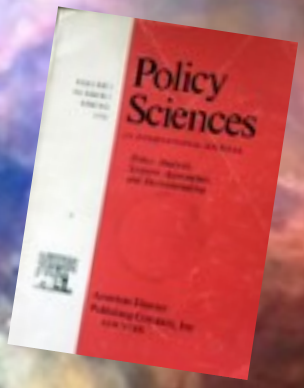
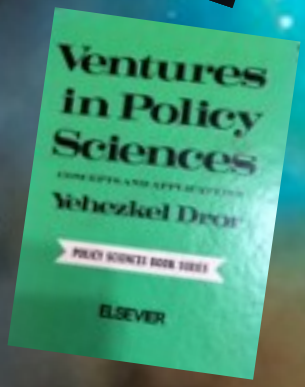
JSP

JOURNAL of SPACE PHILOSOPHY

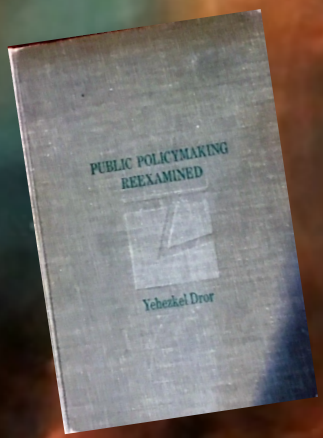
Vol. 7, No. 2: Summer 2018
Special Issue

Yehezkel Dror's Legacy: Improving Humanity's Prospects





Yehezkel Dror, Age 89 and Age 9



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Special Policy Sciences Issue:
"Improving Humanity's Prospects"

Edited by Bob Krone and Gordon Arthur

Vol. 7, No. 2, Summer 2018

Dedication

This special issue of the *Journal of Space Philosophy* is dedicated to the visions, diagnoses, prognoses, and prescriptions for Earth and Space public policymaking created by Professor Yehezkel Dror, of Hebrew University of Jerusalem.

This 2018 overview of his brilliant scholarly work, beginning in the 1960s and continuing today, captures the essence, and a portion of the critical advice for shaping humanity's futures for the better that Professor Dror gives to global audiences and leadership.

Kepler Space Institute's leadership believes that humanity's health, prospects, and the probabilities of its long-term survival in the face of today's historically unprecedented challenges will all be increased if global rulers and public policymakers absorb the wisdom of Yehezkel Dror.

Bob Krone, PhD
Co-Founder and President, Kepler Space Institute
Editor-in-Chief, Journal of Space Philosophy

Gordon Arthur, PhD
Associate Editor, Journal of Space Philosophy

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Preface

Readers of the *Journal of Space Philosophy* (JSP) are advised that this is the first publication of the JSP devoted to the works of one scholar.

The Policy Sciences hold the keys to mapping and understanding macro political and social issues, designing and analyzing promising options, presenting them clearly before the decision is made, and helping with implementation. This special issue of the JSP is dedicated to capturing the essence of the life works, scholarship, and praxis – extending over sixty years – of the co-founder and leading scholar and practitioner of the Policy Sciences, Dr. Yehezkel Dror, Professor of Political Science and Wolfson Chair Professor of Public Administration, Emeritus, the Hebrew University of Jerusalem.

About Professor Yehezkel Dror
He was Born in Vienna in 1928; migrated to Israel in 1938. Studied law, political science and sociology at the Hebrew University of Jerusalem and at Harvard University, United States, where he received the doctorate degree. Yehezkel is Married to Rachel Elboim-Dror (EdD, Harvard University), professor at the Hebrew University of Jerusalem, with main interests in education, culture policy, and history of ideas. They have three sons and eight grandchildren. They live in Jerusalem.

Dror's professional career has been dedicated to scientific studies of:

- rise and decline of civilizations, states and organizations;
- the future of the human species;
- political leadership;
- capacities to govern;
- policy planning and strategic choice;
- select policy domains, with focus on security and raison d'humanité issues.

His academic and professional distinctions include:

- Honorary Member, Club of Rome. Invited by the Club of Rome to write a report on *The Capacity to Govern*, published in seven languages.
- Distinguished professorial and guest appointments at universities and policy research institutes in various countries. Fellow, Center for Advanced Study in the Behavioral Sciences, Palo Alto, 1962-63. Visiting

Scholar, the Woodrow Wilson Center, Washington, DC, summer 1981. Fellow, Center for Advanced Study, Berlin, 1981-82. Distinguished Guest Scholar, Science Center Berlin, 1983. Visiting Scholar, Russell Sage Foundation, New York, 1983. Visiting Fellow, Washington Institute for Near East Policy, autumn 1990.

- Emeritus Fellow, World Academy of Art and Science. Member, European Academy of Sciences and Arts. Former Member, International Institute of Strategic Studies.
- First Annual Harold Lasswell Award of Policy Studies Association as "outstanding scholar in contributing to the understanding of public policy," 1983. Fulbright 40th Anniversary Distinguished Lecturer at 1986 American Political Science Association Meeting. 1990-91; Vice-President and 1991-92 President of the Policy Studies Association. Ludwig von Bertalanffy Memorial Lecture at 1994 International Society for the Systems Sciences Annual Meeting. Aaron Wildavsky Book Award by Policy Studies Organization, for chapter in best policy studies book published in 1993-94. Thomas R. Dye Award for "outstanding service to the Policy Studies Organization," 1997. Arthur Ruppin Haifa Municipality Anniversary of Israel Prize for best social science book, 1999. Landau Prize (one of the most prestigious prizes given in Israel for scientific research) for outstanding contributions to social sciences, 2002. Israeli Political Science Association Annual Certificate of Merit for exceptional contributions to political science, 2003.
- Recipient of the Israel Prize for 2005 for outstanding original scientific and applied work in policy making, capacities to govern and strategic planning.
- Recipient of the Nadav Foundation Jewish Peoplehood Award in 2011, for contribution to the development of Jewish People leadership.

Yehezkel Dror's professional positions have included:

- 1968-70: Senior Staff Member, the RAND Corporation, United States.
- 1970-72: Director of Policy Analysis, World Institute, Jerusalem (a government-sponsored think tank).
- 1975-77: Full time Senior Policy Planning and Analysis Advisor, Office of the Minister of Defense (Shimon Peres), on leave from the Hebrew University.
- 1989-91, Senior Professor and Project Leader, working on European Union policy and structure issues, European Institute of Public Administration, Maastricht.
- Senior consultative positions with international organizations, such as UNDP, OECD, and the United Nations.
- Advisory work for governments and multi-state organizations, on capacities to govern, policy planning, strategic choice, top-level decision systems, governance redesign, situational assessment, global and national trajectory setting, and select policy issues.

- Intense workshops in statecraft, rulership, governance capacities, policy planning and strategic choice for senior politicians and policy advisors in about 35 countries on all continents.
- High-level policy planning advisor to Israeli government ministries and bodies, including two prime ministers. Chairperson and member of a variety of governmental and public commissions.
- Member of the Winograd Commission of Inquiry on the Second Lebanon War.
- Founding President of the Jewish People Policy Institute, Jerusalem.

His professional leadership and innovative works are in several languages. His main books in English are:

Israel: High-Pressure Planning (with Benjamin Akzin, 1966; also published in Hebrew and Arabic); *Public Policymaking Reexamined*, 1968, emended paperback editions 1983 and 1995 (also published in Chinese, Hebrew, and Japanese); *Design for Policy Sciences*, 1971 (also published in Hebrew, Italian, Chinese, Korean, and Japanese); *Ventures in Policy Sciences*, 1971; *Crazy States: A Counterconventional Strategic Issue*, 1971, emended edition, 1980 (also published in Hebrew, German, and Japanese); *Policymaking Under Adversity*, 1986 (also published in Chinese); *The Capacity to Govern: A Report to the Club of Rome,* 2001, paperback 2002 (also published in German, Spanish, Brazilian Portuguese, Greek, Polish, and Japanese); *Israeli Statecraft: National Security Challenges and Responses*, 2011; *Avant-Garde Politician: Leaders for a New Epoch*, 2014 (also published in Bulgarian); *For Rulers: Priming Political Leaders for Saving Humanity From Itself*, 2017.

Bob Krone's personal comments:
My exposure to Yehezkel Dror's scholarship and teaching began at the University of California Los Angeles (UCLA) in 1969 during my PhD studies. I enrolled in the one class he taught at UCLA during his two-year work at the RAND Corporation while he was on leave from Hebrew University of Jerusalem. While at RAND in Santa Monica, California and in New York he wrote the first theoretical analysis of terrorism (*Crazy States: A Counter Conventional Strategic Problem*, first published in 1971, updated edition is Millwood, NY: Kraus Reprints, 1980). He wrote it before terrorists killed 11 Israelis at the 1972 Munich Olympics when terrorism was a spasmodic problem. Today, in 2018, when terrorism has reached global proportions, that study remains a classic. After that first association, his influence with the Chair of the UCLA Political Science Department resulted in my being the first doctoral candidate to have Policy Sciences as one of my concentrations. Yehezkel Dror has remained my mentor and colleague for fifty years.

After you have read the articles in this JSP special issue, you will understand why it is devoted to the sixty-year intellectual productivity of this one brilliant scholar. The original labeling of this academic field, the Policy Sciences, was in 1951 by Dr. Harold Lasswell, Yale University, in the chapter "The Policy Orientation" in *Policy Sciences*, Daniel Lerner and Harold D. Lasswell, eds. (Stanford: Stanford University Press). Since then, the professional global academic world has been blessed with skilled policy scientists working

in public and private organizations and universities. I invite them to comment on the contents of this publication.

JSP focuses on the future of humans in Space. The abundant resources in Space can completely transform humanity on Earth and facilitate human settlements and activity throughout our Solar System and beyond. One of the macro current Earth problems needing research and solution is how to design and direct the positive transformation of humanity to be based as needed on Space resources and settlement. The Policy Sciences will be crucial actors in that research. They were identified in the first issue of JSP (Fall 2012) as the third essential component forming the Kepler Space Institute Philosophy for Space. Those components were: (1) reverence for life, (2) within ethical civilization, implemented by (3) the Policy Sciences. Bob Krone's recent paper, "Maturing Humanity via the Sciences of Law, Policy and Space"[1] proposes increased integration of those sciences guided by that philosophy.

The complex truth is that humanity's improvement and survival will require the involvement of all the hard and soft sciences, the arts, and the spiritual disciplines in new ways unprecedented in humanity's history on Earth. It will require unprecedented vision and commitment of Earth's current national and international leadership. Failure to do so will result in too high a risk of human tragedy. This overview of Yehezkel Dror's works, in this JSP special issue, presents an innovative and powerful set of normative concepts and prescriptions. Humanity will benefit by their adoption, and it will appreciate the legacy of Yehezkel Dror.

Bob Krone, PhD
President, Kepler Space Institute, Inc.

Gordon Arthur, PhD

[1] Bob Krone, "Maturing Humankind Through the Sciences of Law, Policy and Space," paper prepared for the Science of Laws Institute 3rd Annual Conference, San Diego, CA, December 2, 2017. The paper will be published in a future issue of the *Journal of Science Law*, and it is in the Spring 2018 issue of JSP.

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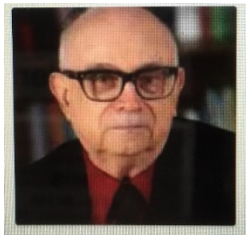
Access to the Journal of Space Philosophy and free downloading of its articles is available at www.keplerspaceinstitute.com/jsp. Anyone on Earth or in Space may submit an article or Letter to the Editor to BobKrone@aol.com.

5. The Yehezkel Dror Legacy



Human societal progress on Earth has been nurtured from the beginning by the thinking and leadership of those who observed their environments and the behavior of others, and who possessed the brainpower and motivation to bring about improvements. This article gives readers abstracts from Yehezkel Dror's publications on seven major subjects, which have been analyzed in detail in his books, and which are illustrated on the cover of this special issue:

The full legacy of Dr. Yehezkel Dror may not be understood for decades, but it needs to be appreciated by Earth's global decision makers before it is too late for humanity. What do we mean by that assertion?

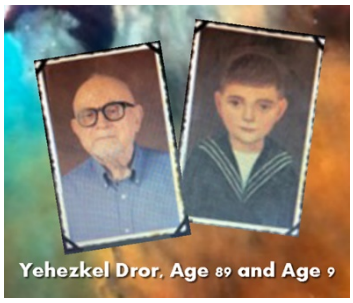
Readers will find in this publication a huge set of Yehezkel Dror's findings, conclusions, and prescriptions for public policymakers concerning the capacity of governance to address problems that have increased the risk to humanity since the mid-20th Century. The beginning of the 21st Century is further aggravating those risks in ways he has described for decades in his publications, presentations, and teaching. For the first time in human history, the crippling or extermination of the human species by human actions is a distinct possibility. Too many combinations of such events would be irreversible once

initiated. We live in an unprecedented era of dramatic scientific and technological advances, bringing good to people. But Dror describes too much of global leadership as sleepwalking amidst the evidence of potential major catastrophes – even human extinction.

Yehezkel Dror's basic findings are:

- There is no acceptable alternative to political leadership.
- However, past and current leadership has failed and is failing in its capacity to cope with evolving and increasingly critical and also fateful problems.
- As a result, radically improving political leadership is imperative. Readers will see such findings, analyses, and prescriptions spread throughout Yehezkel Dror's publications . For many issues, he was the first to identify and describe them – terrorism being only one example.

Having been a co-founder of the Policy Sciences and a leading scholar for its multiple uses, his legacy is unmatched. The Kepler Space Institute leadership places him in an equivalent position in public policymaking to Einstein and Hawking in astrophysics.



For all of those reasons the Kepler Space Institute considers this *Journal of Space Philosophy* special issue to be its most important publication to date. Dr. Dror, reviewing his scholarship at age 90, is not optimistic about Earth's political leadership overcoming historic barriers to resolving many pathological human characteristics that have caused wars, conflicts, intolerance, greed and mental illness that is devastating to humanity. He shares the Kepler Space Institute's vision that the beginning of the current and future Space Epoch holds potential feasible solutions for problems humans have experienced on Earth. He also believes that discovering them through Space Exploration Development and human settlements will provide models for human to replicate back on Earth.

However, we must design and implement all those activities using the principles of reverence for life, within ethical societies, implemented by the Policy Sciences. That is the challenge we, and our children and grandchildren, must embrace.

Bob Krone, PhD
President, Kepler Space Institute, Inc.

Gordon Arthur, PhD

5A. Capacity to Govern

Abstractions from Yehezkel Dror, *Capacity to Govern: A Report to the Club of Rome* (Portland, OR: Frank Cass, 1994).

In his 1971 book, *Ventures in Policy Sciences*, Yehezkel Dror published his "Law #2", which reads:

> While human capacities to shape the environment, society, and human beings are rapidly increasing, policymaking capabilities to use those capacities remain the same.[1]

Over the next five decades, Dror has not found evidence requiring a change to that Law. Instead, he assesses that the capacity deficit has increased, up to endangering the future of humankind. As he put it in his 2014 book, *Avant-Garde Politician: Leaders for a New Epoch* "It is absurd to believe that everything is going to change, but politics will and can remain the same."[2]

His *Capacity to Govern* work was in development for years, and it was published in German, Spanish, Portuguese, Polish, Japanese, and English. It was endorsed and sponsored by the Club of Rome, which has become known as the conscience of humankind (Dror now tries to convince it to consider Singularity issues).

Dror's *Capacity to Govern* book draws on research covering centuries of data, asserts the problem as being unprepared societies and obsolete governance, and defines the mission as being the change from *raison d'état,* created by Italian Renaissance thinkers, to *raison d'humanité* – a term Dror created. The study provides the requirements for redesigning governance.

[1] Yehezkel Dror, *Ventures in Policy Sciences* (New York: Elsevier, 1971), 2.
[2] Yehezkel Dror, *Avant-Garde Politician: Leaders for a New Epoch* (Washington, DC: Westphalia Press, 2014), 30.

The work describes the imperative to make a paradigmatic change, up to a quantum leap to improve and redesign the capacity to govern states, supra-state structures, and global governance radically. The overall goal is to increase the capacity to influence, or weave as Plato put it in *The Stateman*, the future for humanity's benefit.

A summary of the assumptions and conclusions found in *Capacity to Govern* includes:

1) We are living through an historically unprecedented age of radical global non-linear transformations in demography, science, technology, consciousness, culture, communications, and geo-economic and geo-strategic configurations in regimes and in values. Those transformations are sure to accelerate in the 21st century.
2) Without improved capacity to govern, those transformations have a real probability of catastrophic impacts. Governance must prevent "devilish uses of knowledge instruments supplied by science and technology since World War II for mass killing initiated by actors beyond the control of presently available policy structures and tools." Readers should note that *Capacity to Govern* was written and published well before September 11, 2001, which marked a dramatic advance in terrorism.
3) When countries disintegrate, evil rulers engage in large-scale crimes against humanity or prepare serious acts of aggression, or populations are subjected to genocide immediate interventions are required.
4) As long as the United Nations is unable to cope with major crises of global significance, the United States and the European Union, together with China and other willing states, should take appropriate action. But no single country can do so adequately on its own, and such action should be explained and justified before United Nations forums and limited to the minimum necessary to prevent human catastrophes.

Following is an extract of some more of Dror's prescriptions:

A) Countries in serious transformation crises should … be helped to avoid extreme breakdowns, with special attention to states having continental and global significance. But care must be taken not to give one-dimensional and dogmatic advice likely to cause serious social harm.
B) Regarding international interventions to prevent evil rulers from acquiring and using mass killing weapons …. my own tendency is to prefer the risks of global overintervention to those of underintervention; but global systems are not yet ripe for coping with the issue.
C) One cannot rely … on a spontaneous rapid improvement in the quality of candidates entering politics and reaching top positions. Intense efforts to enhance the quality of the politicians produced by existing selection and promotion processes are therefore urgently required.
D) Moral democratic rule is preferred. However, the maximum advisable scope for Western type democracy is quite limited in the foreseeable future.

E) The qualities demanded of senior politicians and governance elites should be radically revised, with emphasis on intellectual virtues and moral character. These requirements should become a basic canon of political theory and culture.

Dror's proposals, A through E above, are illustrative of a very large set he includes in *Capacity to Govern*. Readers need to absorb the entire set, which he describes as

> formulated in general terms, so that they fit a variety of settings … follow a middle path between the mundane and the utopian.… Some proposals are crash programs, while others are long range requiring considerable lead times and implementation cycles.… Most form clusters that are interdependent, supporting and reinforcing one another … they were selected according to their importance in terms of impact and feasibility, but inevitably [they] also reflect my own personal interests, biases, and limitations.

In "Part Three: The Resolution" and his "Finale: Governance Redesign Pending a Quantum Leap," Dror has 144 pages covering

- approaches to redesign;
- fostering *raison d'humanité*;
- virtues against vices;
- empowering the people with public affairs enlightenment;
- refashioning governance elites;
- rulership;
- deepening policy reflection;
- qualifying in "fuzzy gambling";
- improving the central minds of government;
- restructuring governance architecture;
- governing private power;
- making global governance more resolute;
- augmenting oversight;
- gearing governance for crises;
- strengthening the autonomy of high quality government;
- governance redesign pending a quantum leap.

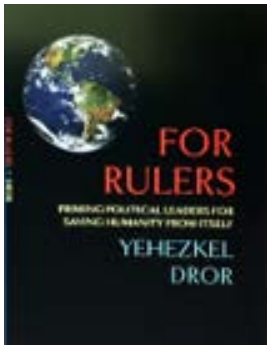
Editors' Notes: Dror's conclusions and recommendations on *The Capacity to Govern,* are accurate, validated almost daily in 2018, but they are still not receiving the necessary attention of Earth's decision makers and scholars. Yehezkel Dror enjoys international respect for being one of the few founders of the Policy Sciences academic and praxix discipline and being the catalyst, since the 1960s, for the establishment of policy departments in universities and the creation of professional societies devoted to policy, such as the Policy Studies Organization (PSO), where he served as the only non-American president. As with nearly all his books, his references and further readings cover a wide range of related publications on the subject, in this case 27 pages of

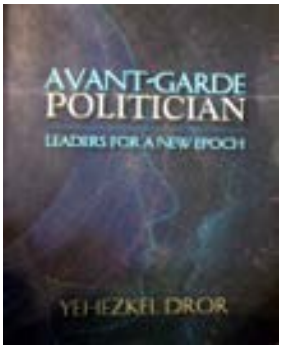
professional references. When Kepler Space Institute's Academics are planned, Yehezkel Dror's works will be a primary source for research questions on Space Governance and Policymaking. ***Bob Krone and Gordon Arthur.***

5B. Humanity's Needs

Editors' Notes: Humanity's needs have occupied philosophers, historians, scholars, and authors for millennia. A search of Amazon.com in July 2018 for "humanity" found over 60,000 books, for "world futures" over 30,000 books, and for "humanity's needs" over 1,000 books. During the 20th century, many organizations researching global resources and humanity's needs began ongoing research—like the Lifeboat Foundation, dedicated to the prevention of global catastrophe risk, the World Future Society, Jerome Glenn's Millennium Project, and the Stockholm International Peace Research Institute. The hope for harmony and peace throughout humanity has always existed in most religions, and there are United Nations organizations dedicated to their pursuit. But humanity's perceived needs, and diverse values systems, have also been the cause of much hate, intolerance, violence, greed, wars, and genocide throughout history. This article highlights an evolving aspect within that huge complex picture in which Yehezkel Dror has been a leader in identifying the dilemma of science and technology serving and impacting humanity (the good), while at the same time moral failures and incapacity to govern and regulate the risks to humanity of science and technology on Earth (the bad) progress in tandem.

Yehezkel Dror has advanced his focus for improved policymaking from national to international, then to humanity—primarily in the 21st Century—for reasons he describes and defends after detailed research and diagnosis within the following books:





This article provides readers Yehezkel Dror's "Lucifer Smiles" story, first published in May 2002 in *Technological Forecasting and Social Change*. Its message illustrates this ongoing dilemma. Nuclear weapons planning following World War II triggered this story. And Yehezkel Dror was a senior staff member of the RAND Corporation in Santa Monica, California, USA, in 1968-1970, when Daniel Ellsberg was also at RAND. Daniel Ellsberg, who became famous for the Pentagon Papers episode, was simultaneously consulting the US Administration on Nuclear War Planning. In December 2017 he authored under Bloomsbury Publishers, *The Doomsday Machine: Confessions of a Nuclear War Planner.* That is a current book by an outstanding professional that clearly foregrounds the science and technology dilemma Yehezkel Dror diagnoses. It is a striking illustration of the need

for humanity to remove the risks of huge potential threats. ***Bob Krone and Gordon Arthur.***

Lucifer Smiles

By Yehezkel Dror
The Hebrew University, Jerusalem, 91905, Israel
Published, after editing, in *Technological Forecasting and Social Change,* May 2002. Lightly updated in 2018.

Overture

Lucifer's eyes became bright on receiving the news, and his sorrowful face suddenly smiled. His hour of triumph was coming, after all the long wait. What he had expected and planned for was becoming real. Thanks to the scientific and technological ingenuity of humanity outstripping by far both moral character and capacities to govern, Earth would be his again to rule and corrupt. The date was September 11, 2001.

A Stranger Brings a Gift

Many years ago, I read a beautiful science fiction story, epitomizing the dilemma facing humanity in its relationship with science and technology.[1] A famous scientist was working on a theory that might make possible use of a new energy source that could become a blessing to humanity, but also the basis for doomsday weapons. He has a thirteen-year-old daughter. One dark evening the doorbell rings, and the daughter opens the door. A beautiful and well-dressed lady stands before the house with a package in her hand. "Here, please take the present I brought you, because you are so good and intelligent," she says in a melodic voice. The daughter opens the package when her father, interrupting with difficulty his deep thoughts on the mathematic proof of theory on which he was working on his computer, joins and sees with shock what is in the package: a primed sub-machine gun sure to fire at the lightest touch of the trigger.

"Are you mad, you murderer," shouts the father at the strange visitor. "How are you giving a small girl a killing weapon." Answers the lady, "the one who is really crazy and evil is you, who are giving to immature humanity the tools to destroy itself."

The scientist awakens from his nightmare covered with cold sweat and palpitations. He rushes to his daughter's room and finds her smiling in her sleep, as if having a beautiful dream. "What shall I do? What shall I do?" he asks himself again and again, unable to return to his computer.

The Dream and Its Nightmare

The dream of science and technology is obvious and largely realistic. Science and technology are at present the main "driver" of the future of humanity, largely for the better. Hunger is being eliminated, life expectancy is prolonged, human drudgery is reduced, lifelong learning for all is becoming a reality, distance is becoming less of a factor dividing

[1] The subtext of the story was the development of nuclear weapons. It was called "The Weapon," and it was written by Frederic Brown. I rework the story to sharpen its dramatic effect.

humanity, and so on. True, disparities continue and in some respects become worse, but the average quality of life and level of development of humanity is rising, and the worst off are also doing better than before. Given time, so the optimistic narrative goes on, science and technology will radically upgrade the situation of humanity as a whole, and it will also provide unprecedented opportunities to improve the very nature of humanity thanks to biotechnologies, while giving humanity the stars.

