The comments and deliberations of all participants are deemed very important to the Foundation For the Future. While every attempt has been made to preserve the accuracy of dialogue in the seminar sessions, it is impossible to guarantee that no errors or omissions were made in the course of transcribing and editing the live-session tape recordings. Though the Foundation does not accept responsibility for positions taken by participants or for the content of dialogue sessions, it does accept responsibility for any inadvertent omissions, misunderstood words, typographical errors, or other mistakes that occurred in the process of transcribing spoken words to print.

A copy of this publication is available from the Foundation For the Future for $10 U.S. ($20 U.S. for international) to cover postage and handling.
Fall 1999

Dear Readers:

Welcome to the world of the future.

I am quite excited to present to you the first major publication of the Foundation For the Future. This book, the Proceedings of Seminar No. 1 of our Humanity 3000 program, documents scholarly discussions about the critical factors that might have the most impact on the long-term survivability of humanity.

The Foundation was established to sponsor research into those critical factors. In April 1999, we brought together twenty-three prominent scholars from around the world in the first of a series of annual seminars and bi-decade symposia.

This book is a comprehensive record of the April seminar. It is the first of a succession of publications focusing on scholarly research and dialogue concerning the long-term future of humanity. I hope you will enjoy reading these discussions about the major problems and opportunities for our species in the centuries unfolding before us.

Sincerely,

Walter P. Kistler
President and Benefactor
The Foundation For the Future wishes to acknowledge the following persons for making the Humanity 3000 Seminar No. 1 such a success:

The Humanity 3000 Organizing Committee, for their incredible foresight and guidance in planning and organizing the Humanity 3000 Program. These members include Clement Bezold, Joseph Coates, Brian Fagan, Barbara Marx Hubbard, Sohail Inayatullah, Charles Johnston, Graham Molitor, Siro Polo Padolecchia, and Allen Tough.

The participants in Humanity 3000 Seminar No. 1, whose wide-ranging knowledge and experience formed the backbone of the seminar and whose contributions will be valuable well into the future. These participants include Walter Truett Anderson, William H. Calvin, George Cowan, James Dator, Terrence Deacon, Steven J. Dick, Howard F. Didsbury, Clive Gamble, Ashok Gangadean, Jerome C. Glenn, Francis Heylighen, Barbara Marx Hubbard, Seymour Itzkoff, William W. Kellogg, Yersu Kim, Dietrich Koelle, Meng-Kin Lim, Rosaleen Love, Frederik Pohl, Phillip Tobias, Allen Tough, R. Spencer Wells, and Paul J. Werbos.

The staff of the Foundation For the Future, for their unfailing dedication and commitment to ensure that event planning resulted in a memorable experience for all involved. This staff includes Carolyn Hobart, Program and IT Manager; Paige Heydon, Program Coordinator; Veronica Spencer, Executive Assistant; Carol Tanner, Executive Assistant; Tom Price, Executive Assistant; Cathy Allen, Executive Assistant; Jeff Holdsworth, Art Director; and Jean Gilbertson, PR and Publications Manager. In addition, Karen Armstrong, Program Consultant, and Glen Hiemstra, Consultant, contributed significantly to the success of the seminar.

Columbia Resource Group, especially Melissa Kween and Leah Hill, for their outstanding organization and execution of the seminar schedule.

Gordon Swanson and Wayne Kaseguma, for outstanding artwork design.

Richard Dowling and David Rapka, the film crew, for capturing the entire seminar on videotape, providing a permanent verbatim archive of all of the seminar sessions.

Bill Wright, for extensive photographic coverage.

The graphic recorders: Michelle Boos, Christine Valenza, and Preston Lewis.

The transcriptionist, Beth Carlson of Rain City Business Connection, and the editor, Elizabeth Flynn.

The Trustees and Executive Director of the Foundation for reposing their patience, trust, and confidence in all of us.

Sesh Velamoor  
Deputy Director, Programs

Donna Hines  
Deputy Director, Administration
The fundamental objective of the Foundation For the Future’s Humanity 3000 program is to bring together prominent thinkers from around the world in a multi-disciplinary framework to ponder issues that are most likely to affect the long-term future of humanity.

The Foundation plans to convene a major international Humanity 3000 Symposium every five years beginning in the year 2000 and hold a series of Humanity 3000 seminars every year beginning in 1999.

The first Humanity 3000 seminar was successfully convened in April 1999 at The Inn at Semi-Ah-Moo in Blaine, Washington, USA.
Summarized below are the contents of each Section and Appendix of the Proceedings of Humanity 3000 Seminar No. 1.

Section I cites the three critical questions that formed the basis of the Humanity 3000 Seminar.

Section II summarizes Seminar No. 1, providing an abstract and details on background and purposes, as well as a description of the process, selection of participants, and key outcomes.

Section III contains statements prepared by the Seminar No. 1 participants, commenting on the factors they consider to be most critical to the long-term survival of humanity, where the greatest potential may be found in their respective fields in the next thousand years, topics to explore in Humanity 3000, and their personal visions of the thousand-year future.

Section IV lists topic areas suggested by participants for discussion subjects. The topics are grouped into categories.

Section V, Suggested Factors for Discussion, includes excerpts from numerous authors who write on subjects related to the future of humanity.

Section VI, Suggested Major Dialogue Questions, offers queries that prompt dialogue into the heart of several future-related issues for the next millennium.

Section VII provides the transcripts of the dialogic sessions conducted over the four days of the seminar.

Appendix I is the Seminar Agenda, noting key activities from the opening reception to closing remarks.

Appendix II is the transcript of an interview of participants Jerome C. Glenn and Francis Heylighen, conducted by Sesh Velamoor, Foundation For the Future Deputy Director, Programs.

Appendix III provides biographical information on the twenty-three participants in Seminar No. 1.

Appendix IV is a bibliography of background papers by leading futurists, scientists, and global experts. Most of these papers were prepared for the Foundation For the Future during the development of the Humanity 3000 program.

Appendix V cites authors and references for further reading.

Appendix VI lists resources, including audiotapes, videotapes, and photography, that provide an available record of the seminar.
List of Participants

Walter Truett Anderson  
Vice President  
Meridian International Institute  
San Francisco, CA

William H. Calvin  
Theoretical Neurophysiologist  
University of Washington  
Seattle, WA

George Cowan  
Founder  
Santa Fe Institute  
Santa Fe, NM

James Dator  
Professor/Dept. of Political Science  
University of Hawaii  
Honolulu, HI

Terrence Deacon  
Professor/Dept. of Biological Anthropology  
Boston University  
Boston, MA

Steven J. Dick  
Historian of Science  
U.S. Naval Observatory  
Washington, DC

Howard F. Didsbury  
Special Projects Director  
World Future Society  
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Clive Gamble  
Professor/Dept. of Archaeology  
University of Southampton  
Southampton, United Kingdom

Ashok Gangadean  
Founder-Director  
Global Dialogue Institute  
Haverford, PA

Jerome C. Glenn  
Executive Director  
AC/UNU/Millennium Project  
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Francis Heylighen  
Associate Director/Leo Apostel Center  
Free University of Brussels  
Brussels, Belgium

Barbara Marx Hubbard  
President  
Foundation for Conscious Evolution  
Santa Barbara, CA

Seymour Itzkoff  
Professor Emeritus/Dept. of Sociology  
Smith College  
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William W. Kellogg  
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National Center for Atmospheric Research  
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Yersu Kim  
Director/Division of Philosophy and Ethics  
UNESCO  
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Dietrich Koelle  
Executive Director  
TransCost Systems  
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Meng-Kin Lim  
Associate Professor  
National University of Singapore  
Singapore

Rosaleen Love  
Honorary Research Associate  
Monash University  
Victoria, Australia

Frederik Pohl  
Professional Writer  
Palatine, IL

Phillip Tobias  
Professor Emeritus/Dept. of Anatomical Sciences  
University of Witwatersrand  
Johannesburg, South Africa

Allen Tough  
Professor Emeritus/Graduate Dept. of Education  
University of Toronto  
Toronto, Canada

R. Spencer Wells  
Research Fellow  
University of Oxford  
Oxford, United Kingdom

Paul J. Werbos  
Program Director  
National Science Foundation  
Arlington, VA
Participants at Work

Walter Truett Anderson
Seymour Itzkoff
Barbara Marx Hubbard
Yersu Kim
Howard F. Didsbury
Terrence Deacon
Meng-Kin Lim
R. Spencer Wells
George Cowan
Steven J. Dick
Jerome C. Glenn (above)
Participants at Work

Phillip Tobias, Bob Citron, and Walter Kistler at opening reception.

Clive Gamble

Rosaleen Love

Ashok Gangadean

William H. Calvin

Allen Tough

Dietrich Koelle

James Dator

Paul J. Werbos

Frederik Pohl

Francis Heylighen

William W. Kellogg
List of Participants
1. What are the factors that are critical to the long-term future of humanity?
2. What do we know about the past and present of these factors and their most likely trajectories?
3. What are the problems and opportunities associated with these factors as they relate to the long-term future of humanity?
ABSTRACT

This narrative is an extended executive summary of the Foundation For the Future’s Humanity 3000 seminar, held in April 1999 in Washington State, USA. The narrative is a textual record of the seminar, intended to complement the graphic art and video documentation of the proceedings. The topics discussed in this document reflect critical elements in the overall seminar. Written and verbal assessments of the seminar from the participants, Foundation staff, and consultants have been utilized in the debriefings held as part of normal program evaluation.

BACKGROUND

Humanity 3000 is a major international seminar and symposium series undertaken by Foundation For the Future, Bellevue, Washington, USA. These seminars and symposia on the thousand-year future of humanity are central to the mission of the Foundation. As part of that mission, the Foundation intends to conduct these scholarly exchanges in perpetuity.

The purposes of Humanity 3000 are: to assess the current status of humanity in the year 2000; to identify the most significant factors that affect the quality of life of the people of the Earth; to discuss and debate the topics considered to be the most important to the participating scholars; and to hold a series of workshops that will suggest research areas and activities essential to humanity’s future.

ORGANIZING COMMITTEE

The Foundation selected an Organizing Committee for Humanity 3000 in the spring of 1998. For over a year, this committee met on a regular basis to assist the Foundation in planning the seminars and the first major Symposium. The Organizing Committee is composed of scientists, educators, and futurists from the United States, Europe, and Australia who bring their own expertise to the planning process.

SEMINAR PURPOSES

This seminar was the first in a series of seminars and symposia hosted by the Foundation as part of Humanity 3000. The primary program focus and objective of Humanity 3000 is to structure a multidisciplinary approach to:

• Identify the key factors that may affect the future of humanity in the next thousand years.

• Map the territory (past-present) of these factors and suggest trajectories.

• Outline the problems and opportunities for the long-term future related to these factors.

Participating scholars engaged in conversations that allowed them to function within their “comfort zones” and also challenged them to listen and absorb other points of view about the long-term future. This seminar and the one scheduled for September 1999 are intended to prepare scholars for a Symposium in 2000. The Humanity 3000 seminars and symposia offer a time of deliberation and discussion on the most essential factors facing humanity in the next one thousand years and maintain a focus and interest on the “long term” on a continuous basis in perpetuity.
Section II: Seminar Summary

KEY SUBJECT AREAS
Through many planning sessions, the Foundation For the Future identified the following subject areas that will “contain” the answers to the questions about humanity’s long-term future. These are:

• Cosmological/Evolutionary Futures, and lessons from the past.
• Biological/Genetic Futures
• Natural Resources Futures
• Scientific/Technological Futures
• Demographic/Social Futures
• Cultural/Values Futures
• Economic Futures
• Governance Futures
• Wildcards

PARTICIPANT SELECTION PROCESS
Participants for the seminars and Symposium were nominated by the Humanity 3000 Organizing Committee. They represent some of the “best thinkers” on the planet: scientists, philosophers, humanists, historians, technologists, and futurists selected for their ability to engage in discussions on the long-term future. A list of nominated participants was assembled and reviewed. From this extensive list, participants with multiple recommendations received the first seminar invitations. In consistency with the seminar design, there were balanced numbers of individuals from the various disciplines, and, when possible, from various geographic regions of the world.

Participants unable to attend the 1999 seminars and the 2000 Symposium will be reconsidered as invitees to future Humanity 3000 events.

VENUE
The April 1999 seminar was held at The Inn at Semi-Ah-Moo, a conference center on the northern coast of Washington State, USA. Highly rated for its service and the beauty of its natural location, the inn is a Wyndham Resort regarded as the Northwest region’s premier waterfront resort. It is located on a 1,100-acre wildlife preserve just 45 minutes’ driving distance south of Vancouver, British Columbia, Canada, and two hours north of Seattle, Washington. The inn is built in a Northwest-lodge style with guest rooms offering panoramic views of Semi-Ah-Moo Bay, the San Juan Islands, and the lights of White Rock, British Columbia. The conference amenities, recreational opportunities, and secluded location of the inn provided a setting that enhanced discussion and inquiry.

SEMINAR DESIGN
A unique aspect of the Humanity 3000 program is the commitment to bring together scholars from different disciplines, different specialties of research within disciplines, and differing worldviews. The seminars are designed to be multidisciplinary as a means of establishing a forum for “deep conversations” about the long-term future that reflect some variety of the planet’s scholars, populations, and priorities. It is hoped that this element of the design will assist the Foundation in disseminating findings and opinions regarding humanity’s future.

The agenda of the seminar included a blend of plenary sessions, large groups of both predetermined and self-selected participant composition, small groups, and scheduled time for individual conversations. This variety of working contexts was provided to promote dialogue and exchanges among scholars who seldom have the opportunity to engage in discussions with their peers from various disciplines and from other parts of the world.

DESCRIPTION OF SEMINAR PROCESS
A packet was sent in advance of the seminar to each participant with a two-page questionnaire and request for biographical information. These completed questionnaires were assembled as a booklet and provided to the participants, along with an agenda, as advance reading materials. They were also used as a means to separate the participants into three groups for an initial exploration of the critical factors. These “affinity” groups were established to enhance agreement rather than disagreement among the participants, and each was asked to generate a list of the five most critical factors facing humanity, along with topics to be discussed about each of the factors.

In the second phase, small groups were formed by self-selection, based on the expertise of the participants. These groups were asked to map the territory of their factors. At the end of this exercise, participants selected three major questions to be discussed in the larger group context.
A “fishbowl” setting was created for discussion of the three main questions. In this phase of the seminar, participants voluntarily formed groups of ten. Each group was dedicated to the discussion of problems and opportunities related to one of the questions, while the remainder of the participants sat in a semi-circle around the discussion table to listen and to ask questions at the end of the dialogue.

Following this combination of large- and small-group activities, along with work in plenary sessions, the participants were provided with time for personal discussions and reflection about the exchange of information that had taken place.

The original affinity groups were reunited on the final morning of the seminar to craft answers to the three questions that had been discussed. These groups were to seek a level of consensus about the factors under discussion. Reconvening these original groups also provided a “before and after” context for participants to discuss new insights, new understandings, and new questions or goals for the future.

In the final plenary session, participants voiced their own personal reflections on the three questions and provided opinions about the seminar outcomes, the value and/or limitations of the dialogues, and how the seminar may influence their future scholarship.

**GRAPHIC FACILITATION**

Every discussion of complex themes creates a challenge for the participants to listen, to dialogue, and to exchange ideas rather than waiting only for opportunities to restate their own positions. A significant amount of creativity was stimulated through the use of professional graphic illustrators. These artists are specially trained in the use of visual techniques to enhance the group process. They capture in graphics and key words the essential ideas being presented, and show conceptual linkages through clustering ideas together on drawing boards.

By the end of the seminar, there was a visual representation of the discussions taking place each day. Placed in the halls of the conference center, the drawings created an “experiential walkway” that enabled the participants to remember discussions and recapture information through imagery. One participant likened the many pages of visual representation to a “modern form of cave art.” This seemed a particularly apt description of this seminar, where conversations had ranged from the prehistoric past to the nearly unimaginable long-term future.

**KEYNOTE SPEAKER**

The keynote speaker was Dr. Phillip Tobias, Professor Emeritus from the University of Witwatersrand, who shared his scholarship in human evolution and his social wisdom. Dr. Tobias was also a seminar participant. His comments reflected his vast experience in paleoanthropology, in university teaching and administration, and in public service at UNESCO and other global institutions. Professor Tobias captivated the audience with his presentation on the archeological findings in South Africa, most especially the recent discoveries of the hominid known as Australopithecus africanus. The seminar participants were the first people in North America to see slides of this very significant recent find. Dr. Tobias also was a pivotal figure in the discussions on humanity’s thousand-year future. He articulated his passionate concern for the majority of Earth’s population, who live in what are commonly called “Third World” countries, those nations not benefiting from the high standard of living made possible through technology and industrialization.

**SEMINAR OUTCOMES/KEY QUESTIONS**

The multidisciplinary backgrounds of the participants fulfilled a key element of the seminar design. It is rare, for example, that a futurist with expertise in philosophy, world religions, and the social sciences is afforded a structured context in which to discuss the long-term future of humanity with a neurobiologist engaged in cross-species transplantation. Concern for global ethics, for the evolution of future species, and for the consequences of human intervention in evolution were listed as priority factors affecting humanity’s long-term future.

Participants grappled with the concept of the very long-term future, and most agreed that their usual focus is primarily on the shorter term, to some 200 years. The Foundation agreed to assume the program task of facilitating a longer-term perspective for the September seminar.

As part of the seminar design, participants were asked to select the three most critical factors/questions for the long-term future of humanity. The three questions ultimately determined were:

1. What do we mean by conscious evolution?
2. What will be the relationship between human evolution and the global environment?
3. How do we create a global ethical system?
These key questions were discussed in a fishbowl setting. Approximately ten participants sat at the center table and discussed their selected question, with the balance of the participants seated in a circle around the core discussion group. Following the group discussions, the observing participants asked their own questions about the topic.

**KEY QUESTION NO. 1:**

*What Do We Mean by Conscious Evolution?*

Conscious evolution, the evolution of consciousness, and the future of biological evolution were considered under the larger topic of Conscious Evolution. The group proposed three subtopic questions and worked to qualify ideas in terms of issues of “implementation or practicality.”

The three subtopic questions were:

a. As consciousness intervenes with the evolutionary process, how will human nature self-transform?

b. What would the optimal futures the human race could create look like?

c. What do we need to know to direct our evolution in a positive direction?

Two “qualifying” elements were added to the discussions of these questions:

- How do we make sure we are learning from the past?
- What about the issue of cost-effective strategies?

Conscious evolution was explored in terms of the evolution of consciousness over millions of years, in comparison with the recent, developing knowledge of humans about evolution. The group addressed both capacities and opportunities for human manipulation of biological evolution. Some participants saw new dimensions of humanity’s consciousness on metaphysical levels as offering a “discrete step,” a “threshold,” or a “new level.” Humans now have an awareness that we can evolve, using the interplay of consciousness and technology. It is a question of adding “intent” into matter, or what has been termed “a shift from dominance of matter to a dominance of life.” The essential unresolved issue underlying this question was a matter of perspective: a) whether humanity faces the dangers resulting from an “engineering fallacy”—pitfalls derived from the issue of whether humans can engineer evolution; or b) whether there is an intelligence—a deep, profound force playing out in evolution—of which consciousness is a natural emergence. If the second option is true, then the alternative to willful engineering is for humans to learn to come into sync with natural emergence.

There was consensus that evolution is about natural selection, about a range of options for survival that depend on diversity, variety, and an effort to maximize intelligence to increase options for evolutionary fitness.

**KEY QUESTION NO. 2:**

*What Will Be the Relationship between Human Evolution and the Evolution of the Global Environment?*

This question combined concerns shared by a number of participants about past and current evolutionary issues. Some of the questions raised specifically were:

a. What about climate change?

b. Can we control or adapt?

c. What is our capability for intervention?

d. Are there limits to the capabilities regarding evolution and the environment?

e. Will our increasing environmental information-gathering capability lead to desirable outcomes?

Discussion on this topic centered on climatic changes, on human capability for intervention, and the potential outcomes of human manipulation. Climate change, especially abrupt climate changes, have had and will continue to have a major impact on the environment and on human evolution. It was emphasized that humans have always affected evolution in their own locales but, for the first time on this planet, the actions of humans are altering evolution on a planetary scale. Human willingness and capacity to collaborate pose a problem when the solutions to environmental issues must be undertaken at the global level.

Topics such as the likelihood that humans have been, and are currently being, cloned at some place on the planet elicited considerable response from the participants about what humans will be like and what the planet will be like in a thousand years. Ethical issues were raised about technology-rich nations benefiting from genetic engineering and other scientific enhancements while the less-prosperous peoples of Earth will be further deprived. The priority concern of some participants stemmed from the tendency of humans to intervene without understanding all of the implications of these interventions.
KEY QUESTION NO. 3:  

**How Can a Global Ethics System Be Created and Implemented?**

The necessity for a system of global ethics emerged as the factor of highest concern to the participants. Questions were raised such as:

a. Why global ethics?

b. What will be in the ethical domain over the next thousand years?

c. What can education contribute to the development of ethics?

d. How will global ethics assist global governance systems?

e. What are some of the approaches to the development of global ethics? And what are implementation strategies?

Current threats to humanity such as accelerated methods of warfare, nuclear and biological terrorism, virulent diseases, and planetary destruction add urgency to this issue. Increased economic and educational disparity was seen as a critical problem. Some of the positive ethics and values of human communities are being lost in industrialized societies, and it is an issue of ethics as to whether technologies will be shared or whether deeper economic and social chasms will develop in the future. Participants acknowledged that the widespread concern for this issue is reflective of humanity at the end of the millennium. It also derives from an expanded sense of the human family that comes through understanding these threats as well as through technologies enabling connectivity and communication. Humankind is able to consider both globalization and galaxialization as viable in the next thousand years. How decisions will be made for the planet, and how humans will live and work, will largely be dependent upon the ethical systems that are created and used.

PARTICIPANT EVALUATIONS

Participant evaluations were solicited in order to assist the Foundation in learning, from the participants’ perspectives, which areas were successful and which areas need improvement. The most successful element, according to the participants, was the multidisciplinary selection process. Many of the participants felt intellectually challenged by the opportunity to dialogue on the future with individuals from academic disciplines different from their own.

Participants evaluated the focus on the thousand-year future of humanity as the second most useful seminar feature. Some of the futurists in the audience found this concept quite familiar, and even chafed somewhat at the newness of the concept to those who had not been active in futurist circles. It is significant to note that many of the scholars were significantly impacted by this discussion, commenting on their evaluation forms that they now will examine their current research in light of this new understanding. The responses to this issue of the long-term future were quite clearly divided into two groups: those who see themselves as active futurists already engaged in examining the long term, and those who explored this concept virtually for the first time. While some were less than satisfied, others were informed and engaged for future work directly as a result of the conference.

The third area of comment asked participants to name the most personally satisfying phase or aspect of the seminar. The more personal and intimate conversations were rated highest. These included smaller group discussions that took place in the separate rooms, the fishbowl aspect of the seminar, and the personal synthesis statements shared at the end of the seminar. Opportunities for “corridor discussions” also rated highly.

Another element that received considerable note was the use of graphic illustrators. Dr. Tobias’ witty and spirited presentation on human evolution was also keenly appreciated.
In advance of Humanity 3000 Seminar No. 1, all participants completed two-page questionnaires designed to set the stage for the dialogic sessions.

The questionnaires elicited the participants’ early deliberation of the factors they would consider to be most critical to the long-term survivability of humanity, and the current map and trajectory of those factors. Participants were also asked to comment on the greatest potential in their individual fields in the thousand-year future, to note specific topics or questions they would like to explore in the seminar, and to articulate their visions of AD 3000.

The Foundation used these completed statements in two ways. First, the statements were compiled and provided as advance reading material to all participants to provide a preview of the reflections of the multidisciplinary conferees.

Second, the statements were used to establish three affinity groups of participants for the initial seminar discussion sessions.

Following are the two-page statements completed by the Seminar No. 1 participants.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

I’d name five factors: technology, cosmology, epistemology, equity, and identity. Technology involves not only the invention of tools but also the invention of symbolic systems such as speech and writing. Cosmology involves a map of the world and the universe. Epistemology: ideas about what truth is, how it can be tested, and where it is to be found. Equity: the distribution of goods, power, and status. Identity questions include: Who and what is this society? Who and what am I? How do I differ from others?

What are the current map and trajectory of these factors?

Technological change is now the leading edge of human evolution and is part of our evolving cosmology as we develop new maps of the universe and ideas about its origins. Epistemology has evolved from premodern (traditional) to modern (scientific/objectivist) to postmodern (constructivist), but neither transition is complete. Epistemology becomes especially critical at times when central cultural values and beliefs are being challenged. In regard to equity, no society has ever been able to achieve true distributive justice. Socialism has failed in this effort, and current opinions divide between those who favor welfare-state approaches and those who believe the matter should be left to market forces and remain outside public policy. Ideas and experiences of identity are changing rapidly in today’s high-technology, globalizing, postmodern, multicultural world.

What are the problems and opportunities with the factors identified?

In the area of technology, the problems involve both actions and reactions—misuses stemming from the inability (or unwillingness) to foresee consequences, and also destructive anti-technological terrorism. The opportunities are virtually endless. Cosmology offers us the opportunity to develop an understanding of our place in the universe (and its place in us) that is both reverent and grounded in science. Epistemology can be a part of this new worldview, as we come to understand that our minds actively construct as well as discover the universe. There are profound problems in relation to equity, which at present is not improving in pace with technological change, but there is a tremendous opportunity to raise the quality of life for all people in the future. We also have the opportunity to understand (or construct) identity in new ways.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

One of my fields is political science. Currently I see a major worldwide transition taking place, with the emergence of a system of global governance that is multicentric—involving numerous different “regimes” for dealing with such issues as the environment, international trade and finance, and human rights. The longer-term potential is for a truly global society in which states have indeed withered away—as Marx once famously predicted they would—as have the doctrinal religions that are so deeply involved in current political conflict.

Another is psychology, and in this field the greatest questions for me have to do with the self, with the ways that we currently understand our boundaries, separateness, and identities, and the ways in which those understandings may radically change. I have no doubt that they are changing now, and that the greatest potential for the future will lay in our ability to develop a deeply different sense of who and what we are, both individually and as a species.
DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. What is our present understanding of human consciousness, and what are the prospects for evolution of human conscious (and unconscious) cognition?

2. What are the real points of contact between spiritual traditions (such as Buddhism) and current scientific understanding of cosmology, evolution, and human consciousness?

3. If we could direct the future course of science and technology, what priorities should we choose? What might we want to discourage or prohibit?

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

I see a continuing shift of the boundary between the given and the made. In the past most people lived in conditions that they understood to be simply handed to them. We are experiencing now an enormous expansion of the living space in which we can (and often must) choose and construct those conditions. We will become more creatively responsible for the entire biosphere, for ecosystems and societies, and for our own bodies and minds.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Avoiding abrupt climate change—which has, every several thousand years in the past, devastated ecosystems within a decade on a worldwide scale.

2. Avoiding the fractures in society likely to be caused by a rate of change in technology and the economy that only the best and the brightest can cope with, leaving most of the population constantly battered by insecurity and lack of job satisfaction, alienated by the situation in which they are trapped.

3. Outdriving our reaction time—causing changes in society or ecosystems that cannot be corrected in time before crashes are triggered. The future is arriving more quickly than it used to, and since we don’t respond any more quickly than before, it makes foresight more important than ever.

What are the current map and trajectory of these factors?

As I said at the beginning of my Atlantic Monthly article (see my website at WilliamCalvin.com): “When ‘climate change’ is referred to in the press, it normally means greenhouse warming, which, it is predicted, will cause flooding, severe windstorms, and killer heat waves. But warming could also lead, paradoxically, to abrupt and drastic cooling—a catastrophe that could threaten the end of civilization.”

The Earth’s climate does great flip-flops every few thousand years, and with breathtaking speed. We could go back to ice-age temperatures within a decade—and judging from recent discoveries, an abrupt cooling could be triggered by our current global-warming trend. Europe’s climate could become more like Siberia’s, and even the tropics could cool down abruptly, creating great forest fires on a far larger scale than we saw during the recent El Niño. Because such a cooling and drying would occur too quickly for us to make readjustments in agricultural productivity and associated supply lines, it would be a potentially civilization-shattering affair, likely to cause a population crash far worse than those seen in the wars and plagues of history. What paleoclimate and oceanography researchers know of the mechanisms underlying such a climate “flip” suggests that global warming could start one in several different ways—all involving the Gulf Stream’s flushing mechanism that makes room for more warm water to flow into high northern latitudes.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

My own “future issues”—the ones that go beyond the general and demand specialist knowledge to see why there are problems—have tended to fall into two broad categories: A) the future evolution of human intelligence (I’m a neurophysiologist), and B) the future of Earth’s climate and its consequences for civilization (I have a long-standing interest in how the ice ages contributed to human evolution from the apes).

1. The future evolution of intelligence probably won’t be like the past (natural selection has been enormously slowed by agricultural surpluses, community responses to disasters, etc.). Instead, germ-line genetic engineering and cloning will likely occur, and we’ll find ways to enhance intelligence when our educational technologies are able to take advantage of insights gained from brain research: we’ll know what to teach when, how to pyramid things, how to exercise the imagination, and when to consolidate. All of higher intellectual function (syntax, planning, music, logical trains of inference, games with arbitrary rules) could look very different after a few generations of this teaching based on knowing how the brain actually works.

2. Devising a long-term scheme for stabilizing the Gulf Stream’s flushing mechanism has now become one of the major tasks of our civilization, essential to prevent a drastic downsizing with wars over food that would leave civilization itself in a shambles. Human levels of intelligence allow us both foresight...
and rational planning. Civilization has enormously expanded our horizons, allowing us to look far into the past and learn from it. But it remains to be seen whether humans are capable of passing this intelligence test that the climate sets for us.

**DISCUSSION TOPICS/QUESTIONS**

*What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?*

1. Making the world safe for rapid change.
2. Creating the ten-generation perspective in the midst of a quarterly-profits focus.

**THOUSAND-YEAR VISION**

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

While I am somewhat optimistic, it is easier to be specific about the downside—all those things we could lose. Whether through inability to stabilize abrupt climate change or inability to avoid fractures in society, we could easily have a world in 3000 where—though *Homo sapiens* survives—the whole world is balkanized into little despotic countries that hate their neighbors for very good reasons, recovering very slowly.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

This question seems to imply survival at a level of satisfaction of human needs that is as desirable as or more desirable than our present level. Humanity will survive but perhaps under what we would consider highly undesirable conditions. Nevertheless, life might still be considered rewarding by whatever standards prevail in that era. Perhaps it would be better to answer a question concerning survival over the millennia of a society that its members are likely to consider desirable. The prerequisites for such a society are adequate and renewable supplies of food, water, air, and energy.

A desirable society must also include a sense of purpose and significance; reasonable amounts of time for purposes other than providing for basic needs; adequate space per individual and family unit—and the list can go on. The factors listed in the sample responses are particularly relevant to producing a more desirable world society than presently exists. I assume that the group is more interested in factors critical to the long-term improvement of the human condition rather than the long-term survival of humanity. The key question here is whether this improvement will occur inevitably as part of a self-organizing, evolutionary process. The idea that progress is inevitable is not universally accepted.

What are the current map and trajectory of these factors?

The population must be held to some acceptable level. This is likely to happen but with a degree of trauma that will be determined by how this level is eventually reached. Unless society solves this problem within the next generation, traumatic solutions involving major wars, dramatic environmental change, or deadly plagues will probably hold the population in check.

Further development and general acceptance of the science and technology of fission and, eventually, of fusion energy is highly likely. This technology should, in principle, solve the food, air, and water problems created by a much larger future population. Solutions to these problems may be found within a generation or may require up to five or six generations.

Although global economic aggregation is occurring at a rapid rate in this generation, the development of higher aggregates of social and political organization, including the global village, is moving more slowly. It will require general acceptance of multiple identities, particularly the identity of world citizen. This has not yet happened but probably will within the next few generations if world travel and transnational migrations continue to increase.

What are the problems and opportunities with the factors identified?

Factors affecting the population problem are the level of economic prosperity, status of women, ethnic and cultural constraints, and government-sponsored family control plans or laws. Of these perhaps the most important is the economic status of women. It is gradually being elevated in parts of the Western world. In other parts of the world, family size may be legislated.

The emergence of multiple identities that flexibly accommodate to the conflicting demands of self, family, religion, village, corporation, nation, and global village will help ease the tensions created by these conflicts.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

My field is science. Its future over the next thousand years is almost impossible to predict. Over the next hundred years we will learn how to deal effectively with problems that are very complex and are ineffectively addressed now in simplistic terms. The most consequential advances will be made in the biosciences, including genetic science and engineering. The life span will increase. Technology will replace exhaustible fuels with nearly inexhaustible fuels.
Space travel will become possible for private citizens with wealth. The communications network will embrace the remotest villages and English will become established as the global, universal language. It will not totally replace local languages.

**DISCUSSION TOPICS/QUESTIONS**

*What are the two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?*

1. How can we control the increasing ability of smaller and smaller groups of people to terrorize others without major curtailments of individual liberties?

2. How do we go about defining a global identity for everyone without unduly weakening other, necessary identities?

3. How do we increase the probability of a benign solution to the population problem.

**THOUSAND-YEAR VISION**

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

A future in which the average person, living in harmony and working in partnership with a peaceful global community, will value and pursue knowledge and personal enlightenment and significance at levels that go beyond what we can presently envisage.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

I am not interested in the “long-term survival of humanity.” However, I am very much in favor of the continued long-term evolution of life, emotions, and intelligence as they have emerged and developed, apparently uniquely, on Earth.

The main factor hindering this “continued evolution” is, in fact, “humanity” itself, which focuses too much on itself and its present fables and foibles, and hardly considers at all its impact on other life-forms in the present or future, or even the needs and possibilities of its own future generations.

What are the current map and trajectory of these factors?

Not good. As I have said elsewhere, I am very optimistic about the 22nd century, but not about the 21st. I am doubtful that humans can or will do the things necessary over the 21st century to make intelligent life possible in the 22nd. If they do, then the 22nd century and beyond could be “wonder-full” indeed.

The 20th century has seen many technological marvels, to be sure, but it is also the bloodiest and most “inhumane” in human history. Will the 21st top it in bloody excess and continued environmental destruction (leading, of course, to humanity’s own deserved demise), or will humanity facilitate the emergence of its own intelligent successors?

What are the problems and opportunities with the factors identified?

The problems are the present powerful human institutions and values, beginning with predatory global capitalism and our dangerously obsolete govern-mental, religious, and educational institutions. All of these encourage humanity to focus first of all on itself, and then on its own material prosperity, and perhaps on its obligations to its ancestors (to the extent we are ever urged to think of anything but our own current pleasures). We are not urged to think about our descendants, whose lives these values and institutions—and our most ordinary daily behaviors—threaten.

At the same time, life is amazingly resilient and intelligence profoundly creative. Some of the new technologies about to emerge may enable intelligent life to survive and thrive beyond humanity’s rapacious, self-centered behavior.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

My field is futures studies, and so I expect that intelligent life will become so future-oriented over the next thousand years that “futures studies” will vanish as a field and just become a normal part of everyday thinking and acting. Indeed, if intelligent life is to exist in one hundred years, much less a thousand years, this MUST happen.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

One important question revolves around the ability of humans to move beyond their present preference for (former) Earth-based “nature” towards the myriad forms of “artificiality” that must be envisioned, invented, managed, and maintained over the 21st century and beyond as these forms become intelligent life’s “new nature.” Can humanity do that? Should humanity do that? Or should we try only to create “sustainable development” for future humanity here on Earth?

Another question concerns what humanity’s attitudes and behavior will be and should be towards the various forms of life, some of them intelligent—and some of those intelligent in ways humans are not. Will humans permit the evolution of such life if it threatens to dethrone humanity as the “crown of creation”? Or, as any parent does, can humanity learn to welcome and nourish (if still somehow envy) its new “children”?
THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

A thousand years from now, our descendants, in myriad forms and cultures utterly unlike any of the present, will thrive in all locations of our solar system and its immediate environs, and begin to share its life throughout all of the cosmos. They will honor us for our foresight and courage in enabling them to be.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Greater and greater power for destruction of large masses of people, despoilment of global-level resources, and manipulation of the behaviors of millions via mass media will become increasingly available to single individuals as technologies advance.

2. Knowledge of the inner molecular workings of organisms will make manipulation of human biology almost irresistible.

3. Discovery of how brains work will proceed hand-in-hand with engineering advances toward building devices that have awareness and thoughts.

What are the current map and trajectory of these factors?

1. We have yet to see the first population-level terrorism (nuclear or biological weaponry), but it may be coming. Understanding of human psychology, combined with mass media savvy, is producing an accelerating pace and effectiveness of mind-control techniques. From sound-byte politics to high-tech religious-conversion techniques, indoctrination and manipulation of opinion have become the newest arms race.

2. Very rapid progress is being made in biology, though an understanding of the large-scale logic of gene systems and neural systems lags far behind our ability to interfere with and crudely manipulate these systems. There is a danger of being overconfident.

3. Though we are technically quite advanced in both fields, our theoretical understanding is still largely hostage to misleading 19th century assumptions about the nature of mind and mechanism. This also means that our view of the ethical implications is correspondingly unsophisticated, leaving the next generation unprepared to deal with the consequences.

What are the problems and opportunities with the factors identified?

1. There will always be individuals with a pathological urge to misuse such destructive capacity, and the statistics of large numbers virtually guarantees that at least one will gain access to it. Defense against this will eventually be too invasive of privacy and freedom. Prevention is the only viable approach.

2. These are immensely complex products of evolution. Human engineering will not approach the ultramicro workmanship of natural selection for centuries. Human manipulations will likely yield far more kludge than improvements. We should take a lesson from the effects of engineered crops on the ecosystem. They are susceptible to pandemic disease, have greater potential for catastrophic failure, and are too dependent on humans to make it otherwise. Continued human intervention in genetics will produce far more unintended results than intended ones. Though the next century is likely to be characterized by the misery resulting from overpopulation and overuse of resources, in the much longer term some of the most difficult consequences will follow from the demographic changes produced by greatly extending life-span and a reduction of childbearing.

   As technology becomes increasingly insinuated into the process of reproduction and rearing, there will also be radical and almost catastrophic reorganization of familial structures. Evolved predispositions of bonding and sexual competition will still influence behavior, but short-term relationships may become the accepted norm. This will place increasing child-rearing demand on nonbiological institutions, mostly with unfortunate consequences, as succeeding generations are subject to progressively “alien” environments with respect to evolved ones. Child rearing left to the whims of the “tragedy of the commons.”

3. Last, Copernican revolution. In the next century, successes in understanding the nature of mind and in creating devices with similar architecture will initially be interpreted as rendering human personhood “cheaper,” less miraculous, and less valued. The possibility that everyday cultural objects may participate to some degree in having subjective experiences will be a particular challenge to religious communities,
who may follow increasingly orthodox antiscience and antisecular directions, in reaction to the suggestion that personhood could be experienced by non-biologicals. This will also be a great source of personal angst, by undermining faith in many comforting religious notions. It could be the impetus for a transformation of spiritual traditions with the birth of deeper ethical and enlightenment insights, or else it could trigger an intellectual dark age of denial. There is thus much potential for “horrors” to be perpetrated on manufactured agents, justified by a kind of biological chauvinism, and for accepting a reduced valuation of human suffering.

POTENTIAL IN YOUR FIELD

*What do you envision as the greatest potential/future in your field in the thousand-year future?*

1. In this last year of the decade of the brain, we still don’t know what makes human brains so different. A concerted effort is needed to investigate the human neurological differences that are most important for producing characteristically human cognitive differences. Theoretical understanding of the brain and practical advances in computing are the first converging steps to the next generations of integrating global and interpersonal information access systems with brains.

2. Understanding the molecular processes involved in embryonic tissue differentiation will also revolutionize transplant and repair surgery. In general, cellular and molecular therapies will be the new direction in medicine. With more sophisticated and successful modes of repair, medical intervention will become more and more income-correlated.

3. Unified theory of the evolutionary dynamic of organism development, neurological processes, social processes, interpretive information processing.

DISCUSSION TOPICS/QUESTIONS

*What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?*

1. Is it too late to decrease overuse of global resources and degradation of natural ecosystems, without producing economic chaos?

2. What are the most likely uses of molecular and cellular approaches in medicine? What are the limits? What are the social consequences of controlling senescence?

3. Can human intellectual and motivational systems be improved?

4. Consequences of a world in which the manufactured devices around us have intelligence and sentience, from cars to homes. What is the range of the kinds of minds that can be produced? Will it humanize and personalize technology or will it dehumanize us in the image of our machines?

5. Electronic minds will be many orders of magnitude faster than human minds. Will we appear as inanimate to them as our plants do to us because of this time-scale effect?

THOUSAND-YEAR VISION

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

Human individuality and separateness will become almost unrecognizable by contemporary standards. The boundary of a person will become fuzzy—confused with prosthetic enhancements and by constant virtual communication with intelligent devices and other individuals.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Understanding our place in the scheme of cosmic evolution, and adjusting our philosophies, religions, and general worldview to the fact that humanity is not central in space or time.

2. Nondestructive contact with extraterrestrial intelligence. That is, positive interaction with superior species that allows for the moral and intellectual growth of humanity.

