctoral levels in three major universities. All my students were bright adults advancing their careers. I learned from them. The third influence has been the global Space community, made possible by Carl Sagan and my NASA beginning in 1980.

To give a better answer for myself to the question of: "What has created meaning in my life?" eight sciences have created major avenues. For each one there were mentors guiding my way: Those sciences have been:

- **political science**;
- **the policy sciences**;
- **systems science**;
- **management sciences**;
- **quality sciences**;
- **knowledge, ideas, and intelligence**;
- **space sciences**;
- **the human creative compulsion**.

Those eight sciences cover a huge portion of humankind's knowledge. My exposure has been enough to impact my own personal philosophy significantly. That exposure has been a learning journey for me. I do not claim top expertise in any of them. And for each there is both theory and practice (i.e., thinking and doing) and both qualitative and quantitative tools and models (i.e., ideas and numbers). This section of my essay can

be used by readers as both a theory and a model for personal relevance. My Air Force aviation, command, and administration career gave me the practical experience to be a mirror for the theories, concepts, knowledge, and insights of those science worlds.

Detailed discussions of any of these sciences are outside the scope of this essay. I will just select the one or two important principles and values from each science that contributed to my personal philosophy through the period 1976 to 2014.

I will begin with my faculty appointment to the Institute of Safety and Systems Management (ISSM) at the University of Southern California in Los Angeles. The director in 1975, when I retired from the Air Force, was Dr. Paul R. Cone. Dr. Cone interviewed me for the new position of director of a new Pacific region for the USC Master of Science in Systems Management (MSSM). USC's MSSM degree program had grown consistently since it won the DOD RFP for a needed master's degree in 1963. The programs were delivered at military installations in Germany, throughout the United States, and across the Pacific. By 1975, the program growth to 55 study centers necessitated the regionalization of program control to Washington DC for the Eastern United States and Europe, to Hawaii for the Pacific study centers, and to the USC Campus for the Western United States.

The USC MSSM degree program continued to grow to 80 global study centers by 1980, when a new USC administration made a strategic decision to reduce its off-campus programs. When I became the chair of the Worldwide Systems Management Department in 1979, our MSSM graduates – ~2,000 each year – were 20% of USC's graduate degrees awarded at annual commencement. It was the first systems management graduate program in the world and it grew to be the largest. Sue and I travelled throughout Asia, Germany, and the United States for my teaching and commencement addresses for 18 years. To summarize the contribution of that experience to my philosophy, there is one universally agreed principle by all the faculty teaching in the MSSM Degree Program. That principle is that systems improvement is the basic goal for all public and private organizations, agencies, companies, churches, and non-profit organizations. No philosophy can be complete without an improvement vision and mission.

My next faculty appointment was as important as the USC experience. It was also due to the leadership of Dr. Paul Cone. When I advised him that in 1992 I was taking early retirement from USC because of the termination of the global MSSM degree, he said "Come to La Sierra University in Riverside, California." I responded, "Paul, you know that I am not a Seventh-day Adventist." And Paul said, "Yes, I know." By 2007, I had taught and consulted with LSU for fifteen years as its only non-SDA faculty member with the title of Distinguished Visiting Faculty.

Both the USC and LSU faculty jobs were in the business and management discipline. The valuable addition for me of the La Sierra University period (1992-2007) was the origin and embedding of the university within the Christian religion. The history and importance of spirituality to humanity was the new lesson learned. The professional who

led that process for me was Pastor Lawrence G. Downing, DMin. Throughout my fifteen years working with the administration, faculty, staff, and students at La Sierra University Larry Downing and I taught together, studied and wrote together, published together, and socialized with his wife, Dr. Arleen Downing, and Sue Krone. We both agreed that leadership is the most important contributor to successful management in any organization. Then we went on to conclude that moral leadership is the most important facet of leadership. History, and present reality, contains overwhelming evidence for that conclusion.

My collaboration with Larry continued into the space community. When we began to plan the Kepler Space Institute in 2009, a team of theologians exchanged views on the subject of *space faith*.[12] The logic took the following form:

1. Spirituality will remain an essential component of human Space settlements.
2. Earth's history records continual religious conflicts.
3. Our hypothesis was that a consensus for a space faith is preferred and feasible.

After two years of sharing thoughts on that hypothesis, Larry created the following which remains today as the best statement on "the essence of our humanity":

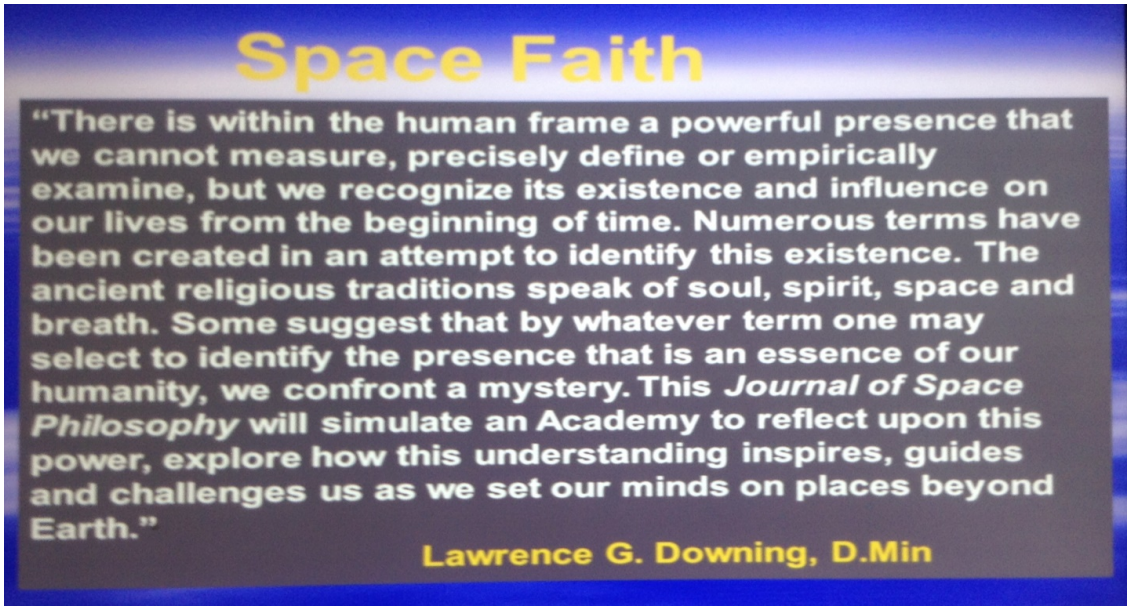

Figure 3: Space faith.

This is a bridge to the *policy sciences*. My summary slide follows:

[12] For a short video of Dr. Downing being interviewed on Ethics for Space, see: www.youtube.com/watch?v=2Zy3SAi6t4c.

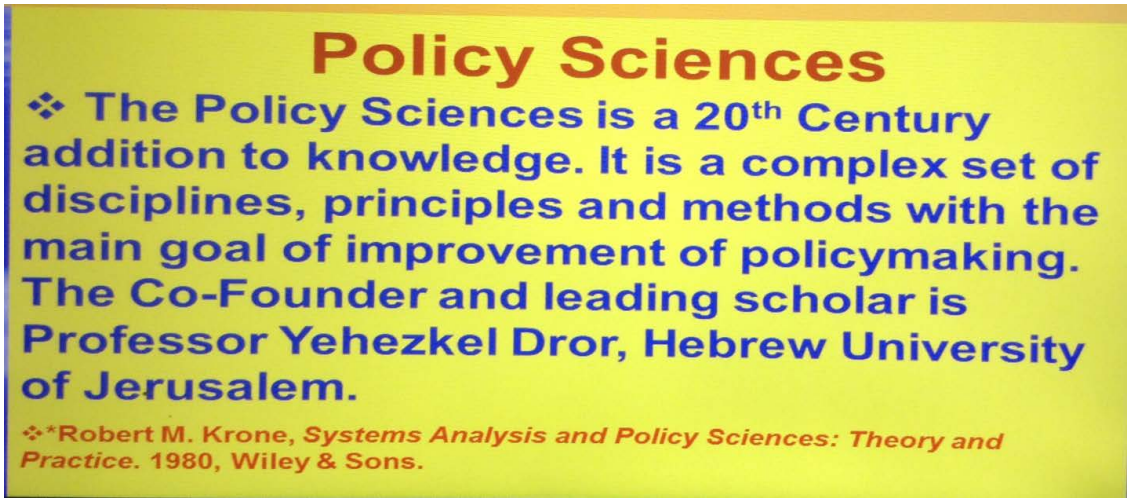

Figure 4: The policy sciences.