All this is potentially true and justified in utilitarian terms. Values of freedom and the moral significance of gaining a better understanding of the universe and of humanity itself provide further, and in some sense deeper, grounding to the conclusion that the scientific and technological endeavor should be free to unfold.

However, the nightmare side of scientific and technological progress must be recognized. Some of the apprehensions, such as on humanity displacing itself by its artifacts,[2] seem groundless. Others, such as on cloning and genetic rewiring of the human brain, may be no more than understandable but unjustified fears of the inconceivable – which may very well be most desirable. However, the possible and likely uses of knowledge and instruments supplied by science and technology for mass killing and perhaps enforced collective suicide require very grave attention and determined action.

In short, the clear and obvious danger – though one strangely neglected till the September 11 trauma – is one of devilish uses of the knowledge and instruments supplied by science and technology for mass killing, genocide, and doomsday initiation by actors beyond control by presently available norms, structures and tools.

Radical Novelty

Mass killings and genocide happened in the past, without the benefit of the most recent advances in science and technology. But, since the Second World War something radically novel[3] has happened: humanity has got from science and technology as a gift the power of self-destruction. And, in the foreseeable future, this gift will be put at the disposal of underdeveloped states and also non-state actors, including small groups and perhaps also individuals.

The facts are too clear to require elaboration. Leaving aside the ambiguous findings on greenhouse effects, the potentials in nuclear engineering and biotechnology to make instruments of mass killing and doomsday available to an increasing range of actors are obvious, up to the specter of an individual “mad” scientist producing in his home laboratory a virus likely to wipe out most of humanity. This power of humanity to destroy itself is radically new, and it requires no less radical innovative countermeasures.

Self-Containment Will Not Work

As against this pessimistic view, there are opinions claiming that self-containment makes radical countermeasures superfluous. The relatively strongest version of this view asserts

[2] As postulated in B. Joy, “Why the Future Doesn’t Need Us,” *Wired*, April 2000, 238-62.

[3] In the sense of Carl R. Hausman, *A Discourse on Novelty and Creation*, 2nd ed. (Albany: State University of New York Press, 1984). The growing literature on the Singularity and proliferating publications on catastrophic risks follow up on Joy’s pioneering essay.

that science and technology will eliminate the causes of evil by eradicating deprivation, help with solving conflicts by transforming them into win-win situations, and making all of humanity much too satiated to engage in self-destruction.

Regretfully, such hopeful views of the "end of history" have no basis whatsoever in human history or in what we know on the human mind. To limit myself here to the most fundamental of all counterarguments, "true believers"[4] are an inherent, though small, part of humanity that is essential for human advancement. But some of them are sure to be committed to "evil values," which entitle and indeed obligate them to kill others, up to the possibility of believing that collective enforced suicide is the way to salvation.

No material or educational advancement of humanity will eliminate this phenomenon, which has accompanied human history from its beginnings. But the difference is that now and even more so in the foreseeable future, such highly committed and in their view extremely moral individuals and groups are equipped with gifts of science and technology, enabling them to realize their destructive values on increasingly larger scales, up to humanity as a whole.

The crucial problem is not "rogue states" threatening to use mass-killing instruments for limited purposes, which are relatively easy to deter. Rather, it is "true believer" rulers, groups, and individuals committed to mass killing and increasingly able to realize their norms effectively that pose the really fateful problem. The paradigmatic model is one of a suicide killer well equipped with mass killing devices who believes with his whole heart and soul that his way to heaven, and often that of the sacrificed masses too, is by killing and being killed – the more the better morally.[5]

Growing Incapacity-to-Govern Deficit[6]

Put into a larger context, the problem is one of a growing incapacity-to-govern deficit. This deficit is less the result of the actual decrease in capacities to govern, as caused inter alia by the effects of mass media on politics, but it stems in the main from the increase in the minimum required qualities to govern essential for coping with crucial issues. The challenges posed to national and global governance by globalization illustrate this point. However, the main challenge to capacities to govern is posed by the potential and likely misuses of the products of science and technology for the worse, up to the absolutely evil.

Science and technology must be free to evolve, as a value in itself and as an essential condition for their flourishing and bringing benefits to humanity. But science and technology and their uses must be controlled to prevent the emergence of fatal knowledge that cannot be supervised, preclude access to potentially dangerous knowledge by persons and groups likely to use it for the worse, and inhibit and destroy those gearing to misuse the fruits of science and technology for mass killings. These contradictory

[4] As discussed in Eric Hoffer, *The True Believer* (New York: Harper & Row, 1951).
[5] For a theory of such behavior, developed during my two years with the RAND Corporation, see my book *Crazy States: A Counterconventional Strategic Problem*, updated ed. (Millwood, NY: Kraus Reprints, 1980).
[6] This subject is extensively discussed in my recent book *The Capacity to Govern: A Report to the Club of Rome* (London: Frank Cass, 2001).

requirements overtax by far present capacities to govern – thus posing a life-or-death requirement for redesigning governance.

Towards a Global Leviathan

Exploration of the required restructuring of governance, including moral and cognitive core capacities, structure, and staffing, will lead to formation processes and subjection to societal control – this should be a main concern for informed discourse, sorely lacking at present. Most of the books on governance miss the main issue, concentrating on deepening democracy instead of the needed phase jump in capacities to govern.

In contrast, real needs, as I see them, are put starkly by my proposal to move towards a "Platonic Global Leviathan"[7] as essential for coping with the fateful problem of armed evil prophets

In short, thanks to the gifts of science and technology we are moving into an epoch in which assurance of life and safety against mass-killing fanatics requires a strong global regime that takes stern measures against the diffusion of dangerous knowledge and instruments and capacitates and destroys potentially true believer mass killers well before they can act.[8] By-bye to national sovereignty, the fiction of the equality of states, global decision making by a majority of states, "power to the people" at global assemblies, etc. Instead, in matters concerning the advancement of science and technology and the diffusion and use of its results, authoritative global decisions and their enforcement by an oligopoly of main powers is becoming increasingly a must. It may take another major mass killing or two for the necessary steps to be taken. But the progress of science and technology together with the permanence of true believers, some of whom are sure to be "evil," will make a mutation in human governance towards a Global Leviathan inevitable.

Finale

Lucifer's face loses its smile. "Is it possible that humanity will preempt my triumph and move towards global coping with evil before I strike decisively?" he asks himself. "Or perhaps, with time, science and technology, together with spiritual and moral renewal, will mature humanity and rid its wiring from original sin, and thus condemn me to eternal impotence and hopelessness?" his mind continues to ponder. He makes up his mind: "I will hurry and act first. Let us see who is faster: my power of evil aided by science and technology or human coping."

It depends on us, humans, who will be first.

[7] As first put forth in my book *The Capacity to Govern*, passim.

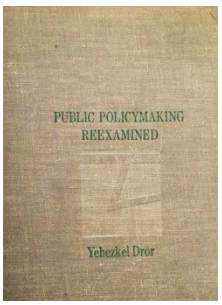
[8] My debt to Thomas Hobbes's *Leviathan*, published in April 1651, is obvious. A recent edition is by Richard Tuck (Cambridge: Cambridge University Press, 1991).

5C. The Policy Sciences of Yehezkel Dror

The beginnings of Policy Sciences as a new academic interdiscipline occurred, after World War II, in 1951 with the publication of "The Policy Orientation," by Harold D. Lasswell (1902-1978), Professor of Law at Yale University.[1]

Later in the 1950s, a number of statistical, mathematics, and economic tools and techniques for decision analysis were independently developed and improved. Government decision-making studies increased, and problems of choice were investigated—primarily in nuclear strategy, business, and individual choice. Systems theory and cybernetics were being developed in the biological and mathematical sciences and in information theory. Management sciences were at a take-off point. The 1960s saw the acceptance of policy analysis on a wide scale throughout US Government agencies. That stimulated the creation of American research centers and think tanks that devoted focused multidisciplinary professional attention to problems of national defense, economic planning, technological development, Space exploration, urban growth, education, poverty, and other social domains.

By the end of the 1960s, Yehezkel Dror was a senior staff member of the RAND Think Tank in the United States, and he had published *Public Policymaking Reexamined*:[2]



Through the 1970s, Dror became the world's most energetic, articulate, and productive advocate of the Policy Sciences. In the Foreword to the Robert M. Krone's 1980 book, *Systems Analysis and Policy Sciences*, he wrote:

> Any serious thinking on contemporary and emerging problems and issues leads to the conclusion that present assumptions, perspectives, orientations, institutions, knowledge, and methods are inadequate and increasingly obsolescent. Energy and food scarcities, erosion of governmental authority, ethnic conflicts, Crazy States, growing hiatus between haves and have nots, new aggressive ideologies, proliferation of mass weapons, global multichannel communications, potential blessings

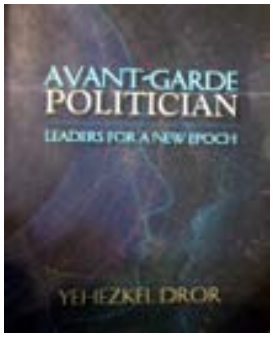
[1] Harold D. Lasswell, "The Policy Orientation," in Daniel Lerner and Harold D. Lasswell, eds., *Policy Sciences*, Chapter 1 (Stanford, CA: Stanford University Press, 1951).
[2] Yehezkel Dror, *Public Policy Reexamined* (San Francisco: Chandler, 1968).

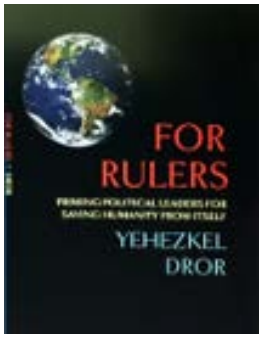
> and curses of genetic engineering, interaction between more than 150 nominally sovereign and independent states—these are just a few of the features that make the present quite different from the past and that promise to make the future even more different from the present. Historic discontinuities, trend mutations, catastrophic (in the technical sense) jumps, and accelerating ultrachange do make traditional modes of incremental policymaking and piecemeal social intervention at best inadequate and frequently counterproductive. Required instead are order-of-magnitude transformations in human and governmental capacities to appreciate situations and design innovative grandpolicies. I think it is not exaggerated to speak about the need for a novel decision-culture, that is essential if humanity is to handle its increasingly difficult problems.[3]

Editors' Notes: Readers of this special issue of the *Journal of Space Philosophy* dedicated to the legacy of Yehezkel Dror will observe that by 2018, those views have not changed. He has further documented and expanded his scope, diagnostics, and professional works over the past two decades. And Earth's problems have advanced as he predicted. If you read all the articles in this issue, you will understand the facets of Yehezkel Dror's Policy Sciences, his concerns and prospects for humanity, and the real possibilities that if his prescriptions are ignored by global decision makers, the huge black clouds forming put humanity's future at risk. ***Bob Krone and Gordon Arthur*.**

[3] Yehezkel Dror, "Foreword," in Robert M. Krone, *Systems Analysis and Policy Sciences* (Hoboken, NJ: Wiley, 1980), ix.

5D. Leadership: The Space Epoch Example





The book covers above present Yehezkel Dror's latest publications on leadership. He has consistently identified leadership as critical for public organization and in particular political performance throughout his career. He has advised rulers and those who guide them. And he has emphasized and illustrated the increasing risks posed to humanity by the widespread phenomenon of top level politicians: *sleepwalking*. His concept of a Singularity Epoch, the theme of this special issue of the *Journal of Space Philosophy,* has the purpose of helping the human species to recreate itself and its environment. To do so successfully, while first of all preventing catastrophes, a new genre of political leaders is essential – as discussed, inter alia, in his most recent book, *Priming Political Leaders for Saving Humanity from Itself*.

The purpose of this article is to inspire readers to delve deeply into the works of Dror – starting with political leadership. The benefits will be for you personally and, if appreciated by leaders worldwide, all societies on Earth will benefit. This fully applies to leadership as needed for advancing space exploration and settlement.

The following discourse addresses Dror's *Mirror for Rulers* within a more generic approach and applied to the forthcoming Space Epoch.

Introduction

Throughout human history, leadership has been a critical variable shaping outcomes for good or evil, for the thriving or extinction of societies, for progress or decline, for harmony or conflict, for peace and war, for the advance of science and technology, for religions, and for happiness or tragedy. With the Singularity, in the foreseeable future the importance of political leadership for humans on Earth and in space will become even more fateful.

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 Singularity and Space Epoch; (2) that the long-term survival and improvement of Homo sapiens as a species will largely depend 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 analyses and prescriptions of

Professor Yehezkel Dror – making the long term pluralistic thriving of humanity as a species a priority – are critically important for the leadership of national and global decision clusters.

Referencing Assumption #2, 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 priority to needs other than Space exploration, development, and human settlements. Readers will be aware of them all. The unknowns on which Space scientists, leaders, managers, investors, and advocates dwell and worry: *Will the potential benefits of the Space Epoch be insufficiently recognized and acted upon by political and other leadership – missing the opportunity when those benefits could be captured in time to solve Earth's and humanity's existential needs?*

Dror's prescriptions for avant-garde politicians are designed for Earth's next epoch. Dror focuses on Space though recognizing its importance, but this article is devoted to the future of humans in Space. The Space environment has many features that make Dror's assumptions more achievable in Space than on Earth. There is no history of human conflict in Space to date, despite the movies in the Star Wars series becoming top money-makers by portraying it, and Donald Trump's recent announcement of the US Space Force. There is no history of human settlement in Space, hindering future possibilities. 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 history reveals no nation or society giving the future of humanity as a whole priority above tribal interests. Leaders are elected or selected to take care, first of all, to their societies. Think of the legal, social, economic, and political leaps required for US political leaders to give priority to the needs of all humanity. Or, at least, to their country subject to the long-term needs of all of humanity!

What are Yehezkel Dror's prescriptions? Dror's works describe global leadership today as being unprepared for coping with emerging increasingly critical and also fateful challenges. Political leaders have the responsibility to serve as the prime agency dealing with them. But the vast majority of political leaders lack essential qualities of the mind, and they are sleepwalkers as far as the future of humanity is concerned. Dror's major conclusion is recognition that leadership will be the key for humanity's future – good or bad. For sure, continued tribalism of political leaders will ensure disasters for their countries and for humankind as a whole.

Preparation and Adoption of a Well-Designed Humanity-Constitution is Imperative
Dror provides three imperatives for a Humanity Constitution:

1. **Absolute priority** should go to assuring the long-term survival of the human species and to preventing serious harm to large parts of it.
2. **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.

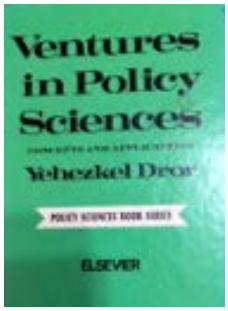
3. **The human flourishing imperative.** Strenuous efforts should be made to advance long-term, pluralistic flourishing of the human species and its parts, while also taking care of pressing short-term human needs.

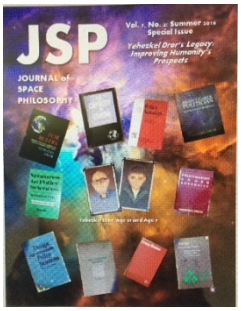
Essential **avant-garde leadership qualities:**

1. Have a sense of being called to serve as a future-shaping leader that is freely chosen by you and that dominates the whole of your life.
2. Acquire moral, cognitive, and volitional qualities essential for coping with rapidly changing challenges and, in particular, the Singularity.
3. Realistically understand the world as it is.
4. Accept that your real legacy for the future will be your positive impact on historic processes, not monuments or rituals.
5. Realize that critical issues, especially those posed by the Singularity, are increasingly of global scale. Therefore, never say and even less think that "my country comes first" without adding "subject to the needs of humanity as a whole."
6. Recognize that state sovereignty must be limited, and that a decisive global governance system is essential for the survival of the human species – up to what Dror calls a "Platonic Global Leviathan."

Editors' Notes: Over his career, Yehezkel Dror has taught, written, and consulted on improving political leadership, grand policy thinking, and critical choice. The emerging Singularity requires all of these, with time not being on humanity's side without drastic changes in global leadership that will stop the Four Horsemen of the Apocalypse (see the article "Singularity Space Contour," by Bob Krone, following). ***Bob Krone and Gordon Arthur*.**

5E. Futures





Editors' Introduction: Future contemplation has always been a part of human curiosity, thinking, and imagining. Nowadays, many public, private, and non-profit organizations, government agencies, businesses, academic and general publications, and scholarly endeavors engage in various forms of futures studies. But Dror is quite skeptical about many of them, thinking they are not really deep or sophisticated.

Following the classic work *The Art of Conjecture* by Bertrand de Jouvenel (whom Dror hosted at the RAND Corporation), Dror emphasized that all planning and choice often is and always should be based on thinking in terms of alternative futures and the variables influencing their relative likelihood, with the choice in substance manipulating those variables to increase the likelihood of the preferred alternative futures and reducing the likelihood of the bad ones – all subject to constant learning.

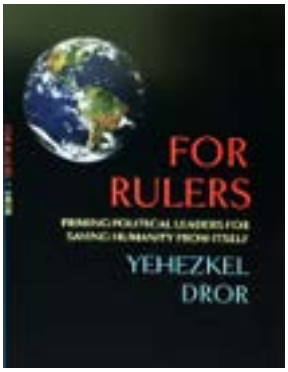
However, going through all outlook approaches, ranging from extrapolation, through analogues and modeling, and up to imagination, he finds them inadequate when facing leaping historic processes and, especially, the Singularity.

Therefore, side by side with debugging main outlook biases and illusions and upgrading outlook approaches, Dror emphasis the need for coping with deep uncertainty – leading to the innovative concept of *fuzzy gambling* and the need for its recognition and handling – as further discussed in this issue. ***Bob Krone and Gordon Arthur.***

5F. Mirror for Rulers

By Yehezkel Dror

Editors' Introduction: At the end of his most recent book, *For Rulers: Priming Political Leaders for Saving Humanity from Itself*,[1] Yehezkel Dror presents to acting rulers and those who aspire to become rulers a set of qualities they require for becoming Singularity Rulers able to fulfil their increasingly fateful mission in the emerging Singularity epoch of radical transformations. Readers should understand that Yehezkel Dror distilled these seventeen qualities from a bent in his mind fusing scholarly studies, theory innovations, and personal mentoring, and advising political leaders around the world – as adjusted to the Singularity epoch as he envisaged it. A best-selling future book will compare the qualities and behaviors of past and present rulers with Yehezkel Dror's mirror on the wall. ***Bob Krone and Gordon Arthur***.



Mirror, Mirror on the Wall

To sum up this preliminary discourse on the Singularity Rulers, who are essential for the thriving of humanity in the 21st century and beyond, and to add some more specifications, let me conclude with a kind of virtual "mirror." In it, the required qualities of a Singularity Ruler are engraved, so that his or her reflection contrasts the actual self with what is needed – thus guiding existing and nascent politicians in self-evaluation as necessary for the climb to remake themselves more fully into Singularity Rulers.

[1] (Washington, DC: Westphalia Press, 2017).

Personal Mirror for Politicians Who Aspire to Become More Like Singularity Rulers

1. As a foundation for all you think and do, regard being a Singularity Ruler as a Promethean calling and mission that imposes on you many responsibilities, with privileges being but an instrument to help you to fulfill your tasks.

2. As a 21st-century high-level politician, or one aspiring to become one, your main mission is or will be to take care of the long-term future of humanity and your country as at least partly a Singularity ruler. This involves devoting much attention, contemplative as well as in action, to weaving the future up to founding parts of a new world.

3. This does not mean that taking care of the here and now is not part of your duty, but that you should not let "now-time" and "here I am" dominate your mind and monopolize your attention. Rather, taking care of the future should receive high priority in both your mind and actions.

4. To do so effectively, you must develop the character, values, cognitive abilities, knowledge, and behavioral skills essential for fulfilling your main mission as well as secondary ones.

5. As a politician, your duty is in part to those who elected and selected you. But you share responsibility for the future of humanity as a whole. Therefore, you should give considerations of raison d'humanité much weight in all your major decisions.

6. Weaving the future involves unprecedented moral issues, such as the meaning of "justice" on a global scale, justified uses of force, limiting the freedom of science and information, and handling the potentials of biotechnology. Pondering such issues is therefore a pressing "practical" condition for responsibly making up your mind on appropriate action. To do so, you should engage a lot in deep thinking, which provides valid grounding for practice and pragmatics.

7. Indeed, more is needed. To make up your mind in a responsible way, you need to engage in a lot of contemplation. Don't let the pressures of daily events, your liking for company, and the temptations of being "practical" hinder you from engaging in solitude and in a lot of action-directed contemplation.

8. Thinking-in-history is at the core of your future-shaping endeavor. You must understand global processes to be able to optimize interventions with them, which will often take the form of grand-policies. This requires a thorough awareness of the complexity of historic processes, which are non-linear and dense not only with both qualitative and quantitative uncertainty, but also with inconceivability. No less important are the identification and invention of policy options that, if realized with an adequate critical mass, can change historic trajectories in desired directions. Developing your capacities to think, feel, and decide in such terms, as well as in frames of rise and decline, is imperative.

9. Beware of being captivated by simplistic slogans, such as “sustainability,” or being enslaved by simple “solutions,” such as leaving all difficult issues to the magic of the market. And avoid the mental cages of “political correctness,” even if you cannot say so in public.

10. Educating the public, and indeed “soulcraft,” are main missions of yours, as a value in itself and as a precondition for realizing new policies and mobilizing the support you need for doing so. Using new modes of interaction and communication well, such as social networking sites like Facebook, blogs, YouTube, and so on, can be very useful – and makes you less dependent on monetary resources and mass media popularity. But be careful not to slide from education of the public and soulcraft into the pits of propaganda and mass media spin.

11. The warning above is but an introduction to your difficult and painful task of engaging a lot in creative destruction, both in respect to your pet ideas and the external stubborn facts of fixed opinions, vested interests, and other tyrannies of the status quo.

12. Partaking in building decisive global governance, as essential for the future of humanity, is part of your mission. Cooperating with other Singularity Rulers is a main way to do so.

13. You depend on others to help you think and decide and to implement your choices. Be careful to avoid “yes-men or women” and cronies. Instead, build advisory and consultative staffs composed of persons willing and qualified to speak truth to power. But do not rely on any single group of advisors. The more important an issue is, the more you should expose yourself to a multiplicity of perspectives, views, evaluations, and options. And always be skeptical, both about yourself and others.

14. For all you do, however valid in itself, you need a lot of power. Unavoidably you will have to use stratagems that may be immoral. Do so sparingly, and take extra care not to let them poison your own mind.

15. Avoid “politics as the art of the possible,” being driven by public opinion polls and seeking easy compromises instead of fighting for the best option on its substantive merits. Explaining yourself, enlightening the public, and building appropriate coalitions of the willing should be your main tools for achieving needed consensus, not fake news or viewing quality media as your enemy.

16. Also needed is nurturing of a fitting personal philosophy, including a lot of stoic enthusiasm, so you can persist in trying to do the very difficult.

17. No human being can become a perfect Singularity Ruler. But you can strive to make yourself into something closer to one. This requires constant self-awareness, constant self-evaluation, and strenuous self-remaking assisted by counselors of high stature whom you trust.

5G. Workshops

Editors' Introduction: We decided to introduce readers to *Yehezkel Dror Workshops* for several reasons. The primary reason is that Dr. Dror has been providing global workshops covering the entire spectrum of public policy subjects and issues over his entire career. The audiences for those workshops have been students, university faculty members, policy organizations and agencies, professional societies, international organizations, advisors to national rulers, and national state rulers themselves. A few of those workshop descriptions ended up in publications. The greatest majority did not, for privacy reasons linked to the audiences.

The secondary reason is that personal workshops are a very important medium for the thinking, knowledge, theories, diagnoses, and prescriptions of Yehezkel Dror to be converted into specific applications by others. They are critically important for the education of any academic or practical forum.

The third reason is that Bob Krone has had long-term personal mentoring by Yehezkel Dror, and both he and Gordon Arthur advocate inclusion of his works in graduate-level study and teaching as well as research in major universities.

The fourth reason, elaborating on the one above, is that a public policy school or program that does not introduce its students to the Singularity together with Dror's key ideas, as elaborated in his books and in the following chapters on Singularity and Singularity policy professionals, is guilty of dereliction of duty.

Bob Krone's learning from Dr. Dror began in one of his doctoral program courses at the University of California in Los Angeles, on November 13, 1969. The subject of the workshop for the class was "The Optimal Model of Public Policymaking." Bob wrote the following statement, in his notes, from Dr. Dror's introduction to the workshop:

> What is needed is a model which fits reality while being directed toward improvement, and which can in fact be applied to policymaking while motivating a maximum effort to arrive at better policy. The model should combine realism with idealism, should be near enough to reality to serve as [a] feasible [guide] for action, and at the time it should aspire decision makers and managers to a higher quality of public policymaking and serve as the means for achieving that quality.