3. Exploration of the cosmos, not only remotely and robotically, but also via human interplanetary and interstellar travel.

These three factors will give rise to “Interstellar Humanity” over the next thousand years.

What are the current map and trajectory of these factors?

Just as humanity in the past century has attempted to adjust to the idea of the evolution of Homo sapiens on Earth via Darwinian natural selection, so in the next millennium we must adjust to definitive knowledge of our place in cosmic evolution. The Search for Extraterrestrial Intelligence (SETI) will either succeed or fail in the next thousand years. If it fails, the implications for humanity are enormous, perhaps indicating that it is human destiny to populate the universe. If, as 20th century science considers likely, we live in a “Biological Universe” in which life is abundant, then SETI programs (or some other mode of contact) will succeed, and the possible outcomes are more unpredictable. Given the youth of our species and the age of the Earth compared to the age of the universe, extraterrestrial species are likely to be millions of years older than ours. The nature of our interaction with them, and the type of knowledge gained, will surely have a major impact on the long-term survival of the species, or its genetic/robotic successors. As the crossing of the oceans in the Age of Discovery affected all areas of human endeavor, so will human interplanetary and interstellar exploration. The “exploration imperative” is itself central to human survival, not only for population reasons, but also for the advancement of the intellectual and moral stature of the species.

What are the problems and opportunities with the factors identified?

The single biggest danger in dealing with a Biological Universe filled with extraterrestrial intelligence is the interaction between our species and extraterrestrial cultures. Although physical contact is unlikely, the knowledge gained by radio contact could shatter many of our most cherished beliefs. The opportunities provided by friendly contact, on the other hand, are limitless, as we learn the answers to many questions our species has asked. Even then, however, there is danger if we become adolescents no longer challenged by the fundamental questions of our existence.

The opportunities provided by interplanetary and interstellar travel are the same as those that exploration of the Earth has provided: extension of knowledge, vision, and wisdom.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

Benign contact with extraterrestrial intelligence, and exploration of the universe by interstellar travel.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. What are the implications of contact with extraterrestrial intelligence, and how can we best anticipate and prepare for this contact?

2. Will new advances in artificial intelligence lead to a “postbiological future,” in which computers surpass humans in intelligence? Has this already happened with extraterrestrial intelligence?

3. How will advances in genetics, artificial intelligence, and extraterrestrial contact synergistically interact over the next millennium?
THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

Interstellar humanity—greatly expanded beyond the current confines of Earth, enriched by new knowledge, wisdom, and vision, resulting in fulfillment of the potential of each individual. Interstellar humanity could be genetically altered or supplemented/replaced by artificial intelligence.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. The impact of global aging populations.
2. The increasing marvels of biological and neurological research, and their possible misuse.
3. Massive global unemployment in developed and developing societies.
4. The death of the future in a hedonistic society.

What are the current map and trajectory of these factors?

The end of the 20th century marks the advent of aging populations in developed societies and also a declining birthrate. A few centuries hence, whole nations may disappear. Future genomic developments may reinvigorate notions of racial superiority. Technological ingenuity casts a shadow of insecurity over the world of working people. What happens when people are valued more as consumers than as citizens?

What are the problems and opportunities with the factors identified?

1. The need to sustain a sense of personal responsibility for the maintenance of Spaceship Earth.
2. The "longevity revolution" necessitates a rethinking of the social contracts of developed societies.
3. The mere fact that something is scientifically and technologically feasible does not mean that it should be done!
4. How to promote a global concern for the likely prospects of present and future generations and avoid the enchantments of the present.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

As a futurist, historian, and educator, I believe the greatest potential is the recording and recognition of the common characteristics of the members of the human race through the past millennia as their emotional and psychological boundaries expanded from family, tribe, religion, empire, and civilization to the dawning of a global consciousness of a common human destiny.

DISCUSSION TOPIC/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. The impact of global aging populations.
2. The perils of raw economic competition in centuries to come, or the advent of a cooperative global economic order.
3. Is philosophy dead?

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

Today the perils humanity faces are largely the results of human ignorance, human disinterest, or human greed. The tempered optimist is convinced that with goodwill, knowledge, wisdom, and determination, humanity’s truly universal Golden Ages are yet to come!
CRITICAL FACTORS

**What are the factors that are most critical to the long-term survival of humanity?**

Sustainability remains at the heart of long-term survival. At the same time, we must be aware that humanity has always been a project of constant reinvention and redefinition, such that the terms under which any current system can be sustained have also changed. For example, if the last Ice Age hunters and gatherers had considered the concept of sustainability, it would, no doubt, have been very different to that of the first farmers a few millennia later—different both in temporal and geographical scale; different also in the implications for the environment. However, from our perch in the future, we see both systems as eminently sustainable compared to the problems that face our global societies and economies. But consider Easter Island. Isolated from the rest of humanity for a thousand years, this small landmass was for its inhabitants as large (conceptually) as our planet is for us. Their confidence in the future of their world led them to chop down the last tree for firewood rather than save it to make a boat. If they had been archaeologists, they would have realised that they came from somewhere; they would, therefore, have become concerned about sustainability; they would have saved that tree in order to rejoin humanity.

**What are the current map and trajectory of these factors?**

What has changed is the idea that somehow some central planning of the myriad societies of the planet could now be effected to solve sustainability and so achieve a greater good. This surfaces in the optimism concerning advances in such fields as genetics or information technology. We seem to be good at growing new trees but we have very little notion about how they should be used, either socially or politically.

**What are the problems and opportunities with the factors identified?**

What do we want to sustain? How do we incorporate short- and long-term change, the essence of humanity, into the debate? For example, how would we cope with alterations to the aging process so that in the next thousand years it would be common for seven or eight generations to be alive at the same time? How will this alter social affiliations?

**POTENTIAL IN YOUR FIELD**

**What do you envision as the greatest potential/future in your field in the thousand-year future?**

Archaeology provides the long view. Its record contains an ethnographic databank with a 5-million-year perspective. We have hardly begun to investigate the implications of that global encyclopaedia from the perspective of collective memory. The challenge that faces archaeologists is to probe this memory for individual histories.

Archaeology arose as an enquiry to legitimize the creation of nation-states by supplying an identity founded on the monuments and materials of the past. The future will create myriad global networks, centered through technology on the individual. These networks will need a different concept of the uses of the past to provide a source for the creation of different and novel identities.

**DISCUSSION TOPICS/QUESTIONS**

**What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?**

1. Was Leroi-Gourhan correct when he characterised human evolution as a process of externalising memory and where eventually the symbols we create to achieve this control the species?

2. Increased industrial activity and population inevitably lead to the destruction of archaeology. Will the projected destruction of all archaeology wipe the tape of our collective memory?

3. To what extent does sustainability change with a planetary perspective?
4. Will the loss of genetic diversity due to the technology of travel lead to a change in our evolutionary potential?
5. Should the preservation of diversity concern us?

THOUSAND-YEAR VISION

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

The future is a creative project powered by the individual. A past that similarly empowers the individual and traces his actions through his material remains provides a basis for the exploration of our unfinished humanity.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

When we stand back from localized perspectives and worldviews and enter a more global perspective, we begin to see deeper patterns of cultural evolution through the ages. In this global perspective across cultures and worldviews, one great lesson that emerges is that we humans are as we “mind”—how we conduct our mind, our thinking, is all important in shaping the realities we inhabit, the quality of our lives, the phenomena we co-create. One great global insight is that we humans directly participate in making our worlds.

In this millennial perspective it becomes apparent through the great perennial teachings that there is a stage of thinking, a technology of minding, that produces disastrous consequences for the human condition—at the personal and corporate levels. It has been seen repeatedly that egocentric or monocentric patterns of thinking and world-making are primary causes of all sorts of human pathologies and cultural disorders. As we now enter the new millennium it is urgent that humanity becomes more aware of the consequences of how we conduct our minds and move together from egocentric patterns to more mature rational patterns of dialogic minding. This shift to dialogical ways of living is perhaps the single most important factor in facing our survival and flourishing as we enter the new millennium.

What are the current map and trajectory of these factors?

In the millennial and global perspective it appears that humanity is now in the midst of a profound and difficult shift from egocentric or monocentric ways of minding and living to a more mature and healthy dialogical form of life. There appear to be two great cultural forces in the human condition that are peaking at the same time: the chronic forces of egocentric culture and the emerging forces of dialogic/holistic culture-making. The future cultural sustainability of humanity now turns on how we manage the confrontation and interaction between these great forces. The next decades will decide whether we will find the nonviolent and creative ways to make the transition from egocentric culture to dialogic culture.

What are the problems and opportunities with the factors identified?

One great challenge in this transition is that the deeply entrenched and chronic patterns of egocentric living resist and tend to eclipse the awakening forces of the dialogical revolution in culture. With increased globalization in cultures there is now a unique opportunity for humanity to enter in a corporate way this great awakening of the global and dialogical mind. The dynamics of deep dialogue between worldviews is now vital in facilitating the transition of cultures to more healthy dialogical ways of life.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

The single most important factor in the human condition is how we conduct our minds—the technology of our thinking and world-making. The greatest potential for our future is our capacity to make the personal and corporate transition from egocentric ways of life to dialogic awakening of the global mind. This shift to the higher form of global minding affects every aspect of human existence and unlocks the potential for the flourishing of life at all levels.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. What are the greatest impediments to deep dialogue between worldviews?
2. Why do egocentric patterns of minding and living cause all sorts of human and cultural pathologies?
3. Why is deep dialogue between worlds so vital for our flourishing at this time in our evolution?

4. What is the dialogical turn in living and how is this connected with the awakening of the global mind?

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

As we enter the new millennium I see the birth of a new and higher form of human life that has been millennia in the making. The transition to our mature nature as rational and holistic beings will be difficult but humanity will evolve to the higher technology of life in the awakening of the global mind. Humanity will gradually overcome the chronic pathological patterns of egocentric living and monocentric minding.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?
The merger of consciousness and technology.

What are the current map and trajectory of this factor?
The confluence and synergies of advances in artificial intelligence, nanotechnology, bionics, materials science, genetic engineering, and telecommunications will allow humanity to evolve into a continuum of technology and consciousness. The built environment will act as if alive by sensing, understanding, learning, talking, and responding to humans, and humans will have microminiaturized technology on and in their bodies providing the individual the sensation of being connected not only to others around the world, but with the “things” of civilizations as a whole. When the distinction between human and technology blurs, we will have reached the “conscious-technology” civilization.

What are the problems and opportunities with the factor identified?
Conscious-technology can be both negative and positive. If humanity evolves into a conscious continuum mediated by technology, individuals could manipulate this continuum to change others’ consciousness without their knowledge. Such “information warfare” could lead to paranoia. Others could also believe that they create “all” of reality and become mentally ill, hence influencing the health of the human unity.

Assuming that the masters of technology are technocrats, and that the masters of consciousness are mystics, then how well these two cooperate in the future should influence the quality of the conscious-technology civilization. A central opportunity is to facilitate the dialogue between these two orientations for an eventual merger of the attitudes of the mystic with the management of the technocrat.

POTENTIALS IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?
Knowledge—visualization computer interface distributed throughout the built environment, including human augmentation, which integrates “all” information into a range of models and formulations allowing anyone to get the best relevant information in a mode they can understand. Such a system would allow for an increasingly intelligent global participatory democracy to continuously improve our future.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group setting at Humanity 3000?
Sustainable ways to collaborate among the participants to create and execute strategy to improve the human condition, be it specific research projects, strategic media alerts, or other joint actions.

Current state of cognitive science’s strategies to improve our brain functioning/intelligence and implications for cost-effective ways for global education to increase humanity’s intelligence.

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.
Space-adapted conscious-technology civilization independent of the Sun exploring mergers with exobiology.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. The augmentation of our individual and collective intelligence so that we would be able to tackle the complex problems that confront an interdependent, changeful, information-rich world.

2. The development of a universal “worldview” that ties all our knowledge together and shows us how we fit into the larger whole of evolution, thus providing us with a “meaning of life.” Its system of values should help us to tell right from wrong in the most general contexts. It should be based on scientific and philosophical insights about which everybody can agree, rather than on dogmatic or culture-specific traditions.

3. The development of a practically enforceable political system, based on the above values, that would allow us to manage global society and the ecosystem, so as to increase the quality of life for humanity as a whole.

What are the current map and trajectory of these factors?

1. As demonstrated by the “Flynn effect,” individual IQ has been increasing over the past decades, together with the general level of education and the technological support for processing information.

2. Developments in various fields, such as general systems theory, cybernetics, evolution, complexity, self-organization and artificial intelligence, seem to point to the emergence of a new scientific worldview, which is dynamic and holistic, and which would transcend both the Newtonian worldview, which is static and reductionist, and the different prescientific, religious worldviews.

3. There is some movement towards supranational, political integration with institutions such as the UN, EU, WTO, and IMF. Awareness of global and ecological issues is growing in different countries.

What are the problems and opportunities with the factors identified?

1. The growth of complexity and available information in present society has been so large that even with their increased cognitive level most people still feel overwhelmed and unable to cope. The danger is real that some classes of poorly educated people will be completely left behind, while the most educated will suffer severe stress because of information overload.

2. In spite of the many promises, 50 years of attempts to build a unified systems science have met with little success, mostly because of the sheer complexity of the task. In the meantime, existing scientific, philosophical, ideological, and religious systems of thought have continued to erode and fragment.

3. Supranational integration and global management meet with huge resistance, because of the intrinsic selfishness of nations and groups who are unwilling to give up their privileges for the common good. After the fall of communism, there is as yet no credible political system to counter the obvious shortcomings of capitalism.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

The single most important opportunity is the emergence of a worldwide, intelligent computer network, a "global brain," that would make the whole of existing knowledge instantly available to every individual. Its intelligent processing of data and knowledge would help us to overcome information overload, to solve extremely complex problems, such as managing the global ecosystem, and to develop a unified worldview that is both firmly rooted in scientific results and applicable to everyday decisions. Borderless exchange and discussion of ideas would make it easier to reach a supranational consensus on values and global policy, while extensive, real-time collection of data would help us to monitor progress towards the chosen objectives.
DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. How can we minimize the effects on individuals and society of change that occurs too fast (“future shock”)?

2. What are the opportunities and dangers associated with the overall reduction of “friction” in technology, society, and the economy?

3. How can we tackle the “inertia of desires” that cause people to continue to want more of some quantity (e.g., food, transport, or information) long after the real need has been saturated?

4. What are the prospects for reaching biological immortality?

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

I see humanity undergoing a “Metasystem transition” to a higher level of evolution. Humanity would be integrated into a single “superorganism,” where individual humans would play the roles of the cells in a multicellular organism. The superorganism’s nervous system, the “global brain,” would have a superhuman intelligence and reason at a level of abstraction or consciousness beyond anything we can presently imagine.
Barbara Marx Hubbard

CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. The evolution of consciousness from a self-centered, separated to a whole-centered, unitive stage of consciousness.

2. The development of synergistic (win-win) social systems of self-governance and management that empower individuals freely to express their creativity in constructive action for the good of themselves and their larger community.

3. The shift from maximum procreation to “co-creation,” fostering the liberation of vocation, self-expression, and chosen work, especially in women.

4. The emergence of comprehensive, inclusive, exciting visions of our collective future that attract us to transcend divisions and to cooperate to fulfill our common aspirations.

What are the current map and trajectory of these factors?

The recurring pattern of evolution reveals a tendency toward higher consciousness and greater freedom through more complex order. As planet Earth complexes, we already see the emergence of global, planetary consciousness in millions of people. We lack the institutional and functional expressions of this emerging consciousness. Yet, through both inner pressure of increasing self-awareness, and external connection through media, environmental crises, and other factors, millions are evolving in consciousness. I expect a critical mass of more unitive, planetary awareness will be reached in time to shift policies from separation and exploitation toward a more synergistic, win-win world. Also, the theory of dissipative structures suggests that in a far-from-equilibrium system, novel interactions accelerate, and a small amount of coherence can help the whole system to repattern to a higher order. We are at that stage and could jump to a higher order than could be imagined by linear projects.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

Synergy among the emerging capacities of human-kind leading to genuine newness and a radical discontinuity from our current stage of evolution. This would amount to the capacity for conscious, ethical evolution based on the Golden Rule and the tendency in evolution for ever-greater capacity and creativity. These capacities include: unitive consciousness; self-healing and life extension, an Earth-Space Developmental Scenario that restores the Earth and develops resources and space for humans in an extended solar environment; access to the “global brain” leading to vast increases in intelligence; contact with other high-technology species who have made it through this phase of their development; the actualization of the full range of personal, meta-normal potentials, leading toward a universal human as a new norm.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. What is the prognostication on the evolution of human consciousness toward a more comprehensive, compassionate, and unitive state?

2. What do we know about the design and application of synergistic, win-win, partnership, chaordic human systems, and how might they be institutionalized to evolve current bureaucracies from their win-lose, dominator, command and control models?

3. What are the chances of real life extension and the overcoming of involuntary death?
THOUSAND-YEAR VISION

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

We have been born as a universal humanity, attuned to the deeper patterns in the process of creation from within, actualizing our unique creativity as members of an open-system, universal society, empowered by science and technology to realize our aspirations to live beyond hunger, disease, scarcity, and pain. We have emerged from the created to the co-creative human.
Seymour Itzkoff

CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

Achieving a level of universal human intelligence and education to enable humans to deal with the inevitably unexpected problems of the moment, century, millennium. Humans must have the ability to recognize the factual dimension of problems, and to deal with them in terms of possible instrumental solutions. One of the great dangers epitomized in current discussions of issues such as population control, abortion, cloning, etc., is that we immediately “ethicize” these issues, turning them into debates over immutable values, inevitably dividing up humans into competing ideological/political cliques, inevitably removing these critical factors from the possibility for rational discourse and conflictless solutions. Concomitantly, our attitude toward what is soluble by rational, long-term planning and what is best left to the creative, moment-by-moment symbolic shaping of cultural life, a metaphilosophy of innovative change, needs to become part of our futuristic planning profile.

What are the current map and trajectory of these factors?

The current international policy situation is extremely serious vis-à-vis our recognition of the intellectual and “human nature” factors attendant to our recent and current inability to resolve the enormous socioeconomic and educational diversity around the globe. These developmental differences in economic and social conditions amongst the political units of the world, whether nations or continental blocs (the “Euro”—the “Third World”) seem to be beyond resolution because we cannot face up to the secular scientific causes attendant to these differences within the human community. At some point scientific advances—the Human Genome Project—may bring home to the international community the intractability of these social/economic differences given current ameliorative sociopolitical instrumentalities, for example, the redistribution of wealth. In our visionless inability to confront these facts, e.g., wealthy, sparsely populated “First World” nations versus poor, overcrowded, volatile “Third World” nations, the international community faces one of its most dangerous policy issues.

What are the problems and opportunities with the factors identified?

We must attend to the facts of human nature, recognizing the dangers of ethicizing any seemingly long-range historical trend such as the gradual unification of the human species, intellectually, racially, culturally (economically, technologically). The human species probably can never be culturally homogenized, even given the experience of Rome, and the ongoing international cultural suzerainty of the American dream, its language, democratic politics, social and economic openness to change. Ethnicity will always constitute a perennial dimension of the ongoing pulsation between universalism and sectarianism. The uniting of the world community under dynamic cultural and ethnic leadership in one phase of our historical march forward seems inevitably to be followed by a loss of dynamic in this culturally unifying force. The result will be a falling into the ethnic political and cultural fragmentation that we have seen before in history, after Rome, after the Soviet Empire, most likely after the “bull market.”

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

As an intellectual trained in philosophy, I have been saddened to see the discipline mired in the scholastic dissection of grammatical categories. This medieval-like academicism has come about partially because of the structure of training in the field, its inability to free itself from traditional philosophical questions, and domains, metaphysics, epistemology, logic, ethics, esthetics, etc. Study in philosophy seems not to recognize that much of the historic energy in theoretical philosophy has been ceded to the scientific disciplines. Thus, what philosophic creativity and
innovation have taken place in recent decades have come from the philosophical and theoretical talents of scientists themselves. In the long run, education in all the sciences will encompass the study of the theoretical and philosophical grounds undergirding the respective disciplines. The challenge will be one of bringing together our knowledge in various fields into larger metatheoretical systems of thought, in the spirit of Aristotle, Kant, Cassirer, Einstein.

**DISCUSSION TOPICS/QUESTIONS**

*What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?*

1. What will it take to persuade the intellectual and political leadership around the world to consciously embark on a process of fulfilling the evolutionary destiny of the species, the equalizing of the intellectual potential of the world’s peoples, to the highest levels possible, given our historic civilizational achievements?

2. How can we balance the historical reality of human symbolic, innovative, and creative tendencies within unique and pluralistic ethnicities with the seeming inevitabilities of living in a world in which much individual and cultural autonomy will be subject to universal laws (material, social, political) required for the great mass?

**THOUSAND-YEAR FUTURE**

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

We ought not delineate a substantive ethical vision of the future for those who must live in this future. Any content-laden imperatives that we lay down will inevitably be tainted by today’s values. Rather, we ought to set forth a methodological program of critical thought that is itself implicit in the evolutionary extrusion of *Homo sapiens sapiens.*
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Critical to the survival of humanity are the problems generated by climate change, pollution, and depletion of natural resources, all of which derive from the growth of the human population.

2. To deal with these problems we can hope for the evolution of some kind of “Global Governance.”

3. The form that this would take will also be dictated by new technology, notably global communications, machines of warfare, and massive international projects (e.g., planetary exploration).

What are the current map and trajectory of these factors?

Current efforts to persuade the community of nations to take united action to control environmental disasters and regional wars have not shown great success so far, so we can expect “business as usual” to lead to serious consequences in the next century and beyond. Will the nations learn from such lessons and evolve a new “global conscience”? The imperatives of the struggle for national superiority (or just survival) coupled with religious and ethnic barriers may stifle the emergence of a true “world order” for the foreseeable future. Human organizations, like individuals, seem innately and inevitably bent on the exercise of power.

What are the problems and opportunities with the factors identified?

Clearly, in order to avoid the consequences of the dangers mentioned above, a process of education and public awareness at all levels of society must be undertaken. Better education of individuals in the industrialized world has not perceptively lessened national and corporate rivalries and conflicts. There is still a hope that governments may become more enlightened in the future but, so far as the evolution of a “Global Citizenship” within the United Nations framework is concerned, there seems little progress. Technology by itself seems of little help here, except that the power of communication is bound to be a positive influence. If properly exploited this can help to lead eventually to a better global society.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

While there is little hope of ever being able to really control the immense natural forces at work in the Earth, the oceans, and the atmosphere, we will learn to live with some of them more harmoniously. Thus, long-term and short-term forecasting of weather and climate change will certainly result in less loss of life and property, and also better management of our natural resources.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. What is the connection between drastic climate and other environmental changes and the evolution of societal means to deal with them?

2. Is unrestricted population growth inevitable? Can it be limited by starvation, wars, and general degradation of quality of life, or can the world find a better way to stabilize its human population?

3. Will technology, massive public works, medical advances, and crowding lead to such a serious degradation of the quality of human life and of societies that the evolution of civilization will have to take new directions? Is there a way to slow this deterioration?

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

Alas, the moral frailty of humans and of their institutions will tend to counterbalance their ingenuity. While mankind will explore the moon and planets, here on Earth there will still be wars and poverty and injustice in the year 3000, and we will still have to deal with planetary environmental changes.
CRITICAL FACTORS

**What are the factors that are most critical to the long-term survival of humanity?**

A set of ethical values and principles that could be accepted across cultures and societies and would enable humanity to deal with the global problems facing it, and provide guidelines for humanity as it struggles to be adequate to the tasks of survival and flourishing in the face of new historical realities.

**What are the current map and trajectory of these factors?**

A synthesis of values and ideas that have guided humanity during the last several centuries as it sought to industrialize and modernize is no longer adequate for the task, and no new synthesis is on the horizon that could replace the old. Yet, during the last decade of the closing century, there has been a veritable explosion of attempts to identify and forge such a synthesis of values in intergovernmental and international organizations and conferences, advocacies of academic, political, and religious institutions, as well as the works of concerned individual thinkers.

**What are the problems and opportunities with the factors identified?**

The greatest single problem in the process of forging a set of common values is that of how to reconcile the demands of universality with the fact of cultural diversity that characterizes the contemporary society.

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POTENTIAL IN YOUR FIELD

*What do you envision as the greatest potential/future in your field in the thousand-year future?*

A world in which there is a consensus on how to deal with the tasks of human survival and flourishing, without sacrificing the diversity that enriches human life.

DISCUSSION TOPIC/QUESTIONS

*What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?*

1. How do we arrive at a conception of universality that is capable of accommodating cultural diversity?
2. What are the methods available for the task of arriving at a consensus on values and principles?
3. How do we identify present and future developments in technology and society that will influence our values in a fundamental way and foresee their moral and ethical implications?

THOUSAND-YEAR VISION

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

A world in which the problems of the past, such as poverty, environmental degradation, fanaticism and intolerance, and exclusion of different kinds no longer figure, in which problems outstanding among nations and societies are resolved through mutual learning and dialogue based on the shared facts of ethical values and principles.
Section III: Participant Statements

Dietrich Koelle

CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Protection of the natural resources on our planet Earth. Long-term solution of the energy supply and distribution problem.
2. Global implementation and control of human rights, superior to any national sovereign rights.
3. Control of population growth in some regions of the Earth and achievement of a minimum standard of life.

What are the current map and trajectory of these factors?

1. The Earth’s resources of oil, gas, and coal are limited and will be exhausted in the foreseeable future. It seems especially irresponsible to just burn these precious resources away. The problem has not yet been seriously enough recognized by most people. Roadmaps have to be developed of how these resources can be/must be replaced and how this can be implemented.
2. Establishment of an “International Police Corps” and an “International Tribunal” to prevent internal and external violation of peace and human rights.

What are the problems and opportunities with the factors identified?

The greatest problem is to create public awareness and initiate the action of politicians. They normally don’t care about problems beyond their election term. There is a great discrepancy between the developed countries (USA, Europe) and the developing countries: In the developed countries energy is available in any quantity. The problem here is to reduce energy consumption without limiting the economic growth. The developing countries need a tremendous increase of energy supply in order to develop the economy and the standard of life. However, they are normally not able to finance the large infrastructure investments.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

1. Global Videophone-Communication System, and a satellite-supported information network (of which the present internet is just the beginning).
2. High-speed intercontinental aircraft (Mach 4) reducing travel time between continents to some 2.5 hours.
3. Establishment of one or more human settlements on the Moon and an outpost on Mars.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

2. Long-term global energy resources and energy distribution.

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

For a better world in a thousand years the human society must develop the means for preventing wars and suppressing crimes. It has also to solve the problem of managing the limited global resources and to provide a solution to the long-term energy supply problem. The global population will stabilize at or below 10 billion, enabling food supplies for all using improved technologies.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

Humanity’s long-term survival hinges on the ability of present and future generations to:

1. ward off short-term threats that endanger human existence. Death could come swiftly (killer pandemic, giant asteroid collision, nuclear Armageddon) or gradually (population explosion in the face of dwindling food and energy supplies, irreparable damage to the biosphere).

2. overcome medium-term obstacles that threaten the progress of human civilization. It is meaningless to merely exist; we must grow and develop to full potential. We must focus our energies and continually push back the frontiers in all dimensions of human endeavour—scientific, cultural, ethical, organizational, intellectual, physical, and spiritual.

3. plan long-term for life beyond planet Earth and the solar system. Earth’s days are numbered. The Sun will one day burn out, and long before that, our planet will become inhospitable. All human achievement will come to nought if we are unable to break out of our closed, finite system to colonize space and beyond.

What are the current map and trajectory of these factors?

1. In a hundred years’ time, world population will double to 12 billion, putting pressures on food production. Oil and gas will run out. Atmospheric CO₂ will increase from 350 ppmv to 650 ppmv, raising global temperature by two degrees C and ocean level by half a metre. The risk of a nuclear holocaust, giant asteroid collision, or an emergent deadly virus strain remains ever-present and unpredictable.

2. Ethnic, religious, and class tensions remain deep-seated. Universal peace is not in sight. The lamb cannot yet lie down with the lion. On the brighter side, globalisation of trade and the internet are bringing us one step closer to the borderless world.

3. The Cosmos beckons. There is continuing interest in space exploration but the will to invest resources in further developing the technology is not as promising.

What are the problems and opportunities with the factors identified?

1. The solutions to problems concerning population, food, disease, and environment may be found in new technologies, especially biotechnology.

2. Human nature is not likely to change, but the saving grace is that the pragmatic side of man will mitigate against his destructive impulses. Cooperation dictated by necessity, especially on the economic front, will buy time for educational efforts to promote international, interreligious, and interethnic understanding.

3. The human aspects of space travel will prove limiting, even more so than the technical aspects. New knowledge and yet undiscovered technologies will solve these problems, especially that of overcoming man’s biological constraints.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

Just as the splitting of the atom revolutionized our understanding of the universe and extended our ability to influence the physical world around us, the splicing of the human gene is revolutionizing our understanding of our biological nature and placing in our hands the power to steer human evolution and destiny. Future knowledge and technologies in the biosciences will enable humanity to:

1. protect itself against biocatastrophes.

2. live longer, healthier, and more fulfilling lives.

3. successfully adapt to extraterrestrial living.
DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

The questions of the future are:

1. **How to avoid untimely demise**: Do we know enough to avert the top ten catastrophes that can potentially wipe out human life on Earth? Are we doing enough in these areas? Have we covered all bases—what about improbable, but nevertheless possible, events?

2. **How to get our act together**: What do we understand about the causes of human conflict and the secrets to human cooperation? Based on a realistic understanding of human nature, what strategies ought we to adopt, not to realise wishful Utopia but to generate goodwill and cooperation (amidst competition) to a sufficient degree that will enable humanity to move forward?

3. **How to spread our eggs in more than one basket**: Are we alone? If we are, and therefore bear responsibility for life in the entire universe, how can we spread the risks to increase our chances of survival should we fail to avert destruction on planet Earth? And if we are not alone, what are our options for response when we do eventually make contact with intelligent, extraterrestrial life forms that are (a) hostile (b) friendly (c) of unknown intent towards us?

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

“Successive future generations becoming less conscious of intraspecies differences and more conscious of our shared destiny; striving collectively to solve Earth’s pressing problems while attaining higher levels of civilization; and eventually becoming strong—and deserving—enough to step out to take our place in the universe among the stars.”
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. The critical factor of peace.

2. The critical factor of knowledge and its applications: (a) knowledge for the benefit and use of people and the environment, (b) awareness of the limitations of knowledge.

3. The critical factor of gender.

What are the current map and trajectory of these factors?

So far we've been unable to live with peace between groups and nations (except in some places, at some times). So far we've been unable to have the combination of an unpolluted world, plus industrial technologies. So far, women have been unable to achieve equality with men in most parts of the world (except in some places, at some times).

In thinking in terms of trajectory, I’d like to examine how some things work at some times and places to see if success stories might aid in projections. New knowledge and technologies matter, but only up to a point. Conflict resolution seems to be an area that needs to develop very quickly as the technologies of war grow ever more destructive. New sciences—genomics, nanotechnology, and informatics—have potential for human benefit but only in social contexts in which individual lives are cherished (including plant and animal life).

With respect to the Australian environment, increasing knowledge about the history of this fragile environment should contribute to appropriate practices for conserving biodiversity. Similar principles apply elsewhere, of seeking and applying local knowledge appropriate to local conditions.

What are the problems and opportunities with the factors identified?

As the pace of knowledge production accelerates, the unintended consequences of that knowledge and the actions that result from it will need to be monitored with great care. The unintended outcomes may be old problems translated into new and possibly more destructive contexts. The new genetic and reproductive technologies have considerable potential for both good and harm. The contribution of women to all phases of public life should provide additional perspectives currently often missing.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

I come to this seminar as a writer who has published in nonfiction (in the history and philosophy of science) and in science fiction. I see the strength of the writing activity as lying in a reflective synthesis. The technology of writing will change in new ways, as it already has, with electronic writing and internet communication. But the activity of writing, in which the seemingly isolated individual reaches simultaneously into her inner life, and out to embrace the whole world, is one that will continue into the future. New technology may facilitate the practice of group writing and reflection, and allow more people to participate in writing, as in learning more generally. What the writer hopes is that the creative process of writing and similar activities, if more widely available to people, will prove a powerful and beneficial force in human evolution.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. What can we learn from reflecting upon the persistence from 20,000 years ago (or more) into the present day of some traditional technologies: e.g., weaving and some forms of social life, e.g., kinship groupings?

2. What can we learn from the strengths of continuity, as well as from the possibilities of change?

3. To what extent do the discussion questions incorporate consideration of the future life experiences of women and children?
4. What can we learn from asking the question, where are the women in this scenario?
5. Where are the children?
6. Will everything be free in the year 3000?

THOUSAND-YEAR VISION

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

A future in which technologies are harnessed to beneficial human ends is one I want to see. I want to see a four-year-old child growing into a world that will have room for her to live her life fully. I want to see a world in which there is more room for laughter.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Control of population. We live on a finite planet. The present global population of six billion is already straining many resources and, while a larger population can be supported, it can only be at the cost of lowering the average standard of living.

2. Amelioration of social, economic, and political differences. Nations and groups that feel themselves to be treated unfairly have learned to use the tactics of terrorism and other strong-arm methods for redress. It is impossible to prevent random acts of violence without the equivalent of something like permanent, worldwide martial law—and perhaps impossible even then—so that the only way of finally dealing with terror tactics is to ease the situations that cause them.

3. Education. The present trends are to regard schooling as a way of learning how to make a living, rather than learning how to live. Particularly in America (but to some degree worldwide) these trends are present from K-12 [kindergarten through grade 12] through graduate school. The effect is that our educational system turns out people who are not well enough informed to understand the needs, prospects, and issues of the world.

What are the current map and trajectory of these factors?

They are all interlinked. For example, as to education: it is clear that education of women in Third World countries leads to smaller family sizes, while education in general increases understanding of other persons’ needs and concerns. In the same way, limitation of population permits amelioration of differences and makes possible better education.

In general, improvement in any of these areas makes the others easier to deal with, while neglect of any threatens improvement in the others.

What are the problems and opportunities with the factors identified?

There are too many of these to describe in this space. The basic problem is a general lack of goodwill, fostered by peer and advertising pressures to acquire more of everything for individuals, and by shortsighted attempts to secure advantage by groups and nations.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

My field is primarily the study of the future, sometimes by formal methodologies such as those pioneered by think-tanks like the Rand Corporation, more frequently by writing science-fiction stories about it.

The two areas of greatest potential that I see are medicine (that is, primarily the application of biochemistry to healing) and computers-artificial intelligence-virtual reality, in particular the work of such persons as Hans Moravec of Carnegie-Mellon and Marvin Minsky of MIT.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. Population and the environment.
2. Computers and artificial intelligence (AI).
3. Sources of conflict.

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

First, a cavil. If there is anything futurologists have learned in several decades of study, it is that hard predictions of future events and developments are not reliable, however found. It is better to deal in “futuribles”—that is, iteration of possible futures—as was done by Bertrand de Jouvenel and associates in Paris,
and in identifying needs that should be met, as in Fritz Zwicky's “morphological mapping.”

My vision of the year 3000, therefore, is not a prediction but a hope, though one that I think can be attained:

For AD 3000 I see a world in which space travel is as relatively common as, say, transatlantic voyages were in the 18th century; in which conflicts are dealt with by arbitration and a form of trial by jury; and in which every human receives a living standard above the equivalent of today's poverty level.
What are the factors that are most critical to the long-term survival of humanity?

1. The broad principle of synthesis, as opposed to atomization and compartmentalization, at all levels of society.

2. Careful study of the basis of prejudice—racial, religious, gender, linguistic, national, regional—its neurological and psychological bases, and the devising of educational modalities and psychosocial approaches, for the diminution of prejudice and its partial or even total elimination.

3. The extending into the future of the graphs of evolutionary change that have emerged from the analysis of past human evolution, biological, cultural, social, behavioural, spiritual.

What are the current map and trajectory of these factors?

During the 20th century several aspects of human development and achievement have become out of step with one another. After the dropping of the atomic bombs on Hiroshima and Nagasaki, it was often said: Stop all scientific work for ten years to give ethics or morality time to catch up! The enormous power that scientific research has placed in the hands of scientists has raised fearsome prospects of a dehumanized and essentially materialistic world, in which what have traditionally been regarded as “human values,” “eternal verities,” have become forfeit and are in danger of extinction. The progressive “technologizing” of human life, in cities and towns in which 50% of humanity now resides. As Aristotle said, “People go to cities to live the good life,” but cities in the last century have become more and more machine-centered and less and less people-friendly.

Urbanization cannot be stopped, but uncontrolled growth in size, ecological pollution, inner city decay, urban pathology (assaults, violence, homicides, suicides, “muggings”) must urgently be addressed. What is the use of the greening of cities if parks have become hideouts for human predators, gangsters, assassins?

What are the problems and opportunities with the factors identified?

The structuring of society is a major problem. Just when the world was beginning to develop major supranational groupings, a sudden resurgence of petty nationalisms has been breaking up many larger groupings (the USSR, Czechoslovakia, Yugoslavia, the Indian subcontinent, the British Commonwealth). Self-determination of nations has become the shibboleth, encouraged by bodies that extol the supremacy, not of people, but of nations, e.g., the League of Nations and the United Nations. Is there no way out of this impasse? In the aftermath of World War II, the concept of World Government became very popular among some political philosophers and idealistic (young) people. Regional and local governments would under such a system be important for regional and local purposes—such as a Tennessee Valley Authority. Is there hope in the total restructuring of the world’s highest political systems?

The advance of science has seen an increasingly international or supranational activity assume an overwhelming predominance among all creative human endeavors. Today’s new discovery in Japan or Brazil is likely to become world property in next-to-no time. Have our political systems, with their heavy emphasis on nation-states and nationality, become not only at variance with the world of scholarship and research, but irreconcilable with the latter?

Potential in your field

What do you envision as the greatest potential/future in your field in the thousand-year future?

The idea of a Global Virtual University is immensely appealing. Such a marvelous development would demand hardware, even electricity. When one thinks of the vast areas of the planet’s peoples where such elemental desiderata are totally lacking, one is faced with a choice: should one seek the resources to make up these lacks in the Third World and Fourth World communities and proceed with the idea of a Global Virtual University? Or, as the First World so fre-
quently does, forget that there are large parts of the world that have no electrical supply and go ahead blithely with the new and entrancing idea—and others like it? Would the latter attitude not simply widen the gap between the developed and the developing worlds, between those who “have most,” “have much,” “have little,” and “have least”? This apparently widening gap is one of the great problems facing humankind in the Third Millennium.

**DISCUSSION TOPICS/QUESTIONS**

*What are two or three topics or questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?*

1. Urbanism and its effects and implications: urban evolution (it’s only 12,000 years since the proportion of human beings living in towns and cities was 0%!); urban pathology; the culture of cities (Lewis Mumford); urban biology; urban sociology.

2. Human evolution of yesterday and today—is it a guide to tomorrow’s people? Perhaps it gives us even more reliable insights than the Futuristics, the Futuribles, the Club of Rome?

3. In the beginning was the Word: if language was the key factor that led to the humanizing of evolving mankind, is it becoming an endangered attribute in the Computer Age—or at least among that sector of the world’s population that has access to computers?

**THOUSAND-YEAR VISION**

*Please articulate your vision of the thousand-year future in a three- to five-line statement.*

Diversity in cultures, languages, habitats, and peoples: to be looked at dispassionately and tolerated; nay, further, to be welcomed, encouraged, much as many people today extol biodiversity!

Minds to be freed of prejudice, and of the desire to make all people think alike, dress alike, talk alike, follow the same beliefs, speak the same languages. We need to find a way to tolerate such heterogeneity without biases, to seek a more holistic world in which the essential humanness of humans overrides their inherited and acquired diversity.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Elimination of warfare and terrorism.
2. Caring for future generations and adopting a long-term societal perspective.
3. Using nanotechnology, robotics, and advanced computers for humanity’s flourishing, not for oppression or greed or war.

What are the problems and opportunities with the factors identified?

1. Warfare and terrorism are widely practiced and endorsed, and are unlikely to fade away in the short run. But there is no way we can get through a thousand more years of handling conflicts and greed with rapidly advancing weapons instead of fresh nonviolent methods. Best path for society: put extraordinary resources into peace research and into conflict resolution experiments.
2. The Foundation For the Future, the Future Generations Program (Malta), the Future Generations Alliance Foundation (Kyoto), and other efforts are gradually increasing our caring for future generations. But the problems are outstripping this positive change. As a result, our societal decision-making is still far too short-term, with little sign of changing to a longer-term perspective. Best path for the Foundation For the Future: Keep on doing exactly what it is already doing so vigorously and so well. And build links with the other organizations, efforts, and individuals that have a track record of thinking about the very long-term future.
3. The scientific, technological, and engineering advances are occurring far faster than our society’s ability to understand and control them. Best path: follow the lead of the Foresight Institute in thinking through how to foster the positive benefits and avoid the potential for enormous harm to our society.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

By the year 3000 we will have explored much of our galaxy. We might accomplish this exploration with interstellar probes (which NASA is already trying to develop), with crewed spaceships, with telescopes far beyond those of today, or in ways that we have hardly imagined. Most important of all, we will likely make contact with several other civilizations in our galaxy when we detect their super-smart probes or their encyclopedic radio messages that have reached our planet. Our dialogue with these other civilizations will have an extraordinary impact on our practical knowledge, our understanding of the universe, and our view of ourselves as part of a galactic family.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics or questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. Without being unrealistic in our discussion nor sloppy in our thinking, can we come up with some feasible way to eliminate warfare? Or is this a completely hopeless prospect?
2. What will be the most significant long-term benefits from our contact with other civilizations in our galaxy? How can we detect any super-smart probes or rich radio/laser messages that have already reached Earth?
3. Over the next thousand years, what shifts will likely occur in personal and societal sources of meaning and purpose? In what directions will shifts occur in our understanding of the spiritual and transcendent dimensions of our lives?