One of my personal great fortunes was my enrollment in the one course that Dr. Yehezkel Dror taught at UCLA, in 1969, which was the second year of my doctoral studies. He was on leave from the Hebrew University at the Rand Corporation in Santa Monica, California. Rand was the world's mother think tank and Dr. Dror had been invited there by RAND President Harry Rowen, after meeting him at an activity in Israel. He was there for two years as a senior professional staff member (the first non-American with a regular appointment at RAND). One class from Professor Dror convinced me that policy sciences would be in my future. We have collaborated over the past 45 years. His writings and wisdom have become a permanent part of my personal and professional philosophy.[13]

The quality sciences caught my attention during my doctoral studies, 1968 to 1972. They have continued as huge knowledge inputs to the present. After my appointment to the systems management faculty at USC in 1975, I designed USC's first graduate courses in quality management and helped sponsor presentations at American Society for Quality (ASQ) conferences. By 2005 I had been a member of ASQ for 30 years and had earned my ASQ Fellow membership. Along the way I created on the Inland Empire, California Section web site *The Quality Classic Essays.*[14] It is not possible to summarize this movement begun by Drs. W. Edwards Deming and Joseph Juran in Japan after WWII, which has revolutionized government and industry work around the globe. There are still large areas where quality has not been adequately applied to work.

[13] Yehezkel Dror's teaching at UCLA followed by my collecting all of his published works led to my first text publication, in 1980, while on the faculty: *Systems Analysis and Policy Sciences: Theory and Practice* (New York: John Wiley & Sons), 216pp. with a Foreword by Yehezkel Dror. Then in 1991, my second text was *Essays for Systems Managers: Leadership Guidelines* (Bend, OR: Daniel Spencer Publishers), 125pp. Leo K. Thorsness wrote the foreword and there was a chapter on the policy sciences.

[14] *Thirty-three Quality Classic Essays* and some other publications can be found at www.asq711.org.

In August 2014, Larry Downing and I taught a concentrated strategic planning online course for the business and development master's degree program at the Pacific Adventist University in Port Moresby, Papua New Guinea. At one of Dr. Juran's last speeches, he predicted that the 21st Century would be "the century of quality." The finding that quality pays is no longer debated. Earth's developing world is too slowly learning the quality sciences.

Knowledge, Ideas, and Intelligence

Trying to prioritize the total philosophical influences on my life from academia and the sciences would be futile. But Leonardo da Vinci's quote accurately reflects the importance to me of continuing education:

> ***Learning is the only thing the mind never exhausts, never fears, and never regrets. It is one thing that will never fail us.*** ***Leonardo da Vinci (1452 - 1519)***

That truth convinced me to retire from the Air Force and to devote my career after 1975 to higher education for myself and others. It was Dr. C. C. Crawford, who I helped return to USC in 1982 from his 1965 faculty retirement, who put capturing ideas and brainpower into my academic activities. It was the faculties and graduate students at three universities, 1975 to 2007, who kept me focused on my own learning and my teaching of others. The one scientist who most dramatically mentored me into the mysteries of intelligence was Dr. Joel Isaacson. We shared a NASA/IEEE 1980 Summer Research at the University of Santa Clara in California.

We were two of 37 professionals researching *advanced machine intelligence* for NASA at the urging of Carl Sagan. We have been university colleagues and friends ever since. Joel's discoveries, beginning at Goddard Space Center in the 1960s, have placed him as the founder and lead researcher of "Nature's Cosmic Intelligence."[15]

I believe history will honor him comparably with Albert Einstein and Isaac Newton.

[15] Joel Isaacson has pioneered in recursive distinctioning (RD) cellular automata since the 1960s. RD 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. See his "Nature's Cosmic Intelligence" article in the *Journal of Space Philosophy* 1, no. 1 (Fall 2012): 8-16.

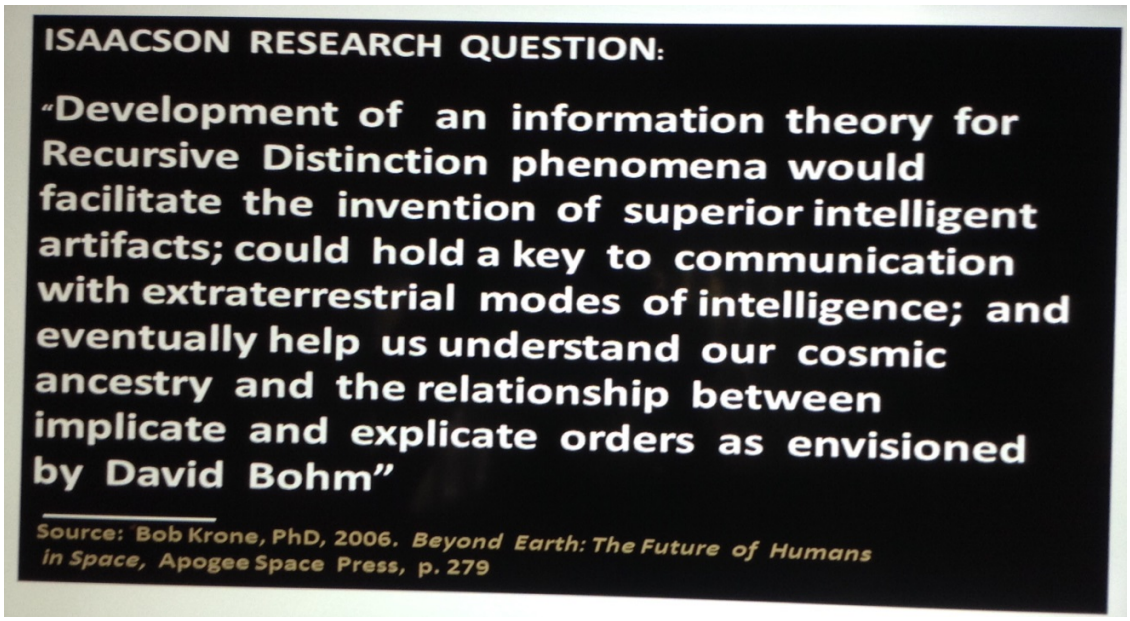

Figure 5: Isaacson research question.