This statement, and the Dror 1969 UCLA course, inspired Bob Krone to commit himself to follow Yehezkel Dror's career and publications, to make the Policy Sciences a concentration is his Political Science PhD program, to use all Dror's works in his own later university teaching, writing, and consulting, and to devote this special issue of the *Journal of Space Philosophy* to the legacy of Yehezkel Dror. We provide to readers here two illustrations of Yehezkel Dror consultative mission recommendations and one illustration of a workshop. ***Bob Krone and Gordon Arthur.***

Upgrading Policy Planning in India

Mission Report by UN Consultant
Yehezkel Dror
Project No. IND/93/007

I. Introduction

1. This mission was different in nature and objectives from my first one (December 28, 1990 to January 20, 1991): Following the recommendations of the first mission and in line with the terms of reference of the second mission, the main purpose of the second mission was to give two demonstration workshops – to help the Indian authorities to make a decision on going ahead with activities to upgrade policy planning and analysis.

2. In addition, the mission included a number of lectures and seminars before senior audiences, presenting main ideas on capacities to govern and policy planning, with tentative applications to India.

3. It is not for me to evaluate these activities and their possible implications for upgrading policy planning and analysis in India. The Indian authorities will collect and process feedback and make their decision. However, thanks to the learning opportunities provided by the meetings and many discussions in workshops, lectures. etc., I would like to add some recommendations on possible steps to upgrade policy planning and analysis professionalism in the Indian government, should a decision be taken to move ahead in that direction.

4. While I accept full responsibility for these recommendations, I would have been unable to make them without the learning opportunities provided at this challenging, interesting, intense, and very well-organized mission. May I thank all the officials I met, who willingly shared their wisdom with me.

II. Recommendations

5. The recommendations are operational, and they focus on the subject of the mission. However, they should be considered within the broad approach suggested in the report of my first mission, as revised and summed up in the Appendix. I formulate the recommendations as applying to the Indian Administrative Service (IAS), mainly at the union government level. However, with some adjustments, the recommendations may also apply to other central services and to state governments.

6. A first set of recommendations deals with steps that might be taken within present structures and policies, with the aim to upgrade the policy planning and analysis capacities of IAS staff:

    a. Training of IAS probationers in LBSNAA, Mussoorie, should include a module in policy analysis, introducing the subject, together with a student project

subjecting a select decision issue to systematic analysis. About two weeks, with preparatory readings, should be allocated to this subject.

b. Before appointment as Joint Secretary, IAS officers should undergo professional studies in policy planning and analysis, within an applied approach as fitting highly experienced officials. About one month of studies, under residential conditions, including time for applied projects reconsidering some main policy issues, should be allocated to this subject.

c. A different type of recommended activity is “policy colloquia” on defined policy spaces for senior officials in charge of them. Such colloquia should be “policy reconsideration” rather than “training” oriented, with main outputs being new perspectives on specific policies and, hopefully, policy improvements. Such policy colloquia should include some mix between policy planning and analysis “mentoring” and work by the participants on the substantive policy domain, this mix depending on the policy domain and the backgrounds of participants.

d. Mentors (a term I prefer to “trainers” when dealing with policy planning and analysis) to provide suitable teaching should be urgently developed. This can be done by a modular series of workshops, covering sequentially main areas of policy planning and salient disciplines and tools within a coherent learning design, combined with advanced studies abroad for a few candidates. The same mentors should teach probationers and joint secretaries, as well as additional groups. This is recommended both for reasons of efficiency and to provide the mentors with diversified experiences, necessary for their continuous development.

e. The group of mentors in policy planning and analysis also constitutes a group of policy planning and analysis professionals. The mentors should divide their time (and/or rotate) between mentoring and working on substantive policy issues, either within suitable positions in the various ministries or as special work teams and task forces.

7. A second set of recommendations deals with building up an infrastructure for developing policy planning and policy analysis professionals and introducing them into appropriate positions in government:

a. A high-quality graduate teaching and advanced research program in public policy, with emphasis on policy analysis and planning, should be set up at one of the universities, preferably in Delhi.

b. This program should, inter alia, provide a two-year master’s program in public policy, with at least half the students coming from the IAS and other central services, as a mid-career learning phase.

c. In select union ministries, special policy planning and analysis positions and units should be set up, to be staffed in part by graduates of the university public policy program.

III. Next Steps

8. It is up to the Indian authorities to decide if and how to go ahead with upgrading policy analysis and planning professionalization in the IAS and elsewhere. But may I mention my feeling that no further demonstration workshops and related activities will provide critical new inputs. The time may be ripe for a decision in this matter.

9. If the Indian authorities decide to go ahead, a multiple approach may be advisable to proceed quickly, to meet urgent Indian needs:

    a. Immediate action to prepare mentors. Given suitable candidates, as widely available in India in the IAS and outside it, one possibility, as used in an UNDP project I headed in a Latin American country, is to design a set of six workshops to be given by different "mentors to mentors" to the same group of future mentors. The workshops should present different subjects and approaches, adding up in a modular way to a comprehensive study program in advanced policy planning and analysis. In the workshops, attention should also be given to teaching and training methods adjusted to policy planning and analysis. Each workshop should last between seven and twelve days, preferably residential, with an interval between the workshops of one to two months, during which the participants divide their time between regular jobs, or special policy planning assignments, on one hand, and guided readings and projects to prepare them for the next workshop, on the other. Alternatively, eight weeks of residential or quasi-residential intense studies can serve to prepare mentors rapidly in policy planning and analysis. It is also possible to combine the two designs, such as having an initial four-week residential learning period, to be supplemented by a number of modular workshops.

    b. In tandem with preparation of the mentors, one should proceed with developing a detailed curriculum for policy planning and analysis courses at the probational and advanced (joint secretary) level, selecting an institute to provide the courses, and running – in both the beginning and advanced courses – by the mentors, with further assistance as may be initially needed. It might be advantageous to have one institute specialize in policy planning teaching, for probationers, for joint secretaries, and for other audiences – all the more so, as the same group of mentors should give all the courses, as indicated above. However, if it is more cost-effective to provide the different activities at various locations, this can be done without difficulty – with the mentors moving to different institutes to give the courses as necessary.

    c. Long-term steps, to be started as soon as practical, but with results to be expected in two to three years, include (1) setting up a graduate public policy program at a university, and (2) sending two or three persons for advanced public policy studies abroad.

    d. Special activities, to be taken when opportune, depending on interests and opportunities, include building up strong policy analysis and planning capacities

in interested key union ministries, and, perhaps, redesigning the Planning Commission in the direction of functioning as a policy planning think tank.

IV. Conclusion

10. Various further possibilities to upgrade capacities to govern, such as possible redesigns of union ministries and further developments of the IAS, came up during the mission and its preparation. Indeed, within a broader perspective, upgrading of policy planning should be considered within upgrading of capacities to govern as a whole. But these are subjects outside my mission terms of reference, which I leave for other opportunities.

11. These tentative operational steps presented in the report too need further study and elaboration. But first, it is up to the Indian authorities to take a decision to go ahead. However, if any further elaborations and explanations may be of help in reaching a decision, I will be glad to try my best to be of assistance, as may be required.

12. Let me conclude by expressing my gratitude for this mission: it was exciting. Certainly, I learned a lot, more than I can hope to contribute. For this I am very grateful.

Yehezkel Dror
Jerusalem,
February 28, 1996

Appendix: Policy Planning for the 21st Century: Some Tentative Thoughts for India

(Revised Version, February 1998)

Yehezkel Dror

1. Rather than incremental decisions and quasi-random improvisation, trajectory setting is the task of statecraft under the expected situations of the 21st Century. This applies especially to a country-continent such as India, aspiring for accelerated advancement while facing serious problems on one hand and great opportunities on the other. Advanced policy planning can and should serve as a professional support for superior statecraft facing such challenges.

2. Four frames of thinking illustrate approaches to policy planning for the 21st Century, tentatively applied to India: evolutionary-potential mapping and mutation, strategies for handling external dynamics, competitiveness upgrading vs. inner-directness, and critical shock choices vs. comprehensive approaches vs. incrementalism.

3. Evolutionary potential mapping involves exploration of ranges of possible futures, including much uncertainty, with mapping of reality-shaping variables and policy instrument identification and selection. But more is needed to escape the cages of the past: realistic visions and nightmares are to be constructed and applied as open-ended positive and negative policy compasses (as well as energy mobilizers and support recruiters).

4. When the requirement is for "jumping" concrete evolutionary potentials, as in part in India, more radical thinking is required. For example, in such cases, free markets are basic but inadequate, inter alia industrial-social policies being perhaps essential. Acquiring the very high-quality governmental capacities required for sophisticated "non-interventionist governing of the market," as best illustrated by the success stories of East Asia,[1] poses a main challenge to governance redesign.

5. All national grand-strategic thinking must be based on handling external and internal dynamic environments. This requires some mix between four main strategies: pre-adjustment, rapid post-adjustment, shaping of environments, and some self-isolation from environments. This is clearly the case in India, where a complex mix between sectors opened to globalization and sectors protected from adverse external influences is necessary.

6. To succeed within a rapidly shifting world, societies and governments need capacities to estimate and understand main relevant dynamics, the ability to develop innovative policies and institutions, and, hardest of all, self-change capacities.

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[1] See Robert Wade, *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization* (Princeton, NJ: Princeton University Press, 1990).

7. Competitiveness, in multiple dimensions, is an additional main approach to the "rise and decline of nations."[2] Building up socio-economic competitiveness is closely related to "jumping" evolutionary potentials, as illustrated by Singapore.[3]

8. However, a country-continent such as India, as mentioned, has also options of inner-directed policies, with some isolation from global competition. Asian cooperation offers additional options. These constitute critical choices leading into alternative trajectories. But thinking them through may be hindered by "motivated irrationalities" as well as "dominant ideologies" and interest networks. Governmental and societal capacities to analyze such alternatives and choose among them may therefore require significant upgrading.

9. The appropriate mix between critical shocks vs. comprehensive approaches vs. incrementalism adds another dimension to the "gambles with history" facing India. Here, governments need high qualities of "legitimation," "social mobilization," and "democratic power concentration" capacities, in addition to outstanding policy thinking abilities. The problem of birth rates illustrates this urgent need in India.

10. Relevant requirements are illustrated by the "social time" needed for achieving substantial results, which is longer than "human time" and "political time." This requires social, political, and governmental capacities not easy to achieve.

11. All governance around the world needs quite radical changes to fit the conditions of the 21st Century.[4] Countries aspiring to radical self-transformation are in especially acute need of upgrading governmental capacities. This probably applies also to India.

12. Governance redesigns to be considered include, for instance, constitutional-political institutions providing central democratic power-concentration while advancing local initiatives, an updated highly professional high civil service elite, upgrading of citizen participation combined with policy enlightenment, and extraordinary measures to contain and eliminate corruption.

13. I can perhaps be more specific on the more limited, but crucial, need to upgrade policy planning. The following prescriptive conjectures, based on international studies and experience,[5] as well as some study of the Indian situation, may serve as a basis for exploring needs and possibilities:

    (1) Compact cadres of highly trained policy-professionals must be prepared at tough public policy graduate programs and through special intensive courses, as part of the IAS and similar services and as a separate group.

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[2] See Michael E. Porter, *The Competitive Advantage of Nations* (London: Macmillan, 1990).
[3] See Kernial Singh Sandhu and Paul Wheatley, eds., *Management of Success: The Moulding of Modern Singapore* (Singapore: Institute of Southeast Asian Studies, 1989); Beng-Huat Chua, *Communitarian Ideology and Democracy in Singapore* (London: Routledge, 1995).
[4] As discussed in my book *The Capacity to Govern: A Report to the Club of Rome* (London: Frank Cass, 1994).
[5] See my *Policymaking Under Adversity* (New Brunswick, NJ: Transaction, 1986).

(2) Islands of policy planning professionalism in the central mind of government are to be built up, with special attention to the Prime Minister's Office.

(3) Essential are independent, but government-oriented, Policy R&D Organizations (think tanks), composed of a critical mass of interdisciplinary high-quality policy professionals, together with politics-practitioners, working full time on main grand-policies in partial isolation from the pressure of current issues.

(4) Crisis management units in the central mind of government are a must, including integration with the policy planning high-staff units and based in part on the work of the Policy R&D Organization.

(5) Budgeting may require radical reform to serve as an instrument for priority setting and policy innovativeness, in addition to its economic implications. Inter alia, multi-year budgets in some domains are essential, combined with uncertainty-handling features.

(6) Interfaces between knowledge and power and between "politics" and "policy" need restructuring within democratic norms, such as with the help of a National Policy College for policy elites, including elected politicians. As a first step in this direction, multi-day retreats and workshops for the higher policy elites are recommended.

14. India has great achievements from which much can be learned by other countries, such as the Indian Administrative Service. Recent policy innovations further testify to the high levels of statecraft of India. All the more so, these are only some hesitant thoughts, offered as a tentative input into the thinking of the persons who know India and are in charge of taking care of its future.

Yehezkel Dror
June 26, 1998

Report on Yehezkel Dror UNDP Mission to a Major Latin American Country, 1998

I. Terms of Reference

1. Following meetings with the Resident Representative and his staff and contacts with the Director of the UN Division for Public Economics and Public Administration, the Terms of Reference of the Mission were reformulated to focus on four main assignments:

   (1) Giving a number of lectures, engaging in "exchange of views" meetings and interviewing a number of high-level officials and presidential advisors, with the main aim of adding perspectives to the governmental reform, with special attention to cognitive capacities for top-level strategic decisions.

   (2) Studying the overall state reform design, to give advice on its principles and overall approach.

   (3) Taking a preliminary look at some of the staffs serving the Office of the President, to give advice on possible improvement avenues.

   (4) Advising the president personally on upgrading policy making and critical choice processes

   (5) On the basis of the mission as a whole, suggesting main possible activities with which the UN may be of help.

2. At the suggestion of the Resident Representative the program was kept elastic, the expectation being that a set of initial lectures and meetings would provide access to further "inner" and "higher" circles of government. This strategy proved itself well: access was gained to senior officials and presidential advisory staff, providing sufficient information for a lengthy personal meeting with the president on the main mission recommendations.

3. However, it is to the UNDP staff in … that main credit is due for facilitating the mission and providing crucial informational and support. And it is the minister and the senior staff of the government reform project and of the Office of the Presidency and related units that provided the learning opportunities essential for the mission. Above all I appreciated the opportunity to have two lengthy private meetings with the president. To all of them I am most grateful. Many of the ideas and proposals presented in this report are based on their innovative thinking and rich experience.

II. State Reform

4. The state reform as designed and as being implemented is without doubt the best overall administrative reform that I have ever seen in Latin America, and one of the best on a global scale. It is utilizing modern experiences and ideas in policy making

improvement, without being captivated by some of the fashionable dogmas. The reform is comprehensive, but it has built in modules in ways providing elasticity and permitting implementation in phases. The units to be reformed are full partners in the activity. International experience has been taken into account. And the reform senior staff is highly professional and competent, and I have much to learn from them.

5. In short, I am very impressed by the reform, and I regard it as an excellent investment of international cooperation resources. Other countries, in Latin America and elsewhere, have much to learn from this reform as it will unfold.

6. During meetings and seminars with senior staff, a number of suggestions were made for possible improvements in the reform. Leaving aside minor and technical issues, my main recommendations can be summed up under seven headings: (1) broaden and deepen the range of experiences of other countries that should be taken into account; (2) strengthen attention to the cognitive dimensions of government; (3) pay more attention to increasing creativity and learning, and also to "informal" processes as a whole; (4) integrate budgeting redesign more fully into the reform; (5) facilitate a special project on the cognitive facets of the Office of the President; (6) strengthen overall reform monitoring, including close oversight of main contractors; and (7) provide the ministers and the senior advisors of the president with study opportunities, in the form of intensive off-the-record workshops on policy making and critical choices.

(1) Broaden and deepen the range of experiences of other countries that should be taken into account.

7. As mentioned, the reform is based inter alia on good familiarity with some main relevant experiences in other countries, such as the United States, the UK, and New Zealand. But the experiences of additional countries may be quite relevant. Thus, I think that the reform could benefit from the experiences of India and Sweden.

8. Also, some deeper study of the experiences of the UK, Canada, and New Zealand, including recent developments, may provide important inputs. This is all the more the case as visiting experts and lecturers may provide incomplete perspectives.

9. Therefore:

> Recommendation 1: Some senior staff should go on an intense, but in-depth, study mission to India, Canada, the UK, Sweden, and New Zealand. Also, exchanges of experience with the Public Management Service (PUMA) of OECD and with other international and comparative public administration centers should be strengthened.

(2) Strengthen attention to the cognitive dimensions of government.

10. The reform takes into account the need to improve policy making, as evidenced by the following statement in one of the reform documents: “Strengthening policy-formulating cores requires these to become able to evaluate risks, to assume future scenarios and to estimate the impact of a given policy over different scenarios.”

11. However, in trying to move from “bureaucratic” to “managerial” forms of administration, the necessity to develop a compact but very high-quality distinct cadre of “policy professionals” for staffing main policy development units, may require more attention. The efforts to differentiate between “executive agencies” on one hand and ministries on the other make this all the more crucial, as the latter will have to concentrate on policy making – which makes suitable professionals essential.

12. Therefore:

> Recommendation 2: More attention should be paid in the reform to the cognitive dimensions of governance, with special emphasis on developing a small but very high-caliber cadre of advanced policy professionals.

13. This recommendation is closely related to some others to be presented in Chapter 4, where developing policy professionals is discussed.

(3) Pay more attention to increasing creativity and learning in government, and also to “informal” processes as a whole.

14. A main need in modernizing the state is to make it more creative and innovative in seeking, developing, and adopting new policies for meeting changing values and needs within shifting environments. This has important implications for structure, incentive systems, career patterns, and “organizational culture.”

15. Related is the need to make government and public administration more into “learning states,” with systematic evaluation of the results of main policies and their improvement through well-designed feedback.

16. Upgrading of learning has important implications for reforming the state. Thus, main policy decisions should include estimates of main impacts on defined populations, independent bodies should map actual results, and semi-structured processes should engage in drawing lessons from experience, with care being taken to avoid “blame or praise” from corrupting learning.

17. However, creativity, learning, etc. are largely a matter for informal processes and organizational culture. The reform avoids the main disease of most administrative reforms in Latin America, namely preoccupation with formal structures and regulations. Still, it puts a lot of emphasis on formal structures, management contracts and agreements, work plans, etc. This is essential, given local traditions and conditions. But it might be a good idea to counterbalance this need with more attention to informal structures and processes, incentive structures, administrative leadership, and organizational culture – together with some relaxation of select formal and legalistic elements of the reform.

> Recommendation 3: More emphasis should be given to encouraging creativity and learning in governance.
>
> Recommendation 4: Informal structures and processes and organizational culture may require some more attention, with some de-emphasis of the formal-legal dimensions of the reform.

(4) Integrate budgeting redesign more fully into the reform.

18. The reform encompasses an important and even crucial dimension of fiscal management, including budgeting. However, a broader approach to budgeting as a main instrument for setting national priorities, of policymaking, of administrative direction, and of serving as an incentive may be advisable.

19. Redesign of budgeting should be an integral part of the structural reforms on one hand and of improving effectiveness and efficiency on the other – in combination with techniques such as life-cycle costing, multi-year budgeting, etc.

20. Getting a good consultant with a broad approach to budgeting and wide familiarity with international experiences with budgeting reforms should be urgently considered. Let me add that this consultant must be an expert in government budgeting, business management experiences and doctrines being quite misleading in this matter.

21. Therefore:

> Recommendation 5: A broad approach to budgeting as a main instrument of decision making and management should be integrated into the reform.

(5) Facilitate a special project on the cognitive facets of the Office of the President

22. One of the main limitations of government reforms is their neglect of crucial "weaving the future fuzzy gambling" decisions. Therefore, they suffer from the danger of bringing about more effective and efficient implementing of policies that may be wrong. This is well illustrated by the experiences of the UK, Canada, and New Zealand – where it is increasingly realized that so-called "new public-sector management" makes upgrading of crucial choice capacities all the more necessary. (Therefore, my recommendation in Section 8 above to provide reform staff with opportunities to study recent rethinking in the countries that pioneered the "new public management" approach).

23. This requirement applies to all state ministries. But, given the presidential regime and the political culture and tradition, the paradigmatic case is provided by the cognitive facets of the Office of the President.

24. I discuss this challenge in Chapter 3 below. Therefore, let me limit myself here to three preliminary comments:

    One. In considering the Office of the President, a distinction should be made between its nature as a management system and its nature as a cognitive system. While there is quite some overlap between these two, it is important to distinguish the "central brain of government" aspects from the "bureaucratic-managerial" aspects. Quite different knowledge and approaches are needed for improving them.

    Two. Within the state reform as a whole, much attention should be given to protect the central brain functions of the Office of the President from being disturbed by overloading the office with many non-essential tasks and structures. It is important to resist the tendency to put into the Office of the President functions that do not easily fit anywhere else and the importance of which one wants to augment. But putting too much into the Office of the President not only hinders its main mission of providing overall national strategic directions and handling critical choices, but in effect, it also leads to the neglect of tasks put there – which will not receive adequate attention. This may apply also to state reform – which, I think, should not be put into the Presidential Office.

    Three. The state reform should include as a crucial component upgrading of the core competencies of the Office of the President with special attention to staff work. However, this is a sensitive project that requires special handling as a separate endeavor.

25. Therefore:

> Recommendation 6: Upgrading strategic choice core competencies of the Office of the President should be a major component of the state reform, as crucial in itself and as a paradigmatic example for main ministries. This is quite a distinct endeavor from improving the Office of the President as a managerial system.
>
> Recommendation 7: In the state reform as a whole, care should be taken not to overload the Office of the President by locating there functions and units that are not essential to its main mission to serve as the central brain of government.

(6) Strengthen overall reform monitoring, including close oversight of main contractors.

26. A number of important reforms seem to be under consideration that are not fully integrated into the main project. This is not necessarily harmful, all the more so when involving distinct entities and sensitive subjects. Still, mutual learning should be assured, both informally and by overlapping advisory bodies.

27. All the more so, overall monitoring of the reform itself is essential. The unavoidable reliance on a multiplicity of contractors, mainly consultants with largely business enterprise experience, makes careful monitoring all the more essential – especially in respect to large projects.

28. Much of the monitoring will have to be done by contractors. This requires all the more care in selecting “monitoring consulting groups” that have much experience, are completely free of conflicts of interest, and are highly competent both in monitoring consultative projects and in public management and governance domains.

29. The reform is quite extensive. Therefore, there is a need for “monitoring of the monitoring”; what can be called “meta-monitoring.” It may well be that the Governance and Public Administration Branch of the Public Economics and Public Administration Division of UN New York can and should be of help in meeting this important, but not simple requirement.

30. Therefore:

> Recommendation 8: Mutual learning between the main reform and other reform activities in government should be assured, such as by overlapping membership in advisory bodies.
>
> Recommendation 9: Careful monitoring of main projects undertaken by sub-contracted consultants must be assured, with the help of separate monitoring consultants.
>
> Recommendation 10: The scope of the reform requires meta-monitoring, that is monitoring of the monitoring. It may be preferable to have this activity done under the responsibility of a UN unit, such as the Governance and Public Administration Branch.

III. Staffs for the President

31. Having had the privilege of meeting the president and some of his senior staffs, there is no doubt in my mind of their high quality. Still, there may be scope for considering a number of improvements.

32. This conclusion of mine is based on the opinion of the president himself and the advisory staffs I met, as expressed both in seminars and in individual interviews. To explain the method: both in lectures followed by seminar discussions and in personal meetings, I presented various ideas and received feedback. This is the empiric basis for my overall impression that the president has excellent staff, but there is scope for improvements.

33. It should also be taken into account that in one year there will be elections for the president. Comparative experience indicates that the best opportunity for upgrading presidential staffs (and candidates) is shortly after elections, which requires that carefully considered proposals should be prepared in advance. But intense workshops for acting ministers, if possible with the personal participation of the president, have proven very helpful in a number of Latin American countries in which I have advised the government.

34. Therefore:

> Recommendation 11: A project on further improving the presidential staff should be undertaken, with an effort to have proposals ready for further development and implementation soon after the elections.
>
> Recommendation 12: Intense workshops for ministers, if possible with the president, should be carefully prepared and provided. This also applies to candidates before elections, with adjustments.

35. Main improvement possibilities concerning staffs within the Presidential Office which may be considered include the following:

    - Setting up a professional policy planning unit providing national long-term perspectives and evaluations on main policy issues and strategic choices.
    - Setting up a "national estimation advisory unit."
    - Building a professional crisis-management team.
    - Engaging in national priority setting combined with goal costing.