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

Human civilization will be happily flourishing, vigorously exploring, eager to continue building a better world for future generations, free from warfare and mass violence.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Population growth coupled with limited natural resources.
2. Accelerating rate of technological advancements.
3. Diffusion of knowledge (avoiding the creation of knowledge have and have-nots).

What are the current map and trajectory of these factors?

Human population growth is proceeding at a high rate (currently 78 million per year), a trend that is expected to continue well into the next century. This, coupled with a finite supply of natural resources, suggests a collision course of unimaginable proportions. While new technologies will play a role in allowing more intelligent use of natural resources, they cannot be expected to solve the problem alone. In addition, some technologies create increased pressure on resources. The rapid pace of technological change during the past half-century will seem slow in comparison to what will be experienced in the future. A major challenge will be how to facilitate the diffusion of the massive amount of information that will be generated, allowing all of the world’s citizens to make informed decisions about their own future.

What are the problems and opportunities with the factors identified?

See above answer.

POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

Near-instantaneous assessment of most diseases with a genetic component, as well as many behavioral and phenotypic traits. Treatment of most common Western diseases (e.g., heart disease, cancer) for those who can afford it. Increased threats from “emerging” diseases as diverse populations come into contact with each other and other causes of mortality decline.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

1. How important is the internet for diffusing knowledge?
2. Is there a correlation between increased political freedom and factionalism?
3. How do we measure technological progress?

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

The future will, more than anything else, challenge our ability to work together. It will demand global cooperation as problems become increasingly complex. Intelligence is Homo sapiens’ primary tool, and we must learn how to use our accumulated knowledge in a coherent way in order to create an informed future.
CRITICAL FACTORS

What are the factors that are most critical to the long-term survival of humanity?

1. Sustainable growth on Earth. Most essential requisites: a) population growth goes to zero; b) use of nonrenewable resources goes to zero (or natural replacement rate)—most urgently oil and aquifer water, but fossil fuels and scarce elements as well eventually; c) consequences of proliferation of weapons of mass destruction must be minimized; d) early warning on the few odd things we could do to really screw up the biochemical ecology of the planet.

2. Developing and strengthening a base for humanity beyond Earth.

3. Spiritual growth in balance with the above.

Other factors, like governance and GNP, I regard as a means to an end, not part of survival as such, but part of the complex system of things that may help or hinder survival depending on how they are used. Beyond survival, for quality of life, it’d be nice to try to make the world more user-friendly and entertaining within the limits of what is consistent with the above.

What are the current map and trajectory of these factors?

I am much closer to 1b and 2, in most respects. These appear solvable, due to lots of exciting new work. But those of us on the real cutting edge are extremely overextended, and major opportunities are being lost as a result. Also, we are approaching a point where the commitment from the rest of society becomes more essential.

Both 1a and 1c are in a very worrisome state—they attract lots of empty rhetoric and moral support, but the level of real action and achievement does not seem enough as yet to overcome the danger that everything will hit the fan before long. Just look at the numbers!!!

Regarding 3, I would not expect a consensus, for obvious reasons. Furthermore, the issue is like the proverbial Sufi elephant—even those of us who can see one part of the elephant very well are missing the other parts, and there is certainly no one on Earth who has the whole picture. In general, I tend to believe that #3 is going in a positive direction, and is fairly robust in that respect, but will it go fast enough to compensate for the negative factors?

What are the problems and opportunities with the factors identified?

In 1b, the issues mainly involve private investment in new technology, and maintaining the growth of communication and cooperation between researchers in different disciplines. In 2, that is a factor, but there are also a number of emerging research opportunities that might or might not survive the strange bizarre ebbs and flows of Washington psychology, in a realistic and useful form (e.g., breakthrough cost reductions in Earth-to-orbit transportation, intelligent systems for closed-cycle manufacturing on Earth or moon, various long-term options involving basic physics).

Regarding 1a, it seems that more work on women’s education, family planning, and even cultural growth may be essential. (There is some link with 3.) Regarding 1c, it’s very complex; however, development of cheaper solar energy sources (as an alternative to nuclear sources) and realistic missile defense would be at least ONE part of the larger solution.

Regarding 3…it’s a maze. Fundamental research on the nature of mind and intelligence is at least part of the maze. In my view, this research could be very useful (in fact, has already BEEN useful), but there are incredible tangles of confusion and misunderstanding in the communication of this work (as in other major strands of culture!). It will take a long time to sort these out. Perhaps there are more lost opportunities now in this sector than in the others, for a variety of reasons.
POTENTIAL IN YOUR FIELD

What do you envision as the greatest potential/future in your field in the thousand-year future?

This is incredibly tricky to answer. For example, even the simple question—what is my field? Also, I note: “potential” is not the same things as “feasible.” “Potential” means it MIGHT be possible, there MIGHT or MIGHT NOT be a way to do it.

At NSF, my main field is intelligent systems. At the last FFF workshop (proceedings available), I argued that we could build intelligent systems with the same kind of general learning/intelligence as the base-level mammal brain in 20 years, if we focus efforts. This ISN’T like the empty old AI predictions; I have outlined a specific pathway with tasks and subtasks. To tune it and optimize it (and account for manpower limitations), it might take longer, but certainly we could do it well short of 200 years!!!! The jump to the human level is not so far beyond there, and the basic principles seem clear. It seems better than a 50-50 chance that we could move on to achieve a kind of quantum intelligence, combining neural nets and quantum computing, which is beyond what exists in the human brain. (This is not a consensus view, but I like to believe I’m accounting for the various sides of the relevant debates, and the most recent research.)

In the energy area, if we survive, we will be using fuel cell cars powered by methanol (or something a tad more esoteric like ammonia) a thousand years from now. There is potential for conversion to an all-solar economy, where the basic pillars may be Earth-based solar (PV or thermal), space-based solar, and photochemical. We may use plasma-based air-breathing vehicles to reach Earth’s orbit at the same cost as a flight to Japan, which should create a “take-off” effect (c.f. the economic development literature) allowing cost-effective settlement of the solar system. I personally believe (on an informed basis—e.g., my paper xxx.lanl.gov/patt-sol/9804003) that there is greater than a 50% probability that there are breakthroughs to be made in basic physics that would allow effective interstellar travel as well.

In the spiritual area, I like to believe there is some hope of humanity achieving a greater level of articulate self-consciousness of its underlying unity, allowing easier cooperation and less need for reliance on authoritarian means of social control.

DISCUSSION TOPICS/QUESTIONS

What are two or three topics/questions critical to the long-term future that you wish to explore in small group settings at Humanity 3000?

Maybe I’ve written too much already here. There are lots of possibilities implicit in the above, and it depends a lot on what the other folks feel ready to take on.

THOUSAND-YEAR VISION

Please articulate your vision of the thousand-year future in a three- to five-line statement.

Mainly, I see humanity as being in a sink-or-swim situation—grow or die.

A race with time. Uncertainty is the essence of it—we should not EXPECT to win or lose, but should maximize the probability of winning. Like it or not, our futures are all linked, for the most part (except for certain spiritual aspects). In nature, some species live and some die, and we are fools to imagine we might be exempt.
The following are discussion subjects suggested by participants in their two-page statements. They have been grouped by subject area.

Evolution
• Past and present as a guide for tomorrow.
• Connections between science-cosmology-evolution and the consciousness-spiritual traditions.
• Next steps in human evolution in the collective.
• How to develop and undertake leadership to fulfill our evolutionary legacy.
• Is human evolution the externalizing of memory? The control of the species through these symbols.
• Loss of genetic diversity and consequences for our evolutionary potential.

Science-Technology and Issues Related Thereto
• Connections between technology and the quality of human life.
• Advances in artificial intelligence (AI) and post-biological futures.
• Results of interactions between AI, genetics, and extraterrestrial intelligence (ETI).
• Computers and AI.
• What are future priorities for science and technology?
• Reduction of friction between technology, society, and economy.
• Will human cloning lead to the end of civilization?
• What can we learn from old persistent technologies (e.g., weaving) for continuity and change?
• Is the future of language in jeopardy in the computer age?
• Future of space developments.
• Current state of cognitive science and ways to improve humanity’s intelligence.
• Gene technology and gene democracy.
• Reality of ADHD—what to do?
• How to use the scientific method for social, community, lifestyle.
• Innovation.
• What are the chances for real life extension?

Population, Sustainability, Environment, Climate, Genetic Deterioration, Economic, Political
• The problem of urbanism.
• Connection between rapid climate/environmental changes and evolution of means to deal with them.
• Is unrestricted population growth inevitable?
• Impact of global aging.
• Is sustainability changing?
• Climate impact on the future.
• Energy resources and distribution in the long term.
• Benign solution to population problem.
• How to preserve genetic diversity.
• Competition or cooperation in global economic order.
• Control of terrorism.
Philosophical, Visionary, Values, Institutions

• Is philosophy dead?
• Defining global identity.
• Study of the sources of conflict.
• How to end warfare.
• Prognostications for human consciousness toward comprehensive, compassionate, unitary state.
• How do we move from win-lose to win-win in human institutions/transactions?
• Understanding human consciousness and evolution of conscious cognition.
• Definitions of human equality.
• Minimizing effects of change on human institutions.
• Understanding and making the UN more effective.
• How to effect shifts in meaning and purpose.
• Is there possibility for biological immortality?
• How to control wants/desires beyond reaching level of saturation.
• How not to repeat mistakes of the last thousand years.
• What are current restrictive metaphors that inhibit transformation?

Other

• Implication for contact with ETI and benefits from ET contact.
• Human attitudes towards “not intelligent” and “different intelligence.”
• Will everything be free in 3000?
• What will be the future life experiences for women and children?
• Problems with destruction of archeological sites due to industrialization.
• How to continue collaboration among participants of Humanity 3000 in the future.
• Earth-based natures vs. artificiality and adjustments needed.
Participants in Humanity 3000 seminars are tasked with assessing the current state of humanity, identifying the most significant factors that affect the quality of life of the people of the Earth, and debating topics they consider to be of critical importance to the future of humanity over the next thousand years. Prior to the April 1999 seminar, the following excerpts were sent to all participants as a means of prompting early consideration into these issues.

1. Manuel Castells, End of Millennium
   “Because the whole world is and will increasingly be intertwined in the basic structures of life, under the logic of the network society, opting out by people and countries will not be a peaceful withdrawal. It takes and will take the force of fundamentalist affirmation of an alternative set of values and principles of existence under which no coexistence is possible.
   “Fundamentalisms of different kinds and from different sources will represent the most daring uncompromised challenge to one-sided domination of informational global capitalism. This potential access to weapons of mass extermination causes a giant slowdown on the optimistic prospects of the information age.”

2. Eric Chaisson, The Life Era
   “As the dominant species on planet Earth, we must now develop (perhaps we should say evolve, and quickly, too) a global culture. We need to identify and embrace a form of planetary ethics that will guide our attitude and behavior toward what is best for all mankind. In short, humans must begin to acknowledge that we are first and foremost citizens of a planet, and only secondarily members of national sovereign countries with ever-changing boundaries.”

3. David E. Comings, M.D., The Gene Bomb
   “Many different studies have documented an increase in the frequency and a decrease in the age of onset of a wide range of behavioral disorders, including depression, suicide, alcohol and drug abuse, anxiety, ADHD, conduct disorder, autism, and learning disorders in the second half of the 20th century.”
   “Because of their marked effect on reproductive behavior, the learning disorders and other impulsive, compulsive, aggressive, and addictive disorders have the ability to result in progressive and permanent changes in the frequency of the associated genes—potentially leading to the genetic meltdown of the species.”

   “We must not overlook the reality of one existence to propound change—to even thinking about it—since it involves such a challenge to the inner assumptions that have been an inherent part of us throughout the greater portion of our lives. Nor should we fail to note that the coming changes will bring about a great deal of fear and uncertainty; in fact, keeping down the level of fear is the greatest challenge of all, since only with low fear levels can we see clearly and take the right action.”
   “One of the most critical issues of our day is whether business will so transform itself as to truly share responsibility for the whole and thus become—as they used to say in the ‘60s—part of the solution, not part of the problem.”
5. Hazel Henderson, *Building a Win-Win World*

“Learning to examine our own space-time frameworks and the mental models they generate of the system we inhabit is now of the utmost importance for our survival. ‘Reality’ is that selective image of the external world, which, as Kenneth Boulding points out, we pull in on our own personal, perceptual ‘TV screens.’

“The mental models this experience of perception generates are systemic and interactive, multidimensional, balancing both equilibrium and dynamic behavior modes, and evolving over time in some purposive manner which I believe I shall never understand. There seem to be elements of subsystem expansion and contraction, ordering and disordering, entropy and syntropy, continuously occurring, along with energy/matter information transformations.”

6. Pat Duffy Hutcheon, *Leaving the Cave*

“The expanding gap between progress in the physical sciences and that in the social sciences ensures that, increasingly, we will find ourselves propelled, crippled and rudderless, into an unmanageable sea of exponentially accelerating technological change…. We will either direct that process by means of morally informed political choices guided by the problem-solving tool of an effective social science, or we will continue to suffer as its helpless victims.”

7. Seymour Itzkoff, *The Decline of Intelligence in America*

“The issue of human variability in brain size, structure, and behavior within and between ethnicities lurks as a great national and international philosophical conundrum. This issue is the most serious semantic barrier to policy making in the world today. It could be a fatal blockage to rational long-range planning for the future of the species and the planet.”

8. Michio Kaku, *Visions*

“Given the fact that astrophysicists do not see evidence of life in nearby star systems even though Drake’s equation predicts the existence of thousands of intelligent civilizations in our galaxy, it is possible that our galaxy is filled with ruins of Type 0 civilizations, which either settled old jealousies and grudges via element 92, or else uncontrollably polluted their planet.”


“Not even the most open societies relax their hold on national sovereignty. Practically all of today’s over 180 nation-states engage in systematic attempts to block the evolutionary process of transnational convergence. The result is the progressive loss of control by national governance of the progressive ungovernability of national societies, an exponential growth of national insecurity, and a greatly increased risk of breakdown in the now-obsolete institutions of the international system.”

10. James Lovelock, *The Age of Gaia*

“If it turns out that Gaia theory provides a fair description of the Earth’s operating system, then most assuredly we have been visiting the wrong specialists for the diagnosis and cure of our global ills. These are the questions that must be answered: How stable is the present system? What will perturb it? Can the effects of perturbation be removed? Without the natural ecosystems in the present form, can the world maintain its present climate and composition?”

11. Peter Peterson, *Gray Dawn*

“Global aging will become not just the transcendent economic issue of the 21st century, but the transcendent political issue as well. It will dominate and daunt the public policy agendas of developed countries and force the renegotiation of their social contracts. It will also reshape foreign policy strategies and the geopolitical order.”

12. Francisco Sagasti, *The Twilight of the Baconian Age*

“Perhaps one of the first tasks we face in the transition to the post-Baconian age is to rewrite the myth of Prometheus to reinterpret and broaden its thoroughly Western meaning and significance—possibly by incorporating elements from the creation myths of other cultures. As Augusto Monterrosa reminds us in ‘The Eclipse,’ other civilizations have been able to acquire knowledge and penetrate the secrets of the universe without the valuable help of the West.

“We should be warned that, to the degree that our prevailing cultural dualism restricts science to the physical level only, we are deliberately depriving ourselves of our most effective instrument for solving the social problems thrown up by the very process as
it continues in its isolated and directionless operation. The risks of such a course are becoming clearer with every passing day.”

13. **Gregory Stock, Metaman**

“The challenge to humanity is not to find solutions, but to implement them, and Metaman’s role will be central.”

**REFERENCES**

Humanity 3000 seminars are formatted in questions, beginning with the Three Critical Questions and proceeding through discussions intended to elicit the participants’ deepest thinking into issues of humankind’s long-term survivability. In order to set the stage for the dialogues, participants were provided with the following list of questions in advance of the April 1999 seminar.

1. Is the age of science and technology at an impending end? Are we moving into the age of the science of genetics/brain/mind/consciousness? What are the implications?

2. Will the single biggest issue for the next thousand years be the globalization of economy/governance/ethics and the resistance to this based on habits of national sovereignty, religious superiority, economic systems, and social and cultural diversity?

3. Will human evolution inevitably lead to a new phase in frontiersmanship and homesteading in space with pioneers escaping to a new world?

4. How does humanity arrive at a universally acknowledged perception of reality, as opposed to the perceptions that are colored by the situational prisms in which we exist?

5. Is human intervention in human evolution the negation of the natural processes that govern evolution, and does this portend the end of human civilization, in terms of genetic hybridization, reversal of natural selection, unrestricted population growth, exhaustion of natural resources, unsustainability, destruction of the environment, extinction of species, political rights and privileges, and guarantees of economic sustenance?

6. What are the most important means for effecting change if consensus on a global level on all of the above questions is attainable?
In four days of meetings, these participants met in multidisciplinary groupings—plenary sessions, large affinity groups, and smaller specific-interest groups—to discuss the factors most critical to the long-term future of humanity. Following are transcripts of these discussion sessions.
The initial session of the seminar provided a description of the overall seminar structure and included self-introductions of all twenty-three participants.

Facilitators: Sesh Velamoor  
Clement Bezold

Moderator: Karen Armstead

Participants: Plenary Session

Sesh Velamoor (Facilitator): What we are about to embark on here brings to mind a poem by Rabindranath Tagore, one of India’s foremost literary geniuses: “Where the mind is without fear and the head is held high; where knowledge is free; where the world has not been broken up into fragments by narrow domestic walls; where the clear stream of reason has not lost its way in the dreary desert sand of dead habit; where tireless striving stretches its arms toward perfection; where the mind is led forward into ever-widening thought and action; into that future let us all awake.”

I’ll describe the seminar process. Based on the analysis of the two-page statements submitted by each participant, three groups have been formed for an initial exploration of the critical factors. The groupings are initially structured to foster agreement rather than disagreement within the groups and were based on identifying affinities between participants.

In the second phase, the groups are formed on the basis of expertise of participants, by voluntary association. In the third phase, the groupings are focused on the questions relevant to the long-term future. The fourth phase provides time for reflection and personal statements. In phase five, the original groups reunite to finalize the answers to the three questions as they see fit. In phase six, the emergence of a consensus is explored with all participants. In phase seven, each individual participant is offered the opportunity to voice his or her own personal reflection on the three questions, and anything else he or she wishes to articulate.

Clement Bezold (Facilitator): Today, we’re going to look at the factors that we think will be significant and ask how those will evolve over the next thousand years. Tomorrow, we’ll start redrawing, with each group drawing its own map. This future can be difficult or uncertain, but what we want to do is ask what the future of humanity is, what we think it is, and what we want it to be. Those are the questions we are asking.

Karen Armstead (Moderator): What I would ask you to do is go around the room as participants, say who you are, and try to answer these questions in one minute. We have one minute or less per person.
Jerome C. Glenn: I am Jerry Glenn. So far, I’m a domesticated primate of this planet. My current work is to try to create a global think-tank. I provide Washington representation for the United Nations University. A book called *Future Mind* explains my own content of futurist work, which is the next post-Information Age or the Conscious-Technology Age by integrating technology and consciousness as a continuum, as space and time would be a continuum. I think the strategy for that is a good conversation between a mystic orientation and a technocrat orientation in all of us.

Steven J. Dick: Steve Dick. I’m an astronomer, the historian of science at the Naval Observatory in Washington, D.C. Regarding the long-term future, I naturally think in terms of cosmic evolution and what our place is—whether we’re alone in the universe. I think our future is very much connected to whether we discover extraterrestrial intelligence in the next thousand years and what the implications of that would be.

William W. Kellogg: I’m Will Kellogg. I got into this business about what’s happening to humanity by going from meteorology into climate change. If climate has changed in the past and will change in the future, as I believe it will, then we have to find out what the interactions between this big environmental upheaval and humanity are. I wrote a book with a young political scientist colleague titled *Climate Change and Society*. This seems to me essential to the kinds of things that we are talking about in the next few days.

Walter Truett Anderson: My name is Walt Anderson. My academic background is in political science and I mostly earn my living writing books. A lot of them in recent years have had something to do with future studies and so occasionally I call myself a futurist. I really think of my own interest as being an evolutionist, past and future. At the moment, I’m working on two books, one about globalization and another that is a bit harder to describe, but the subtitle is *A Non-Spiritual Guide to Enlightenment*.

Dietrich Koelle: My name is Dietrich Koelle. I’m from Munich and my professional area is systems analyst with a space engineering and economics background. Now I’m dealing with climate and energy issues. There are two groups that would help organizing this. One is dealing with humans and humanity, and the other with environmental survival strategies. There are only a few people here dealing with environmental issues. By example, I was the
only one who mentioned the energy problem. It’s one of the most critical issues humankind is facing.

Meng-Kin Lim: My name is Meng-Kin Lim. I’m from Singapore, the place where chewing gum is not allowed. I’m a physician involved in health policy research and health care management. That’s what I do for a living. I also think a lot about the future on a personal level. My idea of the future? I take a practical approach: No point talking about a thousand years if we don’t survive today or tomorrow. In my view, man’s greatest danger is his potential for self-destruction. At the same time, his greatest hope lies in his potential for self-development.

George Cowan: I’m George Cowan. I was trained as a chemist, but never practiced. I worked largely with physicists, and so the chemists think I’m a physicist; the physicists think I’m a chemist; and I’m not quite sure how I should characterize myself. I spent most of my professional career at Los Alamos. During my final years there, I had no job description, although they lent me a desk. I also traveled to Washington during the Reagan administration, serving on the White House Science Council. Then I started at the Santa Fe Institute focusing on complex adaptive systems.

Seymour Itzkoff: My name is Seymour Itzkoff. I teach in Smith College. I was trained in music and philosophy, and over the years I’ve developed a deep interest in evolutionary theory and the evolution of the human species. I’ve read a bit in these areas. My great concern is that the future is practically attainable. I tend to feel that we have to make any hypotheses about the future based on what we are as products of evolutionary theory. I’m not a pessimistic; I’m still hopeful.

When we explain minds...will it cheapen our understanding of our own personalities when you destroy spiritual conditions?

Terrence Deacon: My name is Terry Deacon. I’m an evolutionary biologist and anthropologist, but also a neuroscientist. Most of my current work involves fetal cell transplantation and neural transplantation. The broader interest is the effects of this on our future, and what it means when we begin to engineer biology. Second, I’m interested in what makes humans different. Most of my research has a big comparative compound between what is different about human brains and if that helps us. What all this leads to is what I think is the problem of the last Copernican revolution, which is the explanation of minds. When we explain minds, understand the nature of that process, how to manufacture minds, will it cheapen our understanding of our own personalities when you destroy spiritual conditions? I think that’s the challenge that we face.

Howard F. Didsbury: My name is Howard Didsbury. I am director of special projects and coordinator of the Prep 21 Project: Future-Oriented Studies Worldwide—Preparing for the 21st Century and Beyond, of the World Future Society. I also serve as editor of the World Future Society’s General Assembly preconference volumes. The latest is Frontiers of the 21st Century: Prelude to a New Millennium (June 1999). As a futurist, I would describe myself as a “tempered optimist.” The overwhelming numbers of challenges we face today are largely the result of human ignorance, shortsightedness, or greed. If we have the wit and the will, we can overcome the challenges or greatly reduce their likely harmful effects. We do not need more and more studies—what we lack is the will to do the needful. There are three areas of special concern to me. First, in any attempt to come to grips with the many challenges before us, a serious problem arises over how to devise ways of sustaining an active interest in the future along with the commit-
ment to persevere in the attainment of highly desirable goals. This may be a very special problem, immersed as we are in a telecommunications world of instant everything. In such a cultural milieu, persistence may be an extremely rare character trait. Second, how to develop a global system of ethical values that is intellectually attractive and emotionally compelling. Third, how to enlist the genius and enthusiasm of the artistic community (artists, writers, composers, and performing artists) in envisioning humanity’s journey to the Third Millennium.

Phillip Tobias: My name is Phillip Tobias. I’m from the University of Witwatersrand in Johannesburg. My background training is threefold: in medicine as a physician; then in cytogenetics, the study of chromosomes, for which I did my doctorate; and my D.Sc. in paleoanthropology. It’s my work in divvying up the thoughts of mankind that brings me to this particular meeting. I have been concerned for a long time whether one can draw trajectories or graphs out of the past up to the present and project them to see which way we may be evolving in the future. I have several concerns. Let us not forget the Third World. There are more telephones in Manhattan than in the whole of Africa, with 750 million people on that continent and one-quarter of the world’s habitable land surface. Let’s not forget in our planning and projecting that the majority of the world’s population does not have computers, or even electricity. As we plan for the whole of humanity, are we foreseeing for all mankind, or are we increasingly going to widen the gap between the haves and the have-nots, technologically, spiritually, physically, and nutritionally? This is a very great worry to me. A last point, which I’ll pick up tomorrow evening in my lecture, is let us not assume that the graphs projected into the future are going to be smooth and continuous. There are glitches along the way. I’ll use the term “catastrophism.” We must build into our projections the possibility of catastrophes.

Yersu Kim: My name is Yersu Kim. I have been teaching philosophy at Seoul National University for the last 20 years or so, mostly on the philosophy of language and logic. For the last ten years, I have become increasingly interested in the questions of culture: cultural diversity, cultural particularism, and so forth. The last four years I have been working with UNESCO, responsible for the philosophy and ethics program at UNESCO, and this has given me a perfect opportunity to try to elaborate on some of my concerns. The project with which I am currently involved is something that we call the Universal Ethics Project. It is an attempt to identify and forge a substratum of values that would be acceptable across the cultures and societies, and it is a long evolutionary process, which one participant described as requiring perhaps 300, 400, 500 years. So this time frame of a thousand years suits me perfectly.

Allen Tough: I’m Allen Tough from the University of Toronto. I wrote a book a few years ago called Crucial Questions about the Future. Much to the dismay of some of the old-time futurists, I included a chapter on intelligent life in the universe and what role that may play in our future. Some people said to me, “Why would you put a chapter like that in a book about the future?” Well, for me, the highest-impact positive factor in the next thousand years is if we make contact with one or several other civilizations in our galaxy. I think it’s going to have an enormous impact on us. I’ve been spending much of my time in the last few years active in that field called SETI—the Scientific Search for Extraterrestrial Intelligence—trying to get the field to widen its array of approaches to scientifically detect extraterrestrial intelligence.
**R. Spencer Wells:** I’m Spencer Wells from Oxford University. I’m a human geneticist, I think the lone human geneticist here today. I’m using genetics to study the patterns and processes of human evolution, a field called anthropological genetics. As a biologist, I’m certainly interested in the impact of population growth on the future of humanity and human evolution, also the impact of technology on humanity. Finally, tying into something Professor Tobias said, the diffusion of knowledge and the avoidance of the creation of knowledge *haves* and *have-nots*.

**Clive Gamble:** My name is Clive Gamble. I’m an archeologist, so I take a long view on the future and I’ve been interested recently in writing about two factors. One is how we became a global species, which, in fact, is something that occurred very late in our evolutionary history. At the same time, that links into the fact that we’ve become the only hominid species on the planet. Prior to that, we always shared the planet with other hominids. Those two factors I find very interesting and useful to think about. One of the things that make us different and special, which is something I’d like to explore in this seminar, is what I call the *archeological imagination*, our ability to extend back into time, to use the past to understand the present or as a resource for constructing identities in the present, but which we can also extend into the future to construct new identities and new forms of society.

**William H. Calvin:** I’m William Calvin from Seattle. Like a lot of you, I have a number of interests, and it’s not always easy to see how they fit together. I wrote an article for *Atlantic Monthly* last year on abrupt climate change. It was called “The Great Climate Flip-Flop.” One of the responses that I got was, “What’s a brain researcher who writes books like *How Brains Think* and *The Cerebral Code* doing writing about failures of the Gulf Stream and how this all fits together?” I’m interested in the evolution of the brain as well as its physiological processes, and part of understanding where our brains came from is understanding this problem of abrupt climate change during the ice ages. That’s the next project I have on the books. The book coming out soon is on linguistics and the evolutionary origins of syntax.

**Paul J. Werbos:** My name is Paul Werbos. I work at the National Science Foundation, but I’m on vacation today; I’m not representing the U.S. government in any way. At NSF, I work in the area of intelligent systems. Half of my life is trying to develop a mathematical understanding of how intelligence works in the brain or in machines and how to apply that to technology. Energy technologies are something that I have been working on with a lot of these other things. I see three bottom-line factors here if we talk about survival. One, will there be sustainable growth on Earth? Two, will we expand into space? And three, what is this dimension of spiritual growth people talk about? From those three variables, one immediately proceeds into worrying about energy and war and a number of other technical areas too complicated to discuss in a minute, but they all fit together.
Ashok Gangadean: I’m Ashok Gangadean. I’m a professor of philosophy at Haverford College, outside of Philadelphia. I’ve spent my career as a philosopher exploring the possibility of moving between different worldviews, cultures, and forms of thought. I find that quite relevant when we try to discern where we’re going next, because over the last three millennia of philosophical evolution, the great teachers have been gravitating to a common breakthrough of seeing that there must be a fundamental missing field out of which our different worlds arise. I call that the logos in the global sense. The missing technology, the ultimate technology, is one of making our worlds and making our experience. So it turns on our minds, and one of the great trends is that humanity is moving out of the stage of egocentric ways of mind which has been a catastrophe in terms of human cultures and pathologies. How we mind produces disorders, and moving into a more holistic, integrative, biologic way is the next phase…

Francis Heylighen: My name is Francis Heylighen. I’m a researcher at the Free University of Brussels. My general theme is the evolution of complexity. By the evolution of complexity, I mean the emergence of ever-more-complex organization in the universe, from elementary particles to atoms, molecules, cells, organisms, animals, human beings, society, and so on. In this evolution, variation and selection have the tendency to produce more complex organization, and organisms cope with complexity by becoming more intelligent, by also increasing their cognitive complexity. The primary challenge for our species at this moment is that society is becoming much more complex. Many more things are happening and are interconnected, which makes it more and more difficult to cope with them. The only way to tackle the problem is if our internal cognitive complexity will keep up with the external complexity of the world. That is the main concern and the main opportunity.

Barbara Marx Hubbard: I’m Barbara Marx Hubbard. I’m president of the Foundation for Conscious Evolution, and I’m a developer of this new metafield called conscious ethical evolution. It springs up because our mind has penetrated so deeply into nature that we are evolving evolution itself. In facing that possibility, where we have the powers of co-destruction and co-evolution, I’ve been asking myself, “What could we do to bring the highest possibility for the long-range future?” I think it involves understanding our new story of creation, our cosmo-genesis and the human dimensions of cosmo-genesis. It includes seeing ourselves as humans evolving toward a co-creative universal phase. This future requires that we develop co-creative social processes of cooperation and co-creation. Along those lines, I’m developing curriculum, TV shows, and community development.

James Dator: I’m Jim Dator from the University of Hawaii, where I’m in the Department of Political Science and also direct the Hawaii Research Center for Futures Studies. I’ve been doing futures studies for about 30 years now and am delighted to be with so many other futurists on this particular occasion. I am very pessimistic about the next hundred years for all of the reasons that those who’ve expressed concerns about energy and population and topography and all the rest have stated. I’m very optimistic about the
next thousand years and, in fact, I see us now as being at a point where either we prove that human beings are one of nature’s many experiments that’s just not working out (and Mother Nature will be happily rid of us). Or else we are now about to speciate and create many, many different forms of intelligence, some of which will be similar to human intelligence now while others will be quite different. I teach also at the International Space University in Strasbourg, France. The human experience in space, as Ben Finney points out, is going to allow an enormous speciation of humanity and post-humannity. About that, I’m quite optimistic.

From the point of view of other species, we’re not all that great.

Frederik Pohl: My name is Frederik Pohl. I think I have seniority here because I’ve been speculating about the future since early 1932, when I first began trying to write science fiction. One thing I’d like to say: I have a certain amount of reservation about our attempt to predict what humanity will be like in the year 3000, or indeed what Seattle will be like tomorrow, because it’s impossible to predict the future. When I look at the picture of the river of humanity going into the future, I don’t really see any river. I see something more like the Mississippi Delta with a little river that’s going off in all directions. Which one happens to be the real one depends on factors that we’re not able to manipulate.
Participant dialogues began in three concurrent sessions, each composed of a preassigned group of seminar attendees. Before breaking into the three groups, the plenary session was given guidelines for the discussions.

Facilitators:
- Sesh Velamoor
- Clement Bezold

Participants:
- Plenary Session

Sesh Velamoor (Facilitator): All of you prepared two-page statements and sent them to us before the seminar. We studied them carefully in an attempt to identify affinities in your thinking, and from that analysis we formed three groups for the purpose of this initial exploration of the critical factors affecting the long-term survivability of humanity. We’re calling them affinity groups. You’ll have about two hours to arrive at agreement about the critical factors.

Clement Bezold (Facilitator): Once you have convened in your group, spend the first hour or so generating a list of the factors that your group considers to be critical in the shaping of humanity over the next thousand years. Then try to narrow it down to the five most important factors and determine whether there are aspects of them that need further discussion. Finally, each group will choose one person to report on the discussion to the large group when we all reconvene.
In this predesignated affinity group, six participants discussed factors that they believe will shape humanity over the next thousand years.

Facilitator: Sesh Velamoor
Participants: Walter Truett Anderson, Terrence Deacon, Clive Gamble, Barbara Marx Hubbard, Phillip Tobias, Allen Tough

Sesh Velamoor (Facilitator): Our goal is to determine what the critical factors are for the long-term survival of humanity and to discuss them. Perhaps we can go around the table and each take a moment to list one factor with a summation of reasoning. To offer a couple of samples: here is a quote from Peter Peterson’s book *Gray Dawn*: “Global aging will become not just the transcendent economic issue of the 21st century, but the transcendent political issue as well. It will dominate and daunt the public policy agendas of developed countries and force the renegotiation of their social contracts. It will also reshape foreign policy strategies and the geopolitical order. …any kind of evolution toward a more global consciousness has to evolve some ability to transcend those more parochial identities…

Anderson: I’ll list five. I have been trying to frame the issues. I’ve come up with five factors—technology, cosmology, epistemology, equity, and identity. I won’t try to elaborate on that now.

Facilitator: One thing we might do is to list all the factors and then quickly go through a process of calling out the ones we think are the most important and discuss them.

Tough: I have one positive and one negative. The positive one is our interaction with other civilizations over the next thousand years, other civilizations in our galaxy. The negative one is weapons and warfare.

Facilitator: I hate to be so intrusive, but the Organizing Committee did a lot of thinking over the last several months. Most factors, we felt, would fall in one of the domains we’ve identified.

If the notion of globalizing is taken seriously, then the human family is the unit of consideration, not a community in one location.

...we are going to become part of a galactic family.
Deacon: Some might cross-cut. Some might end up as cross-cutting questions. My interest is in the consequences of learning to engineer biology, and for two reasons: first, the knowledge itself is threatening to our identity, to our spirituality. We underestimate the spiritual challenge that is about to be presented to us. Second, there’s the law of unintended results. This is a system that has evolved over billions of years, and it is remarkably complex, far beyond our understanding. The engineering model is not a good one for the way biology works. To intercede in a system using an engineering model, we know already in ecology, is bad news. When we intercede at the level of genetics, at the level of aging, at the level of replacement of parts, at the level of prosthesis, that amplifies remarkably.

Tobias: Two points I’d like to raise. One is my concern about a mindset that is very powerful in today’s world and underlies warfare, intolerance, violence of all kinds, and repression, and that is prejudice. I believe this is a major problem. Racial prejudice has been devastating during the 20th century, with the Holocaust and attempted genocide, the newest horror called ethnic cleansing, suggesting that some people are dirty and have to be cleaned out.

There are also religious prejudices widely spread in the world today, causing warfare and bloodshed at this moment in more than one part of the world. There are linguistic prejudices, language prejudices. If you speak one way you are in the “in” group, if you speak in another you are not. There are prejudices of gender. There are prejudices of nationality; xenophobia is becoming rampant in the emerging Africa today. There are many different kinds. I have proposed to UNESCO that an institute for the study of prejudice is one of the things the world needs. And I believe it’s very much a part of our thinking for the next period.

The other point I want to make is that if we draw these graphs out of the past up to the present, it seems to me that in the immediate past, changes in the biology of mankind, not human-engineered changes, have been getting fewer and fewer. Survival and adaptation have come to be less and less dependent on what they depended on before. Culture at all levels, including the spoken language, including artistic expression, the written language, the spiritual development: all of those have become more and more important in human survival. So if we were to extrapolate those into the future, it would seem as though the person of the future will be little different from you and me physically, but is going to be functioning at a different level.

Gamble: I’d like to establish something about the time scales. I think that’s crucial whether we’re talking about one generation or whether we’re trying to think 500 years. Beyond that, I see identity as crucial. I would put identity/essence as part of it. The Darwinian revolution hasn’t completely worked through and people are still stuck on the little things, which is why we have prejudice. Essence seems to be at the core of an awful lot of thinking, and a lot of thinking seems to be extremely negative when it comes down to those aspects.

The other area I’d like to bring up is sustainability, which comes back to the time scales—about what we are really trying to sustain.
...is it possible for the human race to evolve in consciousness from a separate state to a more empathetic, connected, and unified state of being?

Hubbard: The critical factors I see, the most fundamental question: is it possible for the human race to evolve in consciousness from a separate state to a more empathetic, connected, and unified state of being? That would deal with prejudice. That would deal with so many issues that spring from a separated mind. Out of that comes a question, even a deeper one, and that is, could we be involved in the actual evolution of our species? Physically, both mentally and spiritually. The most critical factor, can we shift consciousness from self-centered to whole-centered?

The second would be, can we develop synergistic social systems that support the growth of the individual and of the whole simultaneously? Can we move beyond command and control of bureaucracies? Can our democracies evolve into more synergistic social forms that would release the creative potential of the people? The third one would be, can we shift from maximum procreation to co-creation using the energy of reproduction for the energy of self-evolution? I see glimmers of that happening especially in creative women.

I guess my fourth one is that in order to evolve consciously, we must develop images of the future that move us toward them. We don’t have shared visions of our collective potential that excite us to creative action. I think part of the reason we are the way we are is that we don’t have anything to move toward, that moves us.

Facilitator: Does anybody have a question of anybody else’s description or thoughts?

Tobias: Could I raise a procedural point? In this discussion, are we talking about where we think things are moving or where we would like them to move? Are we separating these two?

Facilitator: Yes. The seminar is intended to focus as much as possible on taking what we know and doing the best we can to extrapolate a vision or concept that represents the logical outcome of what we know. We are choosing words carefully, because the very difficult question keeps coming up. When Barbara talks about co-creation or co-evolution, that meshes with what you were saying, in a sense, that evolution does allow for a consciousness in a globalized sense. But you talked about the fact that human beings aren’t going to change very much—in terms of not the biological makeup of the mind but what is it that we think about, or how we perceive reality, or what is a paradigm appropriate for the human race. The root of prejudice is the outsider versus the insider, is it not? If the notion of globalizing is taken seriously, then the human family is the unit of consideration, not a community in one location. Is that possible?

Hubbard: That’s the question.

Facilitator: That is the question. As Richard Dawkins comments, life is like a river that ameliorates at all times and finds the best possible compromise and has no foresight.

Deacon: He does find compromise, but I’m not sure that the best part is....

Facilitator: Perhaps not the best, either.

Deacon: Biology has no stake in the best.

Facilitator: That’s the context of Humanity 3000, to see if it can be framed in the evolutionary context and what is possible to be explored. But simply to hope for and wish for something that is not in the cards? I don’t know.

Anderson: One thing that ties together your three comments is the identity theme. Prejudice presumes identity. It presumes an agreed-upon definition of black and white, a Serbian in Kosovo or a Jew in Palestine. You have to agree that those are real things before you can start killing each other about them. Obviously, any kind of evolution toward a more global consciousness has to evolve some ability to transcend those more parochial identities by deciding to become something bigger, and this is where the epistemology issue comes in, of being able to look back at these identities and recognize them as socially constructed realities.

Gamble: Absolutely. This is also Barbara’s point. I like her vision as to where we are actually moving. Let’s take Allen’s point for a moment. We have interaction with other civilizations; if we find them, then do we just replicate ways of dealing with them from what we’ve had for thousands of years, regarding them as “other” and then reacting to them? The one advantage there might be in having that “other” is it would at least bring the world together in an Independence Day sort of scenario. That way, we’d at least send off bombs in one direction. Well, we don’t want
In answer to your question, Barbara, that’s the kind of vision that would be good to be aiming for, to use that traditional way of dealing with other peoples and the past and overcoming what….