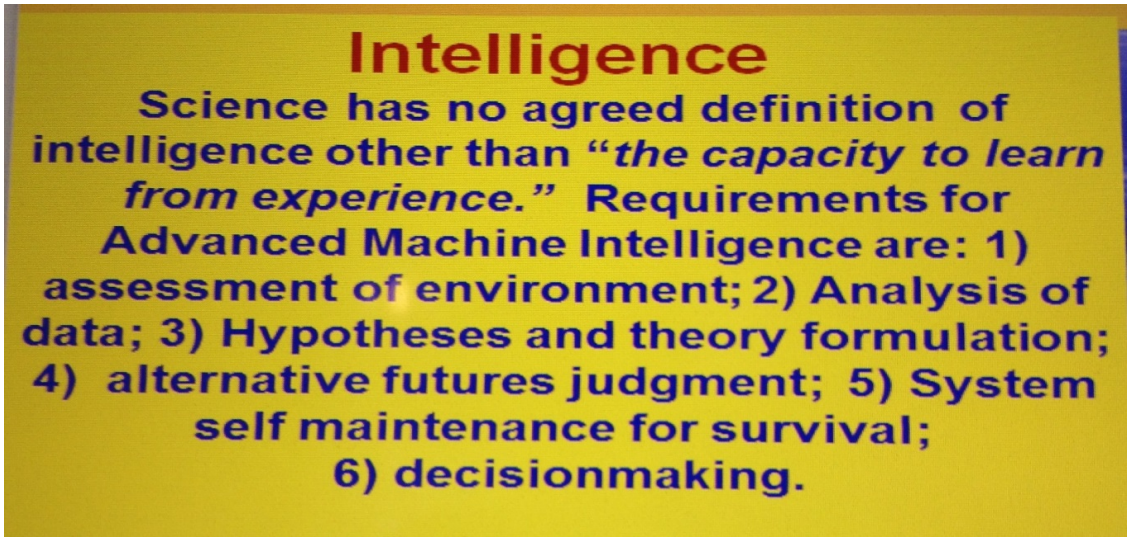

Figure 6: Intelligence defined.

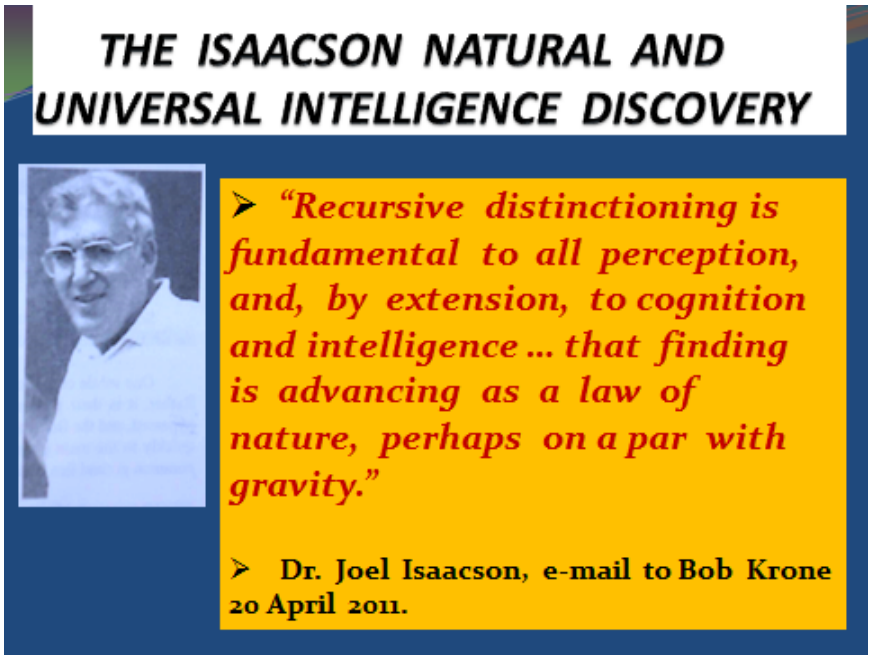

Figure 7: Recursive distinctioning, cognition, and intelligence.

The Space Sciences

That 1980 NASA Summer Research began my involvement with the global Space community that remains today. The most direct links to my personal philosophy are contained in the issues of this *Journal of Space Philosophy* that we, in Kepler Space Institute, founded in 2012. If you read my article in the Fall 2012 first issue, "Philosophy for Space: Learning from the Past – Visions for the Future,"[16] you will see that three of my life's values became imbedded in the space philosophy proposed:

> ***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.**[17]

The professionals I have worked with for 35 years in the global space community have been the important ones for the consolidation of my personal philosophy. Readers will find their images and their publications throughout the issues of *Journal of Space Philosophy*. Most of them have devoted their time and talents with the only compensation being the satisfaction of contributing to the deep meanings beyond and above self promised by humanity's future Space epoch.

[16] *Journal of Space Philosophy* 1, no. 1 (Fall 2012): 17-26.
[17] Ibid., 17-18.

The Human Creative Compulsion

Human curiosity and creativity have always fascinated me because they seemed extra-rational and too slippery to capture. They account for human survival through potential extermination. My first exposure to unusual creativity was with Irvin "Kersh" Kershner in 1949 and 1950. Then he was a young accomplished musician and photographer at USC. During the summer of 1950, I assisted him in building the first photo lab for the Idyllwild School of Music and the Arts. That relationship had existed for 60 years when Kepler Space Institute awarded Kersh the honorary degree, Doctor of Visual Arts in October 2010. Four months later, cancer took his life. Kersh directed films around the world. You can find his filmography of 24 films from 1958 to 1993 and multiple web sites documenting his 1923-2011 life. His most famous film was *Star Wars: Episode V – The Empire Strikes Back* (1980). When George Lucas asked Kersh to direct Episode V, Kersh asked him "Of all the younger guys around, all the hot shots, why me?" Lucas replied, "Well, because you know everything a Hollywood director is supposed to know, but you're not Hollywood." *The Empire Strikes Back* is still thought to be the best of the *Star Wars* series. Sue and I met Kersh and his son, David Kershner, in Tijuana on August 18, 2009, where Kersh was getting the kind of cancer treatment that did not keep him from working. At lunch I asked Kersh, "What is the most important thing that keeps you going?" He thought for a few seconds and said, "Creativity."[18] Creativity is the healing secret for us all.

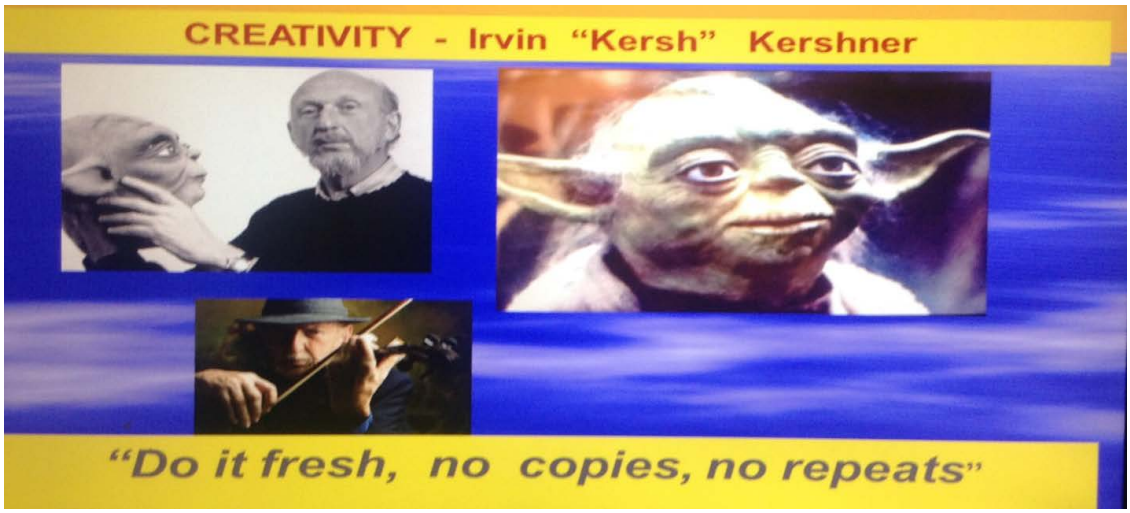

Figure 8: Irvin Kershner on creativity.

Doesn't being creative have risks? Lonnie Jones Schorer, an amazingly talented adventurer with an article in this issue of the *Journal of Space Philosophy*, answers that question:

> RISK and EXPLORATION go hand in hand in a precarious balancing act, aiming for success while courting failure. Together they are the propellants

[18] See Kersh making this statement at www.blip.tv/dashboard/episode/2521267.