36. These units and functions can be combined in various ways, can in part be based on existing structures, and should work in close cooperation with the inner circle advisors of the president.

37. Most important of all, the staff system must fit the preferences of the president and enjoy his full support and confidence. Indeed, a project on improving the presidential staff should be undertaken only on the explicit instructions of the president and after discussing with him the directions in which he would like the project to proceed.

38. Therefore:

> Recommendation 13: Subject to the approval and directives of the president, a project should be undertaken on strengthening the professional staffs in his office.
>
> Recommendation 14: Inter alia, the following possibilities should be considered: setting up a professional policy planning staff, a national estimation unit, and a crisis management unit; and engaging in national priority setting and goal costing.

39. Decision process improvement is another avenue to providing the president with more supports, all the more so as upgrading professional staffs and bettering decision process management go hand in hand.

40. A good illustration is the introduction of standard minimum formats for main proposals submitted by ministers to the president, on line with “Cabinet Memoranda Drafting Instructions” as used, for instance, in Canada. This can assure better presentation of background material, more attention to costing, search for alternatives etc. – and thus it can not only help the president in reaching a decision, but also motivate the ministries to upgrade their policy development processes.

41. Another illustration is provided by the problem of decision implementation monitoring, which for instance requires streaming of decisions according to their importance and sensitivity. This is an area where much experience is available that can be applied without too much difficulty.

42. Therefore:

> Recommendation 15: Decision process management should be evaluated and improved, with special attention to submission of major decision proposals, implementation monitoring, and more.

43. Whatever is or is not done in respect to the in-house staff of the president, some kinds of national policy creativity, development and research organizations (think tanks) are essential – to engage in deep consideration of main national problem spaces with overall, long-term, and interdisciplinary perspectives.

44. Such high-quality units do exist in … and engage in very important work, such as the …. Furthermore, … is rich with foundations and academic bodies engaging in policy-relevant research, as well as many individuals doing policy thinking and study.

45. Therefore, a good basis for upgrading exists. Existing bodies and networking may well meet needs, with some UN help to be provided – such as study missions to outstanding think tanks in other countries. However, to identify needs and develop improvement options, a separate mission by a suitable consultant, to be carefully selected, is necessary.

46. Therefore:

> Recommendation 16: … is well equipped with think tanks. However, there is scope for improvement, such as in strengthening interdisciplinarity, upgrading policy professionalism, and building up networks.
>
> Recommendation 17: A carefully selected consultant should evaluate in depth existing think tanks and similar facilities and prepare improvement proposals.

47. To provide some further background ideas on possible approaches to improving the Presidential staff, I have written a draft paper "Design For a Presidential Office." However, to my regret, my mission was too short to arrive at the knowledge and understanding needed to adjust this paper and its general ideas to the particular needs and realities of the Presidential Office of ….

IV. Developing High Quality Policy Professionals

48. I am quite hesitant about my recommendations concerning the staff system of the Presidential Office, not being sure I acquired sufficient knowledge on the actual situation to justify the "hubris" of my recommendations. I have fewer doubts about possibilities to help with advancing the policy professionalism of existing and future advisory staffs, in the Office of the President, in think tanks, in ministerial policy planning units, etc.

49. This is not the place for an exposition on the nature of advanced policy professionalism, all the more so as I discuss the matter in publications of mine.

50. In short, advanced policy professionalism requires extensive knowledge in a range of subjects, from thinking-in-history to policy-gambling, from rise-and-decline-of-nations theories to managing complexity, with outstanding skills to apply abstract and generic knowledge to concrete policy spaces.

51. Because of the demanding nature of advanced policy professionalism, there is a constant need for further study and development, also when good policy professionals are available. All the more so is there much scope for improvement when public policy university programs are not fully developed and when staffs working on policy issues are highly professional in traditional disciplines, but they often lack advanced training in many policy professionalism subjects.

52. I was unable during the mission to arrive at a reliable estimate on the availability of advanced policy studies at universities in …. But, clearly, this is an important subject that requires evaluation and, probably, improvement.

53. Therefore:

> Recommendation 18: Existing public policy programs at universities in … should be mapped and evaluated, and upgrading proposals should be developed by a suitable consultant.
>
> Recommendation 19: Inter alia, setting up a top-quality advanced post- graduate public policy school at a university in …, in cooperation with the government, should be considered.

54. Upgrading of policy professionalism programs at universities is in the longer run essential for high-quality policy thinking and planning. However, this will take time. Therefore, intense retooling and upgrading in advanced policy professionalism for existing and new staffs in policy units in the Office of the President and the government as a whole should be considered.

55. Assuming that participants are experienced persons with good academic backgrounds, intense studies taking, for instance, the form of a series of five- to ten-day workshops can well meet the requirements and significantly improve policy professionalism in a very cost- and time-effective way.

> Recommendation 20: Intense programs to upgrade the policy professionalism of policy staffs should be undertake, taking for instance the form of a set of workshops.

56. Let me add that there is quite some experience available with such endeavor, also within the UN family, and suitable mentors can be found, though much care is needed in their selection.

57. To conclude this chapter, may I emphasize that upgrading the policy professionalism of compact policy cadres can significantly improve crucial cognitive capacities in government, also without structural changes, while structural changes without high-quality policy professionals are of very limited utility in respect to policy making quality, and they can also become easily counterproductive.

58. Therefore:

> Recommendation 21: Upgrading of policy professionalism should be a main component of reform of the state, with special attention to presidential staffs and think tanks

V. Supporting Societal Policy Thinking

59. In a democracy, good governmental policy making depends on the quality of societal policy thinking as a whole, and on different levels of governance and in the political and policy elites. This is all the more true in ….

60. Hence, a variety of different broader approaches should accompany those focusing on central government as explored in my mission and discussed in this report. Thus:

- The applicability of the various issues and recommendations to state, city, and local governance should be considered.
- Ways to help the work of the Party Institutes, now quite well supported by public funds, should be considered. Inter alia, exchange of experiences with the Austrian Political Party Academies may provide some relevant ideas.
- Projects for legislatures might be strengthened.
- Citizen education in secondary schools and universities should be evaluated and improved.

And so on.

61. Therefore:

> Recommendation 22: Broader approaches to upgrading policy thinking on the societal and political levels should be considered.

Syllabus of a Ten-Day Workshop for Senior Decision-Makers, Policy Planners, and Strategy Advisors on Statecraft, Weaving the Future, Policy Planning. 10 Hours Per Day and a Number of Evening Exercises – Residential in Convenient Facilities

Yehezkel Dror

Preparatory readings are selected to fit profiles and reading potential of participants. Each subject is presented in class, discussed in light of experience of participants, applied to given situations in individual and group exercises, and reconsidered after the exercise. Three integrative multi-stage evening exercises sum up clusters of subjects, with an 8-hour overall summing up exercise.

1. Statecraft Between “Blowing Bubbles” and “Weaving the Future”

   Governments always engage in some mixture of blowing bubbles, fighting fires, distributing goodies, and weaving the future. However, modern developments, such as mass media, result in blowing of bubbles increasingly displacing weaving the future. There are dangers of “multi-media mass democracy.” Hence the need for counter-measures strengthening weaving the future capacity, as in part developed in this workshop.

2. Groundings for Statecraft and Advancing Towards Humanity-Craft

   The idea of statecraft and its adjustments to “humanity-craft.” Main bases: understanding the Singularity and its implications; values and goals; will to influence the future for the better; understanding of historic processes and estimation of opportunities and dangers; innovative intervention options; intervention resources including power. Need to upgrade moral and cognitive capacities; to move towards “statecraft professionals.” Next step: produce Singularity policy scientists (as discussed in coming chapter).

3. Improving Capacities to Govern: Preliminary Look

   The real issue is one of “incapacities to govern” and not “ungovernability.” The growing impact potency of governance without choice improvements produces a dangerous hiatus. A very small number of politicians and other governance staffs unavoidably make critical future-influencing decisions, all the more in respect to critical and also fateful Singularity issues. Hence the need for a broad approach to improving governance, including taboo subjects such as upgrading the moral and cognitive faculties of senior elected politicians. Exercises explore the possibilities.

4. Strategic Policies as Setting Trajectories in Time

   Strategic policies as attempting to influence the future and setting new trajectories into time, by “intervening with deep history.” Exercises explore capacities to engage in strategic choice and the main problems of doing so.

5. Outlook: A Glance Towards the Future

   Main “deep drivers” of the future: demography, science and technology, values and ideologies. Main Singularity features and their potentials for better and worse. Main features of present and foreseeable global and local dynamics, such as Kafkaen processes. Need for thinking in terms of hyper-Heraclitean perspectives, together with awareness of many relative stabilities. Globalization. Alternative geo-strategic and geo-cultural futures: Regionalization. Decline of the West? Turbulence, uncertainty, incomprehensibility, and inconceivability. Exercises explore some main challenges, threats and opportunities.

6. Diagnostics of Dynamics

   Policies must be based on knowing and understanding of salient processes, instead of “estimates of situations.” Problems of intelligence estimates and their improvement. Interface between estimations of dynamics and decision-makers. Exercises discuss intelligence failures and designs for improved diagnostics.

7. Thinking-in-History

   Thinking-in-history as an essential basis for policymaking. Problems of appropriate time horizons. Common misuses of history and their prevention. Exercises consider pressing policy issues within long-term and deep history.

8. Decision-Making Regimes

   Selection of decision-making regimes fitting situational dynamics, with incrementalism on one extreme and break-out radicalism on the other. Exercises identify main issues in need of different decision-making regimes, with emphasis on radicalism-requirements posed by the Singularity.

9. Debugging Choice

   Identification of main choice pathologies, such as “motivated irrationality,” and their reduction, as an essential approach to policymaking improvement. Other main approaches: approximating preferable models and setting normative rules.

10. Advanced Policy Cogitation Frames

    Main frames for policy planning and strategic choice, such as evolutionary potential mapping, design of realistic visions, competitiveness, rise and decline of nations, and the future evolutionary alternative trajectories of the human species. Exercises apply some of the frames.

11. Critical Choice and Agenda Setting

    Critical choices as crossroads in time and opportunities to shape the future significantly, as contrasted with hard problems lacking options. Agenda setting between the urgent and the important. Improvement of problem images, attention allocation, and apportionment of decision-making resource. Uses of policy R&D to

generate new options. Exercises identify main critical choices and hard issues, applying protocols for allocating decision resources accordingly.

12. Basic Deliberator and its Uses

    Core elements of decision-making, their nature and improvement. The basic policy analysis schemata. Common-sense, pragmatic, rationality, optimal and genius-dependent prescriptive models. Exercises explore the possibilities and limits of quantitative decision-making and of decision support systems, applied to obscure policy spaces and quandaries.

13. Augmenting Heuristics

    Heuristic as central to complex strategic choice. Relations to other "extra-rational" dimensions of strategic choice, such as intuition, creativity and inspiration. Special value judgment features. Ways to stimulate them, including metaphoric thinking. Need for multiple "languages" and multiple "cultures." Exercises explore the use of "metaphors" for exploring enigmatic policy issues.

14. Realistic Visions and Nightmares

    Design of realistic visions and nightmares as providing policy compasses. Their political uses and misuses. Exercises work out realistic visions and nightmares and examine their action implications.

15. Alternative Futures: Between Necessity, Contingency, Chance, and Choice

    The "policy cosmos" as between necessity, contingency, chance, and choice. Main cartography for mapping the future, including uncertainties, incomprehensibilities, and inconceivabilities. Exercises map selected policy domains in terms of alternative open-ended futures and surprise potentials.

16. Policy-Gambling: Strategic Choice as Fuzzy Gambling with History

    Fundamental view of decision-making as fuzzy gambling, with the essence of strategic choice being fuzzy gambling with history for high stakes. Radical implications for all of policymaking and politics. Exercises examine main protocols for improving policy-gambling and apply them to crucial choices.

17. Crisis Steering

    Crisis steering as the ultimate mode of coping with uncertainty and inconceivability. Crisis instigation as a breakout strategy. Professional supports for crisis steering and their prerequisites. Night crisis exercises present major crisis situations in stages, demonstrating difficulties of crisis steering and potentials of improvement proposals – summed up in a design exercise.

18. Policy Creativity

    Policy creativity as essential for coping with novel situations. "Analysis" vs. "innovation." Creativity as a "black box." Main ways to increase options and to

encourage policy creativity. The roles of special policy R&D organizations (think tanks). Societal thinking as a critical resource.

19. Value Judgment Upgrading

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6. Singularity Contour

By Yehezkel Dror

Contents

1. Preamble

1.1 This is a first draft of a paper on the main features of the emerging phase leap of the human species, increasingly called the *Singularity*. This special issue of the *Journal of Space Philosophy* provides a welcome opportunity to present it to a distinguished audience, together with a closely related paper on the future Space Epoch by Dr. Bob Krone.

1.2 While I endorse and use in this paper the term "Singularity," personally, I prefer a more professional term that better expresses the contents of the emerging human phase leap, namely *Anthroporegenesis*, as explained in Section 3.2. This is all the more necessary because the term Singularity and its associates, such as *Transhumanity* and *Posthumanity*, are increasingly becoming a flag of convenience for baseless speculations. But there is also a growing body of serious work using these terms (as illustrated in my companion essay "Becoming a Singularity Policy Scientist"), so I adopt them subject to this warning.

1.3 Though rudimentary, lacking elaboration, and without academic references, this draft presents the main features, issues, problems, options, and choices related to the Singularity hypothesis, as conceptualized by me. It can also be regarded as an outline exploration of a radically novel and, indeed, revolutionary paradigm presenting the new epoch into which the human species is cascading, however unprepared. But I prefer the less presumptuous term *contour* for exploring what is a conjecture, however well based on the evaluation of ongoing processes.

1.4 This draft engages in quite some iconoclasm – casting doubt on widely accepted notions and emphasizing serious lacunae in current discourse on the Singularity. I also transgress against political correctness and deviate from common sense and consensual values. The reason is simple, but it has far-reaching implications:

"Thinking as usual" while undergoing a metamorphosis is a widely used speedway leading humankind to avoidable catastrophes.

1.5 All the more so, I need the help of interested readers, who are invited to send their comments and suggestions to the author, at my email address yehezkel.dror@mail.huji.ac.il. To help you to do so on the basis of following my reasoning critically, I put some key statements in emphasized boxes, as illustrated above.

2. Not a *Technological Singularity*

2.1 As best presented by Ray Kurzweil in his books, the term Singularity in the present context (as distinct from mathematics and astrophysics) refers to the scientific and technological quantum leap that pushes the human

species into a radically novel mode of being. But what is usually meant, and sometime explicated, is a technological Singularity.

2.2 Without going into the technological specifics, however fascinating, such as the different possible substrata of superintelligence, the following partly overlapping emerging technologies constitute the main relatively realistic dimensions of the (technological) Singularity (leaving for the long-term future esoteric possibilities such as downloading human minds into computers and thus making them nearly eternal):

2.2.1 Artificial general intelligence leading to intelligent and super-intelligent robots and perhaps spiritual machines, increasing or surpassing the mental abilities of human beings, however enhanced. Included are the possibility of human-machine combinations, and also an escalating chain of intelligent robots designing and producing super-intelligent ones, which in turn design and produce super-super-intelligent robots, and so on into an inconceivable future with radical implications for human beings, such as cohabitation, being marginally tolerated, and elimination.

2.2.2 Nanotechnologies, enabling production of nanomachines, including nanorobots that can act within human bodies, prolonging life and enhancing various abilities, or acting as invincible mass killing machines; and surpassing the ambitions of alchemists by transmuting materials and thus eliminating scarcities and rehabilitating the environment, but also creating havoc, such as by reducing the value of gold to that of lead that is cheaply transformable into pure gold.

2.2.3 Genetic engineering enhancing human bodies and minds, prolonging life expectancy, enabling human cloning, making it easy to transmute and synthesize viruses, and much more.

2.2.4 Human-machine interfaces and combinations multiplying human abilities while compensating for bodily and mental deficiencies, up to transforming humans into cyborgs.

2.2.5 Cheap and non-polluting energy that can be easily stored, changing totally all energy-based technologies and tools.

2.2.6 Accelerated and large-scale space exploration, thanks to enhanced human bodies, intelligent robots, and new space traveling technologies (leaving aside long-term possibilities to reach exoplanets and perhaps to expand humanity beyond the Solar System).

2.3 There are different opinions on the likely timeline of progress in developing the various Singularity technologies, ranging between a couple of decades and one or two centuries. I personally think that the more critical and radical Singularity innovations require scientific knowledge and technologies far beyond our present reach. Thus, to achieve superintelligence, its currently unknown nature has first to be clarified.

2.4 An essential step for doing so is to unravel the riddles of geniuses, which may take a long time if at all possible for human minds. Let me take as an example the Indian mathematician Srinivasa Ramanujan. He was a super-genius, as well put in a biography:

> a man who grew up praying to stone deities; who for most of his life took counsel from a family goddess, declaring it was she to whom his mathematical insights were owed; whose theorems would, at intellectually backbreaking cost, be proved true—yet leave mathematicians baffled that anyone could divine them in the first place.[1]

No advances in neurosciences or studies of the mind provide plausible explanations of the nature and organic bases of such a genius, as may be essential for designing superintelligent robots.

2.5 And what about the four ways to truth, stipulated by Alain Badiou, including art and love (in addition to science and politics in a special sense)? The very term *intelligence* in the term *superintelligence* raises serious questions, and it may be far too narrow, all the more so as neither neurologically nor philosophically are art, and even less so love (as correlated with sexuality and thus both embodied and somehow above the body) included in intelligence.

2.6 Therefore, I recommend a good measure of skepticism on predictions that most of the Singularity is around the corner.

My assessment is that it will take at least one or two centuries before salient Singularity technologies become mature, even if not slowed down by civilizational catastrophes or on purpose. And full-scale superintelligence may take even longer, if at all achievable.

2.7 Nevertheless, it is very likely that by the end of the 21st century some of the technologies will be mature enough to significantly impact on humanity, providing many blessings accompanied by explosive disruptions and harsh moral and political quandaries.

[1] Robert Kanigel, *The Man Who Knew Infinity* (London: Little, Brown, 1991), Kindle edition, 4.

2.8 Thus, within this century, artificial generally intelligent (but not superintelligent) robots are likely to reduce radically labor done by humans, creating mass unemployment. Human enhancement is likely to result in harsh biological inequality between the few who can pay for expensive enhancements, such as significant increases in life expectancy, and the many who will not be able to benefit from such technologies before they become affordable by all – which at best will take a long time. And berserk fanatics are likely to produce mass killing viruses and to use them for extortion and genocide.

2.9 The contrasting uses of emerging Singularity technologies for better and worse, as differently defined by the beliefs of diverse parts of humanity, will pose harsh choices requiring unprecedented measures. While most existential risks associated with the Singularity are widely recognized, and countermeasures are analyzed at various academic and policy units, in my view, much more is needed to reduce serious risks to humanity. And achieving the benefit of the Singularity may not be much easier.

3. The Real Singularity

3.1 Technology is not an agency, being rather a set of tools based largely on science and hands-on creativity. Technology produces the emerging Singularity, is its landmark, and instantiates it. But the real ontology of the Singularity is different:

The real Singularity is the growing ability of the human species to shape its future evolution as a species, the salient features of the evolution of the biosphere of earth, and its physical surface characteristics.

3.2 The human species has influenced its evolution and that of some animal and plant life since its beginnings. Hunting, fire, mating patterns, selective breeding, seed selection, medical knowledge, biopolitics, changing eating patterns – these and related behavior have increasingly impacted on the dynamics of human evolution and parts of its environment, all the more so after the industrial revolution, as recognized by the novel term for our epoch “Anthropocene.” It includes nuclear fusion, the first steps into space, and human-caused global climate changes that constitute the dawn of the Singularity, the core of which is what I call Anthroporegenesis, in the sense of the human species acquiring the technologies that enable it to bring about a new genesis, transforming the human species and its living world radically.

3.3 To put the core ontology of the Singularity clearly:

Humanity as a composite agency is taking charge of critical features of its future evolution as a species, partly displacing natural evolution. It does so thanks to tools provided by leaping science and technology – but the decisions on using these tools are made by humankind.

3.4 The future of our species will continue to depend at least in part on natural events, such as objects from outer space hitting Earth and mega-volcanoes. But the human species is developing technologies it can use to change its biology and minds, to reshape Earth radically, perhaps to settle other planets, and also to terminate the existence of the human species with or without other humanity-generated forms of life taking over.

3.5 Let me recapitulate the critical reformulation of the nature of the emerging Singularity, which is not recognized in current uses of the term but is critical for handling the Singularity, to reduce negative effects and to increase positive ones:

The Singularity is not constituted by technological evolution partly displacing natural evolution, even if phenomenologically this is happening. It is the human species, which acquires the knowledge and tools increasingly enabling it to impact on its future evolution, using the emerging technologies as it chooses. This is not a deterministic process, but one shaped by human discretion. Accordingly, humankind as a composite agency is morally responsible for the Singularity and its consequences, not the scientists and technologists who provide the Singularity tools.

4. To Be, What to Be, Not to Be

4.1 Pondering Singularity scenarios and what to do about them requires a total shift in human perspective:

We have primarily to think, invent, and act in terms of evolutionary processes shaping the future of humanity and the increasing role of human choices in steering them. Therefore, while the welfare of humans now and in the near future continues to be very important, assuring a long-term future for the human species has top priority (unless future generations decide differently, such as letting a super-superior species take over).

4.2 Parts of humanity have faced many critical choices in the past, whether they recognized them as such or not. These have ranged from individual existential choices to collective ones on regimes, economic systems, moral norms, wars or peace, and so on. But few such choices shaped the deeper levels of our long-term history, and none impacted significantly on our nature and evolution as a biological species. All this is changing with the emerging Singularity.

4.3 For the first time in the history of life on Earth, a species has the capacity to shape deliberately its future evolution and, consequently, it has to make decisions, explicitly or by default, on the meta-Hamletian question "to be, what to be, or not to be." And, on a higher order level, humanity has to decide, explicitly or by default, who should make such decisions and shape significantly its evolutionary future, and how to implement such choices effectively.

4.4 Some of these issues receive attention, such as discourse on avoiding catastrophes. Also, somewhat elaborated are decision criteria. But most emerging decision forks, including critical ones, are ignored or badly considered – including the meta-issues of who should decide on interventions with human evolution and how to implement such decisions.

5. Fateful Fuzzy Gambles

5.1 Historic processes are by their very nature dynamic, non-linear mixtures between necessity and chance. This is true, in various proportions, from the macro-level of cosmic processes to the nano-level of atomic and subatomic events; and also, with adjustments taking into account the important role of "choice," the life history of individuals. However, totally novel is the increasing importance of human choice in shaping the processes determining the future of the human species:

The future of the human species is increasingly shaped by human choice interacting with necessity and chance. Therefore, application of existential philosophy to humanity as an agency and developing the nature of humankind as a collective deliberative agency are at the core of upgrading human impacts on the future of humanity as a species.

5.2 This sounds great, but it may be catastrophic unless human future-impacting choices are of optimal quality. However even optimal choices have results that depend in part on necessity and chance beyond human control. This is all the more so the case in the face of prevailing deep uncertainty. Therefore:

Even optimal human future-shaping choices are inherently and unavoidably "fuzzy gambles, often for high and also fateful stakes"—because the future is in deep uncertainty, reaching wild uncertainty and also inconceivability. This is increasingly the case as we move into the Singularity with its unprecedented phase leaps into the largely unknowable.

5.3 If this is the nature also of optimal choices, then all the more so suboptimal choices carry multiplying risks. Taking into account the usually low quality of human choice on complex quandaries, it is far from assured that the increasing power of humanity to shape its future will work for the better. It is

no less likely (to put it relatively optimistically) to result in catastrophes and even collective unintended species suicide.

5.4 Please do not be misled by the fact that humanity is today overall better off by material criteria than ever before. This is true, largely thanks to evolving science and technology, which till recently was in the main very beneficial for humanity without catastrophic risks for the future of the species. Also beneficial have been some governmental policies and social self-regulating processes such as relatively autonomous global markets and mild regimes, such as democracy. But if we take a close look at the actual choices of governments on global issues rather than pious declarations, such as on climate change, then the nakedness of the princes in charge of increasingly critical and perhaps fatal choices is fully revealed.

5.5 A tentative, frightening conclusion is unavoidable:

Choices significantly impacting on the future of humankind suffer from a growing and increasingly dangerous hiatus between the growing magnitude of impacts and the low quality of fuzzy gambling choices by main global decision-makers. This quality deficit is sure to produce global catastrophes. Therefore, radical improvement of critical choices is imperative, together with awareness of unavoidable risks stemming from more powerful technologies, however beneficial they may be if well used.