Facilitator: But in the context of what Walter said and what Phillip said, what about the thorny issue of human differences? Essentially, isn’t that at the root of prejudice? Is it the perception of difference, of being graded, or some larger view of those differences? I am better than you are?

Tobias: In your statement, there were two things. The perception of difference and….  

Facilitator: The actuality.

Tobias: Gradation of them in a judgmental fashion. Is it not possible to accept the existence of differences? There are males and females sitting around this table; there are differences. But is it of necessity a judgmental statement, to recognize the existence of these? There are two levels.

Facilitator: Any comment on the judgmental aspect of it?

Hubbard: It could be considered a gift. If you changed your identity from the separated self to a more unified self, every difference is a gift. There is absolutely no reason to consider differences a problem.

Deacon: The question then becomes: why does this become the standard?

Hubbard: On the identity question, I’ve been saying recently that people are making a shift of identity right now. Probably most people in this room. We no longer identify with a separated self—with this particular religion, that particular nation. We identify with a more universal quality within ourselves. I think that’s possible because a shift of identity is happening. But it hasn’t become dominant.

Anderson: You mentioned there is a “two sexes” kind of assumption. There’s pretty good evidence that, physiologically and in terms of hormonal variations and behavior variations, there are at least five and maybe more. The assumption that there are boys and girls is in itself one that we buy into. I’d say a socially constructed reality presupposes a lot of other things that we then deem to be good or bad or whatever. Race, it seems to me—and I will stand corrected by the real scientists here—has just about no basis genetically as far as anybody can tell. We’re a whole lot of different colors and shapes and sizes, but there are not those five categories that we were all taught. There’s a whole lot of “the emperor’s new clothes” stuff going on about identity and, I think, some recognition of that. To me it’s an epistemological issue; it presupposes being good Christian people in which we transcend the differences. The differences in many cases are a crock, or a mistake.

Gamble: That comes back to this notion of essences again. One particular thing that I’ve found useful recently is some of the work coming out of the anthropologists where they’re going against using words like individual, because it’s, again, this essences thing. The individual stops at the skin. They’re talking about the dividual, leaving off the in at the front. A dividual is someone constituted by relationships. But it’s got much more to do with only relationships—a relational view of the world rather than the individual view of the world that is more modernist or whatever, of Cartesian mind/body separation.

Tough: I’ve never heard that word. That makes my trip worthwhile.

Gamble: It’s just dropping off the in. It’s that constitution of relationships that I think is very much what Barbara’s talking about, that particular anthropological insight.

Facilitator: Most of the wisdom traditions of the world—we can call them religion, culture, whatever—recognize that aspect of it. But I pose this question then: proceeding on the fact that there is still an evolutionary process at work, and there are differences as perceived or judged, not necessarily are we all inherently wise. I am going to connect it with sustainability. The other day, I was reading that 13% of the world’s population consumes 86% of the resources. In this march toward progress, in this Baconian paradigm, what about the fact that four billion of the world’s people aspire to consume at the same rate? When we talk about eliminating differences, are we equalizing everybody? Are we imposing a judgment that says we are now all the same essence?
**Tough:** We are certainly focusing a lot on the present and on the next few years. I thought we were supposed to look ahead a thousand years, to answer Clive’s question about the time scale.

**Gamble:** I think they are two different issues entirely.

**Tough:** We’ve all been to dozens of conferences where we sit around and talk about these issues, but I thought this was going to be fresh and different and take a much longer-term view. To answer Clive’s question: Are we looking ahead a thousand years?

**Deacon:** One of the things that I see regarding the issue of essence is a crucial one, in part because the evolutionary model is a statistical model. The question about dividuals is a statistical problem, really. The question about how many sexes there are—it’s not that there’s a number; in fact, there’s not a number, there are distributions. The other thing I think is really important here is that evolution is what happens when you don’t do anything. We don’t do evolution. We may interfere with it, but evolution is what happens to the world when you let it go. That’s what’s been happening to the world. We get into it and we can play a role in pushing it around, but it will happen and it will go on. It’s not something we do. I feel strongly about not falling into the trap of thinking about evolution as a positive force—that we don’t fall into the trap of thinking about evolution as going somewhere. That’s something that humans do; they engineer. That’s a human-centric perspective on this. We have to think of what little things we can do to tweak evolution in ways that will at least help us in that direction.

**Tobias:** That’s an interesting point, but in the case of the human lineage, we have been interfering with evolution for more than two million years. The first stone implements appeared in Africa more than two million years ago. In the sense of the archaeologist, culture becomes a part of the mode of adapting to one’s surroundings. Proportionately, the biological means of adaptation for survival become less and less significant. So, if we want to look a thousand years ahead, we must look a thousand years back, a million years back, to see that human beings, for a long time past, have not been the passive tools of this evolutionary change. We have done something about it. We have imposed another system of heredity. We don’t inherit just by DNA; we inherit also by word of mouth, by teaching the young—that’s the very essence of it.

**Deacon:** I agree entirely.

**Tobias:** I wanted to stabilize the thinking that we are a bidimensional species, if not tri- or quadridimensional. Our future is more and more dependent upon the cultural/behavioral realm and less and less dependent on the biological. So we’re not going to be passive tools of the evolution.

**Deacon:** I wanted to talk about evolution that included all that. And that is, I think, that social evolutionary processes are just as unpredictable, just as statistical and just as undirected. That’s the real issue. I think you’re entirely right that the tools and technology we’ve developed look like we know what we are doing…in fact, there is a dynamic independent of what we are doing.

**Anderson:** This process that is beginning to emerge here is something that I have thought for a long time is really the long-range thousand-year issue for the future. How much can we actually intervene in or—
to use a word I’m guilty of using, and the title of a book some years ago—“govern” evolution. I think we can all agree that’s one of the biggies to be framed as an issue for further investigation. And I want to stipulate that the intervention doesn’t necessarily mean planned versus unplanned, accidental, inadvertent, conscious, unconscious—those are the things that we need to become more articulate about as we wrestle with the big question.

**Hubbard:** I’d like to respond about there being no direction in evolution. Not necessarily that we’re directing it, but when I look at the 15-billion-year story, to the beginning, the progression and complexity, from molecule to cell to multicell, and as systems are more complex, there has been a tendency for them to become more conscious and have more freedom of choice. We didn’t put that directionality there, but to the degree that we have within us the thought and desire for greater consciousness, I’ve always felt that there was a trend, a tendency.

**Deacon:** I think of it more as entropy. Evolution is entropy; there is copying going on. I also think of it as freezing or cooling. The universe is cooling, making snow crystals, and the microscopic biases show up when things cool. I think to some extent that’s the history of the cosmos.

**Gamble:** What’s Waddington’s phrase—canalization, isn’t it?

**Tobias:** That’s right, canalization.

**Gamble:** What we’re hoping to be able to do is to dig the ditch to help direct it and govern it in that sense. Whether we can is the question.

**Tobias:** A comment on Barbara’s interesting point about ever-increasing complexity. We used the phrase complexification as the rule of life, as it were, from amoebae or pre-amoebae right up to us and the future. But when you look at it and ask: What is the definition of complexity? How do we define it? What does complexification mean from a simple state to a more complex one? How does one get to a more complex state? Are there more entities, or is it that there are more interrelationships among a similar set of entities? Is it complexity of interrelationships, or is it both or all of the above and others as well? It’s tricky, this complexity thing, and although I’ve used the term in my writings I am very self-conscious about it. We can’t give a very good definition of it.

**Facilitator:** It’s something like the U.S. Supreme Court justices being asked to define pornography. One of them said he couldn’t define it, but he knew it when he saw it. At this point, have we launched into a discussion after the identification of the factors? I’d like to revisit those one more time to see if we have exhausted the universe of factors that this group has to add, and then the next step is to weed it out. Ultimately, the group objective is to identify three to five of the most important factors affecting humanity.

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**Deacon:** I would like to echo the caution that we try separating our discussion into the proximates and long-term issues. Certainly, a number of the issues that are core in that are the issues that we are currently in a state about. It’s not clear to me that we want to project those 500 years; in fact, it may not be possible to recognize a racial or ethnic group 500 years from now. I don’t even know whether that makes sense. I want to begin to divide into long-term issues and proximate issues, both of which are crucial.

**Facilitator:** If we applied that test, a lot of these could drop off.

**Hubbard:** That’s interesting, because if some of the negative aspects don’t drop off, we may not have a future. There’s a selection process going on, in memes as well as in genes, and some memes are absolutely lethal.

**Anderson:** Another way to put that is that if we decided to list proximate issues, there would tend to be problems. Whereas I would hope that if you put yourself into a much longer-term frame of reference, you might be thinking more in terms of the goals and objectives rather than the put-out-the-fire stuff that tends to take over our short-range thinking.

**Hubbard:** One of the difficulties here about proximates and so forth is that we’re looking at factors. Do factors make us look at the proximate?

**Deacon:** And the alternative?
**Hubbard:** I’m taking Allen’s thought that we’re supposed to be looking a thousand years ahead, but we’re dealing with immediate issues. Is that because we were asked to name the factors that are critical to our survival? Does that question force us into proximate responses?

**Facilitator:** I’m sure that limitation exists, but it doesn’t have to be a factor. The factor could be the process by which we do things.

**Tough:** One of my factors, interacting with other civilizations, has not happened yet, so it’s not proximate. It could happen 500 years from now. You could have factors that are not pressing us now.

**Tobias:** We should remind ourselves that the Foundation itself gives us a lead on this and says that Humanity 3000’s purpose is to identify key factors that may affect the future of humanity. By that, one would normally think that these are factors relating to the here and now, as we know the past and present. It goes on to say, let’s map the territory, past and present, of these factors and suggest trajectories for these factors.

**Tough:** There’s one major factor that goes under Walt’s technology item. I think a thousand years from now, we are going to be sharing this planet with artificial intelligence, or it will be things that we create, things that grow out of our present-day computers and World Wide Web and so on. They’re certainly going to be smarter than we are. So when we talk about the future of humanity, maybe we should be talking about the future of humanity and our very bright machines, our agents, or whatever we’re going to call them—very smart robots.

**Deacon:** My suspicion is it will be hard to tell the difference between a biological creature, a human individual, and these various intelligent prostheses that are a part of us and link us.

**Gamble:** Because we will endow them with sexual capabilities anyway, and that’s how we deal with those things.

**Deacon:** Exactly.

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**Gamble:** I keep coming back to Barbara’s points—you know, this vision of where it’s all going. We haven’t mentioned globalization or global systems here, and that’s where we are. Globalization has taken place. I would draw a distinction between globalization and global systems in terms of how they operate, but let’s go forward to Allen’s Humanity 3000, because we could have global systems at that point, or we could have tribal systems; it could go either way. The river running toward either of those outcomes could be immensely meandering or immensely varied about how we get there. Perhaps one way to crystallize some of the factors is to think about whether we think we’re going to end up with tribal systems—in other words, a Balkanization of the world—or a Creolization of the entire world under global systems.

**Tough:** Or galactic systems, even bigger systems.

**Gamble:** Something of what we’ve seen in the last thousand years is at least globalization, and some sort of global system. It may help to see it in those terms. A lot of what we’ve been talking about comes back to that, with identity as this key thing that melts into the identifier and then going forward.

**Facilitator:** At this point, I might suggest we take a one-minute pause, then take turns describing the statements that would be factors critical for the long-term survival.

**Anderson:** Are we going to add additional factors at that time?

**Facilitator:** Sure. Then we’ll weed them out based on, hopefully, a consensus.
Anderson: I already know what I want to say. It’s been on my mind quite a bit, and it’s directly inspired from Clive’s comment about whether it’s globalization, Creolization, or tribalization. One of the most difficult things that we confront is that we’re going to have to learn how to see beyond the immediate categories within which we frame these topics and categories. As much as I agree with the point you just raised, what I think is going to happen is those frames of reference are going to become obsolete. Similarly, people often talk about whether China is going to emerge as a major power—and, yes, it will in the next decade or so. At the same time, I’m quite convinced that frame of reference is going to become obsolete. The difficulty in standing on tiptoes to see beyond our own very time-bound, culture-bound frames of reference, or at least knowing that they exist, is one of the big challenges in terms of our being able to think in any long-range terms.

Gamble: That’s a point well-taken. We are hampered by the terms that we have at the moment; I don’t suppose that we’ve had to be carried through this heritage baggage, and evolution works, both with what’s available as well as producing new forms and new niches.

Tough: Three of the biggest factors in the next thousand years are that we’re going to be interacting with other civilizations, and we’re going to be interacting with machines, or other kinds of intelligence smarter than we are. Or, as Terry says, maybe we’ll become them or we’ll become smarter simultaneously. The third one is that we’re going to be out in the solar system and probably far beyond it in the next thousand years. Our horizons are going to expand geographically as well as in these other ways.

Tobias: Even that is predicated on present indications. We have the power to get into touch with extraterrestrial intelligence now. It’s my prediction that such power will culminate in some positive bull’s-eyes. But if we look at the factors governing the future, then I would go along with Allen and say that one of the factors is that advanced technology on Earth today leads us to prognosticate that by a thousand years hence, we will have reached other intelligence, in particular extraterrestrial intelligence. We will have various biological potentials for altering DNA; we’ve got it already today, and we don’t have to extrapolate very far to see that we could make human beings in a test tube, to put it simply and crudely. We already know how to do it. So none of these things is prognosticated or predicated on knowledge that isn’t currently available. I take it, Sesh, that the first thing you want us to do is to give a summary of the present state of play with regard to factors like this that we think will be of relevance to the human survival and treatment by the year 3000.

Facilitator: That’s correct.

Deacon: One of the things that Phillip said that raises a question very similar to the tribal versus cosmic dichotomy of a possible future is whether we recognize a biological organism called human beings. One of the issues that you put well was that our technology has interceded with evolution in a remarkable way. Every indication is that we will interfere radically with our biology, with what it means to be a human being...
Facilitator: Along those lines, in terms of real possibilities, will human nature be manipulable?

Deacon: Of course.

Facilitator: Technologically. Talking about prejudice and governments and universal ethics and being happy with consuming less—all essentially boil down to whatever the process is. If human nature were manipulable technologically, that would probably be the most critical factor. The gap between the ability to manipulate nature and everything else that we have around us is essentially what we are talking about. And that would be over a 10,000-year time frame.

Anderson: To pick up on Phillip’s point, I would submit that we are already capable of manipulating human nature technologically, with psychoactive chemicals being a good example.

Tobias: Can I also say, through the words of a Swiss theologian [Emil Brunnet], that man is an animal capable of the most sublime thoughts and the most superb artistic achievements, and then deny him just a little drop of thyroid and he is turned into an idiot. And turning that around, we know how to treat the need of a little drop of thyroid.

Hubbard: I’d like to add to that, going back to the whole question of the evolution of consciousness. Not only can we manipulate it, but there is a tendency toward cosmic consciousness that has been arising for the last 4,000 or 5,000 years in the human species, where people have already burst beyond the bounds of self-centered consciousness. There are those of us who believe that’s a generalized tendency. If that is combined with conscious manipulation of the genetic code, done in a benign and loving manner, then we have a real possibility of quantum change in the evolution of human nature. Evolution itself could become humane. That would be interesting, because evolution has never been humane.

If human nature evolves and we are entering into evolution consciously, that’s the evolution of evolution. I would say the greatest factor of all is that humans could evolve such that evolution becomes humane.

Deacon: Do you stop your cat from killing birds?

Hubbard: Not the cat, but us. We are by far the greater killers to worry about rather than the animals right now.

Deacon: Of course.

Facilitator: Let’s take that one-minute pause now. Let’s work on everything we’ve talked about for a minute.

Deacon: Sesh, may I make a comment on Walter’s earlier comment before you proceed? I thought about your comment about our vision for the long-term future. We’re not in the future. We’re here and we have a perspective; we’ve got blinders and we’ve got hills that we can’t see over; and there will be new technologies that we create that will change the world.

Anderson: And frames of reference.

Deacon: And frames of reference. But it’s the process of doing that periodically, systematically, over generations, that the Foundation is interested in. We know that what humanity will be a thousand years from now we can’t even envision. But what we want to do is to start the process of thinking about that future. So even though we can’t really see what’s going to happen hundreds of years from now or thousands of years from now, the process is very important.

Hubbard: Good point.

Tobias: It’s a wonderful point. In the flow of the river, this element of forcing ourselves to think about the thousand-year future itself might be the most important critical factor.

Anderson: I don’t think those frames of reference should be viewed as a handicap. One of the great evolutionary discoveries made recently is that there are such things as frames of reference, paradigms, worldviews, subjectivities—whatever you want to call them—within which we see things. That’s a big discovery, and we have a long way to go toward fully understanding its implications.
Facilitator: So let’s go around the table and list one, two, three.

Anderson: I was going to list just one.

Tough: That’s great. The smaller the better.

Anderson: I think the intervention governing evolution tends to order all others, and so I would vote for that strongly, mentioning again that I think there’s a long list of positives, negatives, refinements that you need to consider.

Facilitator: Any intervention, if I might qualify that, is inclusive of technology.

Hubbard: So the factor is that we can intervene?

Anderson: We can’t not intervene.

Facilitator: We can’t not intervene to govern evolution.

Tough: I want to pick up on something that Barbara was saying and that fits under this. She talked about the benign evolution of consciousness—I don’t know if evolution is quite the right word—but in a benign, loving way, we will change consciousness. If that’s part of governing evolution, then we should include that.

Facilitator: When I think of Homo sapiens…

Tough: No. Because it’s going the other direction. That’s one thing. The other thing for me is that we are going to become part of a galactic family. Our whole self-image is going to change. Who will we be if we interact with other civilizations?

Deacon: The first thing is clear and has been reiterated now a couple of times, and that is, the most important knowledge is how evolutionary processes work, and I don’t mean at the biological level. The evolutionary process is at all levels. No matter how you try to intervene, if you don’t understand it, you’ll make a mess of it.

Facilitator: So could we say that inclusive understanding evolutionary process is then learning how to intervene in it?

Deacon: That’s fine. I would certainly put understanding it as the prior factor. The second thing I wanted to pick up on was the reference to essence and identity in one place and consciousness elsewhere a few times. Obviously, essence, identity, and consciousness are one problem. How we will identify what we are and who we are is really the crucial problem. I would add at this point that there is the question of how our tools will change our identities, what we are, what we think we are. How they will change—literally and physically change—our identities is a really crucial problem to sort out.

Tobias: Globalization has been mentioned. We are looking at the present and immediate past as a key to the future. May I set up a contrast between globalization and atomization? Within the 20th century, even the 19th century, we saw innumerable attempts to unite the world and other attempts to Balkanize the world. After World War I, the League of Nations was set up—not equals, not peoples. The great premium was set upon nations, nationality. After World War II, this concept was perpetuated when a United Nations—not united peoples or united humans—was organized.

Now, globalization versus atomization is a pair of tendencies that are with us now. Within the last decade or two, the Soviet Union has been sundered into 20 little nations. Yugoslavia has been sundered into smaller nations as well. Czechoslovakia has been sundered into two. Meanwhile, united Europe is trying to come into being again. When I was a young, idealistic student leader, 49 years ago, there was a great world government movement, led by a man named Powers, I think his name was. That became the great thing. As the second half of the century has developed, we have gone more and more into an atomized direction. Nationalism is a great curse of the world today because it is atomizing us. We had these tensions then and we do now, and if you wish us to do so, we should express a preference, recognizing the existence of globalizing and atomizing tendencies at the geopolitical level.

Facilitator: As a factor.

Is the human of the year 3000 going to be very different compared with the human of today? Are human values going to be forfeit?

Tobias: That is a factor. Dare we go so far as to say we would prefer synthesis, which was one of my three points in my original statement? We would prefer globalization. My second point is this. Is the concept of what is human going to change? It has a connotation for some people of bipedalism and a big brain and a certain number of teeth and fingers and toes,
but it has another connotation for other people, of *humaneness*. Interesting how many words are based on that root—humanitarian, humanistic, human. Is that going to be forfeit? Is the human of the year 3000 going to be very different compared with the human of today? Are human values going to be forfeit? I raise it as a concern. And my third point is to reiterate the prejudice factor, which I brought up this morning.

**Facilitator:** And that is, will we overcome it?

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*...the future is not going to be all biological or all culture, it’s going to be biocultural.*

**Tobias:** Will we know how to overcome these? If a person is this, you can therefore expect him to be this, this, and this. Or if she is a Serb, therefore you can expect her to be that, that, and that. These are prejudices or prejudices. My last factor is on the intricacy of the relationship between biological evolution, cultural evolution, and technological evolution. I accept that they are ineradicably inosculated. They are tied together irrevocably and we must accept that evolution for the future is not going to be all biological or all cultural, it’s going to be biocultural.

**Tough:** Biotechnical.

**Tobias:** Biotechnological, if you will. And it has been for a long while.

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*We are creating a world where the definition of human is disintegrating at the edges.*

**Gamble:** I would agree with much of that already, coming from the United Kingdom, which is about to become a disunited kingdom, if you will. In that case, devolution is on its way. One thing that has been bugging me is material culture in its wider sense, rather than just technology. It is material culture and how we relate to it. We have this universal ability as humans to anthropomorphize. The whole thing about material culture is that we’ve had two and a half million years of it, and it’s slowly become more and more externalized, where we now store our memories outside our bodies. That’s probably a misconception. Actually, it’s much more of an involve-

ment with material culture, but I think it’s just emphasized some of the points that Allen was making. We are creating a world where the definition of human is disintegrating at the edges.

**Tough:** They’re kind of familiar.

**Gamble:** At the moment, the way we treat objects is also transferred into the way we treat other people. That needs to be dealt with. One very clear example is, none of us here has talked about democracy and its demise. It’s very interesting that the way that most people have a lifeline into the world at the moment is through consumption rather than through democracy. I don’t know what the turnout rate in the last American election was, but I think it was about 52%, something like that?

**Facilitator:** I think it was about 43%.

**Gamble:** Look, in contrast, at the numbers involved in consumption as an activity that links them into the social world of being human and how they relate to other people.

**Facilitator:** If you threaten consumption, the polling goes up.

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*We expect technology to be our servant. In fact, it is our equal.*

**Gamble:** That may be, but it’s that involvement with the material world out of which we constitute our relationships and out of which we derive values and our understanding of ourselves. I think that’s something we are a little ambivalent about. We expect technology to be our servant. In fact, it is our equal.

**Deacon:** May I just add one point to that? I think we are very quickly facing an animate culture, in which it’s not just *us*. That was brought up a few times. When that happens, if you can talk to your toaster and reason with it…

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*...the image of ourselves in the future as a universal galactic species, in a community beyond our current knowledge…*

**Hubbard:** Just one comment to Phillip. We might look at the possibility that union differentiates. Is that the reason that we’re having globalization? One,
globalization is increasing through the internet, through mass media, through the environmental connection, all of which are inevitably connecting us. At the same time we’re differentiating. One factor that we might consider is to go through that. We’re going through an awkward period in the breakup of these superpowers.

Ultimately, it’s a virtue to have individuality or uniqueness show up ethnically and express itself more fully throughout the globe. I’d like to put a positive possibility on this dichotomy and say that it may be aspects of the same phenomenon. I want to include what Allen says because it’ll be so vital. So I see three things: the evolution of consciousness—a shift toward a more holistic unified cosmic consciousness as critical factor No. 1. Second, the evolution of the biotechnological quality of our human being, nature/body/mind. And third, developing an image of ourselves in the long-range future as a universal humanity in a galactic community, which then gives guidance to the powers of manipulation. So I would like to see as a critical factor the development of the image of ourselves in the future as a universal galactic species, in a community beyond our current knowledge but that we will know about when we grow up.

Facilitator: How many do we have? Ten. Let’s go around and poll. I know it’s unfortunate we have to do it this way, but we’re running out of time. How do we eliminate, what do we keep?

Hubbard: Let’s see what we can connect as being part of the same thing.

Facilitator: Something that I find very interesting is, I may be the only person in this entire group who comes from a totally different cultural tradition and a totally different wisdom tradition. Everything that we are aspiring to in a primitive intuitive sense is precisely what my culture described 8,000 years ago.

Hubbard: That’s good news.

Facilitator: The notion of being an individual and yet being a part of universality is a very old one. The concept of a system in its totality rather than individuals against something. A holistic view rather than a reductionist view. In a sense, we come full circle. It’s just that now science and technology will substantiate those intuitions.

Gamble: To use the metaphor of the river, we’ve got the river and that’s giving us our temporal flow for a thousand years. We’ve also got two banks to the river. One of them is globalization, while the other one is atomization. One of the problems is actually building a bridge between them. We’ve got prejudice and we’ve got tolerance on those banks as well. One of the tasks is to build a bridge, so I can see developing that metaphor in ways other than just having it as meandering channels and whatever might help those in formulating what we’re seeing.

Deacon: I have another way of thinking about dividing this. There are dynamics that we’ve picked up here, rather than problems and factors—dynamics. One of them clearly is this vicious cycle of technological evolution, cultural evolution, and biological evolution—how they influence each other, alter each other, undermine each other. That’s a dynamic. The other dynamic that you made so clear, Phillip, is the dynamic between unification and atomization. I also liked your notion of differentiation. There’s definitely a biological sense that as things become larger, they also become capable of more differentiation, and that’s not always bad news. So that is not so much a dynamic but now almost dialectic. Finally, there’s the dynamic of directionality or goal, which is coming to each of these discussions. Can we think about goals? Does it make sense to give a value to a future? Does it make sense to think about directions? Can we pick out directions? We’ve been trying to do that as well. One of those is the expansion into the cosmos, into other minds—other minds being technological minds; other minds being minds that we run into in the cosmos. That’s a directionality question. I see three kinds of dynamics: an evolutionary cycle dynamic that has culture, technology, and biology tied in—out of that, identity generates; and the unification, atomization, out of which also identity generates; and this directionality, also out of which identity generates.

Facilitator: So is the flow of the river the identity question?

Deacon: I don’t know how to fit that into the river metaphor.
Facilitator: Clive, you brought up the river metaphor. Is the flow of the river the evolution of identity itself?

Gamble: Yes.

Facilitator: The dynamics of these opposites?

Gamble: I think that’s it. It brings us back to consciousness, and it brings us back to human nature, or whatever you want to call it, and it’s going to change. It will also indicate where your foot is in the flow of the river. To accommodate Allen’s point, also along those banks might be planets and galactic....

Facilitator: Earth versus galactic. That’s the opposite.

Hubbard: Another thing I see is that the evolution of identity is so fundamental. We can already intervene in evolution. That’s not a question. We’ve been intervening. But how we intervene will totally depend on what identity we have.

Facilitator: It’s very simple. The question is, who am I and who are we?

Hubbard: It’s that question of identity and where we are going. It’s that question of identity and where we are going. Identity and vision.

Deacon: We don’t want to get too simple here. One thing about the river metaphor that we haven’t talked about is the movement of the river. We are assuming there is a movement here, but what we are talking about is, there is a series of forces at work, a series of things that cause the river to move. In the case of metaphor, it’s gravity and it tends to roll downhill. That’s certainly part of this. It will keep rolling downhill unless something stops it. There’s something else here, and we’ve been talking about it throughout this. These dynamics are really not about what’s on the sides of it but really about the movement process.

Hubbard: Yes. I’d like to get back to whoever it was who said that understanding how evolution works is so significant in the way we would intervene. I might come down on identity and understanding how evolution works as the two key factors.

Anderson: It’s worth remembering that even the idea of something like evolution has been with us since the day before yesterday.

Facilitator: That brings up another metaphor that I’ve been studying about recently. It is the notion of self-organizing criticality, defined with the metaphor of a pile of sand. Where the next grain of sand in a localized sense could be technology, in another localized area of the pile of sand it could be an extraterrestrial encounter; in a third sense, it could be prejudice, and in a fourth sense it could be a tendency to globalize. The idea is those grains of sand create avalanches locally and then at some point, that final grain of sand creates an entire change to the pile itself. This is Per Bak’s creation, not mine.

Tough: I’ve often been troubled by that, because usually there are collapses of order.

Facilitator: That’s correct.

Tough: Most of the criticality stories are, in fact.

Facilitator: They are catastrophic avalanches, yes.

Tobias: At this point, Barbara, are you, as our synthesizer, happy with our not going further on the question of direction? Where do we see this, where would we like to see this go? Is that at Stage 2 tomorrow morning?

Facilitator: I think the next aspect of the process takes us into other realms.

Tobias: Was this a matter of spelling out key factors first and then looking ahead and seeing what else is next?

Facilitator: This is a wonderful place to stop. I think we have come to the identification of what it is that we have been grappling with.

Gamble: Just one thing. I don’t want to flog this river metaphor to death, but I’m beginning to see that some of the things we are talking about are actually rocks in the river, around which this flow of identity goes.

I’m not so sure what to call the evolution of identity. I’d rather call it the construction of identity because we’re going to actively involve ourselves in the negotiation of what we want to know in how evolution works as we increase our knowledge, whereas
the evolution of identity suggests that we’re going to get whatever emerges—which is actually against what we’ve been arguing. So I think it’s the construction of identity. But that construction of identity is going to have to do some fancy footwork to get around some of these rocks in the river. The rocks in the river are going to change the direction of that flow, which takes us back to your point, Sesh, about the grains of sand being different in different places.

Facilitator: Right.

Deacon: Call it negotiation of identity. To some extent, we don’t have full control, but we can negotiate.

Gamble: Yes, sure.

Facilitator: There’s one problematic issue with the construction of identity, though, and that would be the process of construction of identity. Even there, the construction of an identity presumes there is the possibility of a group of people sitting around, saying, Okay, let’s construct the appropriate identity. Even that is going to have its own particularities and its own fractional views, but it can eventually merge into a construction of an identity.

Anderson: It’s fallacious to assume that things that are done deliberately…are done by a group of people sitting around a table.

Gamble: Not for a moment am I suggesting that there’s a blueprint there that we are following.

Tobias: May I make a compromise, Clive? If, by going over to negotiation of identity and totally excluding evolution from that, I think we may be in danger of losing out on one side of that which enables us to negotiate an identity. I would rather see us, even if it’s a bit ponderous, refer to evolution and negotiation of identity.

Facilitator: That adds the element of instrumentality.

Tobias: Of the present?

Anderson: Absolutely.

Tobias: Predict the future, so I accept that we should add that.

Hubbard: We need to put images of the future—not one vision, but images of the future are a critical factor.

Anderson: There’s something happening that’s analogous to—what was that wonderful phrase you used about the extension of vision backward?

Tobias: Oh, the archaeological imagination.

Hubbard: Did we say that the idea of the direction of evolution or a vision toward which we’re going is not a critical factor?

Anderson: We should.

Tobias: We’re deferring it till tomorrow.

Gamble: No change is not an option.

Hubbard: So we are deferring it.

Tough: I think Barbara suggested earlier that positive vision is one of the most powerful factors of all.

Hubbard: I want to offer that again. Having a positive image of the future is a critical factor now.

Tough: It’s very important.

Gamble: This could come back to Walter’s point about people sitting around the table saying this is where we are going to go.

Anderson: I agree that visions of the future, whether they are positive or negative—you know, is the climate going to get worse? Is this going to happen? Those images that we’ve worked with are certainly critical factors.

Hubbard: We need to put images of the future—not one vision, but images of the future are a critical factor.

Anderson: There’s something happening that’s analogous to—that wonderful phrase you used about the extension of vision backward?

Tobias: Exactly, yes.
Anderson: That needs clarifying, too, because we need to see a kind of globalization that in itself makes atomization possible.

Deacon: Right, that’s the differentiation notion, which I think should go right underneath atomization.

Anderson: Yes, and that’s what Barbara was getting at. That’s something we haven’t talked about yet.

Gamble: I think we were saying atomization could have a negative aspect, so that Balkanization…

Hubbard: Polarities lead to a synthesis. It’s a dialectic.

Facilitator: What topic areas need elaboration where we can use the expertise of participants here and help us make a better case?

Hubbard: One topic that’s been mentioned by quite a few people is the subject of the way evolution works. That’s a topic in which there’s expertise spread throughout this group.

Tobias: Would that be under the subheading of biological?

Hubbard: No, it’s broader than that. I am speaking of the whole idea of cosmo-genesis, the incredible lessons from the origin of creation to us and beyond.

Tobias: Could we put in my personal special request, linguistics, because it has both the biological underpinning and a cultural referent?

Facilitator: Cultural connecting link. We have the experts to lead that group.

Gamble: Could I suggest that globalization is a bit of a catchall? It seems inherently understandable, but once you start dealing with it, it’s a lot more complicated.

Anderson: I’ve discovered that when you start talking about globalization, people are usually talking about two different things. They’re talking about what people get exercised about these days, which is essentially economic globalization, or they’re talking about the large kind of process that has been more in reference to here. People are frequently talking totally past one another.

Tobias: It breaks into the two you just mentioned, Walter, about the geopolitical, which is the groupings of nations, small groupings of nations.

Gamble: It comes back to identity again.

Facilitator: Cultural globalization or cultural synthesis or cultural multiculturalism, under various headings.

Anderson: I usually categorize globalization under four headings: economic, cultural, political, and biological.

Facilitator: Explain biological.

Anderson: It’s one of the things that people tend not to pay attention to when they talk about population explosions and the mobility of people: mobility of life-forms, of plants, animals, and organisms. There is evidence that it’s escalating and is an irreversible biological transformation.

Hubbard: What we haven’t mentioned is environmental. We’ve left out the fact that even as part of globalization, we realize it’s one living system and practically all interconnected environmentally.

Tobias: It almost boils down to geosphere, cosmosphere, sociosphere, biosphere, and, if you wish, the one I’ve invented, technosphere…

Tobias: It almost boils down to geosphere, cosmosphere, sociosphere, biosphere, and, if you wish, the one I’ve invented, technosphere.

Gamble: There’s one that you mentioned earlier. Teilhard de Chardin.

Several: Noosphere.

Tobias: Noosphere. Yes, it’s Julian Huxley’s psychozoic.

Deacon: Unification of mind.

Tobias: They both use different words for the same concept. Future of life, or evolution, will be all at the psychological level. That’s what those two men said from different standpoints.

Deacon: This is the parallel we have there. The dichotomy of atomization and globalization applies to things outside, but it’s equally the same dynamic that Barbara is talking about in terms of consciousness issues. In a sense, globalization of mind, the noosphere.
Hubbard: Right, and a different identity from the separated selves.

Anderson: The subject that I would suggest, but as a separate heading, is the general subject of governance and governance systems. It’s relevant to Phillip’s point about what kind of global system we are evolving. I’m inclined to think that it’s not becoming, or likely to become, a global government, but rather a loosely linked complex of many kinds of governance systems that interact on a global scale.

Deacon: One thing we haven’t talked much about that is implicit in everything we’re saying is what kind of future we envision, and that it is essentially an ethical dimension. We have not really touched upon ethical dimension. It’s part of the identity question.

Tobias: It’s possibly a human question.

Deacon: The nature of what a human is.

Gamble: Is that under governance, too?

Facilitator: It starts to merge now. It’s ethical in terms of globalizing. It’s also involved in terms of government.

Hubbard: And also, fundamentally, it’s an identity, because if you have an identity that relates to the whole rather than just a part, then you’re going to be ethical in a way that’s different than if you’re being forced to be ethical as a tribal, religious, or national member. Following the Golden Rule becomes natural if your identity is connected to the whole.

Facilitator: I’d like to go back to the question, can we engineer human nature? We’ve basically said, “Yes, of course, it’s going to be entirely possible,” but I’d like us to explore that.

Deacon: I think we can manipulate human nature.

Tobias: Make a goal heading of what is human, because it’s part of the other aspects, the spiritual and all the rest, that answer what is human.

Deacon: That may change.

Tobias: If you like a simpler level, biological.

Tough: Another important factor is our expansion into space, which can include contact with extraterrestrial intelligence. There are at least four experts here that know space.

Facilitator: The whole subject of SETI.

Tobias: And nicely summarized by somebody who asked, “Do the Gospels apply in outer space?” Very nice, jiffy summary of the agonizing problem.

Anderson: Could we also ask whether they apply here?

Gamble: I think the last topic to explore is images of future visions. I’m not quite sure what’s in that one. That’s a black box to me.

Tobias: We haven’t quite finished what it is to be human; we’ve only started the biological.

Gamble: Isn’t that actually in our river to some extent, Phillip?

Deacon: We should definitely put it in the river. It’s the identity of what it means to be human.

Gamble: Yes, it’s the evolution and negotiation of identity to be human.

Hubbard: That is fundamental to the question of identity.

Deacon: It’s a species question, a consciousness question.

Gamble: We should probably put evolution back in the river.

Tobias: But then, what headings are you going to put under the biological? We need a few more. There is a political component.

Deacon: Social and political.

Hubbard: And spiritual.

Gamble: We’re seeing a lot of subheadings that are crossing all these groups now. Maybe we could put cultural in there as well?

Deacon: One of my questions about that is under biological, and that is this boundary between humans and things. I don’t know how to talk about that exactly, but to some extent I think we’re going to be faced with how to decide whether things are human.

Tobias: A biotic interface.
Deacon: That’s right. We are going to have to make ethical decisions about our devices, and that’s a question about whether they are human. It’s the same question about extraterrestrials. Are they human too? Is a definition of human something that is not a biological definition, not a cultural definition, but something larger than that? We can interfere with that definition and change it, and it will change us when we do that.

Anderson: In the same general ballpark, you could easily project the evolution of various prosthetic devices and computer uses, so you start out being an us but becoming a part of something else. What it comes down to is that the boundaries between what is human and what is not may become increasingly fuzzy.

Tobias: Under what is human, we need the changing concept of what is human. What is meant by human in the year 3000 may be almost unrecognizable to us.

Hubbard: We didn’t put in the side issue of possibly overcoming physical death. That is as huge as extraterrestrial contact.

Deacon: And the issue of simply prolonging lifespan.

Anderson: I like the idea of prolonging lifespan. That is another one of the inevitables, I think, that Phillip started that list with, and I think there are a lot of them.

Hubbard: That leads to the whole phenomenon of older and older people dominating on Earth.

Deacon: But they may not be old in the same sense.

Hubbard: They’re not old, they’re new, and getting younger every day…. It takes a long while to mature to the edge of your own creativity.

Deacon: That’s when you get this long extension.

Hubbard: That’s a huge issue for what it means to be human, if we are going beyond the animal life cycle.

Deacon: Exit from the biological, that’s what we’re talking about in all of this. Can’t leave it, but you can make it so different that it’s not like what we thought.

Facilitator: Just at the end of your cycle, you reproduce yourself?

Deacon: Here’s the interesting thing: I wonder if you wouldn’t have remade yourself a dozen or so times and forgotten identities. In a sense, it’s a problem of persistence of memory.

**Continuity of consciousness through different bodies is probably what will happen.**

Hubbard: That’s what I’m thinking. Continuity of consciousness through different bodies is probably what will happen.

Facilitator: That’s reincarnation.

Hubbard: That’s it, except that there will be no dying and being reborn. Not necessarily.

Anderson: Keep in mind that there is a spectrum from the inevitable to the speculative in this. The life-extension, life-enhancement part of it is already here. When the question becomes “how far does it go?” and “what kind of forms does it take?” it becomes more speculative. If you keep in mind the inevitability part, it reminds you it’s not that far out.

Facilitator: We’re talking about immortality. Sustainability should be put right next to it. We can’t have starving immortals, but then if you’re immortal, you probably don’t need to eat anything.

Tough: We haven’t talked about nanotechnology, and if it happens—as now looks pretty likely—it’s going to solve the food problem and a lot of other problems as well.

Deacon: So many things that nanotechnology will influence are part of this complex problem.

Tobias: Consciousness was raised in a study, but we haven’t addressed consciousness as such, of which its continuity is one facet. There are other facets too, but I don’t know whether we have expertise in our midst on that particular component.
Deacon: There are two ways to think about the problem. One is that we all seem to know what we’re talking about when we use the word, and the other is that we don’t know what we’re talking about when we use the word. Nevertheless, I don’t have any doubt that we’ll understand what we mean when we use the word, that we will be able to produce it in devices. The consequences of that are very hard to fathom, because that’s the identity question.

Hubbard: You know what’s interesting? Just taking an old-fashioned idea that we’re created in the image of God. That’s what’s happening. That’s what gods do. Maybe this is our original image.

Facilitator: There’s a book this reminds me of. Essentially, the substance of it is that our sense or our definition of ourselves and our consciousness is simply a momentary concoction on a biological basis, and it’s nothing more than self-deception, all biologically based.

Hubbard: That’s the other side of the picture. That’s the dichotomy.

Tobias: That sounds very much a sociobiological concept.

Anderson: It opens up a dimension we haven’t looked at today. In the book The User Illusion, subtitled Cutting Consciousness Down to Size, the author points out that a relatively small amount of our brainpower is devoted to consciousness cognition. The unconscious is in some ways clearly a part of rational cognition, the author states, and we couldn’t have consciousness without it. In a sense, it updates the Freudian or Jungian models of consciousness. We’ve used the word consciousness, but clearly unconscious cognition is inseparable from it—in human life, at least…

Facilitator: The old systems would tell you that a subject/object duality does not allow you to study consciousness. You are it; you experience it.

Hubbard: That’s it.