> of an advancing, enlightened society. Education can introduce students to both, via books, learning, and a process that fosters curiosity.
>
> Risk and exploration are not reckless or inherently extreme. They do not have to be physical, but can be conceptual and intellectual. Humans are curious and seek to know and understand. There are different levels and kinds of risks that we live with and accept every day, such as crossing the street, driving, and flying. We seem readily to accept the risks we can identify with, while rejecting those with which we have no real life experience.[19]

Reflections and Conclusions

Where does this essay belong in the Space epoch literature? My short answer is that it belongs in values analysis. Values analysis is a prime methodology for examining what people, groups, organizations, corporations, nations, and alliances prefer. This one is a personal self-examination, but the questions asked and the sources pursued create a general model.

It took decades for me to understand fully the meaning and mission of my life well enough to want to document it or even to be able to document it. Learning the theory of philosophy was an aid in doing so and editing the *Journal of Space Philosophy* provided both motivation and insight. My hope is that readers find the components of my story helpful in bringing their own tacit philosophical knowledge into a more explicit form. Tacit knowledge is that gained from living as opposed to explicit knowledge gained from learning.[20] A related insight came to me as I was doing the final editing of this article. I can state it as "Intuition precedes the capability to prove one's judgment." On reflection upon my own life, I remember examples. The one most relevant here is the intuition that came to my in early 2012 "to create a Journal of Space Philosophy." I could not verbally state the rationale for that intuition – it was part of my implicit knowledge. Now, with this issue being #5 in the series, I can empirically justify that judgment. Working with Dr. Gordon Arthur, Associate Editor, and all the authors who have contributed has been the best professional part of my later years.

Giving a positive meaning to one's existence is one significant goal of philosophic study. Understanding the behavior of others is another. It includes choosing deliberately the values to which one is committed and not choosing those values leading to pathological behavior. In simple language, it helps you determine right from wrong. The way one shapes one's existence defines one's *being*.

Defining one's personal philosophy has other benefits beyond the personal since one of the classic definitions of politics is "the authoritative distribution of values."[21] And politics is like gravity – found everywhere.

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[19] Lonnie Jones Schorer, "*Education for Tomorrow's Space Developers*," *Journal of Space Philosophy* 3, no. 2 (Fall 2014): 18, www.bobkrone.com/node/120.
[20] Michael Polanyi is the scholar who invented these terms and created the related theory.
[21] This phrase was coined by David Easton.

For those who have created and contribute to the global Space community, it even goes beyond Earth to prescribing the philosophy and values for Space exploration, development, and human settlements. If that new epoch for humanity is done right, the models that decision makers and the public create in Space will be the optimum for replicating on Earth. And Earth will have been the designer for humanity's successes through the universe.

My overall personal conclusion after eight-plus decades is how extremely fortunate I was to spring from healthy genetics, to be raised and surrounded by an intelligent, caring family, and to be given the directions and opportunities for life that produced positive outcomes. *Fortuna* (luck) was also an important variable. It is a sad fact that humanity's social progress is so primitive that millions of people on Earth are not blessed with those opportunities or their lives are ruined or ended in tragic or evil ways. The leadership of Kepler Space Institute accepts the correction of those failures on Earth as part of its vision within the *Law of Space Abundance*.[22]

Creating this essay and sharing it with colleagues gives me another finding. The process of doing it is a valuable learning experience. My hypothesis is that identifying a personal philosophy should be a requirement for anyone in leadership.

Regardless of your own personal philosophy, values, and goals the sentence my Father, Dr. Max T. Krone, had at the bottom of his stationery applies. It was, "The greatest use of a life is to spend it for something positive that outlasts it."

Bob Krone
Fallbrook, California, USA
September 1, 2014

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Editor's Notes: We are grateful to Bob for providing a clear statement of his personal values, values that infuse the thought of Kepler Space Institute. An interview in which Bob Krone talks about the power of values can be found at www.youtube.com/watch?v=tCSiuO8YP6E&list=UU2AvdK6_3mGgyky6T82QBMQ.
***Gordon Arthur*.**

[22] The *Law of Space Abundance,* defined as *Space offers abundant resources for human needs,* was formulated by Kepler Space Institute leadership in June 2009 after studying the extensive knowledge available on resources existing in space compared with the projections of Earth's needs. The Law does not flow from any legislation, but from nature within the cosmos.

Research: Space Strategic Planning Theory

By Bob Krone

Abstract
Strategic planning is the most complex and sensitive function undertaken by organizations – public and private. It both changes an organization and creates new destinies. Five years ahead is a usual time an Earth business will forecast its future. It is rare to have national decision makers commit their planning to any time period. Space planners have much different concepts of time. Their missions require a long period of research, followed by another long period of construction, followed by another long mission period. This article adapts validated existing Earth strategic planning theory to the special planning requirements of Space. The Kepler Space Institute leadership stakes the claim that this is the first Space strategic planning theory model. Those with counterclaims, please e-mail them to BobKrone@aol.com.

Keywords: space strategic planning theory, leadership for the Space epoch, quality sciences.

Why Go?

Debates over the larger question of the need for human space exploration and habitation have occurred for decades. Completely answering that question is a goal for this *Journal of Space Philosophy*. The short answer to the question is that eventual human survival depends on building civilizations in space. Our planet's resources are limited. There are natural and human-made threats to earth-bound people that increase in probability over time. The need for increased quality of life, and the prevention of erosion of today's qualify of life, for people on Earth demands the capture of resources known to be in Space. Science and technology have advanced to make human settlements in Space feasible within the 21st Century. The positive answers to *why go?* we have. The answers to the *how?* and *when?* questions are now being formulated. The conclusion of Space scholars and practitioners is that the most critical variable for humans successfully creating settlements in space is effective leadership and governance.

Space Strategic Planning Theory[1]

Strategic planning, done right, provides the greatest possible insurance *against* failure and *for* long term organizational success.

A spaceship without a pre-planned destination has no chance of survival. Strategic planning is still not universally accomplished by Earth public and private organizations, but major corporations, health services, the military services, schools, and some national governments attempt it. Strategic planning is relevant for every public agency,

[1] Strategic planning theory for Earth organizations fills libraries and can be found on the Internet. For four decades, I have taught, consulted, and published on strategic planning as one of my higher-education subjects. My complete resume and curriculum vitae can be found at: www.bobkrone.com/node/103. I have developed the model adapted for Space here throughout my career and I taught it as recently as August 2014, online to graduate business students at the Pacific Adventist University, Port Moresby, Papua New Guinea.

private company, non-profit organization, and even families and individuals. Done right, it provides the greatest possible insurance against costly failures and the best chance for long term success. Leadership for Space missions, exploration, and development must do it.

The general theory for the Space strategic planning process is outlined in Figure 1.

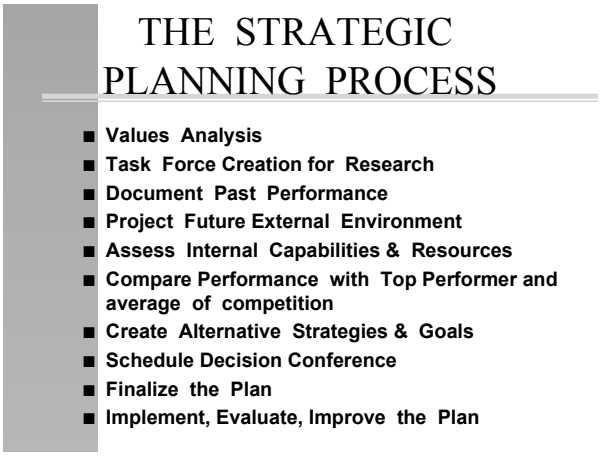

Figure 1: The strategic planning process.