5.6 The assessment above is at the core of this paper. Therefore, it is explored further in the following sections. Fuller though still partial treatment is provided in other writings by the author.[2]

6. Decision Criteria

6.1 Given the insights suggested above, it is necessary to consider decision criteria fitting important choices posed by advancing towards the Singularity. Widely accepted, at least verbally, is the precautionary principle, formulated with variations more or less as follows:

The precautionary principle: If the consequences of an action are unknown but judged by some scientists to have even a small risk of being profoundly negative, it's better to not carry out the action than to risk negative consequences.

6.2 This decision criterion follows the minimax game theoretical rule, aiming at minimizing the possible loss for a worst case. Thus, it does not balance potential risks and benefits. Also, it is very vague on the number and quality of pessimistic scientists who have a veto on novel technologies. Little wonder that the precautionary principle is usually not acted upon; and the

[2] See my short book *For Rulers: Priming Political Leaders for Saving Humanity from Itself* (Washington, DC: Westphalia Press, 2017).

few cases when it was applied, such as the exclusion of mutated seeds by the European Union, are in error, even if they are supported by true Green believers.

6.3 Max More articulates the limitations of the precautionary principle and advocates replacing it with what he calls the *proactionary principle*, which involves balancing the risks of action and inaction. In principle, this is correct. Let me therefore quote a summary of the proactive principle as proposed by him:

1. People's freedom to innovate technologically is valuable to humanity. The burden of proof therefore belongs to those who propose restrictive measures. All proposed measures should be closely scrutinized.
2. Evaluate risk according to available science, not popular perception, and allow for common reasoning biases.
3. Give precedence to ameliorating known and proven threats to human health and environmental quality over acting against hypothetical risks.
4. Treat technological risks on the same basis as natural risks; avoid underweighting natural risks and overweighting human-technological risks. Fully account for the benefits of technological advances.
5. Estimate the lost opportunities of abandoning a technology, and take into account the costs and risks of substituting other credible options, carefully considering widely distributed effects and follow-on effects.
6. Consider restrictive measures only if the potential impact of an activity has both significant probability and severity. In such cases, if the activity also generates benefits, discount the impacts according to the feasibility of adapting to the adverse effects. If measures to limit technological advance appear justified, ensure that the extent of those measures is proportionate to the extent of the probable effects.
7. When choosing among measures to restrict technological innovation, prioritize decision criteria as follows: give priority to risks to human and other intelligent life over risks to other species; give non-lethal threats to human health priority over threats limited to the environment (within reasonable limits); give priority to immediate threats over distant threats; prefer the measure with the highest expectation value by giving priority to more certain over less certain

> threats, and to irreversible or persistent impacts over transient impacts.[3]

6.4 However, neither criteria really take into account deep uncertainty on the short- and long-term possible and likely consequences, for better or worse according to disputable values. Even less so do they consider such choices as fuzzy gambles on critical and sometimes fateful stakes. And both criteria and similar ones completely ignore actual choice criteria of high-level decision-makers, such as public support or opposition, political and material profits and losses, short-termism and so on – all further aggravated by multiple biases, including depth psychological ones in addition to simpler ones explored by experimental psychology.

6.5 Also usually ignored are cultural impacts; value diversity sensitivity maps, decision delay options combined with structured learning, the legitimate role of pattern-recognizing intuition, and more. Even more amazing is lack of giving due weight to the historic fact than nearly all technologies are not only error-prone, but are also earlier or later used for the worse, such as tribal slaughters and damaging greed.

6.6 In short, decision frames fitting real-life high-stake fuzzy gambles within their internal and external contexts are sorely underdeveloped. And second- and third-best criteria, which are available as illustrated above and are much better than nothing, are hardly applied as required – because of short-sighted vested interests and policy inertia. This is clearly demonstrated in the relatively clear-cut case of global climate change.

6.7 Ethics theory distinguishes between rule-based ethics, utilitarian ethics, and virtue ethics. In addition to upgraded decision criteria, I propose a similar approach to Singularity choices, including requiring from high-level decision-makers "fuzzy gambling decision virtues," such as deep uncertainty sophistication, global grand-strategic perspectives, and long-term pondering horizons – within future human evolution frames when Singularity issues are at stake. This leads to the crucial issue who should be the decision makers on major Singularity choices.

7. Global Future-Shaping Super-Elite

7.1 It is essential to recognize, however politically incorrect and in many respects disturbing, that unavoidably (until humanity perhaps becomes super-human) a miniscule part of humanity, however constrained, dominates nearly all important future-impacting decisions. To put it into guesstimated orders of magnitude, no more than, say, a maximum of ten

[3] Max More and Natasha Vita-More, eds. *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future* (Malden, MA: Wiley, 2013), Kindle Edition, locations 12207-12223.

thousand humans make or meaningfully influence 90 percent of significant future-impacting choices.

7.2 In other words, for every 750 thousand humans there is one significant global future shaper. Even if I am wrong by one order of magnitude and there are 100 thousand humans who belong to the global future-impacting super-elite, which is for sure a large exaggeration, still it is one person per 75 thousand humans.

7.3 But in fact, the number of major impactors on the future in relation to the Singularity (and other critical choices) is surely much less than ten thousand, leaving us with a striking though not really surprising conclusion:

Improving the decision virtues of, say, one thousand carefully selected persons can significantly upgrade critical Singularity choices. And doing so is not absolutely impossible.

7.4 Not less important are social institutions and processes, such as the free market and social media. However, despite being cybernetic self-regulative, they can be redirected by the global future-impacting super-elite, even though they in turn are partly shaped by the social institutions and processes, and changing them may require radical or even revolutionary measures. Therefore, for our purposes, it is correct to focus mainly on the global future-shaping super-elite.

7.5 Let me refine the somewhat rough analysis. The global decision-making super-elite is composed of transformative thinkers, the senior staff of international organizations, powerful economic actors, innovative scientists and technologies, a few civic leaders, some military commanders, select mass media moguls, and single outstanding and senior politicians. But not all parts of this super-elite are of equal importance for coping with Singularity issues. Adopting the distinction by David Priestland between societies dominated by merchants, soldiers, and sages,[4] with the addition of politicians, decisions related to the Singularity are in most societies dominated by merchants (in a broad sense of that term). In a few societies, military R&D elites dominate Singularity-relevant choices, but they too are subject to economic considerations. Scientists and technologists, who can be viewed as knowledge sages, are critical in laying the foundations of the Singularity. But, alas, they depend for resources on merchants or soldiers.

7.6 Nominally, politicians are in overall charge, having ultimate formal decision authority over all Singularity-related choices, subject to more or less constitutional limitations. They are also the only part of the global future-impacting super-elite which is value-wise legitimized to make authoritative future-shaping choices, as discussed in Section 8. Therefore:

[4] David Priestland, *Merchant, Soldier, Sage: A New History of Power* (London: Penguin, 2012).

The decision vices and virtues of political leaders are of potentially dominant importance in shaping the future of the species.

7.7 In fact, many politicians abandon this task, despite its outstanding importance (or because of it) to other decision-makers as long as no storms erupt. This bodes ill for the future unless rectified, because many other parts of the global future-impacting super-elite and most of the more powerful social processes do not fit the requirements of optimal future-shaping choices. Thus, market processes and merchants are driven by the profit motive, which often degenerates into greed; public opinions suffer from an abundance of tribalism compounded by ignorance on the Singularity; soldiers serve mainly tribal images and interests; scientists-technologists are seeking knowledge and status, and they are dominated by merchants and soldiers who control the needed resources. Worst of all, the vast majority of politicians are infected by power considerations, ignorant about science and technology, short-sighted, and subject to social demands and values that do not serve the future, but which most politicians are unwilling to confront or do not know how to overcome or redirect.

7.8 The diagnosis above is somewhat one-sided. There are individual exceptions, such as globally minded political leaders, socially responsible merchants, and some scientist-statesman/women. But they are constrained by widespread tribalism and profit-seeking, as well as ignorant and capricious publics misdirected by the amusement industry, even in highly developed societies. The dreams of the Enlightenment are further away from reality than ever, despite mass education.

7.9 Typical in some important respects is the belated awakening of President Barack Obama, potentially a nearly optimal Singularity decision-maker, to the world as it is. As clearly put in the memoir of one of his senior advisors:

> Ambitious legislative activity was out of the question. Abroad, the forces of tribalism and nationalism were building, like tremors before an earthquake…. After years of … growing tribalism at home and abroad, he had priced in the shortcomings of the world as it is, picking the issues and moments when he could press for the world that ought to be.[5]

7.10 The next step should be exploration of the required decision virtues of political leaders. But before doing so, the legitimation of politicians to make choices impacting on generations to come requires close examination.

[5] Ben Rhodes, *The World as It Is: A Memoir of the Obama White House* (New York: Random House, 2017), Kindle Edition, 142-143 and 298.

8. Are Politicians As Such Legitimate Singularity-Shaping Decision-Makers?

8.1 According to democratic values, elected politicians seemingly have the right to make future-shaping choices, subject to some constraints and conditions. This also applies, with adjustments, to senior politicians in non-democratic countries, if they enjoy the support of most of their citizens.

Politicians are the strata in charge of making choices impacting on their societies, subject to constraints such as constitutions and public wishes.

8.2 This is an important and obvious postulate, reaffirming the overriding importance of politics. I do not go as far as Aristotle, who regarded politics as the master science on which all social activities depend. But the future of the Singularity is par excellence a domain for which politicians – not scientists, or markets, or social media – carry by definition the ultimate authority and responsibility. Therefore:

The prevailing abandonment by politicians of fateful future-impacting choices to other actors is worse than dereliction of duty – it is an act of treason against their prime duty.

8.3 But there is a major catch:

By itself being a senior democratically elected political leader (or otherwise being elected or selected) is not an adequate legitimation for making choices shaping the fate of future generations.

This counter-conventional and politically very incorrect statement requires justification. In short, democracy is based on the principle that persons and societies are entitled to determine who is entitled to take decisions impacting on them and their minor children. But future generations cannot vote now. Therefore, being democratically elected by one generation as such does not grant legitimacy to making decisions that are likely to impact significantly on multiple future generations.

8.4 In light of this reasoning so far, the issue can now be reformulated:

On a deeper level, the real question is who is entitled to make future evolution-shaping choices on behalf of humankind as a collective deliberative agency? The only justifiable answer is "politicians who have the moral and cognitive qualities needed for making such decision optimally, together with other merit-based global super-elites having fitting qualities, such as select scientists and technologists."

8.5 I cannot overestimate the broad and deep significance of this conclusion, on the level of both political philosophy and political institutions and practice. It makes havoc of assuming that a democratically elected global parliament

has the right to take decisions shaping the future of human evolution. Such legitimacy can only stem from merit: having the qualities required for optimally steering the future evolution of humanity as increasingly (though surely not completely) possible.

8.6 Therefore:

The theory and practice of democracy and other political regimes have to be reformulated so as to move towards merit regimes, in particular but not only so in respect to significant future human evolution-shaping choices.

However, I will not further develop this radical conclusion in this paper, moving instead to the required merit taking the form of fitting decision virtues, as especially required from political leaders steering the future evolution of the human species in the context of the Singularity.

9. Required Decision Virtues

9.1 The compelling conclusion is demanding:

Senior global future-impactors, and in particular political leaders, require personal decision virtues and supportive environments very different from the prevailing ones.

9.2 As noted, at this stage it is necessary to specify the qualities needed by future-shaping political leaders (and, with adjustments, by other members of the future-shaping super-elite), to enable them to approximate optimal fuzzy gambles on Singularity issues. But in view of the limits of this paper and the two books I have written on that subject,[6] I limit myself here to a list of twelve representative qualities, in no particular order:

1. commitment to the long-term future of the human species as a priority task, together with efforts to facilitate the thriving of contemporary humans;
2. pondering in terms of the evolutionary processes shaping the human future, as transformed by the Singularity;
3. globalism overriding tribalism, combined with political skills, making doing so feasible;
4. good science and technology literacy, with emphasis on Singularity-related domains;
5. multicultural insights;
6. intense innovation-friendliness;
7. a strong “inner citadel,” combined with the Kantian rule *saper aude* (dare to rely on your own potential abilities);

[6] *For Rulers*, as mentioned; and *Avant-Garde Politician: Leaders for a New Epoch* (Washington, DC: Westphalia Press, 2014).

8. uncertainty-sophistication;
9. pronounced reasoning abilities combined with open-ended intuition on Singularity-related issues;
10. seeking advice from Singularity and human evolution professionals, including especially Singularity policy scientists (as discussed in a companion paper of mine, following), subject to careful screening;
11. crisis coping skills, with emphasis on utilizing them to implement Singularity-coping ideas that cannot be realized without conservatism-disrupting and mentality-shocking events;
12. Constant learning and critical self-reflectivity related to major Singularity challenges.

9.3 No human being, even with soft enhancement, can be outstanding in all these decision virtues. And, in the foreseeable future reliance on super-intelligent robots to take care of humanity will not become practical; and if and when it becomes available, it will usurp human authority and nullify human moral responsibility for existential choices, while also endangering the future of humanity. But there are enough examples of political leaders, however scarce, who have clearly demonstrated the potential to become adequately qualified to make good future-shaping decisions, without being outstanding in all respects and always arriving at optimal choices.

9.4 Furthermore, a well-designed global leadership seminary can help carefully selected participants to develop adequate decision virtues. This brings us to the institutional requirements of composing and implementing well-crafted future-impacting choices, which are far beyond the capacities of contemporary global regimes – but not in the realm of the impossible, given the likelihood of crises breaking the tyranny of the status quo.

10. Enforcement Regimes

10.1 Preventing dangerous misuses of Singularity knowledge and tools, whether on purpose or accidentally, is impossible without a radically novel global regime accompanied by painful value transformations, which will be strenuously resisted. Thus, an adequate enforcement regime must be global in scope, overriding state sovereignty, breaking through tribalism, and having forceful instruments to impose its authority when necessary.

10.2 Furthermore, it may have to impose personal duties in addition to human rights, regulate and sometimes limit research freedom and technology marketing, engage selectively in intrusive intelligence collection, and be entitled to impose, after due process, harsh punishments. Some property rights, ownership of mass killing weapons, and promotion of hate ideologies will also have to be inhibited. And conflicts that may escalate to catastrophic levels will have to be resolved, with imposed measures and dictated “agreements” as may be necessary.

10.3 Taking care of human welfare and fairness will remain the task of national governments and the United Nations with its agencies, subject to quite some reforms. But containing dangers posed by the Singularity on lines illustrated above requires some kind of “Platonic Global Leviathan,” subject to controls and maximum reliance on the subsidiarity principle – but with a preponderance of global enforcement tools.

10.4 The concept of global leviathan is clear enough for the limited purposes of this paper for all who are familiar with relevant writings by Thomas Hobbes, though the proposed authority will be less autocratic and more circumscribed than the absolute ruler proposed by Hobbes. But the term “Platonic” needs some explanation.

10.5 Taking into account that the quality of an organization depends primarily on the quality of its senior leaders and staff, it is essential that outstanding politicians supported by excellent professionals constitute its human dimension. This returns me to Plato’s *Republic*, which proposed rule by philosophers. Leaving aside the lifestyles dictated by Plato to the rulers, which are both impossible to realize and not fully necessary, the concept of philosopher that was probably in the mind of Plato (though never explicated in his surviving writings) was one of constant seekers of truth in a comprehensive meaning of that term. If we add the ideas of Michel Foucault on truth and power, we have a good basis for conceptualizing the requirements of the heads of the Platonic Global Leviathan, which add to and go beyond and above the qualities required for being a decision-virtuous future impactor, as already discussed. Thus, deep understanding of human evolution, a fusion between idealism and realism, total exclusion of personal considerations in making important fuzzy-gambling decisions, complete disconnection from tribal identity, psychoanalytic measures to reduce mind-distorting depth processes, proven outstanding pattern-recognizing intuition, and some features of a warrior combined with compassion – these illustrate the extra qualities required for heading and running the proposed global authority.

10.6 Complementarity of the leaders of the Platonic Global Leviathan can help to achieve emergent synergetic qualities meeting more or less such demanding requirements, which surpass individual potentials. Carefully dosed mind enhancement may also be of much help.

10.7 To further illustrate the counter-conventional features of the senior global authority leadership, it may well be advisable to fill many positions by coadoption, so as to strengthen independence. But it is too early to go into such details, which need consideration by outstanding teams rather than by me thinking alone.

10.8 I think enough has been said to provide readers with a sense of what is absolutely needed, but also completely impossible given the world as it is.

There is only one way out of this aporia if we want to be realistic as required:

The only way to establish an adequate global authority approximating the features of a Platonic Global Leviathan, which are essential for containing the risks of the Singularity, is to have good designs ready and to prepare needed knowledge and appropriate political leadership and professionals to utilize global major crises for realizing in stages what is essential but impossible without painful creative destruction.

11. Global Crises As Indispensable Opportunities

11.1 To put it bluntly, without the whip of catastrophes, it is extremely unlikely that humanity will do what is essential to assure survival and thriving while undergoing the nearly apocalyptic Singularity metamorphosis. However, harsh transition crises are assured. Thus, explosive social conflicts resulting from high costs of widely desired human enhancement, kitchen-mutated viruses used for mass killings, escaped nanorobots creating global havoc, large-scale unemployment caused by growing use of broadly intelligent robots instead of human workers, mass migration driven by climate change becoming violent when refugees are not admitted into rich countries, persistent global economic crises impoverishing rich and poor alike resulting from molecular engineering – these are just a few of the possible and in part quite likely catastrophe scenarios, with near certainty that at least some of them will occur in the foreseeable future. Therefore:

Paradoxically, serious but not human-survival-endangering global crises provide the best chance for realizing measures without which the long-term thriving and also the existence of the human species is in doubt, given the risks and chances of the Singularity.

11.2 However, enjoying ourselves in what Georg Lukács aptly termed “Grand Hotel Abyss” in the face of species-endangering catastrophes may well be fatal.

Major global crises are an essential condition of realizing what is necessary for preventing fatal events, but they are not sufficient. Crises can just as well result in danger-escalating panic reactions, which assure further and harsher crises up to endangering the survival of the human species.

11.3 Therefore, urgent action is needed to increase the likelihood of utilizing major crises for establishing the needed global regime staffed by outstanding decision-virtuous political leaders supported by extremely qualified Singularity-policy professionals and broad global consensus. This leads us to the concluding pressing question “What is to be done now”?

12. What Is to be Done Now

12.1 Main suggestions for action now, to utilize coming crises for the better and perhaps also to reduce their costs, include for instance, with overlaps:

- Setting up a global think tank network, based on existing centers studying catastrophic dangers as well as select individuals, to work part time and full time in multidisciplinary teams on major Singularity decision issues and composing humanity-craft (a term I derive from statecraft applied to the human species) options.
- Establishing, as mentioned, a global public leadership seminary, dedicated to developing political leaders and professionals with the necessary decision virtues.
- Activating a global scientific council headed by select Nobel laurates and limited to, say, 150 scientists, philosophers, free-floating intellectuals etc., to serve as a kind of scientific senate, and when necessary, science court, as several times proposed, discussing major Singularity dangers, elaborating and applying codes of ethics for Singularity scientists and technologies, and more.
- Building an intranet for open and closed discussion of main Singularity choices by carefully screened participants reflecting different backgrounds, with canvassing of ideas from interested publics at large.
- Bringing together a small group of highly qualified persons, including also former senior political leaders, to work out alternative designs of the needed global authority or adequate alternatives.
- Strengthening informal colleges of concerned social activists and a variety of leaders together with scientists, philosophers, technologists, etc. – to mobilize broad public support for needed measures including an adequate global regime.

12.2 There is quite some activity in such directions, but much more is needed and can and should be done urgently, beyond my limited creativity and the constrained scope of this paper. But one dimension of urgent action which is in multiple ways an important facet of preparing for the Singularity and, even more so, an integral central part of the Singularity, is large-scale and long-distance space exploration. Dr. Bob Krone, who is highly qualified and fruitfully active in this ultra-challenging domain, discusses this possibilities and requirements in the following essay.

7. Singularity Space Contour

By Bob Krone

Introduction

In what environment could Yehezkel Dror's Singularity Contour thrive? Answer: in the long-term, Space (Figure 1), but this will first require much progress in that direction on Earth.

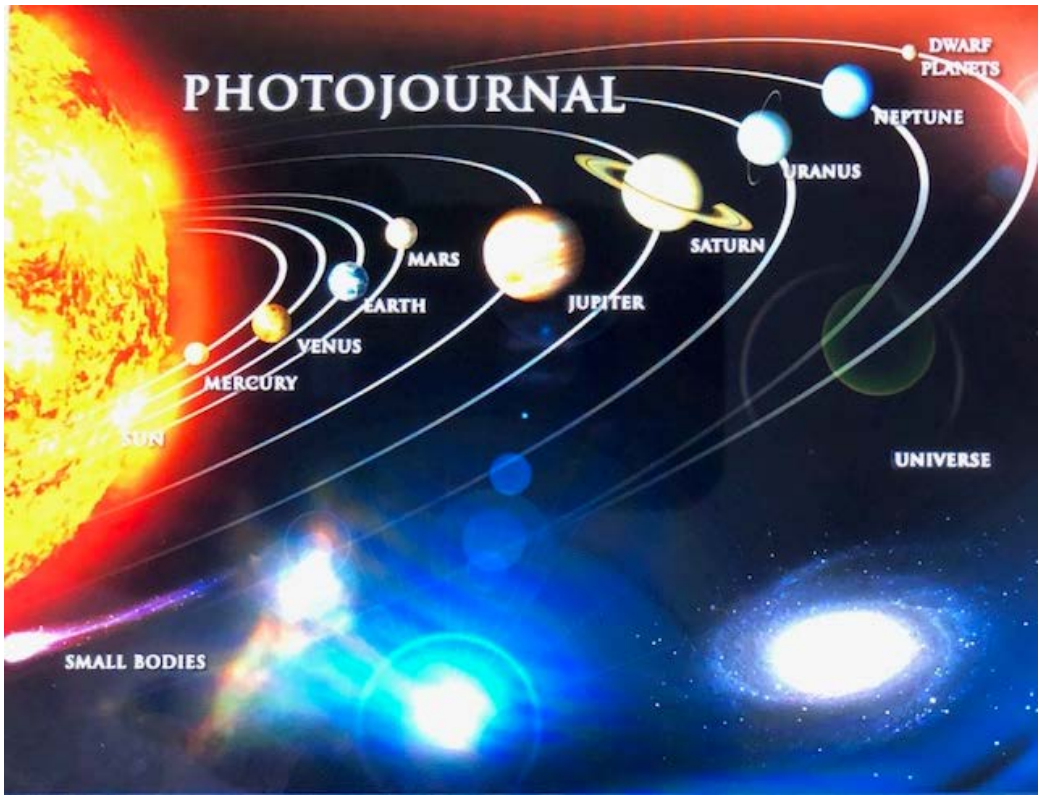


Figure 1: Jet Propulsion Lab Diagram of the Solar System

What follows is the why and how for that answer.

Readers should absorb Yehezkel Dror's article #6, "Singularity Contour," prior to reading this article, which is designed as a follow-up and complementary article to it. The Kepler Space Institute (KSI) Board of Directors and leadership consider the Dror "Singularity Contour" article as historically accurate and profoundly important for what he describes as "the emerging phase leap of the human species." Dror uses the term "Singularity" because it is today the most prominent academic and scientific focus on the future of the evolution of the human species, championed by Ray Kurzweil. In common usage, the focus is predominantly on the merger of human intelligence and machine intelligence, while Dror expands that focus and recommends putting what he calls *Anthroporegenesis*

at the center – that is*, the increasing capacity of the human species to recreate itself and its environments.*

The purpose of this article is to contribute to what Dror described as a need for "a total shift in human perspective." We do so from our past and current involvement and study with Space exploration, development and human settlement. We do not claim that this is the only, or necessarily the best, perspective, but we consider it a feasible and very desirable possibility as the 21st century begins. ***Bob Krone.***

Setting the Stage: The Four Equestrians of Singularity

In the 6th Chapter of The Revelation of St. John, the last book in the New Testament in the Bible, John saw the signs of his times. He saw the Four Horsemen of the Apocalypse. The first horse was white, and the rider carried a bow and went forth conquering. The second horse was red, and its rider had a great sword to kill and to replace peace with war. The third horse was black, and its rider spread famine and pestilence. The fourth horse was pale, and its rider was death, followed by Hades (Figure 2).

Figure 2: 1887 painting of the Four Horsemen of the Apocalypse by Victor Vasnetsov

Those four beasts and their riders still bring misery, suffering, sorrow, and death to the world. Lester R. Brown, Founder of the Worldwatch Institute and the Earth Policy Institute, followed the travels of the four horsemen and issues threatening human progress, He sees "The World on the Edge." His message is that we need to mobilize efforts to save civilization by changing its direction:

> Time is running short, but we can pull back from the edge. While security is a major concern for the world's governments, we have inherited a definition of security from the last century, one dominated by two wars and the Cold

> War. Rather than armed aggression, today we are at risk from the fallout of climate change, population growth, water shortages, poverty, rising food prices and failing states. Military spending worldwide exceeds $1.5 trillion annually, yet they do little to address these true threats to the future.