Facilitator: So now we need to zero in on the topic areas that we are recommending we study. There’s a quote in the book that addresses immortality, the physics of immortality: “Life is information preserved by natural selection.” The sense of my mortality is not so relevant as the fact that the information that gets passed on is what is immortal, and that’s really the substance and the sense of evolution.

Deacon: But I am passing on a great deal of information that came into me…

Facilitator: Through the gene code.

Deacon: But also without the genes. It came into me as social information and that information is perpetuated equally, so I was making the point earlier that, in fact, a tremendous amount of me in that regard is that stuff.

Hubbard: That’s the memetic code.

Anderson: The cultural DNA.

Tobias: That gives us a very wrong impression, because a large part of evolution today is not considered to be by natural selection. It is one part of the story and not everything in the makeup of a modern species has been naturally selected. It’s a mistake to look at a particular feature and say, “Gee, what was the selective advantage of that thing with that shape or a nose this shape?”

Facilitator: A lot of coincidence and accident.

Tobias: That’s right. So there’s the pan-selectionist fallacy that every single thing has a selective advantage, otherwise it wouldn’t be there.

Facilitator: We need to zero in on the topic areas that we are going to recommend.
Gamble: One of the areas is the baggage of the past that we bring with us to these situations, which is also the material on which natural selection can work and cultural selection can work. I think we can look at that a little bit more, not from that simplistic sense in looking for lessons from the past, but to see how the evolution negotiation of identity has taken place in the past and what’s kicked it in different directions.

Deacon: There’s a term we haven’t mentioned here that I want to ask about. I think it’s implicit in a number of things, and that’s the term intelligence. I think it was implicit in questions about consciousness. It was implicit in questions about extraterrestrial contact. We’re talking about certain kinds of intelligence.

Anderson: There’s artificial intelligence.

Deacon: That’s right. But there was an implicit notion that something like intelligence—I don’t mean a person’s intelligence, but something like global intelligence, information more than anything else—will accumulate. That’s not necessarily a given, but it is something that we have been talking around.

Facilitator: The externalized totality of intelligence.

Deacon: The totality of intelligence, internal and external, and perhaps even genetic could be considered.

Facilitator: Let’s choose which three or five we’re going to hang our hats on when we go meet with the rest of the groups.

Hubbard: There’s some overlap, such as changing the consciousness of humans and the development of consciousness.

Tobias: Can human consciousness and intelligence be wedded together?

Hubbard: And what it means to be human—so critically connected to consciousness.

Facilitator: So should the three belong?

Deacon: I would locate that closer to the one down at the bottom that says overcoming physical death, the lifespan issues.

Hubbard: Part of what it means to be human.

Tough: I have a suggestion. Why don’t we go around the table and simply each choose three, and then maybe cluster once we see which ones get a lot of votes. It will cluster some other ones around those.

Facilitator: Okay, you start.

Tough: Moving beyond the planet and the way evolution works.

Deacon: The way evolution works is one we have to put in there, and the complex of identity and what is human, and perhaps consciousness, in that complex of what is human.

Facilitator: Identity, what is human in terms of identity, intelligence, consciousness.

Deacon: That’s right, but I want to make sure we have the other aspects of biological, social, political, and along with that goes exit from biological, part of what it is to be human.

Tobias: I’d go along with the latter two, but I’m not sure if ethics is subsumed under any of the existing ones.

Facilitator: We talked about governance.

Tough: Ethics could be separate for now, anyway.

Facilitator: Global governance and ethics?

Tough: We just said ethics, we didn’t say governance.

Tobias: Ethics, including one dimension at the global level, governance level.

Gamble: I’d change what is human to what will be human. I’d like to get a little futurespeak in there.

Deacon: I like that.

Gamble: I’m sorry to see globalization disappear as a topic. Oh, we’ve still got that, haven’t we? I’d like to put it on this list. I think you can dig into key issues there at a variety of levels.

Deacon: Is there another word? We’ve been talking about expansion in a variety of different forms. That’s what we’re talking about in some sense.

Tobias: I use the word synthesis in my statement. I don’t know if that’s quite a synonym of globalization.

Hubbard: I’m just wondering what globalization and governance will be like. We need an emerging governance. It’s like what will it be like to be human, but...
we’re really talking about the emerging governance taking into account globalization and atomization.

Deacon: Globalization and governance of the biological. All the aspects of the spheres, of the geosphere, biosphere, and technosphere, are governable.

Hubbard: That’s right.

Deacon: You have to negotiate them.

Anderson: I would vote for globalization, governance, the way evolution works, and what will be human.

Hubbard: I would vote for the way evolution works and what will be human, and I would include in that moving beyond the biological life-cycle, and moving beyond the planet, because that’s part of our extended capability as a human, becoming a galactic species.

Deacon: The definition is part of where we are and which entities we call ourselves.

Gamble: There’s a boundary condition there.

Facilitator: I think it’s such a radical departure in terms of moving beyond the planet that I think it stands on its own.

Hubbard: It could stand on its own, but so could exiting from the biological life-cycle. It just depends. Is it better for us to lump it or is it better to have separate rungs, because each of these has a real identity? Just what is preferable from the point of view of the process?

Tobias: We have only five, so could we keep it?

Facilitator: Well, let’s go with that.
Eight participants composed the second group preselected for a discussion on the most critical factors that will shape humanity over the next thousand years.

Facilitator: Glen Hiemstra
Participants: George Cowan
James Dator
Howard F. Didsbury
Ashok Gangadean
Seymour Itzkoff
Yersu Kim
Rosaleen Love
Frederik Pohl

Glen Hiemstra (Facilitator): Our task is to generate a list of potential answers to the question: What are the most critical factors relative to the long-term survival or flourishing of humanity over the next thousand years? Then we want to choose from those the four or five that we consider to be the most critical as of today. Let's suggest what those critical factors are.

Did you think we were going to be able to do that today?

Didsbury: In our own society, this fantastically prosperous society, we have 45 million people who aren't covered by any kind of medical insurance. That's what we're talking about.

Itzkoff: In evolutionary history, whenever you find two closely related races of species having the same ecology and environment, you find that one tends to drive out the other by reproduction or other evolutionary factors. That may be what you're speaking about. The have were the Homo habilis, Homo erectus; the have-nots were the australopithecines. The australopithecines were driven into extinction; they were the have-nots. That's one way one can conceptualize.

Pohl: I'd like to back up a little before we get into specifics. I think there are three classes of critical factors: natural disasters, self-imposed disasters, and opportunities. Howard talked about one of those self-imposed disasters. Others might be war or that sort of thing. Natural disasters include everything from global warming to maybe the eruption of a supernova in our own galaxy. Opportunities include...
things like life-extension and what I call mind extension, which might have something to do with computers or some ability to make us think better. As far as I can see, all of the critical factors in determining the future fall into one of these categories.

Gangadean: On the subject of have and have-nots, if there really is a cultural split between spiritual awakening and more egocentric culture, we have to reconsider what is meant by have and have-nots. As Jesus pointed out, in terms of who’s poor and who’s rich spiritually, there’s another axis of have and have-nots that we should consider as well. It’s not just in material matters. There are those who are impoverished spiritually who may have a lot materially, and those who may not have a lot materially but are wealthy in spirit.

Kim: I think that the most critical factor for humanity in the coming decades or centuries is the absence of some sort of consensus regarding the basic values governing the behavior of humankind. I don’t think there has ever been a society in human history where there has not been a consensus on basic values, and yet society has prospered. Today human society is becoming more and more global, and many of the problems are the same kinds of problems and many of the aspirations are the same kinds of aspirations and so forth. It seems that there is really no basic consensus regarding the set of values that govern human behavior in this global age. So the question regarding the consensus on the basic values seems to me the most critical factor as we move ahead in the coming millennium.

Facilitator: Do you see that as a process of discovering whether or not there are universal ethical values?

Kim: My personal view is that this is a multilayered process. There is, of course, the empirical process of going out and trying to decide which values are common to different societies, but this is only a small part of what could contribute to the eventual consensus on values. The most important source of this eventual consensus is perhaps the problems that humanity will be facing. One sees what the problems are and these are problems that are becoming more and more common. They are problems facing different cultures and different societies, but the problems are the same. By trying to decide what the values are that will be most needed to deal with these problems, and from the commonality or universality of the problems themselves, you get the commonality or universality of values on which you eventually have a consensus. It may require a very explicit kind of intervention on the parts of philosophers, the nations, international organizations, and commissions. But there may be others that are almost unknown in the conscious or unconscious process, and the values may emerge out of these, and these values have to be forged into a dynamic consistent whole.

Facilitator: One participant commented in the pre-conference statement that there is a negative tendency to take any problem that humanity faces and immediately interpret it as a values argument.

Itzkoff: That’s the problem we have in terms of creating something called futurist studies. We could jump into what you might call political studies or political planning and then what we’re doing is politicizing the discussions. My feeling is that when you take the issue of futurist studies, you can’t go from one day to the next in terms of predicting what’s going to happen. It’s a very complex system. I feel we pursue a methodological futurism, given the complexity of the system, given the accidental character, or events that lead from one thing to the next. What develops is a methodological futurism, looking at the species in terms of how we go about solving the problems from day to day, from moment to moment. Could we
reach our year 3000 goal without specifying what that goal should be? If this were 1899 and we were sitting around a table asking what the world will look like in one hundred years, people listening to us in 1915 or 1920 would have figured that we were fools. So rather than talking about substantial futurism, I would argue that we think about it as methodological futurism, and talk about the kinds of intelligence, the kinds of thinking, the kinds of attitudes in which we can solve the problems day to day, so we can realize some kind of basic humane goals that you may be able to agree upon.

Dator: I take the opposite view. My problem in addressing the topic is that it has goals and visions set into it. It talks about the survivability of humanity as though that’s something that we ought to be concerned about. I think that needs to be problematized, and that can be done only by raising some sort of a vision statement about what we consider to be good.

Futures study, as I understand it, has absolutely nothing to do with predicting the future. The future is not predictable, as you’ve all indicated. It seems to me the only thing we can do is take a preferred futures perspective on the one hand, or an alternative futures perspective on the other. How in the world do we know what a problem is unless we know where we’re going or where we would like to go? Some of the things that we’re worrying about now may be nonexistent in terms of the longer-range vision we might have, or they might be things that will help us, depending upon where we want to go. For example, if we consider that humanity is a cancer on society and the sooner we do away with it the better, then the things we might consider to be problems are, in fact, speeding that along.

Facilitator: Perhaps we could raise these as two different critical factors. One critical factor is the ability to solve problems. The other is the ability to think about alternative or preferred futures and to think beyond problems. There’s a tendency, when you ask what the critical factors are for survival, to make a list of problems, but it doesn’t have to be just the disasters.

Dator: You don’t know what the opportunities are if you don’t know where you’re going.

Itzkoff: My value arises out of my interpretation of the human evolutionary hegira, this trip we’ve been on for the last several million years. It’s a trip embodied in the continuum of expansion of the human brain and human intelligence. One definition of human intelligence is the ability to solve problems in terms of the survival of the species. We’ve achieved where we are now through the workings of human intelligence, as fallible as our achievements are good. My argument is, if we are going to continue on for 3000 years, we have to perfect this evolutionary value that is the existence and development of human intelligence. The australopithecines didn’t have it and they disappeared. Maybe we should disappear, I don’t know. If we’re going to continue our evolutionary tradition, this is where we must go.

You don’t know what the opportunities are if you don’t know where you’re going.

Dator: You don’t know what the opportunities are if you don’t know where you’re going.

A prediction is not simply a continuation of what’s going on now; it’s something that hasn’t happened yet.

Pohl: From the point of view of other species, we’re not all that great.

Kim: There is a certain limit to the kind of skepticism or the intellectual purism one can bring to a discussion of this sort. You say that the future is not predictable. I’m not sure that one can accept that statement in such a blanket form. For instance, the Korean Society for Future Studies made a prediction as to when Communist China was going to join the United Nations, and our prediction was exactly to the point. This kind of elementary future prediction is, to some extent, possible. Regarding the difficulty of understanding have-nots and have-haves, if you say have-nots are those who are now starving and have-haves are those who are not, but instead have enough to eat, have sufficient clothing and housing, that is very clear and on these questions I think one need not quibble. I just say this to come back to your point: where are we going? Now one can say with some certainty that most human societies today have clear goals as to where they are going. One is surviving and one is prospering. Maybe they should not be separated. It’s survival with prospering. As to the concrete content of how you want to survive and how you
want to prosper, that may be a point of dispute. This is one of the reasons why I am rather optimistic that perhaps 100 years, 200 years from now, we'll have some kind of consensus on values, because there are already these inarticulate values that are in the minds of most people and societies. Perhaps concerning ourselves in a serious way with the common values would enable us to reach a certain level of consensus even with the question of values.

**Pohl:** I'd like to pin down what we are talking about in the use of the word *prediction*. Thirty years or so ago, The Rand Corporation ran a series of experiments that they called the Delphi Methodology, trying to predict certain events in the future. After about 15 years, they checked on these predictions and found out that most of them had no relation to reality. The ones that were quite accurate had to do with space and military weaponry, and the reason was that, by the time these predictions were made, the plans had already been set. Things were in progress. So these were not really predictions at all. In the same sense, if you want to predict the entrance of Communist China into the United Nations, it's fairly easy to see when that has to happen because it's an ongoing process. It won't help you to predict things that have not yet begun to happen. I don't think there was any way of predicting the Cultural Revolution or the great leap forward and those were key events, but they happened without any continuing process. A prediction is not simply a continuation of what's going on now; it's something that hasn't happened yet.

**Gangadean:** I have found that when you're immersed within a cultural perspective, say a European perspective of philosophy, and exclude the Hindu or the Buddhist or the Chinese or the African, you lose something. But if you can step back and learn how to listen to the different stories on a global scale, some deeper patterns begin to show themselves over millennia. If you have a read on that, perhaps you can get a more secure sense of deep trends and trajectories unfolding. As I have listened to the wisdom of different cultures on this global perspective, one thing that has emerged for me is that the great minds have noticed that how we conduct our thinking vitally affects the nature of our cultural condition. One such trend that begins to take on global weight across cultures is that there is such a thing as egocentric or monocentric minding, or a way of processing reality. A thinker objectifies the content and that has consequences that we may not have perceived enough. Seymour’s remarks, about those who have it will make it and those who don’t will perish, come to bear on us now. From what I can see, gathered from Jesus, Socrates, Buddha, Confucius, all the way through to Gandhi over centuries, is that unless you move out of that egocentric pattern, there has been a cultural disaster. Disasters quite often are man-made and result from the way we are thinking. You begin to see long-range trends emerging and one aspect of cultural evolution is that you can begin to see a movement from this egocentric way of thinking to a more dialogic way of behavior. I’m beginning to get a certain confidence that something painfully slow but inevitable seems to be playing out. As the dialogic forces peak, the egocentric forces have to give.

**Itzkoff:** How will we know that the dialogic forces are winning? The turn of the century is a testimony, it seems to me, that they are losing.

**Gangadean:** What has been missing from the stories of philosophy, both East and West, is finding a common core out of which the different worldviews have arisen. What are the laws and the transitions? What is the fundamental ground? Yet the great philosopher traditions seem to be seeking some primal principle and naming it differently. My own work is focused in trying to bring that out even more. I use *logos* for that fundamental primal name out of which the worlds arise. That’s vital for us because, if one begins to recognize the presence of the logos, that’s a very powerful force; if the logos is the infinite word, it’s presiding every moment. And if that’s what’s moving historical evolution over the millennia, then we’ve got to factor that in, and that tells us something...
about whether dialogic forces will emerge. I think it’s problematic whether the egocentric forces will dominate. What I would like to see up on the board is how we are conducting our culture making and how are we conducting our minds.

**Love:** I put down a critical factor for peace, with a number of different points, one in terms of conflict resolution and another in terms of living in societies in which individuals are cherished. Part of what I was working on when I wrote about the Great Barrier Reef was what the nature of happiness is. What is it about this particular place that brings happiness to so many people, whether the tourists or the indigenous people who live along the coastline of Australia, who call themselves the Saltwater People and who themselves feel a happiness in this place that they articulate very clearly?

**Cowan:** Regarding the original question of what are the most critical factors, it’s possible that the most probable state of humanity will be degradation rather than flourishing and that progress is not inevitable. The future may, in fact, see a termination of humanity and the rise of some other superior life-form. However, if it is going to flourish, a prerequisite of that is energy. We are using exhaustible supplies of energy and unless they are replaced, there is no question that mankind will not flourish. Another prerequisite is food, which is dependent on energy, and that, in turn, is dependent on water. All of these things are exhaustible. If you have an inexhaustible source of energy, you can solve the food problem, you can solve the water problem, and you can continue to support 10 billion people or 12 billion people in a reasonably prosperous state. The social justice factor will become more important than the economic factor. But everything depends on solving the problem of having essentially an inexhaustible supply of energy.

**Facilitator:** Where we’re really driving is to a final statement by you conferees of what are the most critical factors that we should pay attention to. In your own statements, there was some common ground and some disagreement. It would be interesting to spend a few minutes sharing what those are and see what of these are critical. Then do the task of listing out the topics that ought to be discussed. What I propose we do is go around the table, one by one. Say what your preferred vision for a thousand years from now is, and what the most critical factors are. You could pick up to five. We’ll tally them and be able to see the two or three that stand out as the most critical. If there is another factor that is not there, feel free to add it, but we don’t want to get too far off into that. Then we might hear about what our visions are, sense what the commonality is, and be able to see what the most important factors are today for us.

**Gangadean:** My statement is distilled from 30 years of work leading up to a book I’m working on called *The Awakening of the Global Mind*. My field is primarily logic and ontology. Ontology is the science of the systematic investigation of reality. When you look across cultures and listen to the great teachings that have endured for centuries and millennia, there are certain patterns that are very striking. How we conduct our minds shapes our realities. One global truth I would argue for as emerging philosophically across the ages is that we participate in shaping our reality. Therefore, we must attend to the technology of how we shape our worlds, our thinking. The traditions are still in terms of ethics and spirituality and that humans flourish when we overcome egocentric thinking and enter a more holistic, dialogic, integrative mode of thinking. We flourish when we move into that kind of world-making. When you look at that picture of these millennia, it’s clear we are at a crisis moment that has been building for more than 3,000 years. If we don’t get through this impasse, there will not be a long-range future. If we can’t wake up and break the chronic, dysfunctional patterns of egocentric thinking that produce pathologies of culture, we will not be sustainable.
tional patterns of egocentric thinking that produce pathologies of culture, we will not be sustainable.

I’m not thinking about predicting the next thousand years, but looking at 3,000 years of this painful struggle. We’ve reached the point that if we cannot get through this and see the consequences of how we’re thinking—racism, internal violence, ecological violence, fragmentation—all of which have a common pattern or source, we may not survive. The vast range of pathologies of the human condition that threaten our survival and our flourishing traces to how we’re making our world and how we can do it differently. If we don’t get through that together, we will not have a sustainable future. Human flourishing means that individuals thrive in their creativity and autonomy, individually and together, with equity among people, democratic values—democratically in the sense of a community of humans who can live in individuality and distinctiveness and yet together in a common corporate flourishing. That is one of the preconditions that turn upon moving our egocentric thinking to dialogic.

**Facilitator:** So that ties together both your preferred view and what you think is the most important factor.

**Gangadean:** Exactly. It begins to address the many other concerns. There’s a certain sense of the haves and have-nots, the economic question, the energy question. All of these aspects in our world trace back to that.

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**Cowan:** You are the center of your world.

**Gangadean:** Exactly, and there is a split between the thinker and the object, so that you objectify, rather than having a dialogic in which I stand in relation to this glass such that it shapes me; I shape it; we are interactive.

**Cowan:** I understand.

**Gangadean:** Yes. It is Martin Buber: the I/it and the I/thou would be Buber’s version of that.

**Pohl:** I understand what you’re saying; I’m just not aware of any examples in history with non-egocentric people. If they have existed, I’ve never met them.

**Gangadean:** The outstanding teachers who have been teaching the move into dialogue like Jesus.

**Pohl:** Jesus was possibly the most egocentric creature in the world. He was telling people to behave more like him.

**Gangadean:** If you look at it egocentrically, you could see that, but the main point of Jesus is that unless you die, you cannot be born again. Unless you let the ego identity go, which is what the Buddha is saying as well, you cannot become a flourishing human being. Plato was saying that in a different way, too: that we live in a cave of attachment to objects of the senses.

**Pohl:** He wasn’t talking about relating to the objects. He was talking about perceiving them, which is different from what you were saying.

**Gangadean:** There are problems of doing it as in Plato, but I am simply saying that when you ask, “Are there any cultures....” For example, in the Hindu culture, the yogi is one who ostensibly breaks the ego barrier and enters into a more organic way of living. In Zen, it’s the one who breaks out of ego and lives mindful of the moment.

**Pohl:** I’m aware of what the definitions are. I’m just not aware of any of those people existing.

**Facilitator:** The fact that we haven’t done it before still does not determine it’s not a factor. What is your preferred view and which of these factors stand out as the most important?
Kim: The view of my preferred future would be something like this: a world in which people in general, societies, nations, and so forth, have fairly similar notions as to what it is to flourish, to prosper as individuals, as societies, and as nations. I don’t know how long it is going to take or whether it will be possible at all to come to some kind of consensus on this. Without such a consensus or the movement toward it, cooperation between peoples, individuals, and societies is going to be very difficult, making survival of human society itself impossible. I am convinced that we have had such a consensus during the last 300 or 400 years, when the main task of humanity was to industrialize and to modernize. This has provided humanity with some common notion of what it is for human beings to prosper in this world.

At the beginning of this century, the world was in a very real sense one world. I don’t think there was any society or any nation in this human community that did not embrace in some fashion the Western notion of industrialization and modernization. The process of this synthesizing of values dates from the Renaissance—about 400 years. Beginning from about the 1970s, the process has begun to erode from its inner contradictions and contradictions with the historical and material forces that this view itself had created. I’m thinking of environmental problems and the population problems. Today, there is no persuasive notion of how humanity should go about the task of survival and flourishing and prospering. We are in the midst of efforts to form some kind of consensus. Four different groups of problems have to be dealt with for humanity to arrive at some kind of consensus. For what purpose do we live? There has to be some kind of consensus what it is for human beings to be happy. That would really be a long step forward. Closely associated with that is our relationship to nature. How do we see ourselves in relation to nature? This is a long cultural discussion and I don’t think that today we have a consensual view on how we should view nature. These are problems that need to be dealt with. The question of justice has been mentioned many times. How do we come to some kind of equity in distribution of material as well as spiritual and intellectual wealth? How do we stand vis-à-vis the future generations? We need to have some kind of leverage with which we can work. Finally, there is the relationship between individual and community. How do individuals stand to the communities of which they are a part and without which they would not exist? How do we fashion the relationships to the communities? So these four questions seem to me essential, and would have to be considered both individually as well as collectively if we are to arrive at some common notion of human survival and prosperity.

Facilitator: So we would check for nature, happiness, haves and have-nots. We might add also relationship to nature, relationship of individual to community; we might actually make two new ones there. That would be justice. Add two new factors—relationship to nature and relationship of individual and community.

Dator: I don’t disagree with things that have been said, but my perspective is quite different. It’s been formed, for example, by an article by John Platt a long time ago about the acceleration of evolution. There has also been a more recent book by Susantha Goonatilake entitled Merged Evolution, some of the things by Barbara Marx Hubbard, by Walt Anderson, and by Ben Finney, that lead me to problematize the future of humanity, to ask why DNA created humans. What are we supposed to do? I look at the problematic nature of humanity, all the wonderful things and awful things we could do. My vision of the future sees us as Arthur Clarke said a long time ago, that we are the missing link between preintelligence and intelligence. We are not very intelligent ourselves, but we are very good at emotional things, and that’s part of our strength and our weakness. Maybe that’s what we are doing through artificial intelligence, genetic engineering, nanotechnology, and especially the speciation that will result from humans trying to adapt to life on other environments; maybe all that is creating our intelligent successors.
So the vision I see a thousand years from now doesn’t have humanity in its present form at all, but a variety of intelligent life-forms, most of which are those that humans created. They’re our children and great-grandchildren. While I am optimistic about SETI and the existence of life outside the Earth, I’m also empowered in the feeling that so far we have found no intelligent life-form. We haven’t even found any biological life-forms. Ian Pearson’s argument is that biology doesn’t have a very bright future, either. Biology is a strange thing that happened here and doesn’t seem to be happening elsewhere, at least in the solar system, and maybe not in the universe.

What we humans need to do is shed our containers and transfer intelligence into forms that can live in a nonbiological universe. I see a lot of factors moving toward this. One is the general recognition that we create events in our world both in our minds and our technologies, as humans destroy the environment. You can pretty much be sure that when humans show up, there goes the ecology. We think about Mars in terms of terraforming it—making it Earth-like. I think a better thing would be to imagine how life could evolve to live on Mars as it is now. That seems to suggest a silicon base. That may be what DNA is trying to do: evolve us to this form of intelligence so we can move to a form that enables us to live in a nonbiological universe.

Facilitator: Which of these factors stand out?

Dator: We are the enemy. Humanity thinks that it is something important rather than a process toward intelligence.

Facilitator: We’ve got a few more to go. I’m going to impose a new rule, which is about a two- or three-minute time limit. It is unfair, but if you could zero in about two or three minutes, that would help. Then we’ll step back and ask what we have. It’s diverging more than converging at the moment.

Love: I’ll try to converge a bit. I would like to see what it would be like to be a woman in a thousand years’ time. I would like to imagine it as more like my own life than like some other women who are living today. Would nonbiological objects have nonbiological children? We may still have children in a thousand years.

The most critical factors, for me, would be energy and technologies of mind. One other point about the difference between egocentric and dialogic. It’s not quite dialogic, but it’s rather like imagining what it is to be a fish where one would have no sense of self but would have a sense all the time of the other fish in the school.

Facilitator: Thank you.

Itzkoff: There’s a phrase that Plato could not jump over his own shadow when he was predicting the future. Everything that we’re going to talk about of the future is predicated on where we are at this moment. I would hope that after we come out of the thousand-year tunnel, we would have perfected the human species’ evolutionary heritage of intelligent adaptation to the environment. The key thing is this ability of the human species to come up with a consensus that will solve our adaptive problems.

Facilitator: That ties into how we’re conducting our thinking. It’s getting to a new level of thinking. George?

Cowan: I would like to make a comment about moving away from biological life. If you look at carbon chains, they can twist and turn and undulate and assume different shapes. Most of the information is through chemical bonding producing shapes—lock and key-type arrangements—that can carry an enor-
mous amount of information. It’s the secret of DNA and RNA. I don’t know of any other form of chemistry, including silicon chemistry, that can do that. I’m not sure if you can depart from the carbon-based form of evolutionary storage of information at a higher level, except through a biochemical chain.

In terms of a thousand years from now, I can say only what I, as an individual, would enjoy. The desirable future is one in which people are free to pursue intellectual inquiries and in which the pursuit of food and the needs of existence are secondary to intellectual and spiritual and cosmic activities. I also think that the pursuit of knowledge is an infinite pursuit. One thousand years from now, it’ll be infinitely more fascinating and we will be able to engage our senses in ways that we can hardly comprehend at the moment.

Pohl: I have three things to say and I’ll try to do them under a minute each. The first is on this question of nonbiological life. I believe that what most people mean by nonbiological life is something like the future of computers and the ability to store human intelligence in machine simulation.

Second, there are so many things that can not only change our future, but obliterate it. In some cases, there are things we can prevent that we should think about: perhaps establishing better sky-watches to see the asteroids that are heading in our direction and trying to figure out what we can do about them. It’s not likely to happen today, but we’re talking about a thousand years from now, which means that it’s 365,000 times more likely to happen over that period.

Finally, assuming that we are able to define the perfect future for the year 3000 and even figure out ways of getting there, that leaves the question of how we persuade the decision-makers and the people at large to think as we do or take the steps necessary to make it happen. The way we form values in the West and increasingly all over the world is to do it through advertising or through charismatic leaders. There is an essential duplicity to that form of persuasion that I think is unattractive. But if there is some other way of doing it, I don’t know it.

Didsbury: My view of the year 3000 is a society or world in which we have the concept of the human family. Of all the great religions, I can’t think of any religion on the planet that says, “Thou shalt steal.” They all say essentially the same thing. It’s as if we’re dealing with different cuisines; there are exotic differences, but the fundamentals are exactly the same—kindness, sharing, enduring, sense of fellowship, and a sense of community. Another interesting thing is that an overwhelming number of us despair about the future of humanity. Hence, we’re now thinking of ways of improving the human being, of producing a totally new creature this world has never seen. It will undoubtedly be free of emotion, free of any of the things that agitate us, and survive in any kind of environment without any particular concern for the other machine beside it. We’re rapidly becoming more at home with machines than other human beings. I find this alarming. There are two ways we’re trying to solve the problem. We despair of the future of humanity and we are talking about a whole world of cyborgs, of robots, or some incredible developments that will take place in the laboratory where we produce the superior intelligent being that far surpasses us. That’s what lies before us for the year 3000? I hope not.

Facilitator: How do we go back and assign to Rosa-leen the job of saying what we think the critical factors are?

Pohl: I want to stress again the critical factor that even if we know what we want to happen and we know what the critical factors are that must be addressed, we have the additional problem of persuading people in the position to take action.

Cowan: Take action with respect to a thousand years from now?

Pohl: With respect to tomorrow, which ultimately will lead to a thousand years from now in conserving the environment.

Cowan: You can also take the view that our society is self-organizing and that we’re talking about inevitabilities rather than shaping the future. I’m not sure that talking about the future implies persuading somebody to take action.

Facilitator: We have quite an array on the board and we could go through a voting process, but I’m not sure in our case that makes sense.
ing the whole field that makes sense. Take a stab at summarizing, as though you were Rosaleen in front of the group saying, “Here’s what we’ve said; here’s what it comes down to.”

Dator: I heard Howard and myself say absolutely opposite things. It’s important that some of us think that humanity is at the end of the rope, while others think that we are at the beginning of the rope.

Facilitator: I want to raise an interesting question in terms of the conference. What is the likelihood that any of us will leave this conference with a different point of view than we arrived with? The tendency is to come with a point of view, to express that point of view in every form that we have an opportunity to do so, and then to leave, rating our success or lack of success on whether we persuaded people to our point of view. Our hope in this conference is that through something we do, by purpose or accident, we discover together something new, something beyond what we walked in with.

Itzkoff: With these eight different perspectives, maybe we’ve come to the conclusion that the question itself was not helpful or clarified, and that’s a great achievement. When you realize that maybe we’re asking the wrong questions in terms of the future, we can start asking questions that will sharpen differences and not scatter them. I don’t know whether the question about what the world is going to be like in the year 3000 is the best question.

Gangadean: Here’s an alternative: What are the most important critical factors facing us now that will affect and ensure that we have a future at all?

Facilitator: But if we use that frame of reference, how do we avoid just listing today’s biggest problems and figuring out the best way to solve those and therefore lose the thousand-year approach?

Gangadean: I don’t think it’s an either/or. What would be the most important factors facing humanity now regarding our having a future?

Dator: That’s what every other futurist group does. I think it’s a value question, asking us what we would like it to be in view of what our concerns are.

Cowan: In that case, we need to define the differences and the tensions that may exist in points of view here. Unless we choose to resolve them, we’re going to talk about how we would like it to be. It’s interesting to examine the tensions between these points of view.

Facilitator: So what are the major tensions?

Cowan: One tension is how you would value superior intelligence. Human beings have evolved over the millennia and they’re not the same today as they were when they were dragging their knuckles on the ground.

Didsbury: But when you say we were dragging our knuckles on the ground, that’s not a thousand years; that’s millions of years. We’ve had civilization for how many years? Five thousand years. Contrast millions of years leading up to that particular time. We were asked to come here and decide for the next thousand years, which is a split second in time.

Nature provided the human being with an accelerated method of changing…

Cowan: Nature provided the human being with an accelerated method of changing, which is the unwired synapses that suddenly exist in an exuberant form six months after birth and that represent an addition to the genetic change. They almost constitute as much of a potential for changing in one lifetime as a million years of evolution changes the gene. It’s highly accelerated, but it’s a very similar process, changing the architecture of the brain—one form slowly, genetic; the other form accelerated and within the lifetime of the individual. That part is cultural.

Didsbury: Those of us with money will probably be able to avail it with our children.
Facilitator: Rather than going down that road, let’s handle any of the tensions that we see here. It’s wrestling with this question of what the critical factors are.

Gangadean: I hear a tension between those of us who see material conditions in the world—economic factors, have and have-nots, conditions of life—as primary, in contrast with those who may see consciousness and how we’re conducting world-making—the other side of that spectrum—as having priority.

Facilitator: That’s a clear tension. Another one that appears to me is really basic. It is the difference in a view between how we maintain the kind of human values, human lifestyle, human prosperity, human culture that we have now for another thousand years versus how we move to something different, and how we understand what it is that we move to. What do we do to maintain what we have now and what do we let go of that we have now as a human society?

Gangadean: On one hand, the material conditions as being primary concerns, and on the other, the matters affecting consciousness and mind being primary. That’s a tension, two poles.

Facilitator: Let’s come back so everybody’s tuned into the same conversation. Jim, you wanted to say something.

Dator: The question about evolution is an important one, whether evolution is like it’s always been. I think in general there is accelerated evolution, and so you can’t really use the past thousand years to understand the next thousand years.

Facilitator: Is there tension between the view that evolution will continue on the same path versus evolution will be accelerated and become more directive?

Gangadean: Is human essence continuous, or is it transforming itself? Are we going to get a different kind of being?

Facilitator: Pace of evolution. Acceleration. I hate to set these up as simple dichotomies, because none of them is simple. We’re creating a false picture here saying, “Well, everything is an either/or question.” It’s not.

Gangadean: Evolving human essence was the next consideration.

Facilitator: Evolving or transforming human essence.

Itzkoff: I think, along these so-called prosthetic innovations, we’ll still be conditioned by what we are, what we have been over the last several million years.

Facilitator: How do we capture that?

Cowan: I don’t think it’s necessary to make a transformation to say that you’ve made an important change. I think a 10% increase in the interconnectivity of the brain could produce a remarkable change in what people do.

Itzkoff: No more than fire-hardened pottery that they discovered 16,000 years ago.

Cowan: There is Darwinian evolution, Darwinian selection, and then there can be directed selection and I’m not sure whether you want to use the word evolution, but both forms would have the same effect. Darwinian selection is the primary basis of evolution.
**Pohl:** Evolution sounds to me like it’s going to happen whatever we do, and I don’t believe that’s the case. I’d say change instead of evolution.

**Cowan:** Or human intervention.

**Dator:** I agree that evolution is not right, but change is too broad.

**Cowan:** Well, Darwinian selection versus something. Delete the word evolution entirely. Intervention? Darwinian evolution versus intervention. That’s the word.

**Facilitator:** Are there any other key tensions that surfaced? I’m not surprised that we’ll be designing as we go. What we have done is to say there is a set of factors, some of them material and some of them non-material. We’re not able to say that this one or that one is more critical. We made some cases for why one or the other was more or less critical, but we did not come to a conclusion about it. What that did is to bring to the surface a number of different tensions around the question itself and what the critical factors are for the long-term survival. That’s what we hope Rosaleen will report.

Let me recap so you understand what we’re doing. There is going to be some effort to synthesize the three group inputs. Then we will pursue in smaller groups a discussion of these factors and these topics, all of which are designed to elicit two or three major dialogue questions. Then we’ll go through a series of discussions in which a different grouping of you will have a free-flowing discussion like we had just now as the others listen. We’ll do that three times and then this original group will come back together to synthesize what we’ve done so far. We won’t reconvene as this group until about the third day. The model is that at the end of the afternoon today, we will have six topics identified and you will go to the topic that you want to discuss.
In this session, the third predetermined affinity group of participants grappled with the most critical factors that will shape humanity over the next thousand years.

Facilitator: Clement Bezold
Participants: William H. Calvin
        Steven J. Dick
        Jerome C. Glenn
        Francis Heylighen
        William W. Kellogg
        Dietrich Koelle
        Meng-Kin Lim
        R. Spencer Wells
        Paul J. Werbos

What we want to do is ask ourselves what factors will shape humanity over the next thousand years.

Clement Bezold (Facilitator): What we want to do is ask ourselves what factors will shape humanity over the next thousand years. We're going to brainstorm on those, generate a list, and pick five of the most important factors. Then we want to look toward the next thousand years and think about what will happen to those factors. First, let's introduce ourselves.

Koelle: I'm Dietrich Koelle from Munich, Germany.
Werbos: Paul Werbos, National Science Foundation, in Washington, DC.
Calvin: William Calvin, University of Washington in Seattle.
Heylighen: Francis Heylighen, Free University of Brussels.
Kellogg: Will Kellogg, Boulder, Colorado.
Lim: Lim, National University of Singapore.
Wells: Spencer Wells, Oxford University.
Dick: Steve Dick, Naval Observatory of Washington, D.C.

Facilitator: Let's start thinking about the factors that will shape humanity over the next thousand years. We'll brainstorm for about ten minutes, then I'll ask each of you for a factor, going around the table until we've exhausted them. Then we'll talk about them and start arranging them into groups. So what do you think is the one most important factor? Dietrich?

Koelle: I'm a practical guy. I consider energy the most critical problem for humanity in the next hundred years or so.
Facilitator: Energy problem, and we'll let you get away with a hundred years.
Werbos: That gives me population.
Koelle: Population growth?
Werbos: Yes.
Calvin: Rapid change of the kind that really outpaces your reaction time, the sort where you get yourself into big trouble simply because you don't have time to get yourself out of it.
Facilitator: Rapid change that outpaces reaction time.
Heylighen: Incompatibility of worldviews or value systems. Different people wanting different things that are simply incompatible.
Facilitator: Incompatibility of worldview and value systems.
Kellogg: An obvious one that everyone’s already alluded to is the fact that we’re running out of things on this planet. That is a problem that relates to our global environment. However, I would like to raise the even more important question of whether the human race will degenerate as a result of the advances that we’re making in medicine and longevity.

Facilitator: Put human race/degeneration.

Glenn: Conscious-technology, with a hyphen. The future factor is a continuum of human consciousness and technology.

Lim: Self-destruction through wars—nuclear war.

Wells: Communication, diffusion of information.

Dick: I’d say learning our place in the universe and discovery—whether there’s extraterrestrial intelligence.

Facilitator: Take a look at the list and think about it. What are the problems and what are the factors? If you want to think about humanity over the next thousand years, how relevant are those problems that will kill us in the next hundred? In other cases, things may be problems in the next hundred years, but we’ll overcome them. Think about where you want humanity to be in a thousand years. What other factors would you add to get there?

Glenn: Let me see if I understand correctly. I would not say sustainable development simply because if we don’t make it through the next hundred years, we don’t get through a thousand, so I don’t include that in the analysis. If we don’t address the issues of sustainable development in the next hundred years, we will not have a thousand-year future. So I’m assuming if we’re talking about a thousand years, sustainable development is not what I’m looking at. If we’re looking at fifty or a hundred years, then clearly it’s in there. But if I’m looking at a thousand years, the issue has already been resolved.

Facilitator: The dilemma is for a thousand-year focus, but we also need to deal with the hundred-year problems. As yet, we can’t take them off the table, but there’s a lot here we may never discuss.

Glenn: The meat of this Foundation is to push ourselves past all that, to think harder and further out to the year 3000.

Werbos: That’s a fundamental methodological problem. If I were dealing with this at NSF, I’d say that we have two different questions. If they’re different questions, they’ll have different answers. We’re asking for all the things that get us to the year 3000. If we’re asking for that which is critical for the next thousand years but not for the next hundred, then that changes the emphasis. The two factors that I was going to add are more important if you think in a longer time horizon.

The first factor is expansion into space, which I think is critical and more distant, and the other one is breakthroughs in our basic understanding of intelligence and physics. Those are really going to be critical at that time horizon and will begin to have a larger impact than we can see.

Facilitator: Are breakthroughs in biology and physics one or two things?

Werbos: Intelligence and quantum physics are different things, though they come together eventually.

Facilitator: So for our purposes, should we list them as one or two?

Werbos: Two.

Kellogg: Why do you think quantum physics will be important in the future?

Werbos: If you assume you already know everything that’s important, then quantum physics is not important to the future.

Glenn: If you get some breakthroughs in quantum physics, we can talk about energy in a completely different way than we talk about it today.
**Werbos:** There are hints of possible breakthroughs, but it's too early to know what's coming down the pike.

**Facilitator:** So what else is not yet on that list?

**Heylighen:** The need to increase our own intelligence in order to cope with the growing complexity of our world.

**Facilitator:** The need to increase our intelligence.

**Werbos:** Understanding it and increasing it are different things, though they are clearly related and mutually supportive, like chemistry and physics.

**Heylighen:** Artificial intelligence or extraterrestrial intelligence.

**Werbos:** You said our intelligence.

**Facilitator:** Is there a difference between our intelligence and our wisdom?

**Glenn:** Wisdom is a use, intelligence is a capacity.

**Werbos:** There's an old concept of intelligence that did not include wisdom. More modern concepts would include things like emotion as part of intelligence.

**Glenn:** But intelligence is a capacity, whereas wisdom is a use. You have to act upon a situation. Intelligence may or may not have action.