The steps in the strategic planning process, as shown in Figure 1, seem to be in a logical sequence beginning with values, proceeding through research and analysis to the creation of alternatives, then to a decision conference, writing the final plan, and, finally, to implementing the plan, evaluating it, and making improvements. The process in actuality does not neatly track through those steps. All of the steps must be accomplished, but they do not occur linearly one after the other. Several steps will be in progress simultaneously. At times, the process may seem to reverse, go in apparently endless cycles, or even stop at various roadblocks.

Strategic planning creates a new destiny. It will be the most complex and sensitive analysis undertaken by any Space entity. The process will seem messy – or even impossible – as it must be undertaken by the very people who carry the greatest responsibility for current operations. A strategic planning committee should be composed of top performers, managers, leaders, and thinkers. All of those professionals are already overloaded. The challenges are many. The effort is necessary. The rewards will be huge.

The next sections describe very briefly what happens in each step of the strategic planning process.

Values Analysis

Values are principles or things preferred. Three essential questions to answer in strategic planning are: “Who are we?” “What do we prefer?” and “Where should our planning take us in the future?” A consensus for answers to those three questions must emerge before any detailed planning is done.

If it becomes impossible to reach a consensus on "What we truly believe and prefer," a self-destructive diverse opinion undercurrent will override the process from the beginning and a great amount of time, energy, and resources will be expended on research toward goals that are in conflict with the real values held.

An extremely simplified example may help. I was asked to help an arts organization to decide on programs for the next year or two at a Board of Directors meeting. I listened for an hour as board members argued for their various pet programs. There was no agreement and the frustration level was obviously rising. At that point I asked them to postpone discussions of individual programs and for each board member to state briefly what he or she deeply believed to be the primary mission of the group. That took thirty minutes and demonstrated that there was general agreement on the basic values of the organization. I then asked them to come to agreement on the board's three top values. That was easily done. Then I suggested that they now link their future programs to those three values. Fifteen minutes later the meeting ended with agreement on programs.

Do not be misled by that simple illustration to thinking that solving your Space organization's strategic planning needs can be done that easily. In my example there were no values conflicts and no values compromises required by members of the board. The projects themselves were trivial by comparison. They were just starting to think about the trees instead of the forest.

A more typical example was when La Sierra University, in Riverside, California, began its strategic planning process in 1992 after its separation from Loma Linda University. I facilitated Ideas Unlimited[2] workshops with groups of faculty, administrators, students, alumni, and the Board of Trustees with the goal of building an initial values database. The targeting I used asked the groups to write their sincerely held preferences for the long-range future of La Sierra University. That values database became a reference for the next three years of research, discussions, and analysis, which resulted in the board-approved 1995 strategic plan for the university

We must know, and have consensus, for our core values to create a valid strategic plan.

Task-Force Creation

Information requirements are so large for strategic planning that research and analysis teams are created. There are other reasons for creating these task forces. Since everyone is impacted by the results of strategic planning, the widest possible participation in the process is needed. When strategic planning efforts are completed, it is not uncommon for participants to conclude that the process of interactive communications across functions of the school, company, or agency were as valuable an outcome as the written plan. The cross-department learning to reach consensus on destiny-of-the-firm-type decisions produced a new environment of mutual understanding.

[2] Ideas Unlimited is a group survey method validated since its creation in 1926. See Dr. Bob and Sue Krone, *Ideas Unlimited: Capturing Global Brainpower* (West Conshohocken, PA: Infinity, 2007).

The eight task forces that are usually formed are shown in Figure 2. The use of task forces is a powerful brainpower accelerator for strategic planning and serves the function of consensus-building within the strategic planning committee. Active participation by people representing every constituency in the organization and every part of the system brings the necessary expertise and viewpoints to bear on problems. It serves an even more important function of moving the outcomes of your planning process closer to being a *Pareto optimum.* The name comes from the late 19th-century Italian scholar and author, Vilfredo Pareto. A Pareto optimum is achieved when a strategy, policy, or decision results in many people being better off and none being worse off than before. That is rarely achieved in strategic planning for complex organizations, where change usually benefits some and hurts others. Keeping the Pareto optimum as a goal for decision making, however, will stimulate the planning process to search for ways to avoid hurting people. Reducing the numbers of the disadvantaged increases the percentage supporting the changes and thus the probabilities of successful implementation. Unknowns and uncertainties for the future of humans in Space make it highly unlikely that a Pareto optimum will ever be achieved, but there will be tangible benefits to keeping it as a consideration during planning.[3]

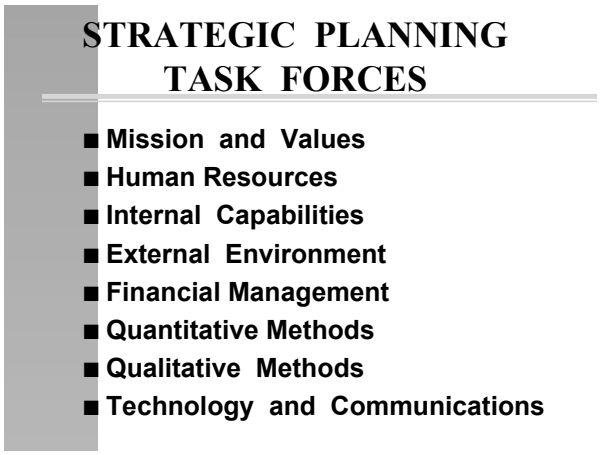

Figure 2: Strategic planning task forces.

Document Past Performance

What sort of performance needs to be documented for strategic planning? There may be no evidence of past performance for the specific Space project. But the strategic planning committee must be satisfied that the system's capabilities, strengths, and weaknesses have been fully described. This is the beginning of the *internal analysis*

[3] Italian philosopher, sociologist, and economist, Vilfredo Frederico Damaso Pareto (1848-1923) is best known for his contributions to income distribution and analysis of individual choice. Three of his concepts continue to be validated and extensively used today. They are (1) the Pareto principle, (2) the Pareto chart, and (3) the Pareto optimum. The Pareto principle is known better as the 80-20 rule: research has shown that 80% of the effects result from 20% of the causes. That rule has held well for most of Earth's organizations. The Pareto chart was developed from Pareto's writings by pioneers of the quality control movement after WWII. The Pareto chart is now widely used in industry and organizational management to represent the time spent performing various tasks. It is a vertical bar graph which helps to determine which problems to solve in what order. The Pareto optimum, described here, is the concept most applicable to strategic planning.

required for strategic planning. The basic goal for any strategic planning is to match internal capabilities with external opportunities. That model is presented in Figure 3.

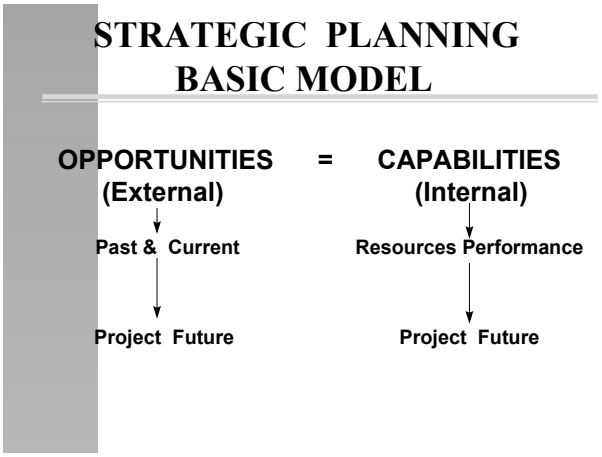

Figure 3: The basic strategic planning model.

Project Future External Environment

Future forecasting for Earth entities has become increasingly difficult with the acceleration of change in local, national, and global environments. For Space it falls into the *fuzzy gambling* category.[4] Since strategic planning creates long-range destiny-type decisions and goals for the organization, future forecasting uncertainties must be appreciated, although the requirement cannot be ignored. The analysis should estimate which variables will remain stable and which will change (and in which direction at what speed). Growth situations, resources, markets, and constraints should be projected. Perhaps the most important part of a Space future external environment analysis is the consideration of paradigm changes, natural phenomena, and major discontinuities. For Space there is also a larger probability of what Herman Kahn called *The Butch*, which is a fundamental error in quantitative or qualitative analysis and calculation.