The Four Horsemen of the Apocalypse have been galloping throughout human history because of behavioral characteristics of at least parts of humanity, such as fanatical tribalism. Those horsemen have been roaming Earth for thousands of years, perhaps with guidance from a smiling Lucifer (see Yehezkel Dror's story above in article 5B), but also due in part to the evolution of humans, which has perpetuated dangerous characteristics through human genes.

All four horsemen need to be defeated and replaced with the vision of reverence for life within ethical civilizations. Dr. Jonas Salk, America's micro-biologist who conquered polio, moved his thinking to macro sociology in his 1973 book, *Survival of the Wisest.* He described humanity as transitioning from "Epic A," survival of the fittest, to "Epic B," survival of the wisest, with uncertainty whether that transition could be achieved. Charles Darwin had scientifically described the survival of the fittest. He had not prescribed how to change that reality or, at least, to ameliorate it to meet human values. Darwin's work was a scientific achievement that precipitated a value change. But world societies are not revealing progress toward survival of the wisest, as discussed by Salk in his book. A large amount of research is confirming Yehezkel Dror's Singularity requirement for humanity as a compound deliberative agency to take up this fateful challenge.

The remainder of this article provides one model for doing so. It is titled *The Four Equestrians of Singularity*. They follow:

1. Yehezkel Dror's Policy Sciences and Anthroporegenesis
2. Education
   Note: These two must be human designed and implemented.
3. Recursive Distinctioning
4. Human Spirituality
   Note: #3 is an autonomous phenomenon in the universe and #4 is a mix of human genetics and learning as well as depending on inspired moral-spiritual leadership.

I have used the title Equestrians to replace the single-gender Horsemen. All genders will share responsibility. Yehezkel Dror and I had an exchange related to the macro-approach to this hugely complex, and unprecedented vision. I have used in my approach to uncertainty, flowing from my Systems Science and Management background, the saying:

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

Yehezkel stated that this statement cannot be validated from history, although we can hope it occurs in the future Singularity as well as Space Epoch. He recommended:

> But, when in doubt choose realism, within a mood of optimism; then act to prevent the bad and achieve the good.

Of course, Yehezkel's statement is accurate, although in the management world there are examples of optimistic attitudes creating a self-fulfilling prophecy outcome, together with many failures. However, the history of Earth reveals a depressing list of pessimistic, depressing, and tragic outcomes, which is why the Four Horsemen of the Apocalypse should be replaced with the Four Equestrians of Singularity.

A look at each of those four necessary components:

1. Yehezkel Dror's Policy Sciences and Anthroporegenesis.

This entire special issue of the *Journal of Space Philosophy* is devoted to this subject. It presents Yehezkel Dror's current vision and definition for the future of Policy Sciences under his Singularity umbrella. It is a 2018 contribution to science flowing from the history of his career studies, writings, praxis, and teaching. The spectrum of hard and soft sciences will also need to be tapped for their contributions to this challenge. Dror is not saying that the Policy Sciences can fill the complete need – only that they are essential for the design, planning, and instantiation of radically novel types of normative philosophy, governance, law, policy-composing modalities, science and technology direction, and so on, without which humankind will face rapidly increasing and more fateful risks, up to the extinction of the human species.

2. Education and Learning

In Article 5C above, "Learning Policy Sciences," education and learning are addressed. The reason this is one of the four Equestrians for Singularity is the validated history of education, in a broad sense of that term, as partly shaping individual, group, society, national and international values, beliefs, actions, and behavior – good or bad. Rather than delve into the massive documentation on the potentials and limitations of education, I will just give readers an individual story that is very personal to me. I know that personal experience must not be generalized. But let me cite my case as illustrative that given certain conditions, education can have significant impacts.

***The Salena Conway-Gregory-Krone Story*.**[1]

> As I think of a part of the spirituality-linked education within me, I feel a higher being hears me, understands me, and most of all will guide me towards accomplishments of human dignity within the goals that I might pursue.
>
> I am remembering when I was in a Catholic boarding school mainly for girls finishing my elementary schooling, that one of the requirements for graduation was to submit a "manuscript of writing" to school leadership. I prayed ardently that my writing would be acceptable. "Thank God" it was.

[1] Salena Conway Gregory-Krone is a Research Associate member of the Kepler Space Institute (KSI), and she has previously published in the *Journal of Space Philosophy*.

> However, as time passed, I still was not assured that it would be sufficient, but I remembered that experience as I progressed.
>
> Years later I was in a United States Air Force (USAF) Management Training position. I became aware that the writing on important military subjects by the top civilians in this military office was often incomprehensible. From that moment on, I no longer worried about my writing. I developed over time the capability to advance from the CAF-1 lowest rank (Department of the Army Civilian Service) to the higher GM-13 rank (Government Management)."[2]

The truth that the Salena Story represents is that in some situations, education of the very young builds socially positive or negative values for the future of society. When young children are taught that those not like them must die, the odds are that some will become killers. Moving toward a positive Singularity for the human species will require appropriate education from birth to maturity and adulthood.

However, as demonstrated by the failure of the Enlightenment in Germany and other large-scale cases, for education to be effective, it has to be redesigned. And even optimal education cannot achieve much unless it is supported by a broad array of cultural and material substructures.

Lacking essential prerequisites, education has rarely led to beliefs, values, and actions compatible with the Dror Singularity. Values and understanding are demanding, and they require much more than formal education to meet Singularity requirements.

The scholar Michael Polanyi (1891-1976) made major contributions to the theory of knowledge.[3] His identification of *tacit knowledge,* obtained from living experiences, being distinct from *explicit knowledge,* obtained through formal education, has provided a powerful insight for analyzing human beliefs and behavior. His findings included: "We know more than we can tell," "What we know and can tell is accepted as true," "We must believe to understand;" and, "Tacit Knowledge accounts for: (1) A valid knowledge of a problem; (2) The Scientist's capacity to pursue it, guided by a sense of approaching a

[2] This story was written for this special issue of the *Journal of Space Philosophy*, dedicated to the Legacy of Yehezkel Dror, by Salena Conway Gregory-Krone on July 7, 2018 at the request of husband Bob Krone. These lessons she learned from parents, in elementary school, in high school, and then at university, guided her for the rest of her life. She became one of America's pioneer Civil Rights professionals in US Government Service, was one of the first leaders of Equal Employment Opportunity (EEO) at Norton Air Force Base, California. In 1972 She personally designed and wrote the first EEO Plan, after the US Civil Rights Legislation was amended in March 1972. That plan was approved by major USAF leadership. She later became influential in the development of national EEO Plans within the Department of Defense. The Air Force awarded her its Top Performance Award in its Equal Employment Opportunity Program. Her career has been recognized in the US Congressional Record.

[3] Michael Polanyi was a professor of Physical Chemistry and Social Sciences at the Kaiser Wilhelm Institute, University of Manchester and Merton College, Oxford, UK. His four books on the theory of knowledge were*: Science, Faith and Society* (London: Oxford University Press, 1946); *The Study of Man* (London: Routledge and Kegan Paul, 1959); *Personal Knowledge* (London: Routledge and Kegan Paul, 1962); and *The Tacit Dimension* (London: Routledge and Kegan Paul, 1966). He and Dror became friends during a year shared at the Center for Advanced Study in the Behavioral Sciences, at that time in Palo Alto. Dror feels he learned a lot from Polanyi while enjoying shared discourse.

solution; and (3) A valid anticipation of the yet indeterminate implications of the discovery arrived at in the end."

There is a large body of research confirming the validity of that personal knowledge distinction of Polanyi. In the history of manned Space flight, America has experienced three major catastrophes: The January 27, 1967 test of the Apollo 1 Capsule, in which three of the original astronauts, Virgil Grissom, Edward White, and Roger Chaffee died when the pure oxygen in the cabin exacerbated an electrical fire; January 28, 1986, when the Space Shuttle Challenger's O-Ring seal for the right solid rocket booster failed, killing all the astronauts; and Space Shuttle Columbia's loss on February 1, 2003 when it disintegrated upon re-entry into Earth's atmosphere. Post-accident investigation for the Challenger loss revealed that there was advance mission tacit knowledge of the defective O-Ring by engineers, which was discounted by launch decision makers.

The above points leave open coping with depth psychology factors shaping personality to some extent. That subject is also beyond the scope of this essay. Clearly focusing on any single basis of Singularity knowledge and action will be insufficient and self-defeating. A comprehensive and creative systems approach is needed,[4] and it will have a steep learning curve.

Inter alia, there are realities of current education that cast doubt on its effectiveness as a reliable contributor to a future Singularity:

1. Education has failed to solve major global, or local, social problems.
2. A needed critical mass of Singularity-committed and knowledgeable teachers is not, in 2018, being prepared; nor are there any national or international plans to do so.
3. It is unknown whether education can overcome genetically imprinted propensities in humans, or whether advances in genetics or artificial intelligence can address the causes of pathological behavior, without inadvertently making matters worse.
4. It may be necessary to focus first on global Singularity elites, starting with political leaders and Singularity policy scientists, as proposed by Dror.
5. Even more urgent are global spiritual Singularity leaders – but their emergence is beyond "social architecture."

We, in KSI, will try to advance thinking, research, and education on all these issues, recognizing that much more is needed.

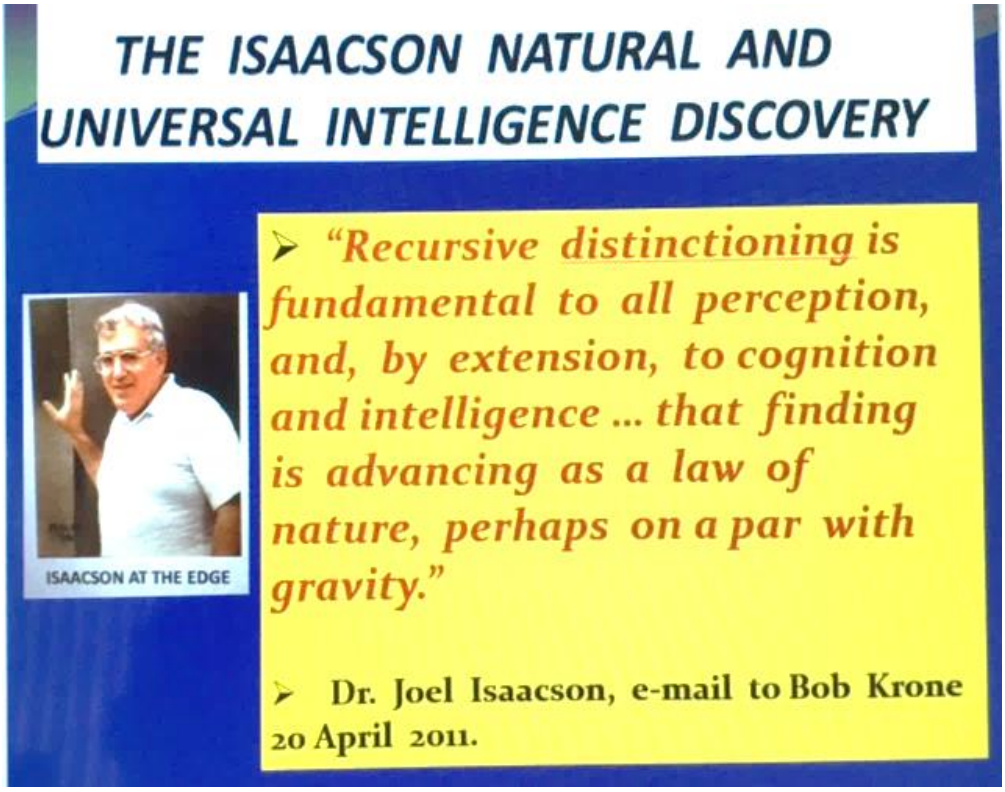
[4] I avoid here getting into the voluminous historical literature on Systems Theory, Systems Thinking, Systems Management, and Systems approaches to research. I spent a career on the Faculty and Administration of the University of Southern California in Los Angeles for the Master of Science and Systems Management Degree Program (the MSSM), where I was the Chair for the Worldwide Systems Management Department. In my book, *Systems Analysis and Policy Sciences: Theory and Practice* (New York: John Wiley and Sons, 1980), for which Yehezkel Dror wrote the Foreword, those subjects were covered. My definition of "Systems" there was: "A complex set of interacting elements."

Research Questions: Following are just a few illustrative research questions that deserve study in future advanced study programs:

- How can we generate decision makers' understanding of and support for fitting Singularity policies (called by Dror in his recent writings "humanity-craft") before catastrophes occur?
- How can we upgrade salient human propensities?
- How can Singularity issues be put into national and global agendas?
- How can a Singularity-Steering Global Regime be advanced?

Required reading for all future KSI students will include *Space Abundance for Humankind's Needs,* (forthcoming 2018).[5] It presents a current systems approach to the issues presented above. This Yehezkel Dror Legacy issue of the *Journal of Space Philosophy* will also be required reading, and it may be published as a softcover book to make it available to a large audience.

3. Recursive Distinctioning, as introduced in the following statement by Dr. Joel Isaacson, who discovered it in 1964:



The publications providing the discovery, diagnosis, definitions, descriptions, and ongoing research for Recursive Distinctioning (RD) can be found by searching the internet for Dr. Joel D. Isaacson and Dr. Louis H. Kauffman. The most recent publications will be found

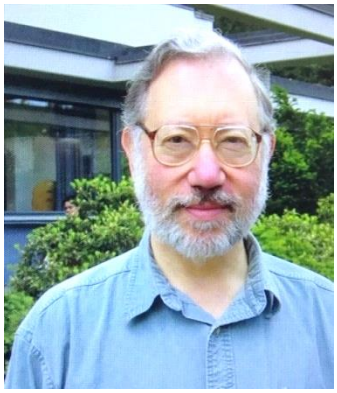
[5] The Krones: Robert M. "Bob" Krone, PhD, Salena Gregory-Krone, GM 13(Ret), and Kat Krone, MBA, *Space Abundance for Humankind's Needs*. BookBoon Publishers. Free digital downloading.

in issues of the *Journal of Space Philosophy*. To capture the interest of readers of this issue we provide the following statements by Louis Kauffman, one of the world's most distinguished mathematicians, presented at an April 4, 2017 Session of the National Space Society's 35th International Space Development Meeting at St. Louis, Missouri:

> Recursive Distinctioning (RD) is the study of those systems that use symbolic alphabetic language that can describe the neighborhood of a locus (in a network) occupied by a given icon or letter or element of language. An icon representing the distinctions between the original icon and its neighbors is formed and replaces the original icon. This process continues recursively. RD processes encompass a very wide class of recursive processes in this context of language, geometry, and logic. These elements are fundamental to cybernetics and cross the boundaries between what is traditionally called first- and second-order cybernetics. This is particularly the case when the observer of the RD system is taken to be a serious aspect of that system. Then the elementary and automatic distinctions within the system are integrated with the higher order discriminations of the observer. The very simplest RD processes have dialectical properties, exhibit counting, and exhibit patterns of self-replication. Thus, one has in the first RD a microcosm of cybernetics and perhaps, a microcosm of the world.

Joel Isaacson is Professor Emeritus of Computer Science, Southern Illinois University at Edwardsville and Principal Investigator of IMI Corporation. Louis H. Kauffman is Professor of Mathematics at the University of Illinois at Chicago, recipient of the Warren McCulloch Award (1993), the Norbert Wiener Medal of the American Society for Cybernetics (2014) and, most recently, the Bertalanffy prize for outstanding work in complexity thinking (2016).

Joel Isaacson writes: Dr Bernd Schmeikal has recently suggested a fundamental structure of the universe relation between RD and Minkowski spacetime.



KSI has conducted three annual RD conventions, 2015, 2016, and 2017. A fourth will occur in the Spring of 2019. Reports on the conventions are available in issues of the *Journal of Space Philosophy*.

4. Human Spirituality

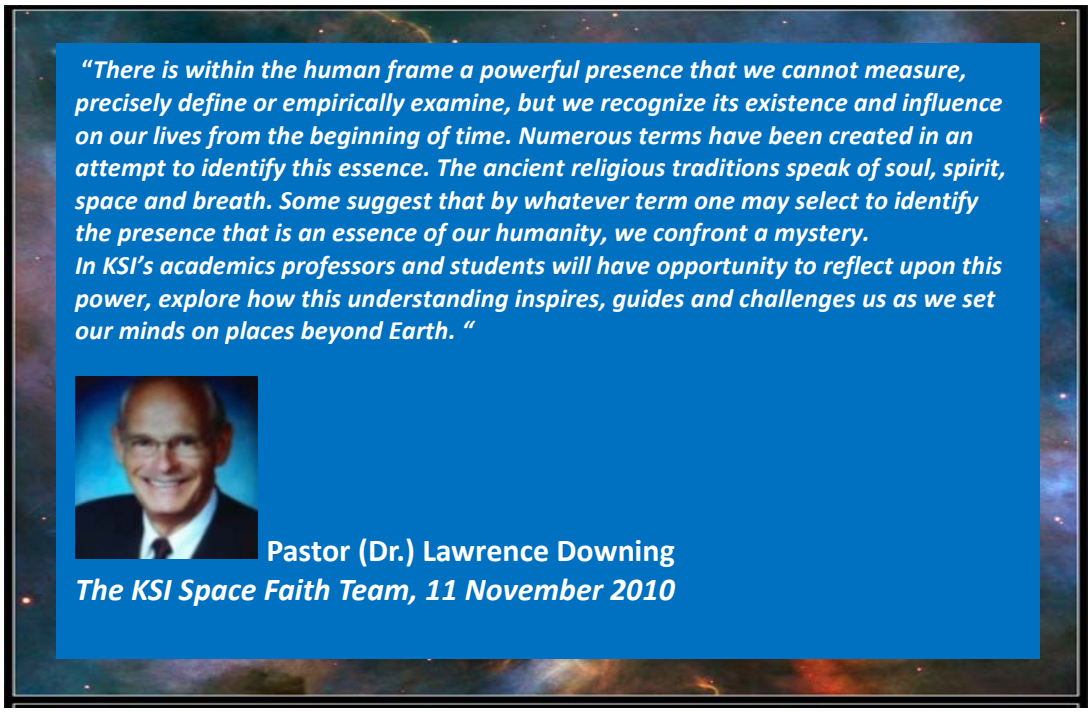
The need for humans to think, dream, and hope for better futures must have been naturally ingrained at life's origins and passed on through the generations. Some of those hopes have been for compassion, love, humaneness, consideration, sympathy, tolerance, happiness and well-being. Some about making more money, amusement, and entertainment. Some about the amelioration or abolition of hunger, crime, poverty, despair or injustice.

Select humans have spent their lives attempting to increase international collaboration, human welfare, individual and collective security, social justice, and other moral values and goods. Small elite groups of utopian thinkers, secular and religious, have dreamed about creating peace on Earth through universal understanding. But not all spiritually based actions are for the good. All too many have caused genocides, making much of history into what Hegel called a slaughterhouse.

Underlying many of the mentioned characteristics are beneficial or harmful forms of Spirituality. Therefore, we make another normative assumption and prediction here:

> Beneficial spirituality is essential for the future of humans on Earth and in the future in space.

From 2009 to today, 2018, Kepler Space Institute has had a team of diverse theologians thinking about the creation of parts of a *Space Manifesto* that, if and when widely accepted, would spare increasing parts of humanity, on Earth or beyond it, from the terrors of Earth's historic religious conflicts. Our study team leader has been Pastor (Dr.) Lawrence Downing. His following statement will be a foundation for continuing efforts to formulate and propagate a Space Manifesto tied in to the Singularity.



Why does the Future Space Epoch Offer New Thinking ?

Space exploration, and ultimately settlement, can contribute a lot to the emerging Singularity Epoch. A valuable contribution to understanding the fundamental differences between Earth and Space are the writings of Frank White on *The Overview Effect*. His Overview Institute has 3,000 followers. His insights came from his personal interviews with astronauts, and he describes a cognitive shift in awareness reported by them from their experiences from Earth orbit or the lunar surface. In the perspective from Space, national boundaries vanish, the conflicts that divide people become less important, and the need to create a planetary society with the united will to protect this "pale blue dot" becomes obvious.

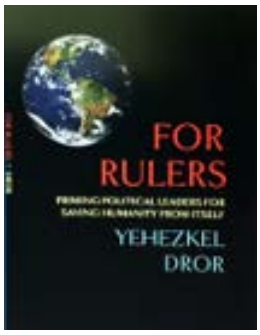
All the resources humans will ever need are waiting in Space. The Law of Space Abundance, which states that Space has Abundant Resources to Meet Human Needs,[6] has been proven valid. Scarce resources have caused conflicts and catastrophes throughout history. Space will not be the only source of solutions for Earth's problems, but it will open new doors to doing so.

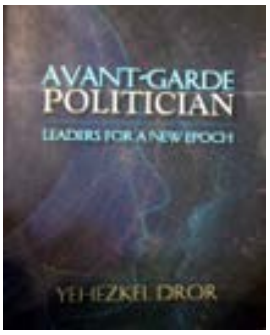
There is a huge spectrum of subjects to be investigated, documented, discovered, and researched – then applied – if humankind is to overcome the problems, mistakes, and pathologies of its history on Earth, and to steer its future evolution beneficially. Science, technology, and education continue to give us some of the needed tools and hope for the future. Our Earth cradle has brought us nearer to maturity, but we are far from there. But science and technology has also given humanity the tools for its own extermination. All the more so, innovative values and understanding, augmented tools, redesigned institutions and positive political as well as spiritual-moral leadership are urgently needed.

Yehezkel Dror's unique scholarly-praxis career provides us with (1) realistic historic analysis, (2) evidence of the increasing risks to humanity in the 20th and 21st centuries, (3) Policy Sciences to improve the capacity to steer the future, (4) his Singularity Contour for humanity, and (5) *A Mirror for Rulers* to guide the urgently needed novel genre of political leaders.

> This dream can become a future reality if the critical mass of moral Leadership and effective governance can be created. Without this unprecedented leadership and international collaboration … the movement of humanity into Space will remain a dream or, even worse, may take the form of nightmares becoming dismal realities for Earth's people
>
> Yehezkel Dror

[6] The Leadership of the Kepler Space Institute formulated The Law of Space Abundance in 2009. It is not a legislated law. It reflects the extensive research on Space resources to date. Current findings will continue to validate it over time.





To add two concluding comments:

1. Thinking and acting on human Space settlements requires a much longer time scale than current discourse. This will require quite a shift in short-term thinking dominating much of politics and business.

2. Throughout history, war and violent revolution have been among the main drivers of social transformations. This was the case through the 20th century, and it is likely to continue in the 21st century and beyond. But Dror is not recommending war to improve coping with the Singularity; rather, he poses the need for a global decision and enforcement regime designed to prevent dangerous missuses of Singularity knowledge and tools, whether on purpose or accidentally. He prescribes a "Platonic Global Leviathan." This will involve a sociopolitical paradigm shift. It will require the kind of avant-garde political leadership and rulers that he designs in his latest two books, shown above, as essential for humanity's improvement and survival. But this involves difficult long-term efforts. In the meantime, space exploration and the beginning of space settlement can provide safeguards for the survival of humanity in case of devastating catastrophes on Earth, and with time, they may stimulate essential changes in human values and institutions, in part thanks to innovate social structures in human societies beyond Earth.

Ongoing global transformations need guidance, to avoid very negative looming consequences and realize very positive potentials. Markets, civil society etc., however important, cannot be relied upon to provide the needed guidance; normatively and realistically only governance can do so. However, to adequately fulfill crucial future-building tasks, politics must be revitalized, democracy must be refocused, and governance must be radically redesigned.

My personal feelings are that Yehezkel Dror's wisdom is a blessing for global rulers and for humanity. Readers of this issue of the Journal of Space Philosophy are invited to send thoughts to:

Yehezkel Dror Yehezkel.dror@mail.huji.ac.il
Bob Krone Bobkrone@aol.com

Bob Krone, PhD,
President, Kepler Space Institute

8. Becoming a Singularity Policy Scientist

By Yehezkel Dror

I. Purpose

This paper tries to help readers, including students, to make and remake themselves into Singularity policy scientists. I start with three necessary foundations: (a) the Singularity hypothesis, (b) steering human evolution, and (c) humanity-craft composing. To serve the partly didactic aims of this paper, at the end of each foundation, essential readings are presented.

Once the three foundations are laid, we can proceed to eight pondering and behavior recommendations: (1) become multidisciplinary; (2) experience different cultures; (3) integrate research, theory building, and praxis; (4) acquire crisis coping skills; (5) experience revolutions; (6) advance in stages; (7) be somewhat Don Quixote tempered by Sancho Panza; (8) stoic enthusiasm is a must.