**Werbos:** In other words, wisdom is part of what we can learn. Intelligence involves the ability to learn it.

**Heylighen:** I would prefer to say increase wisdom. You can't measure wisdom, you can only decide after the fact that some decision was wise. You can, to some degree, measure someone's intelligence.

**Facilitator:** More capable humans. What's a better phrase than more capable humans that you've just described for two generations?

**Calvin:** Add our educational process, but it will no longer be the try-it-and-see-if-it-works that results in an empirical body of knowledge. We're coming into an era when we're going to know a lot about how our brain works. We're going to learn a lot about normal human development in the preschool years. As those two things come together, we're going to have a new educational technology. We may have—after a couple generations of kids go through that kind of education—an adult-level society that's considerably different. We may have a big difference in what adult humans are like.

**Facilitator:** Part of it is bringing up people who are genetically of average intelligence and making them perform as if they had an IQ of 140. There's potential as we feed back our knowledge about brain development.

**Calvin:** Artificial intelligence. Also artificial life with that.
Facilitator: Is that the same?
Several: No.
Facilitator: Artificial intelligence and artificial life are two different items.
Heylighen: What about something like global government?
Koelle: Control issues. Terrorism.
Facilitator: We have two things: one, global governance, and the other, control terrorism.
Werbos: We don’t know what kind of structures are going to happen and we’re going through such fundamental changes in our ecology. The way we think about social organization may not even be relevant to what the choices really are a thousand years from now. It may not be a choice of separate little nation-states like Europe today, or global government. A thousand years from now, they may not even be the options.
Glenn: Absolutely. But the factor here is governing systems. We’re looking at the factors that make the change; we’re not predicting the thousand years. We’re looking at the factors shaping it. So one of the factors is governance.

…sociobiologists are going to shift our thinking and change the possibilities over a thousand years.

Werbos: To put it in extreme terms, I noticed that E.O. Wilson is on the board of advisors here. I’d be willing to say that sociobiologists are going to shift our thinking and change the possibilities over a thousand years. We have not even done systematic thinking yet about what the choices really are, given the hard-core realities of change. It might be the speciation previously mentioned, or it might be something else.
Facilitator: What else is not up there?
Koelle: There’s the interaction of environmental development and human development. One influences the other.
Heylighen: We don’t have anything like ecology on there, so I’d certainly include that.
Werbos: It’s the sociobiology of humanity, actually.

Facilitator: Jerry, look over the list and see if there’s anything you want to add.
Glenn: ADHD—is that attention deficit disorder?
Facilitator: ADHD means attention deficit hyperactivity disorder.
Werbos: Is Ritalin going to rule the world?
Facilitator: There are some short-term things on this list, obviously. We’ve invented short-term disorders like nutrition disorders.
Dick: How about the interactions among some of these things like artificial life and genetic engineering, or is that separate?
Facilitator: Let’s get the individual factors right now.
Werbos: There’s a possibility of new modes of instability as technology goes beyond our ability to understand it. For example, technologies that alter the brain and the genome. It’s bad enough what monoculture can do to ruin an actual environment. If you try monoculture on the human brain with chemicals, there’s a lot of potential for aberrations—for example, wanting everybody to be sane. You get a definition of what constitutes a sane person and you make sure everybody fits the definition. There are a lot of doctors wanting to do it. There are a lot of possibilities where the power of biological technology is large enough that we really have to worry. Misuse of biotechnology is how I would summarize it.
Facilitator: Put in misuse of biotechnology as a subcategory.
Kellogg: What seems to be related to that is our ability to kill each other. Where do you put that?
Werbos: Misuse of physics technology.
Calvin: If you have a way of preventing the psychotic acts that harm large groups of people, there would be a large drive to keep people from being killed. That might lead to a mandatory screening for psychosis.
Werbos: This is the biggest problem for governance, trying to find a system that can navigate the middle passage between these extremes: either leave the Hitlers of the world alone and let them kill people, or massively try to control everybody so they don’t become Hitlers. How to find the middle between the extremes is increasingly the challenge.
Kellogg: That’s something we’re facing right now, isn’t it?
Werbos: That’s right.
Kellogg: In Kosovo, for example. What do we do there?

Werbos: And what happens as the extremes become ever more pressing?

I don’t believe we’re ever going to clone five billion copies of the same person. Those kinds of science fiction scenarios aren’t very realistic.

Heylighen: I don’t think it’s critical, because there will be a balance. I don’t believe we’re ever going to clone five billion copies of the same person. Those kinds of science fiction scenarios aren’t very realistic.

Facilitator: Is Ritalin or Prozac the modern version of what you are talking about?

Werbos: I believe—and we may just have a difference of belief here—that modes of instability are possible through the misuse of biotechnology. It’s real enough to be worth discussing. That would include biological terrorism.

Heylighen: They are very big modes of instability, but I don’t think genetic manipulation and genetic engineering, at this moment, are part of them. Nobody will really want to change all the genes of the whole of humanity in one particular way. Nobody would be that stupid.

Glenn: What you just described is one of about 20 that I could reel out. Some of it is really nasty. The relationship between ethics and biogenetic ethics, together with ethical evolution and genetic engineering, are the factors that you’re discussing.

Facilitator: You could look at that as a factor to go on the list, or you can look at it as a task for this group to do. In the time allotted, we probably can’t do the latter, although it would be a very relevant question. But is that the same as ethical evolution, or is it simply saying do we have an agreement on the sort of ethics we will have at the end of humanity? The year 3000 is not the end, of course. What’s our ontology of humanity? Or our ethics? It may be summed up in ethical evolution, but your point is we’re going to evaluate all of these against our own value screen. I’ll think about that as I give you the next assignment. Let’s see if there’s any more.

Lim: There’s one that deserves attention, I think. It’s organizational evolution—how humanity can optimally organize itself. It includes things like how the economy should flow...

Glenn: Isn’t that referred to in the phenomenon of governance?

Lim: No, I think it’s more than governance.

Facilitator: Organizational evolution is an appropriate term.

Werbos: Governance is a poor word choice, because it suggests the old paradigm of a world dictator, and that’s not really plausible or desirable.

You could have a climate change where the temperature drops down over 500 years, but if the same temperature change happened in ten years...

Calvin: A lot of things aren’t big problems if they happen slowly. You could have a climate change where the temperature drops down over 500 years, but if the same temperature change happened in ten years, you’d be in a real fix. A lot of these problems are on a relative time scale.

Facilitator: So the chart phrase for that would be time scales.

Several: Acceleration.

Heylighen: Normally, any movement has friction or inertia that keeps it from going too fast, but now in our society, things are going faster because friction has disappeared. Messages travel around the world in milliseconds, whereas before they might have taken decades. Things are much more unstable. It’s like...
walking on ice. On ice there’s also very little friction: you can move very fast or you can fall very hard.

**Werbos:** There’s a lot of talk about new modes of instability caused by the globalization and rapid communications that can knock off whole economies in a matter of days.

**Heylighen:** It’s all the same problems. We’re searching for the right terms.

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**Dick:** I’m wondering if we should have a category called unknown factors, because if anything’s definite over the next thousand years, it’s that there will be factors that we can’t even think of now.

**Werbos:** In engineering there’s a metaphor: if you have high-gain, unknown, nonlinear couplings, you open the door to unknown modes of instability.

**Facilitator:** Given this list, I’d like you to reflect on which are the candidates for the five groups.

**Koelle:** What is more urgent and what is less urgent?

**Glenn:** That’s for normal operations; I don’t think it applies to this. Speaking out of turn, I came here because I was interested in the opportunity to think long-range. Using the old argument “we have to do this before we do that” is what we normally do. I don’t think we should be looking at the imminence first, because that’s what the majority of the world does all day long.

**Koelle:** But they don’t. That’s the problem.

**Glenn:** In our world of think-tanks, they do. Here we have an organization that looks at a thousand-year perspective. We should take advantage of that rather than repeat what we normally do in other think-tanks.

**Facilitator:** The Organizing Committee used to say that it was off-limits to talk about the first 200 years, and that would annoy me so much. Over time, I’ve come to realize that we have to deal with the big things and ultimately how we’re going to set directions. We should keep pressing toward the thousand-year view. Take a look at the charts. See how you would group them and then we’ll see if that gives us a sense of priorities.

**Kellogg:** I think simplistically. I see one set of things that have to do with the Earth and the Sun and the cosmos, and the other having to do with people. People and governments and so forth. Environment and people, if you will.

**Heylighen:** There are more. Artificial life, artificial intelligence, genetic engineering are all technology. There are also all the ethical factors, evolution, the incompatibility of worldviews, having to do with the way we see the world. And probably there are the Earth factors and the environment. Then more general factors like instability, change, and acceleration.

**Werbos:** It’s scary that the category called reality, where we build the intelligent systems, and the category of worldviews are decoupled on this list. We have a category that includes reality—the technology, intelligent systems, and how the world works. And there’s another of how we perceive the world. These are totally different categories.

**Facilitator:** Is that the same or different than the category called comparative?

**Werbos:** This is a different subject.

**Dick:** Some of these things are much more general and completely subsume others. For example, if extraterrestrial intelligence is discovered, it’s going to affect everything else and it seems to be a very general topic. So that might be another way of breaking out the groups.

**Facilitator:** Is there another level of exogenous factors that extraterrestrials would fall under? Is there a basket of exogenous factors, including the discovery of extraterrestrial intelligence?

**Kellogg:** I would put that in a separate basket.

**Werbos:** By the way, just for your amusement, what if there’s not only extraterrestrial intelligence? What if we develop an imaging technology in the U.S. that allows us to detect life that may not be intelligent, like plant life in Earth-like planets around other stars? That might have a psychological impact, too. You would have to choose: either there’s life on that planet or it’s an unoccupied, virgin planet. We are currently doing research in that direction. We’re trying to create wildcards.

**Dick:** Why would you pick that planet versus the other planet, when both of them already have life?
That’s one of the things that will come up in five years.

Werbos: Right now, we’re just trying to build the technology to see the planet. What we do when we see them is the next question.

Facilitator: Every stone we turn is interesting. What other groupings do we want to deal with?

Lim: Consider factors that lead to our demise, and factors that are critical for our development. One is negative, one is positive.

Facilitator: So this is a balance of these factors: demise factors versus—what’s the good-news way of saying it?

Lim: Development.

Werbos: Survival and growth.

Facilitator: There are a lot of factors that we could put under these headings. Does this grouping work?

Koelle: Ethical issues and people—isn’t that really one subject?

Heylighen: Yes, they are related.

Facilitator: Is population the same as ethical issues?

Dick: I assume religion and spiritual issues will come under ethical?

Facilitator: Yes, those are people issues.

Glenn: There’s also a tendency under conscious-technology to lump artificial intelligence, genetic engineering, and the like, but there’s also a continuum of consciousness, which is no more technology than it is consciousness. So conscious-technology wouldn’t be under technology, but it wouldn’t necessarily be under ethics, either.

Facilitator: Would it be under people?

Glenn: It’s a bridge between the people and the conscious.

Werbos: I have a totally different image of how this works. If I were building an airplane, I wouldn’t want to do it with five variables, no matter how well I studied them. I might define my utility function in terms of five variables, but then I think of the very complex web of variables leading to those five and I’d really want to know the difference between those five variables at the end and the many variables in the middle. Otherwise, I’d get confused. I would think of this as a game having four terminal values and a lot of contributing factors.

Facilitator: Are you going to tell us what your four are?

Werbos: Yes. One would be sustainable growth on Earth, which is like survival, subject to the caveat that I won’t consider your question of vulnerability to aliens—vulnerability that exists on Earth. The second category is expansion into space, which would include the expansion of our ability to cope with things from space. A third category, and this gets strange, of spiritual growth, which I think will be discussed and we can debate the priority on it. Some of us would weigh it at zero; some would weigh it at one, but let’s call it an ultimate value for some people. The fourth ultimate value would be the quality of life.

Heylighen: I would separate all those things.

Werbos: Here’s the thing: because it’s a complex, nonlinear web, variables related to these affect each other over time.

Koelle: What do you mean by growth on Earth? We cannot continuously grow.

Werbos: I don’t mean population growth or economic growth. Sustainability on Earth.

Facilitator: The heading for this column again is sustainability.

Werbos: You can call it sustainable civilization.

Facilitator: What are these four again?

Werbos: Ultimate goals. Or components of utility.

Glenn: If those are our goals, I’d put down enlightenment and be done with it.

Werbos: That’s number 3.

Glenn: Spiritual growth is a sort of enlightenment.

Werbos: I would include enlightenment as part of that dimension.

Kellogg: We’re getting into semantics, but I would agree with you, they’re together.
**Facilitator:** So, in terms of this task, you start with some process to pick five. You judge their importance and propose them as a set of utilities.

**Werbos:** The other things feed into them, and a lot of things will turn out to be important.

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**Sustainability is not growth.**

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**Koelle:** Change the first utility. Sustainability is not growth.

**Heylighen:** Sustainable development.

**Werbos:** Sustainable civilization on Earth.

**Facilitator:** Sustainable civilization. Does that work?

**Dick:** You could probably say sustainability and have done with it.

**Several:** Sustainability on our environment.

**Werbos:** Well, turning the whole Earth into a nuclear wasteland, that state is highly stable.

**Heylighen:** Yes, it’s a very conservative goal. Sustaining whatever is there.

**Werbos:** Sustainability of civilization, at least.

**Calvin:** Let me suggest that we’re also looking for survival units, things that hang together. They live together successfully or they die together successfully. The eukaryotic cell, for example, is a committee of organelles that live together successfully. When they die, maybe because their membranes have ruptured from antibiotics, they die together. Seek those things that literally need to be grouped together in order to be successful.

**Facilitator:** So emergent properties are not utilities, they’re some type of pattern.

**Werbos:** Components of utility can be emerging variables.

**Calvin:** In a general sense, I really want to focus on the whole issue of new units being defined for survival, like cells.

**Facilitator:** Emergent properties…new units.

**Calvin:** New units in particular. We see this in political units; at least, political cultural units tend to see themselves as having to hang together, or they will hang separately.

**Facilitator:** Okay, there could well be different perspectives on all of these, given the right kind or the wrong kind of emergent properties. Now we’ve got some sense of these as ultimate goals. Let’s say you don’t have to sign away your life on them right now, but let’s use them. Let’s call them multiple variables, more than five, and decide where we want to end up in a thousand years. Are these the sort of goals to use when we judge our future? In the limited time we have, we can pick five factors we want to follow through the next thousand years.

**Heylighen:** We have the four factors of Earth, people, technology, enlightenment. We need to pick just one. Actually, there is a different factor that includes goals, acceleration, change, and new modes of instability.

**Facilitator:** What you’ve just described sounds like emergent properties to me. There’s a similarity between emergent qualities and unpredictability, right?

**Heylighen:** Change in complexity.

**Werbos:** Most of instability relates to sustainability.

**Facilitator:** They’re threats to sustainability.

**Werbos:** Certainly terrorism and things like weapons of mass destruction affect sustainability. Population affects sustainability.

**Glenn:** Paul, you can put a whole slew of these under each of our four factors, but does that get us to our task?

**Werbos:** The problem is that these are all important in the end. Anybody who has a chart of humanity over the next three years knows their significance. I would feel uncomfortable leaving out population growth just because everyone else is doing it. It’s good to draw attention to the longer-term, more neglected issues, but it wouldn’t be right to toss out things like population and energy. They should be somewhere on the list.
Surely energy is a long-term constant that will always be in our future.

**Kellogg:** Surely energy is a long-term constant that will always be in our future.

**Facilitator:** So if you had to put five at the top of the list, what would those do for our future?

**Werbos:** I wouldn’t do it. If you tried to build an airplane engine with five parts, it wouldn’t fly.

**Glenn:** But the objective might not be to build an airplane. The objective may be to increase the intelligence of those of us at the conference.

**Facilitator:** Maybe this is like a war and we should stop now and declare victory.

**Werbos:** Maybe it’s not a laundry list and we need a flow chart or a systems understanding rather than a list of five things.

**Glenn:** Or we could cross-impact all of those and ask which ones have more impact, then say the top five scores would be the most important factors.

**Werbos:** Cross-impact analysis to come up with the top five. If you try this again with everyone here, you could find one of the five most important parts of the airplane and then throw out all the rest. There has to be some way of trying to understand the complexity of the problems.

**Glenn:** What if you had five factors, or four or six, then under each factor you grouped the others so that you keep the richness of the whole? They can work with the process, which, I assume, has been worked out ahead of time.

**Facilitator:** Given the time, there’s only so much we can expect to get done if we start talking about the next thousand years in terms of these areas. These are not intended to be factors; these are groupings of factors. There are a couple of assignments that we’ve planned, and if there are no objections, we’ll do that. One is for tomorrow night. It’s a question about the existence of metasynthesis. We’re going to present this as a pattern that emerges on paper in front of the room. We’ll get audience feedback on whether some larger form of metasynthesis exists that we don’t see.

**Kellogg:** Some overall system.

**Facilitator:** Right, so our plan is for one person from each group to participate in our conversation about metasynthesis. We have nominated Paul Werbos to sit in and represent the pro-metasynthesis position. But now, the more immediate task is to present the results of this group to the full group, and there we thought that Jerry Glenn would represent us.

**Heylighen:** We need just one more factor.

**Dick:** I just thought of something else that’s obvious—asteroid impact.

**Facilitator:** Armageddon comes again. We’re in great shape. What we want to do is start working on the next thousand years within the framework we’re evolving. We have a very rich set of statements, but we’re also using this to prod our collective intelligence about this thousand-year exploration. Let’s start asking about some top factors. We might want to pick one from each of these five, or look for another way. Are there patterns in this clustering? We may learn the most by looking at them and talking about the next thousand years.

**Kellogg:** What are you counting as the five?

**Heylighen:** I think we have just four, and have missed the one including instability, time scale, acceleration, and the like.

**Koelle:** Why shouldn’t we try to group all those factors into three categories, then see what overlaps and what doesn’t?

**Facilitator:** The five factors are the Earth—in effect, the environment, Earth and Sun, the physical reality outside of us. People, which includes policy, governance, and everything having to do with humanity. We’ve broken off technology, recognizing that there are things that span all of these. And then there’s intelligence. Intelligence systems are part of technology, right?

**Kellogg:** People too.

**Facilitator:** Sometimes people, that’s right. Those give us four and, remember, we’re not looking for five clusters. We could start with those four and if we’ve got time, let’s pick a fifth. And now back to your point of categorization or groupings....

**Werbos:** Regarding your comments about what needs to be done in governance to make things work—if I were to speak to some of the nitty-gritty people I work with in my community, a lot of them would say the biggest governance problem is managers who are so fuzzy in their thinking they’re out of
touch with reality. We’re talking about real governance and real problems.

**Koelle:** Yes, but how to change that?

**Heylighen:** You have to change people.

**Calvin:** Constantly use concrete examples.

**Facilitator:** Alternative futures. That’s one of our major and favorite topics, so I’d love to talk about that.

**Werbos:** How to overcome and reduce fuzz-think. Maybe the task is how to break the paradigm in order to think better.

**Facilitator:** Let me go through this and then we’ll go around the circle. We’ll assign letters for these: E-P-T-X. This is E—depletion of resources in environment. Incompatibility of worldview is P. Rapid change reaction time....

**Heylighen:** That’s the one that doesn’t fit.

**Facilitator:** It’s really people’s reaction time given ecological disasters, like the climate flip-flops that Bill writes about. It’s people affected by the environment.

**Calvin:** It would be nice to have concrete examples for some of these, like rapid climate change.

**Facilitator:** Rapid climate change; this would be environment; and reaction is humanity. So it could be either one. All right, we need to come up with some groupings and pick a single factor to follow through the next thousand years. Will it be a threat or an opportunity? My candidates would be scientific breakthroughs, consciousness-technology, and more capable humans or brain development. Governance is interesting, but too much to do in the time we have.

**Koelle:** Depletion of resources could be combined into one major item.

**Facilitator:** That’s another one. Which one of those should we start with?

**Werbos:** We’ll be genetically engineered for increased intelligence and health.

**Glenn:** We’ll be genetically engineered for increased intelligence and health. Plus, there’s the integration of artificial intelligence, nanotechnology, bionics, and material science into and on the human. Confluence and synergies of artificial intelligence, nanotech, bionics. You’ve already got genetic engineering.

**Calvin:** Transition from empirical to scientific education.

**Glenn:** And IT for information technology, which includes telecommunications. So it’s confluence and synergies among those integrated into the human.

**Koelle:** Make it infotechnology.

**Heylighen:** I would like to add a new methodology for thinking. You could probably also add education and higher-level consciousness.

**Facilitator:** How about higher levels of thinking and more capable humans? Do any of these relate to ethical evolution? Is there an ethical component here?

**Calvin:** The gist of it is foresight.

**Werbos:** In terms of intelligence, okay, but concepts of foresight and ethics are already present at the human level of intelligence. How far do we develop them? If we were talking about higher levels of intelligence, we would be talking about qualitatively different capabilities that enhance foresight.

**Facilitator:** We have the capacity of foresight now and don’t use it.

**Werbos:** But are we talking about a qualitative change in the level of intelligence here on Earth?
Glenn: Yes, because the difference between 32 degrees and 33 degrees is one degree, but water becomes a solid in one and remains a liquid in the other.

Werbos: There are two different models representing intelligent systems. One is simply an extension of the present trends. The second model would be extensions to domains such as quantum computing, embedding that in intelligence. Many people believe that some form of quantum computing is already present in the human brain, and there's a larger school of thought that believes that's ridiculous. If you want to talk about a qualitative breakthrough to the quantum level, you are either talking about different intelligent systems replacing humans, or you're talking about a version of spirituality.

Glenn: A third one is by augmentation.

Werbos: Your choice is an artificial intelligence that's outsmarting humans qualitatively, or Barbara Hubbard's spirituality. Those are the only two roots to a really qualitative augmentation. It's at a different level.

Facilitator: You have quantum computing in the brain.

Werbos: Yes, the ordinary human level of intelligence doesn't reflect the potential of quantum computing. This means either new hardware replacing the human brain, or Barbara Hubbard's thinking. This is not a scientific consensus by any means.

Facilitator: What difference would that make over the next thousand years in relation to our four goals? We've said that the ultimate goals are sustainable civilization, expansion into space, spiritual growth, and quality of life. We could refine them. One of the major factors is more capable humans. There are some characteristics of that capability enhancement. What difference would it make over the next thousand years? What opportunities does this give or lead to?

Werbos: If we are more effective, then we would be better able to pursue all four goals. Then all the goals will benefit.

Glenn: If you've got everything else, and you're including the values, ethics, and wisdom, they have close to a guarantee.

Calvin: You may have more capable humans in some cases, but there are going to be haves and have-nots that are more widely separated than they are now. Currently, the more capable humans are the ones who have money. They have children who may be less intelligent but who nonetheless are sent to private schools, and this gives them a big boost up from the others. This tendency will be one of our problems.

Facilitator: Enhancing inequity by these technologies. Now, what would you do about advanced ethics over the next thousand years?

Glenn: We have to seriously consider the downside to the means and actions. Earlier, we talked about attempts to improve the human race through genetic engineering and the problems it could cause, especially in the hands of politicians.

Werbos: And the marketplace, too. Advanced technology will make Bill Clinton smarter, but Bill Clinton decides how the technology is implemented before he's smart enough to evaluate the situation.

Dick: But then you don't have a more capable human.

Facilitator: What is the objective? Do we look at better methods of thinking and more advanced foresight? Do we think that more capable humans would require all three factors? It's easier to come up with potential threats than with positive results for each of our factors. There's a whole set of issues involving our definition of “capable.” And how will we address equity questions?

Calvin: Do we have an exact time lag between knowledge and wisdom?

Werbos: There's a lot of ad hoc development of technology at the expense of understanding; for example, in the medical community. Coming up with a thousand interventions and actually understanding the dynamics of the system you're changing are two different things. The understanding is slower if you...
emphasize interventions; you can cause more harm than good.

Calvin: Prenatal technology.

Werbos: The time lag between intervention and understanding.

Facilitator: And the assumption is that our understanding comes after we’ve intervened.

Werbos: One of the fundamental social problems is the incentives for quick intervention. The practical incentives for developing the understanding to intervene safely don’t make as good a political speech.

Facilitator: Is there anything else on this factor before we close off the discussion?

Dick: Have we addressed the ultimate goals?

Kellogg: How would these more capable humans interact? What’s the new governance system?

Werbos: I have a cynical image. The Borg in Star Trek would fit all of these characteristics.

Dick: No, because the individual is lost.

Glenn: The Borg are also a monosystem bent on assimilating the rest of the universe.

Facilitator: We haven’t gotten into meaning and volition and whether those are key parts of humanity. That would mean that the Borg are outside of the system.

Werbos: They have their own system of volition. In the Star Trek mythology, they evolved through high coupling.

Dick: And they lost their individuality.

Werbos: Only as a result of the fact that the collective interface produces a collective action.

Glenn: It’s like a baseball team: everyone knows what the other players are thinking. As soon as a baseball gets hit into the field, the players know what’s going to happen, but they all react differently. They’re individuals and a group.

Facilitator: In our first attempt to create a more capable human, we’ve defined four goals. The difficulty of looking a thousand years ahead is that we don’t have any practice prophesizing; as scientists we use an analytical approach. So as we break up into groups, which factors, such as more capable human beings, will work to humanity’s advantage over the next thousand years?

Kellogg: Would it be a better world to live in?

Facilitator: Yes. What would it take to make it a better world? How would you solve equity or individuality problems in the year 3000?

Calvin: It’s wonderful talking at this level of abstraction, but to get something like the concept of a time scale across to other people, it would help to have an example.

Glenn: That’s not the objective. If you lived today and went back a thousand years with knowledge of the present, what words from their vocabulary would describe our current state?

Facilitator: Are there some concrete images of a more capable human in, say, the year 2800? We’ve named some of the components and raised a whole host of questions about getting there, but it would have more meaning if it were more concrete.

Glenn: It would be meaningless if we went back in time and told them that we will have this thing called cyberspace in a thousand years.

Calvin: A thousand years ago, the big things were horses and hay.

Glenn: You could talk about horsepower and hay, but you couldn’t talk about cyberspace. If we try to explain concepts that will exist a thousand years from now, it would be understandable if we didn’t use concrete examples.
Calvin: It’s like that old principle of D’Arcy Thompson’s: everything is the way it is because it got that way. We’re trying to discuss the factors that get us someplace. We may not know what it’ll be like in a thousand years, but we can discuss what we know about the process of getting there.

Facilitator: Great start. But remember, part of our objective is for humanity to improve over the next thousand years because of what we’re studying today.
All participants reconvened to discuss the conclusions of the small groups and arrive at consensus on the critical factors that will influence the long-term future of humanity.

Facilitator: Clement Bezold
Participants: Plenary Session

**Clement Bezold (Facilitator):** What we’re working on is the future of humanity over the next thousand years. What are the factors in common for us to do some work on? What are the factors that shape this riddle one way or another? What is the bad news, what are the molehills, what are the mountains, what are the factors that will cause dramatic leaps, revolutions in nature, and folly of humanity? Each of the groups started on this process of saying what the factors are.

This is an exercise in active listening. It’s really listening to what the group at the table is saying, and determining what is it that they said that you like, dislike, or can learn from.

**GROUP NO. 1**

**Tough:** We looked at several negative factors that seem very important now, but we think a thousand years from now, they’re not going to be important. The reason for that is if we don’t deal with them somehow, then we’re not going to be around a thousand years from now. Those are factors such as prejudice and hatred, which give rise to warfare. We also talked about unsustainable consumption. With sustainability and weapons and so on, if we don’t deal with those fairly soon, within a few decades, then there’s no point talking about all the other factors because we’re not going to be around to worry about it a thousand years from now.

One of our themes was to govern evolution. It just happens that Walt Anderson was in the group. He wrote a book of that title and we talked about how there’s going to be more intervention. Are we going to control or have an effect on evolution? This question, of course, includes the evolution of the planet and genetics and those things that we think of. We also talked about evolution in the sense of the construction or negotiation of identity. What does it mean to be human will be more inclusive and more universal, rather than everybody being separate.

We also discussed that governing evolution may include developing a loving consciousness. Barbara Marx Hubbard has written a book with this theme: that consciousness won’t just happen to evolve, but we’ll actually learn how to guide it, how to change it.

Within this governing evolution theme, we also talked about the development of artificial intelligence and robots. We may be seeing ourselves as a very rich and diverse galactic family within a hundred years, let alone a thousand years.

**We may be seeing ourselves as a very rich and diverse galactic family within a hundred years, let alone a thousand years.**
getting intelligence that is machine intelligence, which means it’s going to feel different from our human intelligence. It may also be a lot smarter than we are. This could happen within the lifetime of people in this room. IBM’s Big Blue has already won a chess match against the world’s best chess player. It’s going to be quite a change to deal with that; in fact, it may be these differences between humans and machines and extraterrestrials, that some of those distinctions will blur over time. It won’t be clear that these are humans, these are machines, and these are extraterrestrials; it may be much more of a coming together, so you aren’t quite sure what you are. So the theme of what it means to be human becomes either more relevant or less unimportant. I’m not sure which way that one is going to go.

We talked about the fact that one of the most powerful factors in the next thousand years will be our interaction with other civilizations within the galaxy. That may occur through radio or more close-up kinds of interactions. If there are other civilizations in the galaxy, we’re almost sure to make contact with them in the next thousand years as we move out into space, telescopes become more powerful, and we look at different ways of detecting intelligence that may have already reached here from other planets. One way or another, it certainly is going to happen. It may happen with many civilizations. We may be seeing ourselves as a very rich and diverse galactic family within a hundred years, let alone a thousand years.

The one other point we wanted to emphasize is the importance of visions. We have the flow of the river going into the future, but what we imagine the future to be can influence how the river flows. We talked about the power of images of the future. Negative images can have a negative influence. Positive images can have a very positive influence on what we strive to achieve, so it’s important to develop them, since our society at this point seems to lack positive images of the future. We’re going to move beyond the planet, we’re going to be bigger, and we’re going to have a much bigger context in which we view ourselves.

We thought a group might study the way evolution works. We included here biological, cultural, technological, consciousness, cosmological, and cognitive. We also thought a study group might look at what it means to be human, but we switched that to the future tense, what will it mean to be human? We thought here of identity, consciousness, and also intelligence. Because of interacting with kinds of intelligence that are different from ours—either they’re machines or they’re aliens from other parts of the galaxy—that’s going to affect this question of what it will mean to be human. Or we may merge with them, which makes it more difficult to know what it means to be human. We called it exit from the biological because Barbara Marx Hubbard has written about longer lifetimes. What may happen is that we have endless lifetimes. We may transcend the biological—we transcend our bodies, or we get new bodies somehow. In one way or another, we become eternal. Finally, ethics, emerging governance, and globalization. We talked a lot about kinds of globalization. We thought a group might look more at that, at how you govern in that case and at the ethical component.

Hubbard: We didn’t quite bring out the idea of globalization, or the atomization leading to differentiation. We saw certain opposites, such as prejudice and tolerance, that would lead to a synthesis and we began to see a possible dialectic among those things that look like opposites right now.

Itzkoff: The topic of extraterrestrial life and communication didn’t come up in our group. The universe is approximately 14 to 18 billion years old at the present calculation. The solar system is 4.6 billion and life began somewhere at 4 billion to 3.8 billion years ago. One of the theories is that organic matter may have been transported to our planet, that it didn’t arise indigenously, but it flourished here. In this discussion, why isn’t there a consideration that extraterrestrial life or intelligence has already been in contact with us? If they’re out there, isn’t it possible that they are communicating to us? [Laughter] How else will you interpret the 20th century but as a means of communicating to us, perhaps in a very negative manner? I’m not being facetious here.
**Tough:** There's a range of ideas in the literature of what might be. Steve Dick has written a book that maps the entire development of ideas on this subject for the last hundred years. Some people will say that some alien group placed us here. Some say that aliens gave us our technology. Some say that around the time of World War II, they secretly gave the U.S. the knowledge of how to do lasers and all kinds of things. You can find all these things in the literature—though radio astronomers tend to ignore them.

**Itzkoff:** My comment is really a methodological comment on the issue of pursuing the problem of the future. How far do we go out of the empirical world of being able to deal with concrete issues? I could propose a whole series of other issues about the future—metaphysical, religious, mystical, and so on, but there's no evidence anyway. There is as much evidence that extraterrestrial intelligence is here among us right now but does not wish to communicate to us.

**Deacon:** The intention of the discussion was not so much to say that this is something for the future; rather, it's to ask how it will affect our identity if this happens. How will it change the notion of being a human being? It's not whether we'll run into these people and they'll change our technology or whatever. I think it's the question that is implicit in this issue of artificial intelligence. I think they're the same question: How will it change our perspective of ourselves?

**Anderson:** As a clarification, we identified a long list of pretty far-out things that are happening already. Things like life extension, life enhancement, manipulation of consciousness or human nature. What were some of the others, Phillip?

**Tobias:** Genetic engineering.

The question came up of whether we would be able to manipulate human nature in the future. The answer is, of course we will, because we can already...

**Anderson:** Genetic engineering. The question came up of whether we would be able to manipulate human nature in the future. The answer is, of course we will, because we can already manipulate human nature in any number of ways. What we found is that there is a long list of things that you can identify as inevitabilities: the more you scope them out into the future, the more they become probabilities. We found it useful to identify a lot of things that are on that kind of spectrum.

**Facilitator:** As we think about topics for tomorrow, there's a zone of confidence about what we now know. Some of the items being raised are potentially most important; other things we are not sure about.

**Itzkoff:** The two issues are logically somewhat different. As for extending genetic manipulation into the future, we do have a certain amount of empirical evidence in terms of our ability to do these kinds of things. As a Jew, one might argue that the coming of the Messiah has this category of expectancy and transcendence and such, but I don't see the logical difference between the expectancy of the coming of the Messiah and our speculations about extraterrestrial intelligence somewhere in the universe.

**Tough:** What's been happening in the last 10 or 20 years in science is that there's more and more evidence that the universe could have life.

**Dick:** The short answer is that one is scientifically based, and the other one is not.

**Tough:** We're finding other planets now, so there's evidence that there could be life on those.

**Glenn:** How many planets have we found so far?

**Tough:** Eighteen.

**Glenn:** How many planets did we know about ten years ago?

**Tough:** None.

**Glenn:** Point made.

**Koelle:** That's the key problem. There may be a lot of intelligence in the universe, but it cannot communicate with us.

**Dick:** The only way to know is to observe.

**Itzkoff:** Our own consciousness needs to evolve further before we are able to understand and communicate.
GROUP NO. 2

...are we moving out of an egocentric worldview or constructing a meaning of human life toward a more dialogic culture?

Love: Throughout the group we found a few points in common. Our discussion took place in two phases. First we looked at the critical factors and then realized that some of us might have forgotten the thousand-year time frame. That helped us in the second part of the discussion. The critical factor was separating the *haves* and *have-nots*. That took us into defining what we mean by those terms. We had a variety of views ranging from the *haves* in terms of material needs, like the telephone, versus the *have-nots* who lack those material things. There were those who would argue that you could invert this and see the *have-nots* as those who might have something that the *haves* lack. So that was rather nice imagining what the chasm is, thinking about it in different ways, and coming to realize that there are all these factors leading to that. Then we got into the nature of happiness and the reverse, how to suffer successfully. I would say we got about five points. We certainly didn’t come to 15 points as we have next door. The second point we looked at was, are we perhaps considering the basic values of humanity, thinking in terms of the universal systems that might be evolving.

The third point is the relationship between individual and community expressed in terms of, are we moving out of an egocentric worldview or constructing a meaning of human life toward a more dialogic culture? In the event we move to a dialogic culture, how will we know when we’re there? Another point is how exactly do we have this flourishing? What we would need—energy, food and water, material goods—was also part of what we talked about. There are natural disasters and self-imposed disasters that we may or may not be able to do anything about. We realized at the end that we had not thought much about opportunities.

Some of these points down at the bottom are points that individuals made. For example, improving our ability to solve the problems. If we’re talking about the future of humanity, what do we mean by that? It must be the idea that we should problematize the notion of the future of humanity. We managed to achieve a list of factors in deciding what the most critical factors would be. We decided it would be best to present it in terms of main tensions within the group. As somebody said, there are eight different views in this group. There was the problem of how we would value superior intelligence. One person’s version of superior intelligence or a different intelligence would be inhabiting the surface of Mars, which was another person’s nightmare. Optimism versus pessimism, that was a constant theme. I don’t think you could divide us equally. In talking about evolution, there was a tension between whether we were talking about Darwinian evolution of the past or accelerating human evolution now.

Dator: It was tough to capture a commonality because there wasn’t any. If it is difficult for people who weren’t in the group to grasp the thread, that’s because it was all tangled.

Glenn: I would make a request that you get rid of this term *futurism*. We’re trying to open up the mind, not close it. *Ism* is an ideology. So *future studies*, *futurology*, *futurosis*, anything.

Facilitator: Other questions or observations for this group? I would argue that we had a lot of similar comments, but we didn’t have quite as clear disagreements. I get a sense that there are a lot of people with strong feelings. Part of our task is to keep going, to hammer at the disparities in different ways and at the job we want to accomplish, to ask, “What’s the future of humanity; how close can we get?” Given our disagreements, are there any other shared aspirations or shared insight or shared wisdom? Keep pressing that and listen for both your agreements and disagreements.

Kellogg: I’d like to ask the other group what they included about faith and evolution and human intervention versus Darwinian evolution. That’s obviously a subject that we dealt with. What about evolution? Will people be different a thousand years from now?

Gangadean: That was a question that was raised. We were speculating. Some worried whether we could presume a continuing human essence moving through this future evolution or would intervention be so dramatic as to radically alter the future course.
Itzkoff: Will it make any difference with all these new technologies and computers? Genetic transformations in the human genome? Will we come out the same after a thousand years? Some said there would be a radical change, while some were skeptical about that.

Deacon: There’s a dangling question at the end of one of those that looks as if it should be highlighted in red. It says, “What do we let go?” I’m very curious as to the list of suggestions about what values we let go of. That’s as far as we got, so we put that as a question.

Glenn: We began by brainstorming a bunch of factors that we thought were important. One was increasing intelligence, which included the idea of wisdom, the right use of knowledge. Another key factor was self-destruction, which is also a thousand-year thing. It may take 500 or 700 years, but we can still self-destruct. I know you’re optimistic about the next period, but that’s not over yet either. Next is relationship of conscious-technology as a continuum, human race, advancements, degeneration both directions, and energy. Energy is long-term also; energy is a constant need forever. Population growth. Here is a shorter-range thing on Earth. Rapid change reaction time. That was a phenomenon going through all of them. The problem of incompatibility of worldviews. Depletion of resources, communications, extraterrestrial intelligence, ethic evolution, and genetic engineering. More capable humans and increasing human potential. Artificial life as distinct from artificial intelligence. Global governance and governing systems, or maybe organizational evolution—there was controversy over the terminology. Control of terrorism; terrorism into the future as well. Again, governance here, what is the middle ground? Environment versus human development. New modes of instability from such things as misuse of biotechnology: our ability to kill each other in biological terrorism. How humanity optimally organizes itself. Organizational evolution. As for the time scale on these things, we’ll come to that later on. Expansion of space, business, science, breakthroughs, intelligence, physics, quantum physics. What are the choices given and changing?

The general goals we’re looking at here are stability or sustainability of civilization on Earth, expansion into space, spiritual growth or enlightenment, and quality of life. These are the four general goals. We said a lot grouped under technology, a lot grouped under environment, and a lot grouped under people. There’s also a bridge between technology and people, a conscious-technology relationship, and these relative rates of change. The rates of change
of these things are also a factor. Some things take a long time. There are other factors: expansion off Earth, extraterrestrial intelligence, asteroid impact. The factor called out that we wanted to dwell on was more capable humans. Out of this, what makes up a more capable human included the synergy and confluence of artificial intelligence, new technology, bionics, genetic engineering, information technology, and communications in or of the body. The other factor coming into that was better methods of thinking. Another factor was advanced foresight and ethics, and there was a controversy over quantum computing and the brain, whether that was a spiritual thing or an extension of current directions. There was no consensus about that part.

Dick: Under goals for humanity, we need to add something on understanding our place in the cosmos, which doesn’t necessarily have to do with expansion into space and may have to do with spiritual growth; it may also have to do with knowledge.

Werbos: I was worried about the timeline between intervention and understanding. We both have concerns that efforts to move too fast to interventions in this area, before we develop deep understanding, could lead to major problems. If you engage in major interventions before you understand what you’re doing, and you talk about replacing human intelligence with artificial intelligence, there are all kinds of difficult issues that are worth worrying about.

Facilitator: You use the term to say that the incentives to innovate are greater than the incentives to understand.

Werbos: The incentives for intervention are stronger than the incentives for understanding, and if you need understanding first, that could present a problem. There is a sense that short and fuzzy lists are one of the fundamental problems. The challenge is how to develop a comprehensive framework we can understand, which is nevertheless close enough to reality and concrete enough that we can come together without “fuzzying” over everything that matters.

Hubbard: One comment on that comprehensive context: one of the difficulties of any participation like this is there is no comprehensive context established in which we’re working. I’m not saying there could be in such a diverse group, but on the other hand, without a comprehensive context….

Glenn: This was an attempt to answer that. Our comprehensive context was bound by these four.

Hubbard: I see.