A note on selecting a future time period for analysis: this article refers to the global Space community.[5] Space systems have huge economic, social, and political impacts on the Earth's nations and their people. Space projects must consider long-term research, planning, and implementation. For instance, an excellent current study of the world's energy needs shows that without developing space-based solar-power systems, the world's energy needs cannot be met in the second half of the 21st

[4] *Fuzzy gambling* is a term invented by Professor Yehezkel Dror, the co-founder and leading scholar for the policy sciences, beginning in the 1960s. He defined it as follows: "Because of pervasive uncertainty and inconceivability in most domains of policy making and all domains of future weaving, governments engage necessarily in 'policy gambling,' that is, fuzzy gambling for high stakes. The notion also applies to the default option of continuing past policies despite changing circumstances." See Yehezkel Dror, *The Capacity to Govern* (Portland, OR: Frank Cass, 1994), xiv. The concept applies in all space strategic planning.

[5] By the Space community I mean the entire, huge spectrum of people, groups, agencies, and businesses throughout the world devoting their time and talents to Space projects and learning.

century. Strategic planning by relevant solar energy corporations needs to project analysis out to 2100.[6]

Assess Internal Capabilities and Resources

The skills, knowledge, motivation, and creativity of people plus the investment in personnel development should be documented. The property, plant, and equipment; assets and investment position; financial position; communications and technology; process flows; profitability; waste reduction programs; research and development strengths; resources available through the Board of Directors; customer satisfaction; and retention programs should be included in the analysis. Current liabilities, long-term debt, legal actions, and stockholders' equity (if applicable) should also be assessed. This analysis allows the building of a profile of organizational strengths and limitations. The quality sciences are the best knowledge sources for identifying and measuring these variables.[7] Due to the risks inherent in Space missions, quality management has been fundamental to planning going back to the Sputnik launch.

Compare Performance with Top Performer and Average of the Competition

This is a basic theory component for Earth-based systems that may not have application for Space missions until a set of businesses occur that are competing with each other for a similar goal. At this time, in 2014, asteroid mining might be such a mission, but it is too early to have multiple performers for comparison. Top performers in an industry are doing things well. We need to know what those things are and whether we can apply them to our situation. We need to know industry averages to compare with our system's performance. Performance is evaluated using profitability, revenue generation, finance generation, investment position, cost position, and achievement of goals. Above all, it is necessary to evaluate continually to determine if performance is consistent with values, neutral to them, or in conflict with them for both internal operations and external dealings with customers and constituents. A valid vision statement and mission statement are prerequisites to making that kind of performance evaluation.

Create Alternative Strategies and Goals

The strategic planning committee should develop alternative strategies and goals because of a universal phenomenon involved with organizational decision making, which is that top decision makers want options. They are suspicious when given only one choice to approve or disapprove. For the planning of Space programs, top leadership may have been involved throughout the development from idea to concept to strategic plan. It is probable that alternative strategies will have been considered and abandoned fairly early in the process. However, the proposal may have to be given to government or private funding organizations that have not been involved with the entire planning process.

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[6] See especially the intensive research of James Michael "Mike" Snead at spacefaringinstitute.com and his "The American Energy Crisis and Solution – Space Solar Power," *Journal of Space Philosophy* 3, no. 1 (Spring 2014): 20-65.

[7] The American Society for Quality (www.asq.org) is the source. Over the past 15 years, I have written essays on the *quality classics*, those theories, concepts, models, and tools that have been validated as quality improvement devices. See www.asq711.org and click on *Quality Classics*.

Schedule a Decision Conference

The *decision conference* is where the alternatives get concentrated attention and a final strategic mission or goal is selected. When all parties of the planning process have completed their research, or when events in the environment force closure, the decision conference is scheduled. In attendance should be the decision cluster (i.e., President, CEO, Vice Presidents, Department Heads), the members of the strategic planning committee, and any other system stakeholders whose inputs will be important. The chair of the strategic planning and task force leaders present the following in summary briefings:

* draft new vision and mission statements;
* the results of the research and analysis;
* priority recommended strategies, goals, and objectives;
* impacts of those alternatives (projected benefits and costs);
* recommendations for decisions by leadership.

Discussions and debates occur. The decision conference often takes two or three days for the issues to be covered thoroughly and a consensus to be reached. If basic conflicts occur within the decision cluster, the strategic planning committee may be directed to do new research and analysis to be presented at a second decision conference. This process continues until agreement is reached on strategic directions and associated objectives for the organization. Contingency strategies should be identified if assumptions and projections of the planning process prove to be inaccurate.

Finalize the Plan

The final written plan is accomplished under the supervision of the chair of the strategic planning committee and should contain:

* vision statement;
* mission statement;
* major strategic decisions;
* priority and alternative goals and objectives;
* programs and courses of action with assignment of responsibilities;
* resource allocations and projected financial statements.

Implement, Evaluate, and Improve the Plan

Completion of the strategic plan is a major milestone for the organization, but it represents only a portion of the total effort. Implementing the plan, evaluating that implementation, and subsequently revising the plan will determine success or failure. There are two main reasons driving that conclusion.

The first lies in the four characteristics of our age: complexity, novelty, uncertainty, and adversity. Unless we are very lucky, one or more of those characteristics will cause us to rethink some part of the plan. That reason has its origin in the system environment. The second reason stems from internal system functioning. Even though every effort at participative involvement in the strategic planning process is made, when provisions of the plan are implemented it affects everyone in the organization. Some people in the system may object, rebel, or even sabotage parts of the plan that they see as a threat

to them personally or to their department or function. Planning responsibility lies primarily with leadership. Putting the plan to work requires everyone's cooperation.

The failure of strategic planning can have three root causes. Causes #1 and #2 will flow from the two reasons described in the previous paragraph. Cause #3 can come from Herman Kahn's *The Butch* – mentioned above and defined as an error in basic assumptions, logic, or analysis that invalidates findings reached from research and goes unnoticed through the decision point. Good strategic planning will prevent that cause of failure.

Judging the Worth of Strategic Planning
How do we evaluate our strategic planning efforts over time?

The benefits of good strategic planning can be enormous. Those benefits and goals flow from the process involved in working toward a strategic plan as well as from the plan itself. Figures 4 and 5 depict this truth.

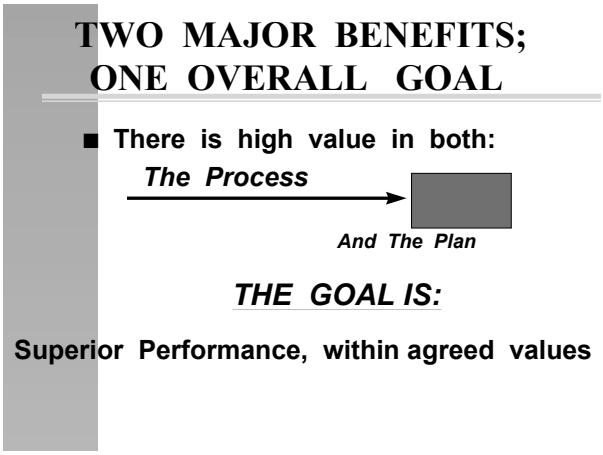

Figure 4: Benefits and goal of strategic planning.

The Value of the Process of Strategic Planning

- **New understandings, awareness, and appreciation.**
- **Cooperation increases; conflict decreases.**
- **Negative fantasies addressed.**
- **New administrative climate.**
- **New decision-making culture.**

Figure 5: The value of the process of strategic planning.