Finally, I discuss your duty to check and recheck whether you have the "bent of mind" essential for being a Singularity policy scientist. But, before proceeding with the foundations and recommendations, with illustrations from my personal experiences, the novel concept of "Singularity policy scientist" requires exploration.

II. What is a Singularity Policy Scientist?

In 1967, I published an article on "Policy Analysts: A New Professional Role in Government Service,"[1] which is still widely read and was recently selected as the best article published that year in the *Public Administration Review*, but which I regard as partly outdated.

In particular, it ignores the imperative to cover in the policy analysis of every significant choice possible implications for the future of humankind. In other words, the slogan "what is good for my country," if used at all, has to be reformulated into "what is good for my country, on condition that it is good for the future of humankind."

Using the term "science" in the broad European sense, including the humanities and social studies, the proposed concept of Singularity policy scientist refers to policy scientists who concentrate on steering the future of the human species, which is the ontological core of the Singularity, rather than the technologies that are its tools. An adequate number of Singularity policy scientists is urgently required to help to optimize the use of the growing powers of humanity to influence the evolution of our species. Such a novel scholarly and applied profession is needed all the more because humanity is not prepared to meet the fateful challenges posed by the Singularity;[2] and – most ominous of

[1] *Public Administration Review* 27, no. 3 (September 1967), 197-203.

[2] See Donald N. Michael, *Unprepared Society: Planning for a Precarious Future* (New York: Basic Books, 1968). This short book is more au courant than ever, but I would write "willfully blind" instead of "unprepared."

all – nearly all political leaders and their policy advisors are ignorant about most of the Singularity, and they prefer to ignore it.

To cope with this increasingly dangerous situation, political leadership needs, inter alia, Singularity policy scientists as trusted and influential advisors. But more is at stake. To steer the future of human evolution, as increasingly possible, if subject to overwhelming natural processes, humanity needs elements of a scientific revolution and radically novel policy options. Also required is an effective global regime headed by a new genre of political leaders, up to a kind of Platonic Global Leviathan – supported by a general staff composed of Singularity policy scientists,[3] a knowledgeable epistemic community,[4] and increasingly edified publics.

For all these Singularity policy scientists are essential. Leaving other requirements to two books of mine,[5] this paper focuses on them.

III. Foundations

A. Singularity Hypothesis

Being cautious in discussing the future, I prefer to regard the Singularity as a hypothesis rather than a "fact," with some more or less plausible parts. In my view, the growing power of humanity to shape its evolutionary future constitutes the ontological core nature of the Singularity, in contrast with the tendency to view the technologies that enable doing so as the Singularity.

Given these clarifications and this caveat, there can be no doubt that humanity is increasingly acquiring tools that can and will impact strongly on its future evolution, such as bioengineering, nano engines, molecular transformation technologies, artificial genera and later perhaps superior intelligence, climate change impactors, realistic virtual realities, space exploration breakthroughs, and more. These will change human bodies and minds and the world in which we life. More radical possibilities cannot be excluded, such as the production of spiritual machines[6] and the creation of life in laboratories – shattering prevailing beliefs and ways of life.

Opinions may differ on "transhumanity," "posthumanity," human cloning, and reaching the stars. But there can be no doubt that humanity is not prepared for the Singularity. Therefore, uses of emerging technologies for worse are nearly certain, and transition crises, up to catastrophes, are unavoidable. Furthermore, it is not impossible that

[3] It is impossible to overestimate the importance of such a kind of composite and distributed "brain" for the future of humanity, though political leaders have the last word. The crucial importance of high-quality staff work is demonstrated by the convincing thesis that the fast occupation of France by Germany in World War II was due to the superiority of German staff work. See Ernest May, *Strange Victory: Hitler's Conquest of France* (New York: Hill and Wang, 2001).

[4] On global epistemic communities see Peter M. Haas, *Epistemic Communities, Constructivism, and International Environmental Politics* (New York: Routledge, 2015).

[5] *Avant-Garde Politician: Leaders for a New Epoch* (Washington, DC: Westphalia Press, 2014); *For Rulers: Priming Political Leaders for Saving Humanity from Itself* (Washington, DC: Westphalia Press, 2017).

[6] As discussed in Ray Kurzweil, *The Age of Spiritual Machines: When Computers Exceed Human Intelligence* (New York: Penguin, 2000).

humanity will terminate its existence as a species, by accident or on purpose, with or without procreating another, perhaps superior, species.

Deep understanding of the Singularity hypothesis and what it implies constitutes the bread and butter of a Singularity policy scientist. This sounds simple, but is very demanding, requiring knowledge and understanding of general and human evolution and the fundamentals of Singularity technologies. Also required is familiarity with social sciences as well as current global dynamics.

Acquiring such knowledge requires in most cases doctorate studies, much reading, and plenty of praxis. Harder to define are the scarce mental abilities essential for thinking through the Singularity, composing humanity-craft (a term I coined on the basis of the "statecraft" concept) and instantiating effective action. Therefore, becoming a full-fledged Singularity policy scientist seems to require a special, scarce talent, what I call "bent of mind." I think it depends on congenital potential. The only way to find out if you have it or not is to try and see if you develop a "sense" for the Singularity and related issues, in addition to just "knowledge."

Recommended Reading: Start with Bill Joy "Why the Future Does not Need Us." *Wired* (April 2000), www.wired.com/wired/archive/8.04/joy_pr.html; *Ray Kurzweil, The Singularity Is Near: When Humans Transcend Biology* (New York: Penguin, 2005); a new book by the author will be published in 2019; and, in part more critically, Amnon H. Eden, James H. Moor, Johnny H. Søraker, and Eric Steinhart (eds.), *Singularity Hypotheses: A Scientific and Philosophical Assessment* (Berlin: Springer, 2012).

On human enhancement and related issues, see Max More and Natasha Vita-More, eds. *The Transhumanist Reader: Classical and Contemporary Essays on the Science, Technology, and Philosophy of the Human Future* (Malden, MA: Wiley, 2013).

A good illustration of salient socio-philosophic pondering is Perpaolo Antonello and Paul Gifford, eds. *Can We Survive Our Origins? Readings in René Girard's Theory of Violence and the Sacred* (East Lansing: Michigan State University Press, 2015).

On Singularity technologies the following texts will serve as a beginning: Ray Kurzweil, *How to Create a Mind: The Secret of Human Thought Revealed* (New York: Penguin, 2013); Nick Bostrom, *Superintelligence: Paths, Dangers, Strategies* (Oxford: Oxford University Press, 2016); Eric K. Drexler, *Radical Abundance: How a Revolution in Nanotechnology Will Change Civilization* (New York: Public Affairs, 2013); Markus Schmidt, Alexander Kelle, Agomoni Ganguli-Mitra, and Huib de Vriend, eds., *Synthetic Biology: The Technoscience and Its Societal Consequences* (New York: Springer, 2009).

B. Human Species Evolution

On the basis of comprehending and "feeling in the blood" of the Singularity, a becoming Singularity policy scientist has to understand the evolution of life on earth, and in particular of *Homo sapiens*, within cosmic evolution.

Also crucial is the cultural level based on the substructure of human evolution, including civilizations, languages, beliefs, institutions, and so on. Trying to steer deep levels of

evolution involves changing the cultural level to impact as desired on evolutionary processes. This comprises using the tools increasingly supplied by science and technology, as decided by political and other institutions, as agents of the human species viewed as a composite deliberative agency.

To glance for a moment at the crucial political institutions, they include political philosophies and beliefs, regimes, constitutions, legislative bodies, politicians, instruments of compulsion controlled by political bodies, and so on. As I stated in one of my books “It is absurd to believe than everything is going to change, but [that] politics will and can remain the same.” Radical redesign of politics is essential for coping with the Singularity, including inter alia, as mentioned, establishing a different global regime and upgrading the qualities of senior political leaders. All these are bread and butter for a Singularity policy scientist.

Singularity policy scientists cannot be omniscient, depending therefore on relevant experts as partners in evolution steering efforts. But Singularity policy scientists have to be familiar with critical cultural features, such as human history, political beliefs and institutions, and the cultures of science.

Recommended Reading: Cosmic evolution is presented by Lola Judith Chaisson, *Epic of Evolution: Seven Ages of the Cosmos* (New York: Columbia University Press, 2005); Martin Rees, *Our Cosmic Habitat* (Princeton NJ: Princeton University Press, 2017).

On the theory of evolution, the most imposing book is Stephen Jay Gould, *The Structure of Evolutionary Theory* (Oxford: Oxford University Press, 2002). This is a bulky volume of 1,413 pages in a small font. Luckily an easily readable Kindle edition is available. But, however demanding, this book is obligatory reading and absorbing for a Singularity policy scientist. So is a book casting doubt at the completeness of the Darwinian science of evolution, namely Thomas Nagel, *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature is Almost Certainly False* (Oxford: Oxford University Press, 2012).

Proceeding to human evolution, start with Yuval Noah Harari, *Sapiens: A Brief History of Humankind* (New York: Harper, 2018); and continue with Frederick L. Coolidge and Thomas Wynn, *The Rise of Homo Sapiens: The Evolution of Modern Thinking* (Oxford: Oxford University Press, 2018). Thus, prepared for more advanced texts, study Jeffrey H. Schwartz, ed., *Rethinking Human Evolution* (Cambridge, MA: MIT Press, 2018).

On human culture, not wishing to overload this reading list I limit myself to three books, letting you search for more as may become relevant for your tasks: On human history and its study, read Aviezer Tucker, ed., *A Companion to the Philosophy of History and Historiography* (Hoboken, NJ: Wiley-Blackwell, 2010). On the evolution of governance, read the two volumes by Francis Fukuyama: *The Origins of Political Order: From Prehuman Times to the French Revolution* (New York: Farrar, Straus and Giroux, 2012); *Political Order and Political Decay: From the Industrial Revolution to the Globalization of Democracy* (New York: Farrar, Straus and Giroux, 2015).

If you add to your readings John S. Dryzek, Bonnie Honig, and Anne Phillips, eds., *The Oxford Handbook of Political Theory* (Oxford: Oxford University Press, 2006); Mark Mazower, *Governing the World: The History of an Idea, 1815 to the Present* (New York: Penguin, 2012), you are well equipped to start considering the changes in political institutions required for adequately steering the future evolution of humankind.

Still, your readings are lacking without going into Singularity-caused possible, and in part likely, catastrophes. The literature on this subject is proliferating, so care must be exercised to pick the few serious treatments rather than would-be sensational bestsellers. I recommend Nick Bostrom and Milan M. Ćirković, eds. *Global Catastrophic Risks* (Oxford: Oxford University Press, 2012), as a comprehensive treatment; Jeff Goodell, *The Water Will Come: Rising Seas, Sinking Cities, and the Remaking of the Civilized World* (New York: Little, Brown, 2017) as an example of recommendable writings on particular possible and perhaps likely or even unavoidable catastrophes.

C. Composing Humanity-Craft

In additional to research, theory building, and praxis, the main mission of Singularity policy scientists is composing humanity-craft options and, after critical analysis and choice, helping with implementation subject to steep learning curves.

Therefore, it would be good if I could present reliable recommendations on composing optimality-approximating humanity-craft options. But this is impossible. Because of the diverse processes involved in composing humanity-craft, no structured heurism produces high-quality options; nor do protocols and algorithms. Still, it is possible and useful to explore some approaches and insights that throw light on humanity-craft composing.

To start, please note my use of the term “composing” rather than “planning” and “designing.” Composing humanity-craft involves planning and designing, but much more, such as creativity, imagination, intuition, and if possible some elements of “geniality.” This is why I mentioned earlier that a special bent of mind is essential for becoming a full-fledged Singularity policy scientist.

I am in deep waters, so I will proceed carefully, starting with the extreme example of the genius Indian mathematician Srinivasa Ramanujan. As presented in a fascinating biography:

> a man who grew up praying to stone deities; who for most of his life took counsel from a family goddess, declaring it was she to whom his mathematical insights were owed; whose theorems would, at intellectually backbreaking cost, be proved true—yet leave mathematicians baffled that anyone could divine them in the first place.[7]

Humanity urgently needs geniuses who “know the Singularity” as the Indian mathematician “knew” some mathematical breakthroughs. But, alas, none is on the

[7] Robert Kanigel, *The Man Who Knew Infinity* (London: Little, Brown, 1991), 4. Needless to add but still important to mention in the present context, after intense study of the life and achievements of Srinivasa Ramanujan, the author of the biography does not even try to explain his outstanding genius nature.

horizon. However, there have been half-geniuses in composing national security grand-strategies, such as Herman Kahn and Albert Wohlstetter (with whom I had the privilege to interact a lot professionally and personally at the RAND Corporation). But these two were radically different in background, personality, and thinking modalities, thus falsifying any standard prescription on how to invent-compose breakthrough grand-strategies. The process may in part be more related to composing a poem than applying Bayesian algebra.

I am not moving into mystery, but on the basis of quite some personal experience, I am pretty sure that subconscious processes that are not really understood are critical for being a top-quality Singularity policy scientist. This is the case for two main reasons:

(1) the inherent and unavoidable nature of humanity-craft as bounded or wild "fuzzy gambling," because of the deep uncertainty on and also inconceivability of results of different humanity-craft options in largely unknowable future environments;

(2) a lack of relevant historical experiences, which puts imagination and creativity at the core of composing humanity-craft.

Still, we are not abandoned in completely terra incognita. Useful ideas and methods are available, such as sensitivity testing, value analyses, institutional design techniques, accelerating learning curves, systems thinking, modelling and gaming, theory of games, structured heuristics, application of modal logic, outlook methods moving from guessing to at least guesstimating, estimating critical intervention mass, intuition training, and creativity-stimulating environments. These are useful for composing humanity-craft, but they leave a lot to be desired, and they are no substitute for indispensable bents of mind.

Learning from outstanding teachers, mentors, and colleagues who combine scholarly achievements with much experience, reading relevant literature as illustrated in the recommendations, and accumulating lots of diverse personal experience are necessary for becoming a Singularity policy scientist, and they will help you do so. However, they are not sufficient. To become a full-fledged Singularity policy scientist, you have to be one of the few who possess the already emphasized essential though undefined bent of mind. With it, you may do well without knowing all the available approaches and methods; without it, you can become a good Singularity humanity-craft technician, which is a needed and honorable profession, but not a full-fledged Singularity policy scientist (I impose here a threshold on what is a matter of more or less, but I think there is a clear divide between policy technicians and policy scientists).

Recommended Reading: Moving from the ground floor of basic approaches to the penthouse of brilliance, start with a good introduction to policy analysis, such as William N. Dunn, *Public Policy Analysis: An Integrated Approach* 6th ed. (New York: Routledge, 2017). Moving up a few storeys, proceed to Lawrence Freedman, *Strategy: A History* (Oxford: Oxford University Press, 2015); climbing up a few stairs, read John Lewis Gaddis, *On Grand Strategy* (New York: Penguin, 2018).

Near to the penthouse, read two books by Michael E. Bratman: *Intention, Plans, and Practical Reason* (Cambridge, MA: Harvard University Press,1999); *Shared Agency: A Planning Theory of Acting Together* (Oxford: Oxford University Press, 2014). Another stair up, read Jonathan Dancy and Constantine Sandis, eds. *Philosophy of Action: An Anthology* (Malden, MA: Blackwell, 2015); Anthony O'Hear, ed., *Philosophy of Action* (Cambridge: Cambridge University Press, 2017).

In the penthouse itself, enjoying a vast vista only brilliant policy-composers see, to get a feel for their imitable but inspiring minds, read Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (Boston: MA: Da Capo Press, [1954] 1988); Paul Aligica, *The Essential Herman Kahn: In Defense of Thinking* (Lanham, MD: Lexington Press, 2009); Robert Zarate and Henry D. Sokolski, eds., *Nuclear Heuristics: Selected Writings of Albert and Roberta Wohlstetter* (Carlisle Barracks, PA: Strategic Studies Institute, 2009).

Now go down to the garden, where diverse readings presenting partial approaches to policy composing can be found, such as: Robert E. Goodin, ed., *The Theory of Institutional Design* (Cambridge: Cambridge University Press, 1996); Emiliano Ippoliti, ed., *Heuristic Reasoning* (New York: Springer, 2016); Susan Schneider, *Science Fiction and Philosophy: From Time Travel to Superintelligence* (Malden, MA: Wiley, 2016); Gary Klein, *Seeing What Others Don't: The Remarkable Ways We Gain Insights* (New York: Public Affairs, 2013); Daniel C. Dennett, *Intuition Pumps and Other Tools for Thinking* (New York: Norton, 2014); Donella Meadows and Jorgen Randers, *Limits to Growth: The 30-Year Update* (White River Junction, VT: Chelsea Green, 2004); Donella Meadows, *Thinking in Systems: A Primer* (White River Junction, VT: Chelsea Green, 2008). Finally, more like a cactus with sharp needles, Daniel Ellsberg, *The Doomsday Machine: Confessions of a Nuclear War Planner* (New York: Bloomsbury, 2017).

Unavoidably, you have also to understand the main obstacle to essential Singularity measures, namely nationalism. To do so, you cannot do better than read Gerard Delanty and Krishan Kumar, Eds., *The SAGE Handbook of Nations and Nationalism* (London: Sage), 2006. Then get familiar with the good intentions and some interesting idea, but overall delusions of Cosmopolitanisms, in Gerard Delanty, ed., *The Routledge Handbook of Cosmopolitanism Studies* (New York: Routledge, 2017). Then return to the main challenges you must fact, in Anthony Burke and Rita Parker, eds., *Global Insecurity: Futures of Global Chaos and Governance* (London: Palgrave Macmillan, 2017).

I am still stuck with the fuzzy gambling problematic. It is dealt with it as far as I can in my last two books, and I am not aware of any writings that add much to my approach, however rudimentary. Rather, most of the literature fails to penetrate to the fuzzy gambling nature of nearly all Singularity issues (and many more, pushing them instead into the Procrustean bed of probability theories or the superficiality of baseless scenarios. The newly founded Society for Decision Making Under Deep Uncertainty[8] and its planned publications may make a difference, but we will have to wait and see.

[8] See www.deepuncertainty.org.

As of now, I hesitate to recommend to you any of the books presuming to deal with "random," "chaos," and so on. Instead, I recommend two books on a more philosophical level, which stimulate understanding of the phenomena of chance and its possible interpretations: Duncan Pritchard and Lee John Whittington, eds., *The Philosophy of Luck* (Malden, MA: Wiley Blackwell, 2015); Klaas Landsman and Ellen van Wolde, eds., *The Challenge of Chance: A Multidisciplinary Approach from Science and the Humanities* (New York: Springer, 2018). Even more important and in many respects eye-opening is Matthias Gross and Linsey McGoey, eds., *The Routledge International Handbook of Ignorance Studies* (New York: Routledge, 2015).

Given the discourse on the foundations of a Singularity policy scientist, we can now proceed to eight specific pondering and behavior recommendations. In this part, I mention some illuminating personal experiences without burdening you with more reading recommendations.

IV. Eight Pondering and Behavior Recommendations

1. Become Multidisciplinary

Division between disciplines is unavoidable, but misleading. Complex processes, such as evolution, cannot be validly divided into conventional academic and professional fields. At the very least, you must become familiar with the ways of thinking and main ideas of public policy, social sciences, the theory of evolution, human history, prescriptive philosophy, and science and technology. Diversified university studies leading to a doctorate, if possible, including a good public policy school and lifelong reading are essential. But look around for learning opportunities focusing on the Singularity, such as at the Singularity University and, on space exploration, the Kepler Space Institute.

To achieve interdisciplinarity, you need numeracy, knowledge of basic mathematical concepts and familiarity with classical and modal logic. Knowledge of at least one language in addition to English is also very desirable, because many relevant books and interesting experiences and conferences are not accessible in English. I would recommend Chinese as a top priority, but if this is not practical, then Japanese, French, Spanish, or German will do.

I started reading early, still remembering the popular science journals I enjoyed when I was seven years old. By the age of thirteen, I knew German, English, and Hebrew and I agitated my school friends by falsifying their pet views with quotes from serious literature. This did not make me popular, nor did I get high grades in school subjects I found boring (in contrast to my A+ grades at the Hebrew and Harvard Universities, where I could pick courses as I liked), but I never cared about being popular, and I did not take high school seriously, though it was the best one in Mandatory Palestine.

2. Experience Different Cultures

Humanity is divided into different cultures. Though egocentric tribalism must be overcome, the multiplicity of cultures enriches humankind, stimulates creativity, and provides different life options. It should be preserved despite globalization and a needed upsurge of human solidarity. Therefore, as a policy scientist dealing with all of humankind and its environments, you need acquaintance with main cultures. Readings and short

visits will not do. Needed are years of living and working in at least two different cultures in addition to your own one.

I sought such opportunities to do so and succeeded. Most of my life I lived in Israel, but I spent years in the United States, the UK, Germany, the Netherlands, and South America, I advised the Indian government for altogether three unforgettable months, and I have worked for shorter periods in 45 different countries.

But I should have lived for at least a year each in China and the Republic of South Africa. They invited me to do so, but I managed only short visits. I continue to regret it deeply. You should do better: I urge you to live for at least two years in non-European cultures.

3. Integrate Research, Theory Building and Plenty of Praxis

As is clear to you by now, the policy sciences are very demanding. They require good familiarity with the realities of policy making, a lot of experience in composing policies, and, on the basis of research and praxis, developing sorely lacking theories – to be put to reality tests by praxis. The necessity to integrate research, theory building, and praxis is all the more pronounced in the novel domain of *Homo sapiens* future steering, so you must work hard to synthesize them.

Case studies and projects during your studies are useful, but only partly so. They are too static and lean. The best way to learn integrating research, theory building, and praxis is to work in a good think tank or policy consultancy group, or at least in multi-background teams.

I started early to advise public bodies, such as an overall evaluation of the planning system of the Jerusalem municipality. This job also taught me something of the responsibilities of praxis: a senior municipal planner had a heart attack after I submitted my report, and I was told that my negative comments on his performance, though fully justified, caused the disease.

However, my real postgraduate studies on combining research, theory building, and praxis were in my two years (1968-70) as a senior RAND Corporation staff member, mainly in Santa Monica, but also doing an evaluation study of the RAND New York office, which did not make its heads happy. It was also at RAND that I gave a push to the “policy science” concept first coined by Harold Lasswell, by founding the Policy Sciences Journal.

I not only learned from ongoing RAND projects in which I was involved, but also from close and often friendly family contacts with RAND star thinkers, such as Fred Ikle, Victor Gilinsky, Herman Kahn, Andrew Marshall, Albert and Roberta Wohlstetter, Tom Schelling, James Schlesinger, and more. While being in many respects a novice, I had already published my foundational book *Public Policymaking Reexamined*, and I did make some contributions to RAND work, the public part of which is expressed in my book *Crazy States: A Counterconventional Strategic Problem*.

This book hit a fundamental limitation of the mutually assured destruction (MAD) grand-strategy, developed at RAND and adopted as the basic Cold War security doctrine, namely its dependence on Western-type rationality. No wonder that my ideas were

received by the heads of RAND as “very original but unrealistic.” During later visits at RAND, the second part of the initial evaluation was never repeated.

It is very likely that the crazy states doctrine gestated in my mind thanks to Israeli strategic experiences, which I knew well. Thus, it illustrated my efforts to combine praxis with theory fruitfully. Another example from my two years as Senior Policy and Planning Advisor in the office of the Israeli Minister Defense Shimon Peres (1975-77) was the concept of statecraft as fuzzy gambling, later developed in my conceptualization of all major choices as fuzzy gambles ranging from very bounded to wild and chaotic ones, depending on the depth of uncertainty they faced. I arrived at this idea on the basis of my scholarly interest in chance, but more so thanks to my praxis in Israeli defense planning, which is another example demonstrating the absolute requirement to integrate research (in this case intelligence estimates looked at critically) with theory and praxis.

4. Acquire Crisis Coping Skills

Unavoidably, humanity is moving into major crises caused by Singularity processes, such as mass migration due to climate change, social explosions when robots take over most human jobs, and revolutionary violence when expensive human enhancement technologies create intolerable social differences between a new, ultra-rich caste of those who enjoy a life expectancy of, say, 150 years, and the vast majority of humanity condemned to die before reaching 90. Mass killings by fanatics who synthesize lethal, very contagious viruses in kitchen laboratories are also a distinct possibility, and so on.

Therefore, Singularity policy scientists must be adept in coping with radical and often bloody crises. This includes using such crises as opportunities for instantiating measures needed for steering human evolution that are not feasible without crises imploding the tyranny of the status quo.

Therefore, crisis experiences are essential. At least you should participate in crisis exercises, even if they are quite unrealistic. I realize that this may be difficult. Therefore, you may have to limit yourself to virtual crisis exercises in your mind, perhaps with some peers.

I had an outstanding experience of studying the realities of a real-life major crisis, namely the Second Lebanon War, when I was appointed as a member of the governmental committee of inquiry into its management. Over 18 months, the so-called Winograd Committee interrogated top politicians and military officers and studied nearly all existing written material, parts of it highly classified.