Facilitator: Or at least those represented goals. If you’re saying “comprehensive context” in terms of understanding intellectual frameworks as well as objectives, we used this to ask if there was a pole that we could put out here in terms of goals.

Dick: We have the goals there, and with some there are commonalities. Expansion into space is exactly the same as moving beyond Earth.

Facilitator: Let’s ask about commonalities. Our objective is to pick six goals and to break into groups of five. We have an incredible task to talk about the next thousand years. We need to talk about what we know about and we need to talk about things like the 18 planets we have discovered and how we deal with that. We’re dealing also with concrete, scientific, knowable, observable things, and we’re talking about consciousness and spirituality, which are much more distant in terms of physically knowing in the scientific sense. All of that is wrapped up in the question of humanity over the next thousand years. We’re going to come back tomorrow and ask, what are the problems and opportunities in exploring these topics? Through this discussion, what we’re saying to the world is: Over the next thousand years, here are things that we want to think about; here’s what we think in terms of where humanity is headed, where it could go. As we ask this question, what are the topics that you hear that are common or what are the most important things that we should focus on? Where do you see commonality across the groups?

Dick: The first one, moving beyond the planet, in the broad sense means not only physically going beyond but also understanding the cosmos and our place in it and whether there is extraterrestrial intelligence.
Werbos: What is the role of artificial intelligence, and whether it’s related to more capable humans or silicon evolution.

Facilitator: How you phrase it might alter people’s interest in it. Whether it’s more capable humans, including some kind of intelligence or …

Werbos: The role of artificial intelligence and computer networks.

Hubbard: That could go along with exit from the biological limitations of Homo sapiens. I would put that in a similar category.

Gangadean: In terms of language, I could see a cluster across the three different groups that you might be getting to find a common generic analog, whether you speak here of future visions or use the term understanding or intelligence or awakening. From a philosophical point of view, they all have to do with the conducting of the mind and the role that plays. We speak the language of visions or ethics here. Ethics has to do with reflective awareness: visions, imagining the future and shaping that reality, the technology of our thinking. Generically, we could lump those together in terms of our minds and how we’re thinking.

Glenn: You say that a category is mind by itself, yes? That’s not what I’m seeing up there; I’m seeing vision, understanding, intelligence, ethics.

Gangadean: I was lumping those together as all mind-related. Human consciousness, how we’re understanding ourselves and our world, and how we’re conducting our thinking all make up a vital factor that should be looked at.

...it’s basically a question of how things evolve, almost by definition, including how people, social systems, and technology evolve.

Pohl: The word that I’ve heard most often in this group is evolution. It seems to me that if we’re going to try to visualize the next thousand years, it’s basically a question of how things evolve, almost by definition, including how people, social systems, and technology evolve.

Hubbard: We have one called how evolution works, so that really would help people with that.

Koelle: Do these include environmental issues? Resources? That’s a separate item, which is environment/sustainability.

Facilitator: There are things that are included in more than one place, but this is a focus on sustainability. What other topics did you hear that you think should be on the list?

Hubbard: I’m not sure if this goes together, but our second thing after how evolution works was the evolution and negotiation of identity, which comes down to what will it mean to be human? What is the nature of human with all these new things happening?

Facilitator: What is the human and what will the human be? That’s both personal and collective identity.

Hubbard: Yes. I’m wondering if, in your mind, that comes under vision, understanding, intelligence, ethics, or is that a separate subject altogether?

Gangadean: Our reflective consciousness will have to look at who we are, our identity, and our presence over time.

Gangadean: Our reflective consciousness will have to look at who we are, our identity, and our presence over time. So that’s incorporated, and there is an overlap there.

Facilitator: If you start with vision, vision means a number of things, but one is, what is that you want to build, what is it that you want to create? And that’s the mind doing that. What will be the best that humanity can be in the year 3000?

Werbos: Human consciousness and identity.

Facilitator: And vision. You could ask this question as a “what might be?” question, or you could ask it as a “what will we create?” question.

Deacon: You could also ask it as a biological question.

Facilitator: How will biological evolution evolve; what will identity mean by then? We have these two components. This is a human identity from a biological view, although biology touches a number of these.
Pohl: Is that the same category as more capable humans?

Werbos: The more capable humans clearly crosses the first two topics there. A part of Jerry’s presentation was a different human interfacing with the artificial intelligence. A lot of the questions that we debated regarding Jerry’s position would be focusing specifically on the technological aspect. I see the second one as providing a home for some questions that Barbara is asking. How much is technology part of this artificial intelligence hardware and part of the human identity, or human society, and how do we manage that? I see the second one as being more specifically human.

Pohl: I actually see that as a subset of more capable humans.

Facilitator: For the moment, let’s put more capable humans down here. We’ll have redundant categories, and we’ll see which ones we like by the time we get finished.

Glenn: A procedural suggestion. We may want to have more capable humans as a category to begin with, the understanding that quite soon a node or two of that discussion self-selects and divides.

Heylighen: I would suggest that one is increasing intelligence and the other is ethics. The first concerns connections using computers, but also using engineering, and so forth. I would split it up like that.

Facilitator: It’s sort of the difference between intelligence and wisdom.

Deacon: The reason it came up was a talk about the difficulty we may have in identifying what the boundary of a human being is. I want to make it clear we were talking about this problem of identity, which is different from the getting-better problem, which has a vision sense to it.

Heylighen: Another topic for discussion is global governance: replacement of the position of nation-states with their governments by some better way to organize society.

Facilitator: We’ve got what it will mean to be human—it’s three that are different cuts to the same elephant here. Then we’ve got artificial intelligence and computers. What is the vision of humanity, in fact, using the mind?

Gangadean: I think the problem has shifted. What I was starting out to do was to see themes recurring to use different vocabulary—vision, ethics, understanding, intelligence—all of which are pointing to the priority of mind and consciousness and the awakening of the mind. The human mind is a factor that’s vital to consider as you project beyond. It wasn’t specifically vision, that one dimension of consciousness raising and conscious human potential.

Hubbard: We should use the word consciousness in there, too.

Facilitator: All right then, evolution and how things evolve.

Koelle: That’s too general. We should delete that because it’s going into all the other subjects.

Facilitator: Someone nominated it, so we won’t take it off at the moment. Okay, environment and sustainability are on the list. More capable humans, global governance, and then the evolution component, which is the third over here that includes these aspects. So we’ve got eight.

In this brave new world of AD 3000, what values will be lost for humanity?

Didssbury: In this brave new world of AD 3000, what values will be lost for humanity?

Tobias: That question about what values will be lost we intended to be covered under what will it mean to be human? We speak of human values today, and the question is, what will the human values be a thousand years hence?

Velamoor: Here are the topics that emerged as the most sought after.

Facilitator: We’ll divide you into new groups and ask that you explore these factors. If you take this factor and play it out over a thousand years, what do you see? How might it shape that river of humanity? What would you want it to do? What are the key opportunities and threats? In your conversation, you want to look at these topics over the next thousand years and ask, What’s going to happen? How do they relate to the future of humanity? The eight factors are: What’s the role of artificial intelligence and computers? What’s the role of the mind, in conducting the mind, including effects and consciousness and vision? The third is evolution and how things will
evolve, including social systems, technology, and so on. The fourth is environment/sustainability. Five is more capable humans. Six is global governance. Seven is moving beyond the planet. And eight is what it will mean to be human, what’s human identity?
To open the second day of dialogues, all conferees met for explanation and guidelines concerning the small-group discussions on individual critical factors.

**Moderator:** Karen Armstead  
**Facilitator:** Glen Hiemstra  
**Participants:** Plenary Session

Karen Armstead (Moderator): Let me give you an overview for today, and then Glen will get into specifics. There was a lot of work done yesterday, and the conversation at dinner last night was actually an extension of the day’s work. Today you will be working in small groups to focus on the topics you selected, and then you will come back to this larger body to present what you have defined. Next, we’ll ask you to work with us to come up with three main discussion questions reflecting the work you did in your groups. Following that selection, we will create a large table and one group will have dialogue around a main issue while the others of us listen, and then we will rotate. There will be three of those sessions, two this afternoon and one in the morning, with the purpose of giving you a chance for wider exploration and more in-depth thinking. Glen?

Glen Hiemstra (Facilitator): Yesterday you signed up for discussion on specific topics. We will spend the next hour in those small groups, which are as follows:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Participants</th>
</tr>
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<tbody>
<tr>
<td>Artificial intelligence</td>
<td>Jim Dator, Frederik Pohl, and Paul Werbos.</td>
</tr>
<tr>
<td>More capable humans</td>
<td>George Cowan, Jerry Glenn, Francis Heylighen, and Seymour Itzkoff.</td>
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<tr>
<td>Moving beyond the planet</td>
<td>Steven Dick, Dietrich Koelle, Meng-Kin Lim, Rosaleen Love, and Allen Tough.</td>
</tr>
<tr>
<td>What will it mean to be human?</td>
<td>Walter Anderson, Howard Didsbury, Ashok Gangadean, Barbara Hubbard, and Yersu Kim.</td>
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In these small groups, we want you to zero in on what your image of the future is. First, identify what we know now about this particular area. Second, what is the likely path over the next thousand years? In particular, we would like you to identify key opportunities and problems. One observation made yesterday was that it seems easier for us to name the problems over the next thousand years than it is to name the opportunities. What are the leaps that may be possible in the next thousand years?

Third, what are the key pieces of information that you as a group would like others at this seminar to know about this particular topic? When the hour is up, a spokesperson for your group will have about ten minutes to make a report.

Last, how would your view of the future fit into a metaphor that shows movement? Yesterday we talked about a river metaphor. Whatever metaphor works for your group, make that part of the report.

Now, as we listen to these reports, we’re going to move to what we think is the most critical part of our four-day program: identifying the most significant metalevel questions about the future. We will identify three critical metalevel questions and then hold three round-table discussions to try to tease out the most in-depth information that we can, the best information that we can produce in our seminar.
Participants divided themselves into five groups, according to individual interests, to discuss the factors identified as critical to the future of humanity. The following discussion is on the subject of EVOLUTION.

Session led by: Graphic Recorder

Gamble: Because there’s been a lot of misunderstanding about evolution, maybe we could just kick off with what evolution is not. Then the whole group will know where we’re starting from.

Deacon: It seemed clear to me that there were groups who were excluding that discussion. I think that’s the New Age....

Wells: It’s also the 19th century view.

Tobias: We saw the Darwinian evolution up there, and that in itself is a moot point.

Kellogg: What is it that evolution is not?

Wells: It’s not necessarily progress.

Deacon: It’s not necessarily additive.

Tobias: It’s not necessarily continuous.

Gamble: It’s not necessarily directional.

Deacon: It’s not even all adaptation, a very important piece of the puzzle.

Calvin: Most of it’s curb-cut type secondary uses.

Tobias: It’s not all-selective, in the sense of natural selection.

Kellogg: If it’s not adaptive, what is it?

Wells: What’s the feeling of the group about adaptation?

Deacon: Certainly, it’s not that it’s not adaptive; it’s that it’s not only adaptive.

Tobias: Not necessarily was the term used.

Calvin: Invention first, improvement later.

Tobias: It could be maladaptive.

Deacon: I always tell my classes when I begin that 99% of all species are extinct, and there are good reasons for that. Evolution is not about improving things and keeping things around. Evolution is about clearing the decks regularly.

Tobias: Evolution is the exception to the rule. Extinction is the rule.

Calvin: On the other hand, for our purposes, we need to be concerned with human evolution.

Wells: And a thousand-year time scale.

Gamble: It’s quite possible to be reminded that extinction is the rule. I think that might be useful for the wider group.
Deacon: I think your point about the thousand-year time scale is important. We need to recognize that, most often, evolution is not something that you can follow in a thousand-year time scale. What we have to talk about is probably not the same concept of evolution that you would take in a big sweep of the world. That means we’re going to have to start talking about other modes of evolution; that is, Baldwinian relationships in which behaviors change the ecology and change the biology.

We’re going to have to talk about higher-order forms of evolution, social processes of themselves that have an evolutionary dynamic. It’s important to distinguish what’s an evolutionary dynamic from evolution; that is, a dynamic that has this kind of process of selection and elimination associated with it.

Kellogg: What do you mean by “higher order”?

Deacon: I mean that we traditionally have a view of historical processes with great men and great events creating what happens, when in fact most of the things that happen are because of statistical matters distributed over large groups of people. Some things persist and others don’t, purely by virtue of things that don’t make any clear sense from an individual or a purpose point of view.

Calvin: For instance, why should English have become the _lingua franca_ of the world?

Gamble: That’s right. And why should the QWERTY keyboard have dominated the world?

Wells: Why was Mendel ignored for 60 years?

Deacon: That’s right. So in some sense, those are not evolution and—and this is the tough part—they’re not really evolution in the broad sense that we usually talk about, but they do have the same logic. The importance of this concept, as I see it for the discussion of the next thousand years, is relatively minor in terms of the biology, but relatively major in helping people understand that the same dynamical process is at work in a different way elsewhere. It’s understanding that process that’s the hard part.

Tobias: If we could come back for a second to the thousand-year story. In terms of evolution, a thousand years is the blink of an eye, and that was within a thousand years. In effect, those thousand years can be a time of great extinctions, but we won’t see much in the way of evolution for those that survive and are not extinguished.

Wells: Biological evolution.

Calvin: One of the things we will need to distinguish with this thousand-year scale is that many of the processes that have been important in the past—all the adaptations and secondary uses—may not be the same name of the game for the next thousand years. Because of the success of agriculture, and the way transportation has eliminated regional pockets, traditional Darwinian evolution runs on a much slower time scale these days, just because you don’t have the famines and the turmoil that used to be the case in many parts of the world. A lot of the lessons of the past do not extrapolate into the future in the same way.

The name of the evolution game for the future may be much more about genetic engineering, large-scale cultural changes, reflected in having an educational system based on knowing how the brain works. Things like that may cause great evolutionary changes without having the biological backup.

Deacon: Can I convert that? Not convert it, necessarily, but go to the other side of it. One thing that maybe we can contribute is also this question about what evolution has allowed us to bring into the present. We carry our past with us. What we are is the result of this long stroll through the Paleolithic. One of the major discussions that have grown out of the discussion of human evolution is: What is it? What is human nature? How does that aid or impede us in this transition? In some ways, there is a lot of superficial discussion about human nature at odds with the possibility of putting together global communities, putting together groups with different ways of communicating.

Tobias: We might pause to ask ourselves: to what of the various changes do we apply the term _evolution_? Originally, though Charles Darwin never used the
word except in the second-to-last or last paragraph in *The Origin of Species*, it was Herbert Spencer who picked up on the concept and spoke about stellar evolution, cosmic evolution. If he’d had the words, he would have spoken of geosphere evolution, evolution of the Earth, evolution of the sociosphere, and so forth. Now, there are those who argue that this is not a good thing, that it merely smudges and fudges by making evolution synonymous with change. The question is one that many archaeologists today do not like to refer to; they do not like to speak of cultural evolution as though there is inevitability to what the DNA brings.

**Gamble:** I think that’s absolutely right. Spencer used Darwinian evolution as a kind of metaphor, which then got hijacked and subsequently has been used poorly by many other people, when all they’re really saying is that change has occurred. They’re just describing it and documenting it; they’re not explaining it. I’d like to do something that Terry started us off on earlier, which is to broaden a bit at the moment and bring in co-evolution as this dual process. That actually is something that wasn’t there in the original formulation but does come about with Baldwin and with later interpretations, which gives us a broader picture of what’s happening, as Terry demonstrated in his language book.

**Deacon:** This is what we were talking about yesterday. It is who we are in one sense, but it’s also going to become more important. Is this process becoming more troublesome so you can’t tell any longer what is a cultural process and what is a biological process, because we muck it up so severely?

**Kellogg:** There’s a term I see: *conscious evolution*.

**Deacon:** I think of it as an oxymoron because I consider evolution as what happens when you let go of stuff. It’s what happens when you don’t do anything. Things evolve as a statistical process. It’s simply the statistics of how things survive and how things don’t. I don’t think you need much more complexity than that.

**Kellogg:** That makes sense.

**Deacon:** When you intervene with it, you’re intervening with those statistics, but the statistics are still there.

**Wells:** You may increase the rate, but the process is essentially the same; you’re changing frequencies, for instance.

**Kellogg:** If you’re making a big distinction between the evolution of a species and the evolution of a society, maybe you should have another word for the evolution of a society. It would help me, because I’ve always thought of them as similar, but perhaps you don’t like to think of them as such.

**Deacon:** There’s another word that’s been used in this regard, and that’s *development*. Evolution initially meant that. It does not anymore, and that’s an important distinction. But we can talk about the development of a society, the development of agriculture, and so on. It’s not the same to talk about evolution describing the same thing. It’s a different way of describing it; development has an end, development seems to go somewhere.

**Wells:** It’s crucial to untangle directionality.

**Deacon:** What’s happened with the term *evolution* is it’s been pulled out of that going somewhere, out of
that directionality, even though it may have, in some sense, a kind of directionality.

**Tobias:** The trouble about *development* is the word itself, because there is development within the lifetime of the individual or ontogenetic development. And there’s development within the lifetime….

**Kellogg:** What was that word you used?

**Tobias:** *Ontogeny.* The development was in the lifetime of the species, which is referred to as *phylogenetic* evolution. Very often one has to specify. Sometimes I say to my students, long-term development and short-term development, just as a subject matter.

**Wells:** They can be one and the same.

**Deacon:** That’s what we’re trying to escape, as clearly as we can.

**Tobias:** Yes, but they are not unrelated, if you go along with the ontogeny recapitulating phylogeny idea.

**Calvin:** This is wonderful background discussion for something else I’m involved in. I’m on the science advisory committee for a *Nova* eight-part series on evolution in the making now. But I have a feeling it may not be the right discussion for the thousand-year time frame that we’re charged with here.

**Deacon:** I want to talk about one of the problems. Something about Baldwinian evolution comes to mind. There’s something called *masking,* and a good example is Vitamin C. We all need Vitamin C, and we drink orange juice to get it. But it turns out we have the gene to *make* it; it’s just damaged. In fact, all primates have the gene to make it; it’s just damaged. It’s damaged in different ways in different primates. The damage began about 35 million years ago when we began eating fruit. Eating fruit gave us Vitamin C. It supplemented this thing that the genes produced, but it masked selection on those genes, so there was no longer a reason to have a good-working Vitamin C-producing gene.

**Wells:** So the gene is vestigial?

**Deacon:** The gene becomes essentially vestigial. The problem is, we are now addicted. This is a kind of evolutionary addiction. One of the things I wanted to bring out is that this is a metaphor for the technology story. What you move into, what you take advantage of, masks selection. Medicine is a masking of selection.

A whole range of things mask selection, and they set evolution in motion. What happened with Vitamin C is that not only can’t we produce it, but now we have a whole bunch of secondary adaptations that make it more likely that we can get it since we’re addicted. Color vision is one that comes in about this time almost certainly, and things like the taste for sweet and sour. Part of the process of getting it, in a sense, is that once you mask something and screw something up, it always squirts out elsewhere in the genome. There’s no way you can do just one thing. I really think it’s important that evolution at least gives us the complexity of this problem.

**Gamble:** Can I get a little further? There’s this whole mention of environment and selection coming from the environment. Then through these masking techniques, of which technology is a wonderful example, the outside recedes. We’d reconstruct our own environment, like a bubble. I’d like to say that we’ve always been *within* the environment; it’s never been us against the environment. We’ve always had that relationship, in a sense, with the environment, which gives that space for those masking behaviors to take place. But there isn’t a difference in what was going on two million years ago from what’s going on now. There may be different components to that environment, but our relationship to it is a very similar one.

**Deacon:** Wouldn’t you say there’s been an increase in the complexity of that relationship because of our behavior? The Vitamin C selection, as an example, is one that doesn’t require technology to explain. Behavior still influences evolution there. I would say that, to reverse your point, behavior has always influenced evolution. And the environment has always been a part of that; it’s always been included.
Tobias: It would help the larger group if we were to make the point that the environment is not only the physical environment. It was originally the physical environment, but there is a biotic environment, the animals and plants, if we’re looking at it from a human point of view. Second, and increasingly—Gordon Childe made this point earlier in the century—while man makes his environment, the environment makes man; therefore, man makes himself, which is the title of his book. There is not only the cosmospheric environment, the geospheric environment, the biospheric environment, but there is also the man-made environment. Of our species, 50% live in cities; 50% of Homo sapiens live in towns and cities. Just a number of years ago, that percentage was zero; there were none. We were rural. We have created this environment, which today dominates our survival and our adaptation. Increasingly, it’s the man-made environment that is dominating our development. We’re no longer subject to the physical environment…

Tobias: There are levels of change. You can adjust; you can become acclimated. That does not necessar-
are growing taller today because the conditions of life are good, because there’s a good balance between nutrition and exercise. We are growing taller but not in Third World populations, where they are either the same or growing shorter. That’s part of flexibility. Many of the things that we change—that change in our behavior, our way of life, our food intake, all of it—illustrate the principle that we are adaptable. Somebody once commented that humans have specialized in being unspecialized. Our great strength, not unique to us, is that we are highly adaptable, highly flexible, within the range of our present genome.

Calvin: We could solve some of the world’s food crises, by breeding humans only a quarter of the current American body size.

Tobias: The Bushmen are doing that already in the Kalahari.

Wells: And the pygmies.

Tobias: Yes, even more so than in the Kalahari.

Graphic Recorder: What are some other things that we know about evolution? What do we know, what are some scientific data that may or may not have been validated?

Calvin: There’s too much known about that to present any of it. We’ve got to pick themes to talk about, not data.

Deacon: Yet somebody has actually done some of this. Some of this is actually…. 

Gamble: It would be better if we stuck to misconceptions rather than trying to list what we know. Maybe it really is coming back to Spencer’s thousand years, which is probably more important.

Graphic Recorder: That’s a great way to go about the misconception.

Gamble: Because of what Phillip’s telling us about flexibility, there’s a can-do feeling of evolution, that we’ll be able to solve the problems. Even though we may be evolving those problems, but, you know, we shouldn’t be pessimistic.

When I look at… Western societies raising babies in playpens and cribs, what I recognize is that we’re engaged in an enormous evolutionary experiment…

Deacon: Since we don’t know the limits, I would also want to talk about what those limits are. One of my favorite examples is Harry Harlow’s monkey experiments. Harry Harlow demonstrated that monkeys not raised by their mothers are terrible mothers themselves; they’re completely asocial, they bite themselves, they’ll destroy themselves. A number of researchers demonstrated that you can almost eliminate every one of those behaviors by putting a baby monkey on a randomly moving object. Those baby monkeys become much more social, they won’t bite themselves, they won’t have rocking behavior. In a sense, monkeys come into the world expecting something of their world. One is that monkeys are born expecting to be carried and moved always, to be in contact, to have to hold on, and to have to do a lot of random movement stuff. They’ve become addicted to that. If they don’t get that, their development is abnormal, not just in terms of movement behavior, but also in social behavior and tactile behavior and bonding behavior. A lot of unpredictable things come out of this that you wouldn’t expect.

When I look at present Western societies raising babies in playpens and cribs, what I recognize is that we’re engaged in an enormous evolutionary experiment without knowing that we are, to find out what the consequences are. Taking this one feature that all primates have—and this includes hominids, maybe less so because we’re bipedal, but probably not much less—and putting them in an unusual environment just to see what happens. That’s a microcosmic example of what we’re doing. And that’s what technology is about, putting us into this context. Now, what would you expect in apes like ourselves in that environment? You’d expect a lot more antisocial behavior. You’d expect a lot more self-damaging and aggressive behaviors. You’d expect a lot worse parenting behaviors. Do we see that? Yes.

Tobias: You don’t have to look at monkeys; let’s stick to human beings. Shove human beings into a city,
and there are more homicides, suicides, violence, muggings, and minor neurotic manifestations like nail-biting and talking to oneself. Macrobehavioral aberrations occur as well. All of these things are seen much more in the cities than among the country cousins. This is the human zoo effect. We are thrown together. It overwhelms us. There are other cultural factors. Where do human beings grow taller? You’d think in the country: sunshine, vitamins, fresh foods. They grow taller in cities than do their cousins in the country. Now, is it just food or is there some other thing?

**Wells:** Medical care?

**Calvin:** Vaccination as children.

**Tobias:** Constant stimulation. The excess and over-stimulation of city life is having some effect on our growth potential.

**Deacon:** This is how you get chickens to keep growing and reproduce, putting them in artificial light 100% of the day.

**Graphic Recorder:** We have 15 minutes to get to what the opportunities are.

**Deacon:** Opportunities and problems or just the positives?

**Graphic Recorder:** What are the opportunities for humanity from now until 3000, trajectories and possibilities?

**Kellogg:** It seems to me a crucial question. A thousand years is a pretty short time for any real evolution of the human species, isn’t it? Will people be different a thousand years from now in the sense that you speak of, the genome? Will our genes be different a thousand years from now? I doubt it.

**Deacon:** There are two sides to that. Evolution will not change us by then; the standard mode of evolution is not going to do that in a thousand years. There is no question it goes too slow to make a big genetic change. On the other hand, we’re already fiddling with genes. I work with transgenic animals, in which we’ve inserted or removed genes. It’s an easy process, and we can do it with multiple genes. If we can do it now, this will not be a problem a thousand years from now. Further, one hundred years from now, we will have enormous abilities to fiddle with human genes.

**Tobias:** But we’ll be doing it on a few, tiny, select foci of the world, a few areas where there are facilities and where there are affluence and opportunity. Five billion people will not have any access to this. Are we looking ahead for just the small groups exposed to the most technologically advanced development, or are we looking at the entire human species? I would think we should start this discussion with survival. Are we going to be here in a thousand years? If we are going to be here, are our genes going to be substantially different from what they are today? And our patterns of life, given that particular genome?

**Gamble:** Considering what we know, we could consider if our flexibility is going to become greater or less through the processes you’ve been talking about. Picking up on your point, Phillip, are we actually going to remove some of the inequality between a core and a periphery, the periphery being your five billion and the core being those with access to these resources? Will that actually be part of that flexibility?

**Deacon:** Gene replacement could be a eugenic operation of genetic cleansing just as easily as it could be improvement and enhancement…

**Tobias:** I instinctively react almost with fervor against that idea, because who’s going to decide?
Deacon: I don’t mean it in a good sense. I don’t mean it in a democratic sense. I mean it in a bad sense.

Tobias: This is the great danger, and maybe we’ve got a voice in it. We should start with survival. Then we should see what has survived, genetically speaking. And then, from a third point of view, what is the behavioral pattern? Has flexibility increased? Has the gap widened or narrowed?

Calvin: When you start making changes rapidly, as we’re doing, you have to consider reaction time—like outdriving our headlights at night. We’re changing so rapidly now, but as far as I can see, our abilities to engage in foresight about what the future’s problems might be is not much better. You can see that we’re going to run into a problem with this rate of evolution. It’s going to get us into some deep trouble because we don’t have time to react to them. That’s one of my worries about this thousand-year span. At the rate that we’re seeing cultural or technological evolution at the moment, we could wind up participating in changes that could produce big population crashes just because we don’t have time to react.

Deacon: There’s something we have not mentioned yet that’s important and that I think is crucial in the modern world, and that is disease vectors. One of the major tools that evolution uses to sculpt population is disease vectors. We’re in a world in which everyone now knows that we’re only a plane ride away from plagues, and that’s going to increase. Our technology, in fact, is playing a role in evolving disease vectors that will affect the genes, the disease animals.

Wells: Even without any genetic change, we’re changing our susceptibility to diseases simply by changing the culture.

Gamble: Ability being the key factor there.

Tobias: Next, what is survival, genetically speaking? Third, the behavior and the flexibility, the disease susceptibility, and all the problems. With survival, are we going to dim our faith that there will be human beings here in a thousand years’ time?

Calvin: There’s a good chance that human beings will be here, but civilization might have degenerated into a series of Balkanized states that all hate each other.

Deacon: So we’ve got to talk about survival. What are the threats? Maybe we should identify the threats from an evolutionary point of view. Clearly, it’s simple extinction, but we have a hand in this extinction problem. What you described in that last example is a case in which we can imagine, even under the worst of holocaust conditions, a survival scenario, or at least we desperately cling to survival—I’m not sure which. But are there other modes? This is why I brought up disease. Is there a possibility that there are other modes in which there could be extinction? If we can’t think of too many ways to make ourselves extinct unless we commit suicide, then we have a pretty good shot at thinking we’ll be here in a thousand years.

Gamble: That goes back to something that our group was talking about yesterday. Human beings will survive, but whether we would recognize them as human beings, because of the societies around them that we construct, is another matter, and by definition those societies make us human as much as the genetic structure. We can survive in the genetic way, but whether we would recognize that as human survival is another matter.

Kellogg: How would we be different? You were saying that a thousand years is a very short time in terms of evolution of a species.

Tobias: Can I give you a very simple, illustrative answer to that? When I started studying the Bushmen of the Kalahari in 1950-51, there were 55,000 and some mixed alive; most textbooks were speaking of a few hundred. I predicted that their way of life would be extinct by the year 2000. Not the people; the people have become acculturated. They have not disappeared. The culture, the hunting and gathering, have all but disappeared. There is hardly a group left
today who are pure hunters and gatherers. Forgive the word pure.

**Deacon:** They don’t have any place to do it.

**Tobias:** They at least have dogs, which historically were the first domestic animal—interesting, because it helps on the hunts. It’s a marriage of domestication but still hunting. They are now keeping animals. The people are there. The numbers are going up. And we were able to show they’re a little taller than they have been traditionally. I don’t believe for a moment their genes have changed. It’s a secular change. It’s the first secular change seen in Africa.

**Calvin:** They don’t go hungry as often.

**Tobias:** That’s an illustration of how the people may go on but the way of life may change immeasurably. One of the facets of that way of change of life is population explosion, because it would be better if you’ve got more food coming in, better ways of getting food.

**Deacon:** So that brings up the other road to extinction....

**Kellogg:** Too many people.

**Deacon:** Certainly, mass changes in population.

**Tobias:** Would it be offensive for me to say that not only should we look at survival, but how many humans are going to be around for predictions for 3000? There are 12 billion predicted, aren’t there?

**Gamble:** I don’t know, Phillip. I think that works.

**Tobias:** About 12 billion? On top of today’s world, yes.

**Deacon:** And that’s after the population’s begun to flatten out.

**Tobias:** So we’ll be approaching a steady state in population. The amount of carnage and destruction of life by disease or man’s willful activities counterbalancing the tendency to have more children. Is that accurate, Bill?

**Calvin:** I think there are too many vulnerabilities in the system. Either a plague or mass terrorist activities. There are all sorts of things that could take down half of the population.

**Tobias:** Let’s not be afraid to mention AIDS; look what it’s doing.

**Deacon:** And AIDS is just the first of many, you can be sure of that.

**Tobias:** Look at what the bubonic plague did to Europe in the 14th century. This has happened recurrently. Smallpox in South Africa almost totally wiped out the Hottentot peoples, as they used to be called.

**Gamble:** What we seem to be good at doing is drawing out limits. What we’re not so good at doing at the moment, or maybe we don’t want to, is to go for this flexibility thing. Flexibility also hits limits; therefore, there’s no solution for that particular problem except as a major reorganization. I’m cautious about using the word evolution, but I’m seeing a major reorganization that produces something completely different. We don’t seem to be too keen on talking about that. We seem to want to keep it open-ended and optimistic, although there are some big, obvious problems lurking there.

**Deacon:** I am not terribly optimistic. I see the Harlow monkeys as a good example of what’s going on, and the way I would answer the flexibility story is to say that flexibility is always purchased at a cost. When you have to stretch beyond your median behavior level, there’s always something you give up, whether it’s stature or sociability. There’s always a tradeoff. The limits question is a very important one, and that’s why I haven’t gone on.

**Gamble:** The limits are also there. It’s in a selected force, but they come back to what we’ve got on the left-hand side. We’re not saying that things are going to be better. We’re going to say that change is a constant but things are not going to be better or directed.

**Deacon:** I bring that up in each of these other examples because there is one thing we can do with evolutionary information. The knowledge about evolution can help us figure out what kind of an environment is best suited for human beings.

**Wells:** That’s really human median behavior level.

**Deacon:** But it’s something we could do considerable work on to find out. The evolutionary background gives us some hint. It may be possible to recognize
that many of the difficulties we have had in the last 10,000 years as we’ve moved into the role of cities and the large quantities of food is that we’ve pushed the limits. We have the ability to rethink that, so it’s not actually an evolutionary change in humans, but using evolution to change social structure, family structure, or at least to re-form it, which we’ve never done. We’ve never used the information in that regard. And that’s the positive side.

**Graphic Recorder:** We’ve got only two minutes left and we need to do three things. One is to see what else we need to present to the larger group. What’s missing? Second, to choose someone to present the information. And third, we need to think about how the topic of evolution fits into the river and what its metaphor is.

**Tobias:** Are we going to plead the cause of evolution to be applied to biological evolution? There are certain connotations of biological evolution: the limitations of the genetic material, the mutability of the DNA, and what happens to the mutations. The other thing we haven’t touched on is limitations on this astronomical population growth that’s going to occur in this thousand-year period. When you look at birth control—we haven’t spoken about birth control—we see two big models. The Indians have used education, and managed after a couple of decades to have a major effect on the rate of reproduction in India. The Chinese have used a coercive system, that no family may have more than two children, and it’s led to a huge increase in infanticide, because the popular fashion in China runs in favor of boys. If your first two are girls and you still want a boy, that leads to infanticide. Here are two systems advocating birth control, one educational and one coercive. One seems to be working. The other one, I don’t know. Are we going to consider this as a factor for the limiting of population? We can’t wait for evolution to give us a steady state.

**Wells:** Most of the evolution of human culture has occurred during this period of exponential population growth. Over the next thousand years, we’re going to have to get used to the idea.

**Deacon:** So we have to have a metaphor?

**Graphic Recorder:** Yes. Every other group has a metaphor.

**Deacon:** River or swamp?

**Tobias:** The river.

**Deacon:** I have had a hint that our problem may be the most complex to think about clearly. Evolution is one of those things that people think they know, but they don’t. It may well be wise to find a way to make it at least simpler. How do we do it?

**Tobias:** Just remember, it’s only a metaphor.

**Deacon:** I think there’s an antimetaphor for me, and that is that I don’t find the river very helpful because it seems to have a direction.

**Tobias:** Biological evolution has had a longstanding metaphor, and that was the landscape. Certain American geneticists adopted the idea. I think Dobzhansky spoke about it and Tan at certain stages, too.

**Calvin:** How about a dam breaking and the water creating new channels?

**Deacon:** Eddies and rivulets.

**Tobias:** There’s got to be a dam building before there can be a dam breaking.

**Calvin:** Our rate of technology qualifies as something like a dam breaking.

**Gamble:** It’s a landscape. How about this: we get rid of the river but we keep water, and we turn the metaphor into the ocean. What we’ve got is a topological surface. Let’s see, there might be an old rubber sheet being bent and pulled, so you get your little valleys and your canals. But the weather changes, and we’re not always sure what changes the weather, but that changes the surface of this landscape. If you’ve got humans on this, then it’s going to go down different pathways, but it’ll be impossible to predict exactly how that landscape is being changed.

**Deacon:** Maybe we can just do it, instead of putting these two together—not the river, but the making of rivers and rivulets, coming down a mountainside. What happens is, the water comes down, carves out a few niches, and those carvings make a big difference. But eventually, they carve down; they might get the classic rock story. As you course through the landscape, wearing it down, things change.
Tobias: Aren't we instinctively reacting to the river idea? The very nature of a river is directed. It has a source and it has an end.

Wells: We're talking about change.

Deacon: We're doing that, but instead of the groove of the water, it's the carving down of the change that we focus on. What we can do is say, this is just a shift—the same metaphor, but it's a shift in emphasis. It's not that the river is already there. The river is actually carving the landscape. What's interesting is not the flow of the water but what it's doing to the land.

Tobias: The difficulty with the river metaphor is that not only is it about change—many of these other metaphors are, too—but it looks like directional change. It looks unidirectional. You can have it meander; it can make a mild delta; but basically, it's going somewhere. And we can't be sure that evolution is going somewhere. We've said as much.

Gamble: That's where the landscape is a much better analogy. But as to whether it's a landscape that's made up of mountains and valleys, or plateaus, or one that is more fluid in terms of oceans, I can't tell you.

Deacon: It's the change in the landscape that's interesting. In some sense, it's not the river, it's the change in the landscape that the river produces that's interesting.

Graphic Recorder: Thank you very much.
ARTIFICIAL INTELLIGENCE (AI)—one of five critical factors expected to have a major impact on the long-term future of humanity—was chosen for small-group discussion by three participants.

Session led by: Graphic Recorder
Participants: James Dator  Frederik Pohl  Paul J. Werbos

Graphic Recorder: Our topic is artificial intelligence. A few things that we’re going to cover are: what do we know now, and what has been proven? What is the likely path of artificial intelligence over the next thousand years, including the problems and opportunities? What information do we as a group want others to know? How would this fit into the river metaphor, or should we decide on another metaphor that might work better? Finally, what are some of the things that are going to steer us down the path of the next thousand years? Let’s introduce ourselves.

Pohl: I’m Frederik Pohl. Marvin Minsky says that artificial intelligence has really progressed, but some of the progress has been redefined out of artificial intelligence. Pattern recognition was once one of the functions of artificial intelligence; now there are these reader devices in every supermarket.

Dator: I’m Jim Dator. I have a friend, David Miller, who defines artificial intelligence as whatever machines can’t do now. It’s exactly what you said: when machines can be programmed to do it, that’s not artificial intelligence. You probably have a more formal definition.

Werbos: I’m Paul Werbos. A couple of background thoughts: I became interested in this topic after Jerry Glenn gave us his vision of capable humans. It reminded me a little of the Borg in Star Trek. I’ve been working in stuff you might call artificial intelligence, but Jerry’s talk shook me up. Am I doing something good for humanity or not? Do I really want to create a world of Borgs? There are real possibilities now to do the classic building of machines that can outsmart humans. Do we want to do it? How much do we want to do? Do we want to have little things wired to people’s bodies that give them advice on what to do?

Pohl: We’re at that point already. There are these wearable computers that have a stream giving you advice and information before one eye.

Werbos: They have little virtual glasses at MIT.

Pohl: There was a conference on wearable computers here right before this. There were people walking around with keypads in their pockets and monocles in one eye that were little screens. They were summoning up whatever information they wanted.

Dator: Definitely Borg.
Graphic Recorder: A verbal computer is a good example of where we are now. What are some other examples in terms of artificial intelligence?

Dator: The scan readers in the supermarkets that speak to us, and a lot of the intelligence in micro-waves and automobiles regulating gas and air. All of those things make judgments. I work primarily with judiciaries, and it seems to me that a lot of what judges do and a lot of what law school is about is creating artificial intelligence. If there was ever an artificial human activity that requires people to know how to program things properly, it’s the law. It’s a highly artificial way of thinking, one that takes three years of law school to take a human being at one end and spit out a lawyer at the other. The human element, the nonartificial intelligence element, keeps breaking in, though. I have argued that the next step after Big Blue should be a contest: if you can’t tell from the quality of the decision whether humans or an artificial intelligence device made it, then just let the courts go home and let the machines settle the very large number of human activities that waste human time in making routine decisions. Save the human element for the things that the computers and machines can’t do.

Pohl: We’re talking about specific things that can be assigned to computers, like pattern recognition or preparing a legal brief. I think intelligence is a larger phenomenon than that. I’m not sure how to define it exactly, but it does not limit itself to being able to turn a thermostat on and off when you need it. We have all sorts of computers around that are not really very intelligent; they’re just single-task devices that pay more attention than we do and deal with small problems when they come up.

Werbos: Most people would peg me as part of the neural network community. There was a time when early neural networks were regarded as one of the three basic streams of artificial intelligence. There was a stream that said: I don’t know what intelligence is, but I recognize it when I see it. Intelligence means you can solve hard problems, so we’ll play chess and do other things that require intelligence. Somehow, if we can solve these hard problems, by definition we will have acquired intelligence. That’s one school of thought.

Then there was a general problem-solving school of thought that said: intelligence is not the ability to solve any one particular problem; it’s the ability to solve any problem. So we have general problem-solvers. Of course, if you’re an engineer trying to build a machine that solves all problems, you have to have something a little more specific to work with. You have to at least define a general class of problems. Most of the work went either into formal logic and reasoning, which is a general class of problems, or into something called reinforcement learning, as in how to optimize some measure of performance over time with learning.

Then there were the guys doing artificial neural networks. Over the years, Marvin Minsky and his school of thought tried to discredit the neural nets. Minsky said they couldn’t solve certain problems, and in graduate school I proved that they could. Gradually, the neural net field came back as a different field, in competition with the AI world, where you could think of it as a different approach to building an artificial intelligence. These days, people talk about the new AI, and in current artificial intelligence meetings they bring back some of the learning algorithms that we developed in the neural net field. Usually, they’re not giving credit to the original research, but at least the AI meetings are now beginning to get back to more general-learning issues. Some of the obstacles that appeared insurmountable ten years ago have just dissolved.

Pohl: For example?

Werbos: At this point, I don’t see any obstacles at all conceptually to building human-like or beyond-human intelligence artificially.
Pohl: Do we want human-like intelligence, rather than nonhuman-like intelligence?