These benefits of the strategic planning process can be huge value-added events for an organization. People accustomed to thinking only about their own functional areas gain an appreciation for what happens in other areas. Coming to agreement on long-term goals for the company facilitates cooperative efforts where turf battles previously existed. Negative fantasies are the erroneous, bad visions of the future that people generate when uncertainty and anxiety prevail. Going through the process of strategic

planning can replace those negative fantasies with positive goals and ways to reach the goals – especially when positive things happened initially. Doubts may still exist, but there is a philosophic approach for consideration.

When in doubt, chose optimism, then manage wisely to achieve a self-fulfilling prophecy.

Both optimism and pessimism can be self-fulfilling prophecies when faced with uncertainty. If people believe it cannot be done and act on that belief, it is fairly certain that their pessimism will produce that self-fulfilling prophecy. The same will occur if they chose optimism, then act wisely to make things happen.

Creating a positive administrative climate is the responsibility of organizational leadership. No leadership role has more influence on success or failure than the building of a working culture that motivates people to achieve superior performance and self-development. That kind of culture can be a by-product of the strategic planning process. Similarly working through the research and analysis of strategic planning often exposes weaknesses in the decision-making system of the organization. If that were the only benefit of an organization's strategic planning, it would be worth the effort.

These benefits of the strategic planning process tend to be less obvious than the benefits that flow from the final written strategic plan, which are summarized in Figure 6.

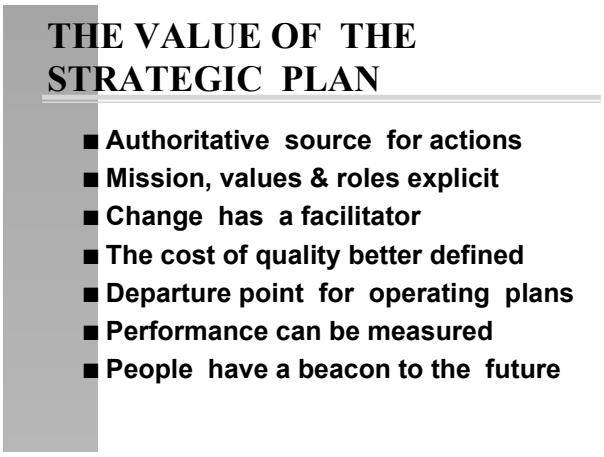

Figure 6: The value of the strategic plan.

These benefits can easily be related to strategic planning needs. The term "cost of quality*"* comes from the quality sciences and means the costs being borne by the organization for poor quality of policymaking, products or services.

The overall benefit of strategic planning is shown in Figure 7.

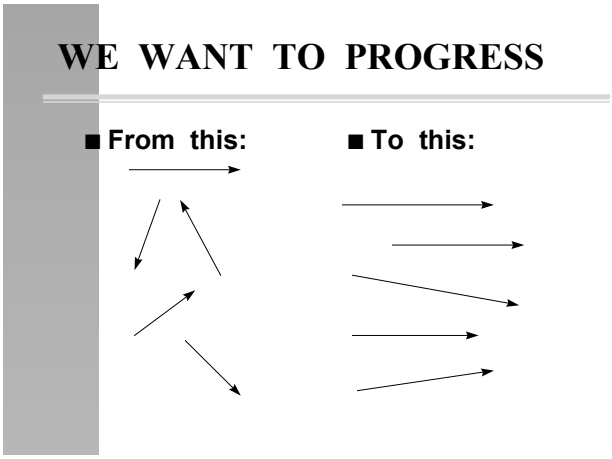

Figure 7: Strategic planning overall goal.

Teamwork is needed in the system to avoid the waste, costs, frustrations, setbacks, inefficiencies, and failures that occur when business degenerates to *ad hoc* actions, jumping from one crisis to another. Using coordinated strategic and operating plans that establish interrelated objectives and best courses of action to pursue a vision is a formula for excellence. Achieving that formula is one of the great challenges of leadership.

The Barriers and Pitfalls

Figure 8 summarizes the difficulties and pitfalls involved in this complex challenge. Space professionals reading this article will have real-world memories from their own experience of the eight bullet points. For this theoretical model, delving into details is not necessary. Space mission planning and execution will expand this list, which was generated from Earth-based organizations.

Figure 8: Strategic planning barriers and pitfalls.

The <u>most important barrier</u> to Space strategic planning is not in Figure 8. It is the vacuum of qualified global leadership, which is the subject of the feature article of

this Fall 2012 issue of the *Journal of Space Philosophy*: "Leadership Will Be Key: Applying Yehezkel Dror's Avant-Garde Politician: Leadership for a New Epoch." I urge readers to absorb the article and to read Yehezkel Dror's 2014 classic book. He has a uniquely radical model to overcome this huge barrier.

Findings, Conclusions, and Recommendations

This article has provided a theoretical model for Space strategic planners. Space literature is, in 2014, blessed with a multitude of future plans for human exploration, development, and settlement of Space by our leading astronauts and space scholars. The Moon and Mars now have detailed plans which are available to national decision makers.

It was Leonardo de Vinci (1452-1519) who made the universally true statement that "Learning is the only thing the mind never fears, never exhausts and never regrets. It is one thing that will never fail us." To the degree that leadership can create policies, plans, and decisions that make many better off and none worse off, their success over time will be assured. Corporations and governments have the same need – to improve their capacity to govern. Trends over the past three decades show that societal, client, and customer needs on Earth have been exceeding capacity to govern both nationally and internationally. Humanity's learning must continue to avoid catastrophic failures – even extermination. The Space Epoch awaits us. Without new wisdom for strategic futures, there will be no positive self-fulfilling prophecies for humanity.

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About the author: Dr. Bob Krone is the Co-Founder and President of the Kepler Space Institute and Editor-in-Chief of the *Journal of Space Philosophy*.

Editor's Notes: It is a truism that those who fail to plan, plan to fail. However, it is useful to have a theoretical model of what can go wrong and how to overcome it. While this model is applied to Space here, it clearly has much wider applicability and can therefore be applied in a wide range of fields. ***Gordon Arthur***.

Journal of Space Philosophy (JSP) Board of Editors

Kepler Space Institute is honored to have 40 of the world's Space Community professionals as members of the Board of Editors for the Journal of Space Philosophy.

Dr. Elliott Maynard, our Journal of Space Philosophy Board of Editors colleague, has beautifully stated both the purpose and the style for our peer reviews:

> This is such a hi-caliber group of leading edge thinkers and supercharged individuals, it should be natural for each of us to wish to provide a supportive and synergistic environment for the others. I have also learned always to have someone else proof read any material I write, as I have discovered that the brain tends not to "see" my own simple mistakes. Ergo, within the new Kepler context I feel editors should be there to support our writers in the most creative and positive ways possible. (Elliot Maynard, e-mail to Bob Krone, 23 March 2013)

The purposes of peer reviews of article submissions to the *Journal of Space Philosophy* are: (1) to determine the relevance to the Vision and Goals of Kepler Space Institute; (2) to help the author(s) improve the article in substance and style or recommend references; and (3) to provide publication recommendations to the Editor-in-Chief.

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1. 

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KIM, KEE YOUNG, PhD, Republic of Korea Senior University Academician and Administrator. Former President, Kwang Woon University; Former Dean of the School of Business and Provost, Yonsei University; currently the Chairman of the Board of the prestigious Samil Foundation, the oldest Korean institution to award and provide scholarships to high performing scientists, artist and engineers.

15. 

KIKER, Edward, General Engineer, GS-13, Office of the Chief Scientist, U.S. Army Space and Missile Defense Command/Army Forces Strategic Command, Kepler Space Institute Chief Scientist.

For Bio Info: www.indeed.com/r/Edward-Kiker/45bd40a86c090f07.

16. 

KRONE, Bob, PhD, *Journal of Space Philosophy* Editor in Chief, Provost, Kepler Space Institute.

For Bio Info: www.bobkrone.com/node/103.

17. 

LIVINGSTON, David, PhD, Founder and host, *The Space Show*.