The findings were in part devastating, as fully revealed in the public version of the report. Membership in the committee thus provided me with a very unusual opening to study the realities of a high-level political and military crisis management case. It also provided me with the opportunity to make a real difference to Israeli prime ministerial and cabinet decision processes by pushing successfully for the establishment of the Israeli National Security Staff (which I had proposed years earlier, but I lacked the power to overcome resistance).

Much of what I learned was new to me, despite years of being near to the Israeli corridors of power. In particular it strengthened my conclusion that upgrading the qualities of high-level politicians and augmenting their professional staffs is a must, otherwise it is certain that many critical choices will not only be far below optimum, but often the worst possible ones.

5. Experience Revolutions

A Singularity policy scientist needs more than crisis coping skills. Humankind is cascading through a quantum leap. This wild process cannot be fully understood and adequately steered without a feel for the realities and requirements of revolutions, such as future shock, high risks, total commitment, creative destruction, radical creativity, and, when essential, lethal force.

I was lucky living the Zionist revolution and the Omega experience of founding the Jewish State of Israel, feeling the flows of emotions and sharing the pains and triumphs, while having access to information never published and taking part, however limited, in significant choices and some action.

Such experiences may be beyond your reach, though I think you are likely to experience revolutionary transformations during your lifetime. Pending such events, you should gain virtual experience by intensely studying at least one revolution, such as the founding of the United States, the French Revolution, or the emergence of modern China through a chain of contradictory revolutions.

I know this recommendation does not fit common American ways of thinking, though the United States is based on the revolution against British rule and the Civil War and civil rights revolutions. But deep revolutionary transformations are sure to come and require steering, so I stick with my suggestion.

6. Advance In Stages

The Singularity hypothesis and the very idea of partly steering the future evolution of the human species are far too new, complex, and speculative for you to jump into them without first having gained knowledge and experience as a more mundane policy planner, such as in a large municipality, some government department, etc. Also, it is important for you to work with experienced policy analysts and planners before you proceed on your own.

I was very lucky be starting policy planning at the age of nineteen when serving as a junior staff officer in the Israeli Defense Force General Staff during the War of Independence, and continuing on and off to engage in increasingly higher level defense planning. Not less important were my two years at the RAND Corporation, as well as my six and a half years as founding president of a think tank, namely the Jewish People Policy Institute in Jerusalem.

Still, I did not feel called upon nor qualified to deal with Singularity issues and human species evolution steering until about five years ago. Not only was the field novel, so I hardly knew about it, but I also found it very demanding scientifically, morally, and

professionally, and also somewhat depressing when confronting the tremendous challenges for which humankind is clearly not prepared. Therefore, I recommend that you advance through various study and praxis stages before undertaking the missions of a Singularity policy scientist.

7. Be Somewhat Don Quixote Tempered by Sancho Panza

I cannot put what I try to suggest better than Joe Daron in his lyrics of "Man of LaMancha": "To dream ... the impossible dream ... to run ... where the brave dare not go .... to reach ... the unreachable star...."

To put it into prose, a Singularity policy scientist must be somewhat of an optimistic dreamer, have some crazy ideas, engage in iconoclasm, however unpopular, and from time to time let imagination roam freely in the mind. Meeting fanciful thinkers and selectively reading science fiction may help in doing so, but it is your mind that has to be very imaginative, up to accommodating some phantasy.

The eyes should look up to the stars, but the legs must be on solid ground. A good portion of Sancho Panza is also needed in your mind. When the chips are down, realism is a must.

Living the realization of the fantastical dream of reestablishing a Jewish state in the Promised Land and then dealing with the very real problems of assuring its national security taught me to imagine and to try to realize at least partly surrealistic possibilities, while simultaneously engaging with the morasses of reality.

I am not sure what to suggest to you in the absence of such very unusual opportunities. If I could I would design virtual realities in which you get fitting surrogate experiences.[9] As matters are, I have to leave it to you to find ways to combine some elements of Don Quixote and Sancho Panza in your mind, theories, and praxis.

8. Stoic Enthusiasm is a Must

However much you toil and trouble, you will be very frustrated. This is the fate of all highly committed persons who never fully achieve what they believe in. But this is especially the lot of those who swim against strong currents, including Singularity policy scientists. Most of your humanity-craft recommendations will be strongly opposed, pending mind- and culture-shuttering crises. Thus, you may conclude that some regulation of science and technology, diffusion of their findings and marketing of their products is essential for the safety of the human species. Nearly all will oppose you, including most scientists, nearly all business enterprises, the vast majority of politicians, and large segments of the public. If you think I exaggerate, just study more closely what happens with the relatively mild environmental policy proposals (though in this case most scientists are supportive, and none of their interests and values are being endangered).

[9] For steps in such directions, see William S. Bainbridge, *Star Worlds: Freedom Versus Control in Online Gameworlds* (Ann Arbor: University of Michigan Press, 2016).

And, if you put your trust in crises as hard but useful teachers of humanity, as you often must, in most cases you will again be frustrated. Crises will come, but learning is likely to be wrong – till more and harsher crises give humanity another chance .

The nature of humanity-craft as fuzzy gambling will add to your failures. Your best recommendations may be accepted, with dismal results, and your reputation may be shattered. Therefore, not to end as Don Quixote and worse, you need a lot of stoicism. But to have any achievements you must be enthusiastic about your endeavor. Combining these two traits is hard, and it has unavoidable emotional costs. To cope, you have to build a strong inner citadel in your mind.

I succeeded in doing so. If you are made of the stuff of Singularity policy scientists, so can you.

ESSENTIAL READING: Pierre Hadot, *The Inner Citadel: The Meditations of Marcus Aurelius*, revised ed. (Cambridge, MA: Harvard University Press, 2001).

V. Check and Recheck If You Have a Fitting Bent of Mind

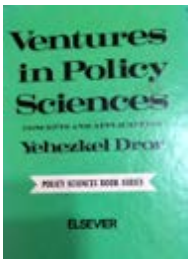
The observation above returns us to the mental requirements of a Singularity policy scientist. As discussed, needed is a special talent, a policy-composing bent of mind. To this I now add “keeping enthusiastic in the face of many failures” and “having a formidable inner citadel.” If you lack them and fail to develop them, becoming a Singularity policy scientist is not for you. There are many other worthwhile life missions. Pick one of them and save yourself useless frustrations, or even much worse – becoming a bad humanity-craft composer, causing much harm.

I am tone deaf, I have no artistic talents, and my social intelligence is fair at best. As a policy scientist, I have made serious errors and suffered from many disappointments, together with experiencing some real and in part exhilarating successes. Now, I am enthusiastic about becoming, however late in my life, a Singularity policy scientist, hoping still to have opportunities to make some contribution, however minor, to human skills in impacting for the better on the future evolution of the specie.

I hope some of the readers of this paper too will be able and willing to make and remake themselves into Singularity policy scientists. Humanity needs you urgently.

9. Becoming a Space Policy Scientist

By Bob Krone



The Space sciences began in the 16th century when ancient mythologies, dating back to the 5th century BC and attributing the movement of the Sun, Moon, and stars to the actions of the gods began to be replaced by astronomer Nicholas Copernicus (1473-1543), who produced the first serious model of the solar system placing the Sun at the center of the then known universe. Since then, the world of Space scientists has grown to encompass all the scientific disciplines that involve space exploration, development, and human settlement, plus the study of natural phenomena and physical bodies occurring beyond Earth in outer space. The world in 2018 now has scientists in all ten NASA Space Centers in the United States, and throughout the world there are scientists studying, researching, and teaching on Space.

This article is devoted to providing answers to the question: “How does one become a Space Policy scientist?” In Yehezkel Dror’s article #8, in this special issue of the *Journal of Space Philosophy*, he presents his “Becoming a Singularity Policy Scientist” with the following purpose:

> **I. Purpose**
> This paper tries to help readers, including students, to make and remake themselves into Singularity policy scientists. I start with three necessary foundations: (a) the Singularity hypothesis, (b) steering human evolution, and (c) humanity-craft composing. To serve the partly didactic aims of this paper, at the end of each foundation, essential readings are presented.
>
> Once the three foundations are laid, we can proceed to eight pondering and behavior recommendations: (1) become multidisciplinary; (2) experience different cultures; (3) integrate research, theory building, and praxis; (4) acquire crisis coping skills; (5) experience revolutions; (6) advance in stages; (7) be somewhat Don Quixote tempered by Sancho Panza; (8) stoic enthusiasm is a must.

Dr. Dror asked me to follow with this essay and to speculate on “How will the role of a Space Policy Scientist be different from an Earth Singularity Policy Scientist?”

We start with the fact that today, there is no person in Earth's global Space network holding the title or having the characteristics of a "Singularity Space Policy Scientist." Yehezkel Dror is probably the only one qualified to have that title, because he has created it and provided his definition of Singularity for this publication.

So, based on Yehezkel Dror's career creation of the Policy Sciences, summarized in this issue, and his prescription for becoming a Singularity Policy Scientist, I offer readers my hypothesis for what the additional characteristics, skills, and tools for future Space Policy Scientists should be. I do so using short bullet statements, for which readers and scholars can consider the total set an original heuristic model.

Space Policy Scientist Criteria:

- Understand and accept the Singularity Vision and hypothesis for Human Settlements and Societies in Space. Have the Dror *"Bent of Mind."*

  Note: It may be unreasonable to expect this of all Space policy scientists, however called – particularly in the early Space Epoch period. However, to the degree that visions differ, or are subsystems, to the Yehezkel Dror Singularity, seeds for future problems and failures will be planted.

- Identify with the facets of Yehezkel Dror's "Becoming a Policy Scientist" essay.
- Have doctoral-level academic achievements plus professional career experience in a Space science or technology.
- Be a lifelong learner with a penchant for breakthrough thinking.
- Be free of ideological, political, or religious dogma.
- Have the mental conviction that you are dedicating your life to improving humanity, wherever societies exist and evolve and especially in space.
- Space Policy Scientists will prepare on Earth, and then become part of the next major leap for humans, which is now starting to emerge in extra-Earth environments humans have only begun to experience in the last seventy years.

Readers are invited to send recommended new items for this list.

Illustrative Space Sciences Doctoral Program:
Following are core subjects for programs to be offered at the doctoral level by academic departments to prepare candidates for becoming Space Policy Scientists, in addition to those stipulated by Dror is his chapter:

- Space Philosophy and Theory
- Space Singularity
- Evolution within a cosmic perspective
- Singularity implications for space exploration and settlement
- Space exploration
- Policy Sciences applications to space issues
- Leadership and governance in relation to space endeavor

- The politics of space exploration
- Technology and engineering related to space exploration and settlement
- Exobiology
- Human and social factors and processes significant for space exploration and settlement
- Settlement construction and configuration beyond earth
- Space systems and design requirements
- Space infrastructure
- Space and recursive distinctioning
- Energy and civilizations interface with human activities in space
- Space commercialization and entrepreneurships
- Astrosciences
- Humanity-centered education focused on space as a future habitat
- (doctoral dissertation supervision)

Bob Krone, bobkrone@aol.com

10. Epilogue

By Yehezkel Dror

Teaching capable students and helping them to become weavers of the future of the human species in the Singularity epoch is one of the greatest achievements of a policy science professor, and one of the few that do not require “dirty hands” – which is often unavoidable when advising rulers and having to take into account their interests and moods. Bob Krone was such a student at the seminars I gave at UCLA in 1968-70 during my stay with the RAND Corporation.

To be frank, this happened many years before I felt somewhat justified to regard myself as a complete policy scientist. Engagement with the evolutionary future of the human species started in earnest only around 2012, when I dropped all teaching and praxis activities and concentrated on updating my understanding and broadening my concerns, leading to my concentration on improving human steering of its future evolution, as the fitting peak domain of what can be called the Grand Policy Sciences.

Therefore my 1968-70 part-time university teaching at UCLA is not something I am proud of today. But, still, Bob Krone was infected by the policy sciences idea and became a top space exploration policy scientist, thus advancing a critical dimension of the future development of the human species; and with time, becoming the founder of the Kepler Space Institute, which honors me more than I deserve by this special issue of the *Journal of Space Philosophy*.

What remains for me is to thank Bob and his associates, in particular Gordon Arthur, for devoting this issue to my work, giving me the opportunity to contribute two items; and for the privilege of years-long friendship and cooperation in trying to do the little we can to assure a thriving future for humanity.

11. Letter 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***.

From Dr. Robert L. Frantz

Dear Editor,

Having read several of Dr. Dror's books, I was inspired to create the website www.sunshineparty.us. Below are the mission statement criteria for grading a government at any level. I hope that I can build a team that is similarly inspired to help to expand the vision statement and to add a grading component. I have used this approach myself at the local government level and then, based on the results, targeted deficient areas. With a team of distinguished members, we could realize significant results. Please take this template, absorb it, and try it out on your local government.

****

Mission Statement

The **Sunshine Party** seeks to improve the capacity to govern at all levels of government. To this end, we are working under the umbrella of the Policy Sciences and specifically exploring the theory of "capacity to govern." Within this theory, there are certain constructs that are measurable, providing the opportunity to use these metrics to arrive at a meaningful scorecard for government at any level. These constructs are listed in the following vision statement.

Vision Statement

Ethics
This term implies virtuous civic work that can be scored by first establishing a "code of ethics" for elected officials and employed staff. The Sunshine Party will establish a written code of ethics.

Transparency
Governance is a shared responsibility of all stakeholders. Operating "behind closed doors" except in very specific circumstances creates an atmosphere of suspicion and distrust by all stakeholders. Inappropriate "behind closed doors" behavior is measurable, and it can be scored.

Morality
To enjoy legitimacy, those in governance must display unquestionable moral standards in such important areas as "human rights." Good governance recognizes basic norms of freedom and democracy, and it requires constant striving to improve upon these fundamentals. The construct of "morality," although somewhat subjective, can be measurable in terms of democratic and economic freedom.

Knowledge Seeking
Government is not static, it is dynamic, and it should constantly evolve in innovative ways to arrive at least cost decisions. Technology today plays an important role in this objective, and it can result in cost efficiencies and taxpayer savings. A comparison between governments of similar size can result in measurement scores.

Future Commitment
Through comprehensive annual strategic planning, government can determine realistic future goals for the benefit of the entire community. The achievement of these goals can be measurable.

Deep, Holistic Thinking
Understanding synergies within a community can lead to optimization in decision making where one realizes that the whole is greater than the sum of the parts. A failure to think holistically can result in bureaucratic stagnation and waste. An ultimate goal should be to strive for a Pareto optimum, where everybody gains and nobody loses. Holistically arrived-at results are measurable through return on investment analysis.

Value Statement

Raison d' humanité, an appreciation of humanity as a whole in meeting the expectations of all citizens, is a moral imperative!

Editors' Notes: Dr. Robert L. Frantz's Sunshine Political Party in South Carolina is the first local political party in the United States to be founded on the works of Yehezkel Dror. Dr. Frantz is a co-founder and past president of Kepler Space Institute (KSI), and he will be active in KSI's future operations. Letters to the Editor for this issue are at the end because they only address the legacy of Professor Yehezkel Dror. ***Bob Krone and Gordon Arthur.***

12. Space Epilogue

***By Bob Krone and Salena Gregory-Krone*[1]**

Preface

We urge readers to have at least skimmed through the first five articles of this Special Issue of the *Journal of Space Philosophy* and to have read Dr. Dror's articles 6, 8, and 10 before reading this final article. We believe that this will prepare you for the awareness of both his brilliant career and the critical importance of his "Singularity Contour," presented here to the world. We doubt there has ever been an equal knowledge of the history, and current status, of global public policymaking to Yehezkel Dror's. His continual professional publications beginning in the 1960s – summarized here – provide complete evidence for that belief. There is a theme that runs through Professor Dror's works. That theme is the shadow of pessimism about humanity's capability to overcome historic and increasingly dangerous aspects of human existence on Earth.

He fully understands all the good imbedded in the genetic origins of life, which have given homo sapiens the will, the hope, the intelligence, and the creativity augmented by some geniuses to survive and prosper in multiple ways through repeated natural and human-caused catastrophes, especially over the last fifty thousand years since the still not understood leap in human mental abilities. He also fully understands the impacts of the Four Horsemen of the Apocalypse impeding progress. He is acutely aware of the increasing risks to humanity posed by the likelihood of inadequate control of emerging Singularity science and technology. And he describes the human species as cascading through a phase leap into a radically novel epoch – the nature of which is unknown and largely unconceivable.

Visions and Values for the Next Human Transformation

With all that background of learning, Yehezkel Dror turned to the study of the evolution of the human species to map the critical variables needed to steer the next evolutionary leap toward heaven while avoiding hell and, as the top priority, self-caused extinction. He presents his analysis, findings, and prescriptions in his three latest books, published within a couple of years, but grounded in his lifelong scholarship and praxis. The subtitle for his most recent *For Rulers* book is *Priming Political Leaders for Saving Humanity from*

[1] Bob and Salena Gregory-Krone share in every way in their senior lives. They first met professionally in the 1970s, when they each had earlier partners. The four of them – Salena and husband Norris Gregory, and Bob and his wife, Sue – became fast friends socially and professionally. They travelled together globally in mutual respect and friendship. That foursome ended when Norris passed in 2011, then Sue passed in 2014. Bob and Salena returned to their professional partnership, which moved on and blossomed into marriage in 2015. Bob, as President of Kepler Space Institute (KSI) and Salena—having had a unique thirty-four year US Civil Service career which began in the War Department in 1944, including pioneering work for the US Air Force and Department of Defense in the Equal Employment Opportunity field that was recognized in the US Congressional Record—become a Research Associate and author for KSI. They collaborated, again, in the development of this special issue of the *Journal of Space Philosophy* dedicated to Professor Yehezkel Dror and his remarkable legacy for the positive continued evolution of humanity.

Itself. Then he moved on for this journal issue with his “Singularity” and “Policy Scientist” articles.

Before we provide you our Space Epilogue, we summarize six important findings of Yehezkel Dror:

1. Leaders/rulers have always been critical for humankind, together with other variables; they are becoming fateful in steering the Singularity, shaping the uses and misuses of the power to mold human futures significantly.
2. Contemporary political leaders are utterly unable to cope with the critical issues posed by the Singularity. Therefore, a much-improved genre of political leaders is a sine qua non for assuring the future of the human species.
3. “Anthroporegenesis” is the term Dror selects for the epoch in which humanity has the power to transform features of Earth critical for humanity and, in particular, to recreate main properties of human beings. Science and technology are providing these powers. However existing forms of governance are not equipped to make and implement harsh choices on regulating their production and use as essential for preventing catastrophes up to self-termination of the species, and instead facilitating long-term human thriving.
4. Absolutely essential are global measures overriding tribalism, extreme nationalism, greed, and fanaticism, and instead enforcing worldwide Singularity-steering measures. Accordingly, Dror proposed moving towards a “Benevolent Platonic Global Leviathan” equipped with moral and cognitive qualities and having the authority and instruments needed for assuring the survival of the human species and facilitating its evolution towards novel forms of human thriving.
5. Science and technology as such are not the danger. It is their misuse – together with human errors – that poses the risks of catastrophes and self-termination of the species.
6. The survival of the human species is an overriding imperative, subject to hypothetical future choices by humanity to create a superspecies taking its place.

Transformations of Human Societies

The timeline of the so-called cognitive revolution of the human species is in debate, but in terms of symbolic abilities, on which modern humanity is based, it apparently ended about 50,000 years ago – leading with time to language, writing, science and technology, and a variety of symbolic and material cultural artifacts. But mutual killings were a feature going back to the beginning of hominins, and they are still common among some types of higher apes, being imprinted also on Homo sapiens.

Altogether, the history of humankind was rightly characterized as a slaughterhouse, together with much cooperation. Both processes pushed learning, leading to present realities with advancing cultures together with science and technology, but combined with

misery and mass killings. But, with the emergence of mass-exterminating tools, starting with nuclear bombs and sure to expand and multiply in the Singularity, the cohabitation between killings and cooperation cannot continue without endangering the future of humanity by a dangerous mix of better lives for most of humanity and the increasing likelihood of catastrophes.

Focusing on one of the most important variables shaping these processes, while recognizing the importance of many others, Yehezkel Dror concludes that there is no substitute for new types of global governance and a new genre of global political leadership. But these too may fail, endangering the very existence of the human species. Therefore, humanity must move into an emergency mode and proceed with space settlement to have a second chance if calamities hit humanity on Earth.

Space as Humanity's Chariot

Given Humanity's history with mutual mass killings, ice ages, megavolcanoes, etc., we may wonder how humankind survived and in the long run thrived. There seems to be something in our genes that provides hope for the future. As Carl Sagan said, "We are Star Stuff." We have an unquenchable curiosity about the universe and our role in it. This may turn out to be humanity's ultimate benefactor.

There were, in March 2018, 7.4 billion humans on planet Earth, and this number will further grow before probably levelling off. This large mass of humans contains heaven and hell and much in between: those who create beauty and self-fulfillment for themselves and others, and those who want others to suffer and non-believers to be exterminated.

We are, as Jonas Salk commented in 1973, blundering through the transformation from Epic "A," Survival of the fittest, to Epic "B," Survival of the Wisest. We aren't sure where we are, and Yuval Noah Harari, in his book *Sapiens: A Brief History of Mankind*, ends with the statement:

> The real question facing us is not "What do we want to become?" but "What do we want to want?" And Yehezkel Dror asks: "Humanity, to be, what to be, not to be?" but he also accepts as axiomatic for the foreseeable future an existentialist imperative to assure, as far as possible, the long-term existence of the human species. (*Avant-Garde Politician: Leaders for a new Epoch*)

So, we now follow with a bit of Aristotelean logic:

- If history reveals inadequate evidence of human capability to weave the future positively in the emerging Anthroporegenesis epoch,
- Then, a set of radically novel measures is required, including a critical mass of novel values, regimes, and leadership.
- We have summarized the most crucial ideas and recommendation of Professor Yehezkel Dror.

But that still leaves unanswered the question “How can Dror’s compelling proposals be realized?”

We think that human space exploration and then settlement can provide an important part of the answer, recognizing the fuzzy gambling of that concept.

US President John F. Kennedy, on May 25, 1961, in a message to Congress, announced to the world:

> I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to the Earth. No single space project in this period will be more impressive to mankind, or more important for the long-range exploration of space; and none will be so difficult or expensive to accomplish.

On July 20, 1969 people all over the world watched in anxiety and fascination as the Apollo 11 Space mission brought astronauts Neil Armstrong, Buzz Aldrin, and Michael Collins to the Moon, and Armstrong and Aldrin became the first humans to step on the Moon. That was a humankind revolution that changed public awareness for possible future human Space exploration and led to unprecedented international cooperation to build the International Space Station (ISS), beginning in 1998. That Earth-orbiting home for humans is continuing to be expanded today, and it is expected to operate until 2028. Astronauts, cosmonauts, and Space tourists from 17 nations have been aboard since November 2, 2000. It is the largest human-made body in low Earth orbit and the experimental pioneer for the future human space settlements throughout the Solar system and beyond. The recent discovery of water on Mars, if verified, is just one sign of many of the potentials of Space as, with time, an additional habitat of humanity.

We cite the Moon landing as an historic mega-event that happened thanks to a massive, coordinated US science and technology project with top-level political support. This approach can also realize unprecedented Space visions.

A Phased Implementation Program for a Humanity Space Singularity Prospect

1. **Announcement of the creation of an initial select Space Singularity dedicated group.**

   KSI has offered to be a sponsor for this first step. It would be an emerging global umbrella collegium determining its own visions, priorities and programs.

   Dror has provided extensive evidence to support his publications on the incapacity to govern of rulers and political leaders, and the required Policy Sciences qualifications of future Singularity leaders. This applies to the space Singularity group, which must engage in shared learning. KSI is now composing a doctoral-level educational program focusing on Space leadership that will become one model for a larger scale leadership development endeavor.

2. **Mobilization of wide public support by a range of publics, high-quality mass media, and social networks.**

3. **Pushing Space exploration and preparations for pilot settlements on the Moon, Mars, or in massive solar system orbiting entities.**

4. **Efforts to put support of this humanity-focused effort on the agendas of global international organizations and within the visions of national leadership.**

It could take a hundred years, or longer, for those four steps to meet the needs of a cognitive revolution for the human species, assuming the existing human species does not self-destruct. This “Space Epilogue” is hypothesized as one step in that direction.

We, in KSI, will use the following slide to introduce the education and research to understand, and work toward, the launching of this revolution:

Anthroporegenesis

A term, and concept, proposed by Yehezkel Dror for the emerging radically new epoch in the history of the human species in which, thanks to novel science and technology, humanity will be able to impact significantly on its future evolution as a species and on its environments, including perhaps creation of new sentient beings – thus engaging in acts of "genesis."

Yehezkel Dror

Tim Watkins Image, New Scientist

Bob Krone & Salena Gregory-Krone
Kepler Space Institute, Inc.

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