For Bio Info: www.thespaceshow.com.

18. 

MARZWELL, Neville, PhD, Space Solar Power and Robotics Scientist. Career at JPL as Manager for Advanced Concepts and Technology.

For Bio Info: www.spaceinvestment.com/lcr2_bios.html.

19. 

MATULA, Thomas L., PhD, Business and Management Professor, Lunar Commercial scholar.

For Bio Info: www.trident.edu/dr-thomas-matula.

20. 

MAYNARD, Elliott, PhD, Founder, ArcoCielos Research Center, Sedona Arizona, www.arcocielos.com.

For Bio Info: www.fasiwalkers.com/featured/ElliottMaynard.html.

21. 

MITCHELL, Edgar Dean, ScD, Captain, U.S. Navy (Ret), Apollo 14 Astronaut, sixth person to walk on the Moon, Founder Institute of Noetic Sciences.

For Bio Info: Google Edgar Mitchell.

22. 

MOOK, William, PE, Trained in aerospace engineering, 15 years in alternative energy, Space Commerce Technology.

For Bio Info: www.vimeo.com/user1527401.

23. 

O'DONNELL, Declan J., JD, Space law attorney, Fifty publications in Space Law and Policy, Publisher, Space Governance Journal, President, United Societies in Space, Inc.

24. 

OLSON, Thomas H., PhD, DBA, Professor of Clinical Management and Organization, University of Southern California Marshall School of Business, Los Angeles, California, USA. Dr. Olson's specialty in research and consulting is on strategy, development, organization. and human capital. He has authored four books and 100 professional articles.

For Bio Info: See http://www.marshall.usc.edu/faculty/directory/tholson.

25. 

PALMA, Bernardino, Historian, Portuguese Age of Discovery.

For Bio Info: See Issue 1.1, Article 8.

26. 

PEART, Kim, Co-Founder, Virtual Orbiting Space Settlement (VOSS). Artist, visionary, virtual worlds.

For Bio Info: www.independentaustralia.net/about/ia-contributors/kim-peart-bio/.

27. 

ROBINSON, George S., III, LLD, Space law pioneer and international space expert. Smithsonian Institute Legal Counsel.

For Bio Info: See Issue 1.1 Article 14.

28. 

SCHORER, Lonnie Jones, *Kids to Space* author and teacher. Architect, aviator.

For Bio Info: See Issue 1.1, Article 17.

29. 

SCHRUNK, David, MD, Aerospace engineer, Founder, Quality Laws Institute, KSI Faculty.

For Bio Info: See Issue 1.1, Article 18.

30. 

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

For Bio Info: See Issue1.1, Article 21.

31. 

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

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

32. 

STEPHANOU, Stephen E., PhD, Emeritus Professor of Systems Technology, University of Southern California, Los Angeles, California, USA.

For Bio Info: See Issue 2.2, Article 26.

33. 

TANG, Terry, PhD, KSI Director of Research.

For Bio Info: See Issue 1.1, Article 24.

34. 

THORBURN, Stephanie Lynne, Author, Astrosociology.

For Bio Info: See Issue 1.1, Article 12.

35. 

WERBOS, Paul, PhD, U.S. National Science Foundation, Space scholar.

For Bio Info: See Issue 1.1, Article 19.

36. 

WHITE, Frank, MSc, Founder, The Overview Effect Institute.

For Bio Info: See Issue 1.1, Article 9.

37. 

WILKINS, John, PhD, Professor of Space Settlements.

38. 

WOLFE, Steven, Space advocate and author of the 2013 Space novel, *The Obligation.*

For Bio Info: See Issue 2.2, Article 26.

39. 

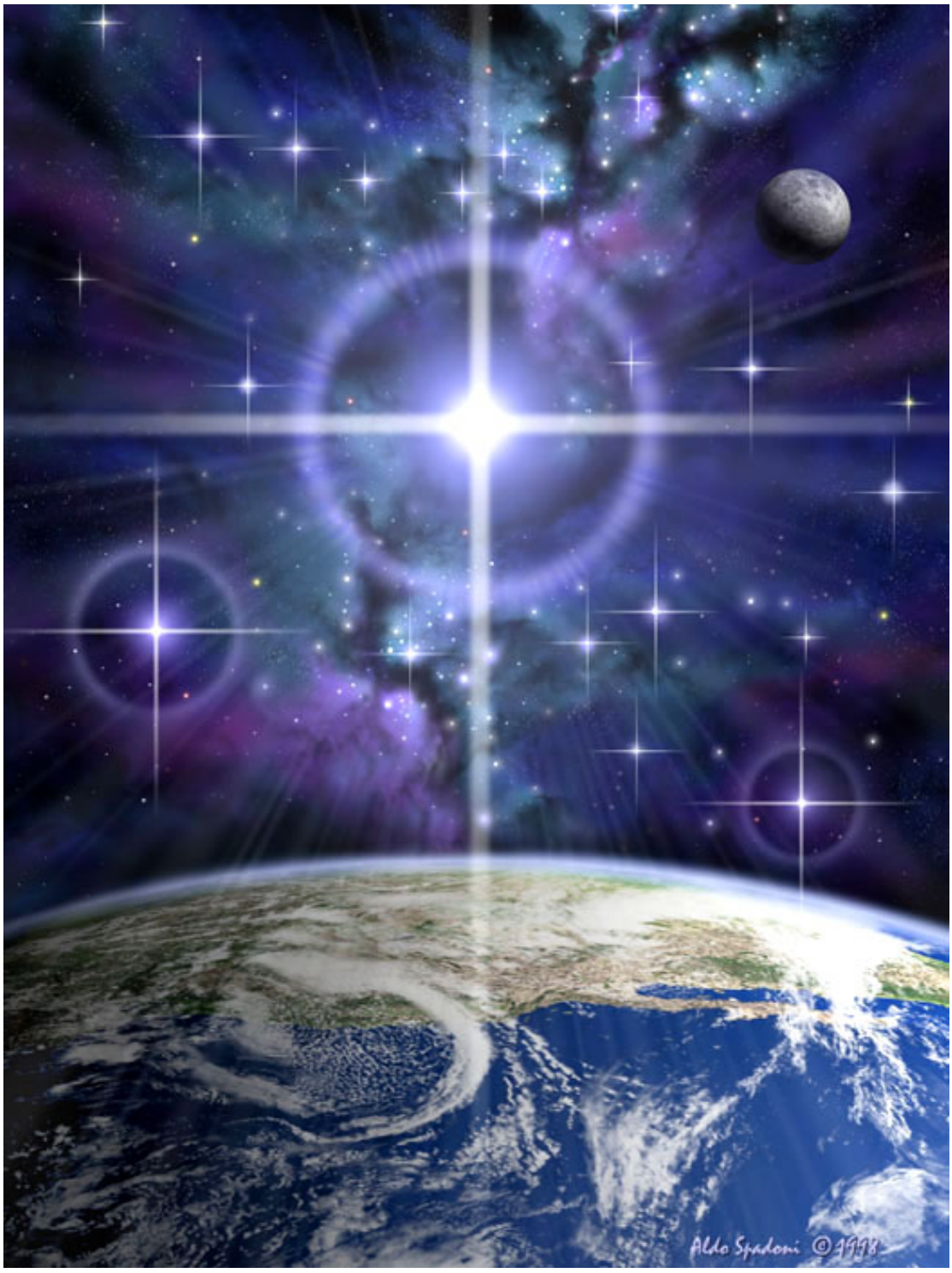
YACOUB, IGNATIUS, PhD, Founder and first Dean of the School of Business and Management, La Sierra University, Riverside, California. Currently Professor of Graduate Studies, Loma Linda University School of Social Work and Social Ecology, Loma Linda, California.

40. 

ZUBRIN, Robert, PhD, President, Mars Society.

For Bio Info: www.en.wikipedia.org/wiki/Robert_Zubrin.

"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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