Werbos: Well, yes. There are some profound ethical questions about what we want. There are also some profound questions about what we can avoid. If you get too close to a magnet, there comes a point where you can’t pull away. How far can we go down this path without making the end of humanity inevitable, for example? What is safe? What is not safe?

Dator: That’s what I’m in favor of.

Werbos: You’d rather get rid of humans?

Dator: Yes.

Werbos: I wouldn’t. People accuse me of being a human racist.

Dator: Yes, you are. I’m the founder of the Machine Liberation League.

Werbos: You’re not the only one. There are a lot of people working in the AI and neural net field who want to get rid of these dirty, nasty, frustrating human beings and replace them with something clean and efficient and rational.

Dator: I don’t know about that.

Pohl: I’ve been reading Hans Moravec’s new book, Robot. Hans is exactly in that position.

Werbos: Yes. And Rich Sutton.

Pohl: Hans wants to get rid of organic bodies; either intelligence would start in the machines, or machines would become humanly or superhumanly intelligent. He is not thinking in terms of a thousand years, either. According to him, it’s within the next century or so that we’ll reach what he calls the “third stage of robots,” which are independent intelligences able to compete with us.

Werbos: I remember a Star Trek episode about that.

Dator: Forget your science fiction.

Werbos: Oh, no. We should not forget science fiction.

Pohl: People do forget it. It’s where the scientists get their ideas in the first place, but then they forget it.

Werbos: And never give you credit.

Pohl: Right!

Werbos: A lot of mathematics is like that, too. Science fiction is something we all ought to appreciate more.

Pohl: I agree. Over the next thousand years…. I can imagine what might happen over the next 100 or 200: we will have reached the point where what we’re discussing now is no longer relevant. There will be the superhuman and machine intelligences. There will be symbiotic arrangements between humans and machines, making products a lot more intelligent.

It’s going to be essential, if we want to get off the planet, for artificial intelligence to play a major component.

Dator: I’m interested in this topic in relation to two others being discussed elsewhere. One is about getting off the planet. It’s going to be essential, if we want to get off the planet, for artificial intelligence to play a major component. Our biology is not suited for anyplace in space we’ve gotten to so far. Given what we’re doing to this planet right now, we need to have this. The other is the basic question of what is humanity? One of the things I’ve been doing recently is asking people for a description of what man is. I think that we are very problematic in everything that we have done, and I don’t see this as any more problematic.

Pohl: We’re a Rube Goldberg kind of creature. It’s all been improvised, and in the most elaborate and convoluted way possible.

Dator: Especially our intelligence.

Pohl: Especially our intelligence.

Dator: As I said yesterday, I see us as being evolved at this point to create true intelligence. We may not seem to be Homo sapiens, or thinking man; we may not seem to be very sapiential compared to other things, but what we are doing is creating sapience.

Werbos: Have you read Dan Simmons’ Hyperion series? The Hyperion series presents an interesting image of the future with human intelligence and machine intelligence; we’re all big in different ways. But I certainly would not want to write off the human race. We were talking yesterday about what we should do. My basic point was that you cannot logically deduce a statement of that form. If it’s not in your axioms, you can’t possibly deduce it, so any attempt to use logic alone to deduce an ethical conclusion won’t work. In the end, it comes down to what we like or don’t like. I would argue that it is in our nature as human beings to have an inclination toward organic life and wanting to preserve it. When I sit in this beautiful place overlooking the water, I
have to say, from a purely logical point of view, it’s arbitrary whether it’s humans or other forms of biological life that survive on this planet. But from the subjective point of view, I look at the grass and the water and I ask, do I really want this world to turn into a giant robotic beehive that’s nothing but asphalt parking lots and meadow?

**Pohl:** But that’s what you do.

**Werbos:** I hope not. Aesthetically, I have a preference. Now, there is a question of, are we doing this too much already? Is the world already less than the best place you want to be?

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**Pohl:** That may be a question of maturation. There was a time when we were sent off to school for the first time. We didn’t really want to go; we wanted to stay home instead. Probably when we are first born, we’d rather be back in the womb. Then we learn that there are more interesting things in the new environment. Has anyone raised any questions about a dream of a posthuman life? It’s not the same, but if we had it, the feelings we have now would be transcended.

**Dator:** Tell me more. Are you thinking of a specific myth?

**Pohl:** I’m thinking more of X ideas of machine storage of intelligence where you can simulate whatever environment you want. If you want a nice bay vista with a beach, you can create it. You can have any surroundings you’d like. You can populate it with the girls from *Baywatch*, if you like, or you can have monsters coming out of the deep, if that’s what you like. That’s what makes it tempting. I do not expect to experience it myself, but as a dream I think it’s very attractive.

**Werbos:** No, I think….

**Pohl:** You’re not attracted to it?

**Werbos:** No. I know there are people who are attracted to that. I think someone has written about this, and I think he was an advisor for one of the Hollywood movies on virtual reality—I think *Lawn Mower Man*, but I’m not sure. It is true that if you download a human mind into metal, you no longer have the same feelings of pain and pleasure driving it. But then what? There are only two options. One option is that you don’t have any feelings of pain and pleasure input into the system. The part of the neural circuitry that inputs data from the hypothalamus could be basically truncated and inputting zeros. If you do that, you end up with a system unable to do anything. There was an early *Star Trek* episode that gave a good picture of how that would work. The other option is to wire in pleasure and pain sensations just as nasty as the ones we already feel, aimed at advancing the survival of these machines.

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**Pohl:** There’s a better option that you haven’t mentioned, which is to be able to use pain for what it’s useful for, but be able to turn it off…

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**Dator:** There’s a better option…which is to be able to use pain for what it’s useful for…but be able to turn it off…

**Pohl:** There’s a better option that there is intelligence on the one hand and emotions on the other…This is a common Western myth.

**Werbos:** Our culture has strange attitudes toward pain and emotions that have nothing to do with the way the mind really works, as far as I can tell. Sometimes I feel like culturally I’m a Martian. Having looked at the mind and the brain from this perspective, you code things differently. For example, there is a common belief that there is intelligence on the one hand and emotions on the other. So the struggle in the advancement of humanity is that you make decisions based on your intelligence as opposed to your emotions. This is a common Western myth. The Chinese are fully aware that this is a myth. Every Chinese intellectual I’ve ever known is enthusiastic about a book titled *EQ: Emotional Quotient*. In mathematics, it’s also crystal clear. If you try to build a robot and it has no emotions—like *Star Trek’s* “Data,” it has only an objective representation of reality—if all you have is an objective representation of reality, how do you
ever do anything? Action is based on preference, and preference is evaluation, and evaluation is emotion. In a real intelligent system, the emotional component and the understanding component are mutually supported, and neither can work well without the other. One of the common myths we have in our society is that emotions are not part of intelligence; they’re an enemy of it. Another peculiarity of our society is that we have attitudes about fun and pain and pleasure that are a little curious. The way people take painkillers is an example of this. There’s a sense in which I’d say, what’s wrong with pain?

Pohl: It’s not enjoyable.

Werbos: It’s a messenger.

Pohl: Beyond a certain point, as long as you’ve got the message, what’s the point of continuing the pain?

Werbos: Why should it bother you? There are people who say that if you understand the message, pain shouldn’t bother you.

Pohl: I don’t know any of those people.

Werbos: You know at least one.

Dator: Let me go back to emotions and intelligence. I am a participant in that myth that you talked about, not because I feel that emotions are inferior and nonemotional intelligence is superior, but because there are times and places when it would be useful to be able to separate my emotions from my intelligence, and that I cannot do. But artificial intelligence could do it, and it might be very useful to have an intelligence that isn’t human. You keep using the way we are now as the definition, and that’s only one possibility. What I think we are trying to develop is not human-like intelligence but nonhuman-like intelligence, recognizing that the emotions are very much part of the major driving factor and our intellectual ability is relatively minor—inconsequential, really.

Werbos: I don’t think the accusation is true that we are limiting ourselves to slavishly following all of the peripheral characteristics of the human life. Actually, there are several parts of the neural network community. Some are limiting themselves to following what is totally verified about membranes and connections in the brain—that which is known. What is known is clearly a small subset of what is out there. If you have a model that describes only what is known, you know it’s wrong because the whole brain is more than that. There is another group that is more the engineer-oriented group, which is where I come from, where you consider what is necessary to build a flexible learning system, but more general-purpose. There are a lot of things that we think of as weaknesses in the human brain that are just the symptoms of partial learning. Babies are not born knowing how to drive cars. Does that mean babies have inferior brains? No. It means there are some things you’ve got to learn through experience. The brain was designed to learn effectively through experience, but it takes time and there are a lot of things to learn.

The other thing is we’re judging people’s imperfections as human beings. We say somebody is doing something stupidly because we know how to do it better, but programming computers to do as well as human beings could be a formidable challenge. The power of human brains is really remarkable, judged from an engineering point of view. Humans can look very imperfect when judged by other human beings for the same sort of intelligence. The problems we solve are really very complex. Think how many millions and billions of variables we process in parallel. There are few engineers out there who know how to work with systems that have more than ten variables in a complete nonlinear-coupled system. So human brains are not so bad as we sometimes feel when we get mad at that guy next door who isn’t as smart as we are about something.

Dator: Let me go back to the distinction we were starting to make between the intelligence that humans have created artificially and the intelligence that humans have naturally. Again I give my example of the judiciary. Criminal law assumes that people are rational, calculating actors, that they know what the law is, they know what the penalties are for not following the law, and before every act they make a rational calculus. Criminal law assumes that people are rational, calculating actors, that they know what the law is, they know what the penalties are for not following the law, and before every act they make a rational calculus.

Werbos: Fred’s science fiction is more plausible.

Dator: Yes, but that’s what our laws are based on.

Graphic Recorder: I want to make sure that we get out of this discussion what other people are going to be interested in. In looking at everything you’ve spo-
Ken of, what I saw and heard were different areas that obviously you all are knowledgeable in, that span out to maybe the next 100 to 200 years. In looking at these things, what are some problems and opportunities that you see?

**Werbos:** We have said some things about problems and opportunities and questions. One of the real questions is this ethical question of preserving organic life versus silicon life. To what extent is organic life potentially threatened by silicon life? To what extent is it an opportunity rather than a threat?

**Pohl:** I think that there is a third opportunity, which is to have your pocket computer with you all the time so you're really in a symbiotic relationship, not competing.

**Graphic Recorder:** Any others? There were some things, for example, about emotional intelligence. In working with feelings, is that looked upon as an opportunity? Are you able to go with that aspect of our brain? Or is that a problem?

**Pohl:** Our emotions are sometimes driven by our metabolism. We get hungry or we want sex or whatever. I see no reason to preserve those, except to keep the race going and to keep ourselves going. There are other kinds of emotions that could be just as gallant for silicon intelligence: the excitement of discovering something new, of saying, Wow, that's wonderful! What else can I find out about this? I think those emotions are ones that we want to preserve.

**Dator:** Working with artificial intelligence gives us some examples of intelligence other than our own, and therefore, we can learn more about our own as we have that of others. The opportunity is to find out more about emotions in relation to intelligence, and to sort out the emotions that you're describing. I'm a reductionist in all this, and I assume that even what you call an emotion has a physical, chemical, molecular basis. I don't believe there is a “little me” in here making decisions.

**Werbos:** The conventional hypothalamus....

**Dator:** That sounds as though we have an intelligence driving our emotions or making our choices. I forget how you put it, but it's as though there is something in there that is you apart from this evolved combination of emotions and intelligence making these decisions.

**Werbos:** I haven't said anything like that, at least not in this hour.

**Dator:** I heard that in back of what you were saying.

**Werbos:** Oh, no.

**Graphic Recorder:** I didn't see you pick up on many problems.

**Dator:** The problem is the ethical question. I think it's an opportunity to raise the problem.

**Werbos:** It may come to an end. Is this a problem?

**Pohl:** Do we risk competition we can't handle?

**Dator:** Yes, do we? Your example of the magnet is good. We get a little too close and then, suddenly, that's it.

**Werbos:** When do we know it's out of control? That's the problem. When do I know?

**Dator:** I think it's out of control already. I am impressed by the artificiality of the world in which we live and everything in it, and the clear trajectory toward artificiality.

**Werbos:** This is one of the things that hit me yesterday when I was listening to Jerry, and I mentioned it to Walter later. Is it out of control? Frankly, the construction of real intelligent systems is still a sufficiently deep intellectual challenge that if a handful of people decided that they wanted to put a stop to it, I think it could be stopped. I don't think it's out of control. If I decide that I don't want to see this world populated by intelligent systems, and it's almost out of control—I may be wrong; this is my personal opinion—I could say no, and it wouldn't happen.

**Dator:** It wouldn't happen here, but it might happen in Japan or India.

**Werbos:** No. I know what's going on in Japan. I know what's going on in India.

**Dator:** But you don't have control over that.

**Werbos:** There are some very deep factors limiting what Japan is doing in this area, but I wouldn't want to talk about them in print.
Graphic Recorder: In looking at everything we have gone over, what would you like to share with the group?

Pohl: The question of whether we can build a competition that we can’t deal with.

Dator: And whether that’s good or bad.

Graphic Recorder: Can we deal with what might happen?

Pohl: Can we deal with a problem we are creating? It’s not going to happen without intervention on our part.

In a certain sense, I don’t see this as any different from what bothered Prometheus or Adam and Eve.

Dator: Right. In a certain sense, I don’t see this as any different from what bothered Prometheus or Adam and Eve. It’s what humans do and it’s one of the things that make us so problematic. We always get closer to the magnet than we intended, and then we have to deal with that, usually by creating some technological fix that gets us into another pickle. And I like that. There are a lot of people who think that’s what’s wrong with us. I can’t see any reason whatsoever not to go as far as we can with the creation of artificial intelligence. If it means we are transformed and transcended, well, parents have that same feeling with their children. I want my child to be exactly like me but to do all the things that I didn’t do—but the kid goes off and does something else.

Werbos: One reason the waterfall analogy is good is that you know you’re going to go over eventually, and you’re not entirely sure where you’re going over to.

Dator: That’s very important.

Werbos: An interesting question is, how does it work in this case?

Dator: If you were to do what you just threatened to do and stop doing this stuff, it wouldn’t stop it; it would slow it down.

Werbos: To be perfectly honest, that isn’t my perception. It requires paradigm-breaking. In the ordinary course of our society, there’s a feeling that progress is inevitable; that’s just not true.

Dator: I don’t think it is, either.

Werbos: It happens only when individuals are motivated and empowered to break paradigms. We have new paradigms at hand, but the existing vested interests are sufficiently powerful that they will throw all the research into what they’re interested in. That’s the way it works.

Dator: I agree with that.

Werbos: The power of vested interest is so great. That includes vested interest in computer science as much as anything.

Pohl: Are you talking about funding? You can stop the funding and, therefore, you can stop the research?

Werbos: No, it’s more paradigms than funding, although funding is definitely part of the picture. If there’s no funding, it does affect things, but it’s paradigms as much as funding. If everybody and his brother decides that from now on the thing to do is to try to build the jazziest web agent by doing micro-changes with a GUI [Graphical User Interface], then nobody’s ever going to build anything that’s really
intelligent. If you look at the way the money is going right now for internet investing on Wall Street—if it were up to Wall Street, we would never have intelligent systems, because the ordinary go-go funders are all looking for the latest search engine. The number of guys who are trying to build things that really think—there might be one or two people, but those one or two are part of a group of six who might have other plans.

Dator: I agree with you entirely. I am not at all certain that with the demise of the liberal welfare state, they will be able to accumulate wealth for long-range projects. The further that capitalism takes over, the more it is concerned with the present.

Werbos: It isn’t clear that the government funding at DARPA [Defense Advanced Research Projects Agency] really helped this process a lot. DARPA was very effective in enshrining old paradigms in vested interests. People are now inventing fifth-generation computing for the third or fourth time. There will just be parallel processing machines that are doing finite element calculations, and you won’t ever have to worry about artificial intelligence.

Dator: Have we done everything we’re supposed to?

Graphic Recorder: We have. I just wanted to polish what we’re going to be presenting, and then we have to decide on somebody who feels most comfortable sharing.

Dator: I think Fred ought to do it because he was particularly interested in the topic, and I would be interested in the way Fred interpreted it today.

Graphic Recorder: Is there anything you would like to have in this note that Fred is going to present with?

Werbos: I don’t think this image of a little black box that sits in a room pondering the universe is really the correct image of where we’re going. With any intelligence, there is some motivation that comes from the outside. There is a myth that we will abolish pain by putting our bodies in silicon. I just don’t think that’s the way it works.

Dator: That’s not my motivation. I’m interested in diversity of intelligence beyond just our own, because our own end pain and pleasure....

Werbos: They’re never going to go away.

Pohl: I’ve never met a fan of pain before.

Werbos: I’m not a fan of pain; it’s just part of the system.

The pain would be a transistor that isn’t functioning, or some kind of quantum effect device. It would not be muscle spasms...

Pohl: You would hurt in different places, that’s all. The pain would be a transistor that isn’t functioning, or some kind of quantum effect device. It would not be muscle spasms or anything like that. Pain is useful insofar as it calls your attention to what you need to do. Beyond that, it’s not useful.

Dator: There might be other ways that we could do so that don’t involve pain. You could devise a little machine to get your attention.

Pohl: Put a little sign up.

Werbos: There’s a book by Esterbrooks on hypnosis. He and other people estimate that 95% of the pain reaction that we feel is basically psychosomatic.

Pohl: Oh, yes, I’m quite sure.

Werbos: If one has a sufficiently mature framework in the brain, there’s a sense in which that 95% disappears.

Pohl: There was some great research years ago on comparing the pain suffered in warfare and the pain in an automobile accident, with identical injuries. The people who were injured in warfare required less morphine and reported less pain than those who
were hurt in the car accident. The soldiers saw purpose, I guess, to the pain. I don't know if that's what it was or not, but there was a distinct difference.

**Graphic Recorder:** We're coming to the big question of what the opportunities are. I understood your feelings on the metaphor in that there could be opportunities or there could be other directions we could go before or after the waterfall.

**Dator:** Before the waterfall. We can go hop in the sun, whatever. What about the developments to have emotional artificial intelligence simply so we can interface with it more comfortably?

**Werbos:** There is a question of what emotional artificial intelligence is. Partly, there is this myth that emotion is not part of intelligence. My feeling is that people who are really up on the state of the art take for granted that a functional system is going to have an evaluation or emotional component anyway. So it's not a big stretch. Sometimes I have this image in my head that years from now, a learned philosopher and a computer scientist will be driving along in this car and they'll be saying, "You know, I don't think people will ever develop artificial systems with emotions. Yes, these things will never be built. Never, ever." Meanwhile, the car itself is feeling bad every time it needs a tune-up, and the control of the car they're driving is already governed by a neural network with an emotional system and that's why they're even allowed to drive their car on the road. It turns out that they don't even know what's going on under the hood. This is not science fiction. Starting in the year 2001, Ford has announced that every car sold in the world will have a neural net chip in it. At least one version, from what I understand, does have what I would consider an emotional system as part of the system.

**Pohl:** When it feels pain, it lights up a little red light on the dashboard.

**Werbos:** Not this one.

**Dator:** It solves its own problems.

**Werbos:** Exactly. It feels.

**Pohl:** It can't solve the problem of being out of gas, though.

**Werbos:** This particular design is not addressed to forage for gas. This particular design just doesn't like to feel stinky or need a tune-up, so it tries to control itself to limit the stink.

[Comment added on retrospect] This discussion was a bit one-sided. Some of my friends argue that humans should not be entrusted with powerful new technologies until first they learn to understand themselves better. I continue to work in this area, because I believe that the science of intelligence will be necessary to humans understanding themselves better. Once again, we are in a race between the positive aspects and the negative aspects of new developments. It is unfortunate that society often gives greater encouragement to the negative aspects.
MORE CAPABLE HUMANS, identified as a critical factor for the long-term survival of the species, caught the interest of four participants who chose this factor for more in-depth discussion.

Facilitator: Clement Bezold
Participants: George Cowan
Jerome C. Glenn
Francis Heylighen
Seymour Itzkoff

Glenn: From an anatomical point of view, they add to the plasticity, and that means the capacity is larger.

Heylighen: This new discovery supports the theory that the brain continues to develop into adulthood. Earlier this year, we found movable hairs on the dendrites of neurons, proving the brain possesses far more plasticity than previously thought. The hairs actually change in diameter, length, and location. The nerve is more complex than previously thought.

Itzkoff: The IQ research doesn't show anything.

Glenn: No, but our conception of the neuron has changed—that’s a fact. The inference is debatable.

Itzkoff: We produce new knowledge constantly. I’ve been watching this for a year and the macro results, in terms of the plasticity of human intelligence, are as ephemeral as ever. So I’m not convinced about the validity of neurons and their relationship to plasticity, and about IQ tests in general.

Glenn: On an IQ test, 100 is average. It turns out that it goes up, so every ten years or so we’ve got to average it back down again.

Itzkoff: The so-called “Flynn effect.” The IQ tests that were formed 40, 50, 60 years ago were based on their structure of knowledge. Those were paper and pencil tests; they weren’t using probes to measure the brain itself. There’s been a macroincrease in information and awareness at the middle levels of IQ, so a child today can do better on a test that was formed 40 years ago—but other indicators such as the SAT have declined.

Glenn: The SAT is testing for different things.

Itzkoff: I do not agree that IQ levels are rising.
Clement Bezold (Facilitator): Seymour, would you put a question mark next to new neurons?

Glenn: They’re the same neurons. When we get the tunneling microscope down there, we find not only that there is hair, but the hairs move.

Facilitator: That’s brain plasticity. You said that there is regrowth of neurons.

Itzkoff: It’s a quantum jump to conclude that intelligence can be manipulated.

Facilitator: Is this a potential foundation for the more capable humans?

Glenn: The brain is a more complex organ than we thought.

Cowan: As our knowledge of the brain increases, this will have to affect our understanding of the developmental process.

Itzkoff: People are homing in on the genetic complex of the “g factor.”

Glenn: Okay, and the Genome Project is supposed to finish toward the end of the year.

Facilitator: Keep in mind that more capable humans are much more than IQ.

Heylighen: More intelligence.

Facilitator: And a variety of technostimulated factors.

Glenn: That’s right. It’s also human augmentation, whether it’s glasses, telescopes, or anything else. All this technology increases our capacity.

Itzkoff: It’s possible to do something with the human genome.

Glenn: No, I was referring to the capable human. That’s not just the brain and nervous system; it’s also their augmentation. I can’t see those little hairs on the dendrites without an electron microscope. So that increases my capacity. The Hubble Space Telescope allows me to examine and analyze things I’d never seen before. Jet planes have moved me around the Earth. Computers have allowed me to remember things from 20 years ago.

Itzkoff: This is a product of our ability for abstract thought.

Heylighen: I agree. There’s an enormous potential to increase our intelligence, both internally and externally, particularly through the use of computers. A classic enhancement is to increase the oxygen level in the brain. This technique is being used medically to treat diseases, but it may also increase memory.

Cowan: You mean the blood flow containing oxygen?

Heylighen: Yes.

Cowan: Okay, so the vascular system makes a difference.

Itzkoff: There’s a finite amount of economic sophistication where the future is concerned, and we have to make choices. Making a condom is cheaper than placing an implant in the brain, although the latter may eventually become preferable. I’m saying something radical, but I think it’s realistic.

Heylighen: The best way to increase intelligence is through education, and education is not cheap. In my country, Belgium, there’s a general system so that even the poorest people get a good education, and it does make a difference. It’s one of the differences between the educational system in the United States and in a number of social democratic countries in Europe. The intellectual gap between the rich and the poor is much narrower because everybody there gets a basic level of education.

Facilitator: We’re saying that education implies intelligence.
Itzkoff: Highly intelligent people benefit from education in a tremendous, explosive way, and less intelligent people don’t benefit. The United States has proved this over the last 40 or 50 years.

Heylighen: You have to adapt your education to the people you help, but even below-average people can increase their intelligence by 10 to 20 points with an education.

Cowan: It’s very difficult to control variables and get reliable statistics on social science research. Studies using large populations done longitudinally cost more than has ever been allotted to this subject. Therefore, all the results we’ve been using in discussions like this are debatable. What would it cost to do a large, definitive study?

Itzkoff: All those involved with educational issues will almost unanimously say that education has been a tragic failure in the United States. Experiments on a macrolevel, working with thousands of students, fail miserably.

Facilitator: We’re going to have a less-capable human in the future?

Itzkoff: The profile is down. Our culture is barbaric. Look at the television programming, popular movies, and the books that are being published.

Glenn: We’ve made a lot of social progress; for example, 40 or 50 years ago blacks couldn’t go into bars and women were denigrated in many different ways. Now people communicate more. There’s a tremendous amount of civility among total strangers that was never there before.

Facilitator: Back to more capable humans: how is technology going to interact with human capability? What better thinking methods over the next thousand years will create increased intelligence? And what role do advanced foresight and ethics play in making the more capable human not only smarter, but also wiser?

Glenn: The knowledge explosion of the last 50 years has gone well beyond the futurists’ projections of even 25 years ago.

Itzkoff: If we get back to where the 5th century BC Greeks were, we may be lucky.

Facilitator: In terms of wisdom?

Itzkoff: In terms of credibility as a population.

Glenn: The knowledge explosion of the last 50 years has gone well beyond the futurists’ projections of even 25 years ago.

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Facilitator: In terms of wisdom?

Itzkoff: In terms of credibility as a population.

Glenn: If I had the capacities that I have today—the glasses, the telephones—and I was asked to go to war with Athens in their time, I would win. It’s a capacity.

Itzkoff: But it’s a relative capacity.

Cowan: Social policies will determine how much money will be spent on educational programs and whether they’ll be universal. It will be a matter of selecting the wisest use of the money.

Facilitator: Is emotional intelligence more important than IQ for success? One line of thought is that improvement is IQ-driven. Does a higher range of IQs make for more capable humans?

Cowan: The smartest people are the most emotionally well adjusted; they go together.

Itzkoff: More capable humans, in the plural. What are the strategies to get there? That’s a legitimate futuristic question.

Glenn: Let’s say there’s one person with an IQ of 100 who has no technological augmentation of the body, but who does have computers and uses jet planes and other technological capacities, and another person with an IQ of 100 who doesn’t. Which is the more capable human? It must be the one with access to technology, even though he’s got the same IQ.

Itzkoff: Having glasses and being able to fly on an airplane make a person more capable?

Glenn: Correct. For example, if my job was to manage the millennium project and you took away the internet, my budget would increase so much that the majority of my time would be spent raising money.
The rest of the job would never get done. If you took my glasses off, I might not get to the right airport.

**Itzkoff:** Plato cites Socrates as saying, “There’s been a great deterioration in the average Greek in Athens since the invention of written word.” People don’t have memories anymore.

**Glenn:** He also said that a slave could figure out geometry, given the right questioning.

**Itzkoff:** It was internal.

**Glenn:** But he’s saying that even a low IQ can be brought up.

**Itzkoff:** He didn’t know the meaning of IQ.

**Glenn:** He didn’t use the term IQ, but he did say that a slave could do geometry.

**Cowan:** The slaves were simply the people who lost the war. It had nothing to do with their intelligence.

**Glenn:** He meant anybody could apply the principles of geometry.

**Itzkoff:** A Greek, not a barbarian.

**Facilitator:** We’ve come up with a number of different paths. One is that human capability won’t change in the next thousand years. What’s your negative forecast?

**Itzkoff:** It depends on social policies. There’s the Chinese solution of one child in each one family. That would be eugenic. The higher social, intellectual, educational classes should have as many children as the lower classes. A tremendous dysgenic trend exists in the world today, and in a thousand years from now we’ll have even greater numbers than we have now. There’s no predictable, definitive future, only possibilities.

**Facilitator:** That’s good. What’s the next scenario? Some of you sound optimistic.

**Cowan:** Use the European model of a universal schooling system that begins at one month of age. If it’s successful, it will have a very significant result. I don’t believe in the argument of finite resources, regardless of what the bookkeepers tell us. We can easily afford it.

**Glenn:** A thousand years from now, technological advances will be way beyond our imaginations. Conservatively, I expect nanotechnology will have become integrated into human DNA, and that all manufactured objects will have some degree of artificial intelligence within their parts. Whether it’s clothing, vehicles, body parts, or whatever, you essentially have a merging of technology and the human. This interconnectivity will utilize not only nanotechnology, but also bionics and genetic engineering—the whole gamut of technology. Humans will be far more interconnected with each other, creating a whole new kind of humanity. And we would become a space-adapted, conscious-technology civilization living beyond the Sun.

**Facilitator:** How, and what else, would happen?

**Glenn:** Use physical engineering for space exploration and evolution beyond the Sun. Look at our current energy systems technology and the new kinds of propulsion systems.

**Itzkoff:** This is fiction.
be able to do in a second the equivalent of something that took Einstein 15 years, just by using and processing these huge amounts of knowledge that will be available in a network.

**Facilitator:** Beyond intelligence and knowledge, what else would you say about humans a thousand years from now?

**Heylighen:** The next step is wisdom, the capability to apply this knowledge for the good of humanity. You will have an ethical system, not just with the government system, but also with your knowledge system, that would start with a very abstract value, such as survival and development, and then would become more concrete. The knowledge on one hand and the value on the other would merge into each other. You’d have a pyramid growing from everyday knowledge to the highest values.

**Itzkoff:** Study creativity involving the total character of the human civilization, of which technology is a very small dimension; creativity in terms of the whole spectrum of what civilized behavior is when technology is a small factor. People without glasses or hearing aids or computers can do other things and live a terrifically rich life. On the other hand, people with all those advantages can live a barbaric life.

**Glenn:** To say that technology isn’t going to make a difference a thousand years from now is ridiculous.

**Cowan:** I would hate to go back two centuries, no matter how rich the intellectual life was. I would be attending public hangings. Life would be short and brutish. And if you dislocated a vertebra, you would use a cane from age 30 on. My grandmother would have been old at 65. That doesn’t happen anymore. Everything is improved. It’s true that a lot of people live anonymously; just as in Athens, you heard from 10% of the Greeks in the Agora and the other 90% were slaves. But the notions of social justice have improved and there is little chance of an “intellectual barbarism” in the masses. Suddenly they have money to spend, so they are marketed and catered to. Even though they have richer lives, the average IQ is still low, though both the high end and the barbaric end are going up.

**Heylighen:** They’ve become more visible.

**Cowan:** They’re a market, and TV reflects that, but that doesn’t mean that the intellectual level is going up.

**Facilitator:** We’ve come a long way in a couple hundred years, although human capability may not have come very far in 2,500 years.

**Cowan:** I wouldn’t want to go back a hundred years. I would be miserable.

**Itzkoff:** You can’t jump over your own shadow. You’re from 1999. If you asked an average Russian about the past, he would romanticize the Romanov dynasty. The Russian society has gone down; you can’t rule out the crumbling of an entire infrastructure.

**Glenn:** Of course, those are blips in the human saga.

**Facilitator:** That’s true. It’s almost like saying that Yugoslavia, France, and Germany are the same now as they were one hundred years ago. It used to be okay for the French to kill the Germans and vice versa, and now it isn’t. But what have we missed in our conversation about capability? There’s an opti-
mistic set of images, and there’s a skeptical set. There’s an argument about the necessity of IQ, and there’s an argument over what we do and don’t know. There’s also the social policy of the Chinese to limit the population to enhance capabilities. What images come to mind to portray a thousand years from now?

**Cowan:** In the spectrum of the views that were presented here, one of the pictures is a waterfall. The other picture is a rocket. Things in motion have a flight path, right? We want a dynamic trajectory. It’s either upward or it’s parabolic and falls back to Earth. There are a lot of theories agreeing with the latter.

**Glenn:** Another image would be the birth image beyond the solar system. The forecast is that the baby’s going to die, but, lo and behold, the system changes and the birth comes out. So one image would be the birth of humanity beyond the solar system, with the Sun as the parent. We’re in a little zygote. Another image is of conscious-technology as an emergent property of a set of trends evolving in society—technological, sociological, and psychological. All of these trends together create an emergence of conscious-technology, the integration of the mind and technology.

**Cowan:** Setting aside the individual, we can debate about whether there is an inevitable trajectory toward aggregation. If you look at cultural anthropology, the social unit went from the family to the tribe to the village to the fiefdom to the nation-state, and now we’re talking about the global village. It is an inevitable trajectory. It doesn’t mean that it transcends the other; regional areas still develop, and the nation-state doesn’t disappear. An economic global village will be followed by a patchwork transformation of regional units. And those things will have a profound effect.

**Itzkoff:** Human beings can say *no* to every one of these propositions. Maybe they don’t want the global village.

**Glenn:** In the 1970s, I was involved in experiments using computers for computer-mediated communications. I heard a huge number of *no*s in this country about computers, and later in the 1980s around the world, many rejecting the whole concept of computer communications. Now people joke, saying that you can improve the value of a currency, say the yuen, by saying *yuen.com* and people will invest in it. Anything with *.com* at the end of the title is now considered valuable. The *no*s have been universally trumped.

**Itzkoff:** There are minor technological advances. I’m talking about a global village. That’s a macroprediction.

**Cowan:** In the beginning of the 19th century, people were debating the state versus federalism. But there was an imperative, a war was fought, and we’re still arguing states versus federalism. Today the federal power is there and that’s transcended the power of the state. Now the imperative is moving toward the other side, in spite of our hopes.

**Glenn:** There’s a homogenization, and English is becoming the primary language.

**Itzkoff:** I’m not denying the technology; I’m just denying your macrosignificance of what the human species is going to become. That’s the great issue.

**Facilitator:** How would the next thousand years look if they were designed consciously with more profound ethics? And if these three are positive, we are heading toward the global village with enhanced humans of incredible capability versus those self-destructing factors that have us protecting ourselves from ourselves. Will we choose consciously to help create a humanity that looks like this? Will we really choose to support scientific research?

**Heylighen:** If some people create more capable humans by whatever technology, education, or whatever, the others will have to follow.

**Facilitator:** So the global village has a competitive aspect?
Glenn: Absolutely.

Cowan: It’s part of the self-adaptive force that is going to determine the outcome regardless of what we’re saying.

Facilitator: We have four paths and two charts, and images from the waterfall and the rocket, to birthing from the Sun.

Cowan: The idea of progress is a modern idea. In Greece, there was a notion of an ideal state, but the idea of progress wasn’t even mentioned. Things were static.

Facilitator: The four paths here are: a negative path, unless we engineer with social policy to get over the antidysgenic effects. The second is that there’s a lot of broader social policy that will enhance humanity. The third is, if you add in all the technologies, from nanotech, DNA, bionics, genetic engineering, and human-manufactured items possessing intelligence, you’ll end up with more interconnected humans with individuality. And then the fourth is the global brain. It goes further and says that the whole body of human knowledge is instantly available. It’s a collective intelligence, and we’ve barely begun to explore what that means. Those are the different paths.

Cowan: How would you present the first?

Itzkoff: As a kind of methodological futurism. I’m not concerned about what’s going to come out of it in a thousand years as long as we proceed to increase and enhance global human intelligence.

Facilitator: Even pessimists have to walk out and make a difference.

Glenn: There’s a clarification: that there’s no faith in current research. George, when you said you didn’t have faith in the research, you were talking about the brain function and IQ, right?

Cowan: Yes.

Glenn: That’s a much different statement than the rest of these.
Itzkoff: You can’t do that unless you get the general consent.

Glenn: He’s asking you for a definition.

Itzkoff: Well, the social policy of enhancing human intelligence.

Facilitator: But primarily by flow-limiting rather than by enhancing.

Cowan: They’re both social policy.

Glenn: One is focusing on education and the other on genetic selection. Nature and nurture.

Facilitator: Social policy.
This self-selected small group of five participants discussed the critical factor MOVING BEYOND THE PLANET.

Facilitator: Glen Hiemstra
Participants: Steven J. Dick, Dietrich Koelle, Meng-Kin Lim, Rosaleen Love, Allen Tough

We ought to start with what we know about moving beyond the planet...

Glen Hiemstra (Facilitator): We ought to start with what we know about moving beyond the planet, including listing elementary information that others here may not be familiar with. First, let’s go around the table and say who you are.

Lim: I’m Meng-Kin Lim from the National University of Singapore.

Dick: Steve Dick from the Naval Observatory in Washington, DC.

Tough: Allen Tough, University of Toronto.

Koelle: Dietrich Koelle from Munich, Germany.

Love: Rosaleen Love, Monash University, Melbourne.

Facilitator: I thought Steve had an interesting trio of topics yesterday. One was about moving beyond the solar system. Second, how one way or another, we may have contact with other civilizations, other kinds of intelligent life. We may bump into it out there somewhere, or it may send us a message, or it may come here. The third one was understanding the cosmos.

Dick: Our place in the cosmos.

Facilitator: Who we are and how we fit into the cosmos is going to change dramatically from further research. Space, extraterrestrials, and understanding our place in the cosmos. Maybe space exploration, moving beyond the planets. Is there anything we’re leaving out there?

Koelle: A multiplanetary society.

Tough: I’d say that ties those together.

Lim: There’s also the question of whether it is an option or an imperative.

Facilitator: Is this an imperative?

Tough: No, moving toward outer space.

Koelle: Moving beyond the planet.

Facilitator: Moving beyond the planet is an imperative?

Koelle: Yes, it’s not an option; it’s an imperative.

It is an imperative for practical reasons and also for a sense of who we are.

Tough: It is an imperative for practical reasons and also for a sense of who we are. We don’t want to be stalled here for the next thousand years.

Lim: Yes. Because the Earth will become inhospitable—either because of damage to the biosphere, or because in four to five billion years, the Sun will burn out. But long before that, the effects...

Koelle: If we have to take our biosphere with us, that’s a problem.
**Lim:** Either you take the biosphere with you or you create an artificial microenvironment, as we do with space capsules.

**Koelle:** In a million years, the Earth will be too hot.

**Lim:** Sure. Of course. But the positive side is future development. As we evolve and venture out, we will be spreading our eggs in more than one basket.

**Koelle:** One of you mentioned the asteroids as natural resources. Some people say the asteroids are very valuable materials.

**Dick:** They are a threat if we bump into them, or they bump into us.

**Facilitator:** Does that cover it? Is there anything we're missing before we go on to discussing moving beyond the planet in more detail?

**Koelle:** I think the extraterrestrial problem is two different cases. One is the probability of intelligent life in the universe, and the second is if we ever make contact. Two different problems, I think.

**Dick:** It's possible that they're out there but we may not be able to make contact.

**Koelle:** Exactly. Human life has been in existence for less than 1% of the lifetime of the solar system. We've yet to encounter others, to make contact with other life-forms in that period. It seems to me almost impossible.

**Lim:** To propose a metaphor, I'd like to suggest that in terms of human development, I see this whole period on Earth and in the solar system as our being in utero—i.e., before man is born into his larger destiny, which is to take his place among the stars. We have this period to evolve, so as to become worthy of moving out into space. We might be doing the universe a disservice if we don't get our ethical evolution act together. We might, in fact, be doing the universe a favor to keep ourselves quarantined within the solar system. If we do make it out there, it's imperative that we make sure we deserve to spread our version of life-form throughout the universe.

**Dick:** If we talk about the thousand-year horizon, one of the interesting questions is going to be about what I call interstellar humanity—whether we actually get to the stars. I think a thousand years is a long time and we will find a way to get at least to the nearest star, so we will be able to expand from interplanetary to interstellar exploration.

**Lim:** In principle, yes, but the question is whether that makes sense. Alpha Centauri is the closest system to us; are there any habitable planets? If not, then it doesn't make sense to go there.

**Dick:** It depends. Why do we want to move beyond the planet? Is it for exploration or is it something else? We're not really exporting the population of the planet.

**Koelle:** Then you have to distinguish between research missions, interstellar missions, or any other human missions they are talking about.

**Tough:** Or humans going to do research.

**Koelle:** That is a very costly idea.

**Tough:** I'm not promoting it. I'm just saying it is an option. I want to pick up on something Lim said about not putting all of our eggs into one basket, which is a survival thing. It means that there'd be a lot of experimentation going on out there, with different societies and different space elements. If they're fairly free of influence from Earth, they may develop in some interesting directions. Little laboratories, in a sense; social laboratories.

**Koelle:** The colonies may surpass the mothership, in a sense.

**Love:** Australia rising from the south.

**Lim:** Or an ex-colony like Singapore.

**Love:** I always find a social metaphor rather difficult to use for what is technological activity. I can see why you're suggesting it. I would not pretend to go for a more technological image.

**Lim:** Actually, I feel that the technological aspects would not be the limiting factor. As we have seen in the last century, man's capacity for technology knows
no bounds. Half the things we enjoy today were beyond the dreams of 19th century man. New technology will take care of new problems. I think the human aspects of space travel will be more limiting. After all, we are flesh and blood. We have physical and biological constraints. We are designed for terrestrial pursuits.

**Dick:** Over the next thousand years, we may genetically engineer ourselves.

**Lim:** That’s right. Technology again hosts the potential solutions to those kinds of problems. Biotechnology.

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**Koelle:** I’m surprised you are so confident of technical development. I am an engineer, but I am not so confident.

**Lim:** Engineers got us to the moon, doctors designed the life-support systems, and so on. So the two must go hand in hand. We mustn’t emphasize just the technological aspects. We have to look at the human aspects as well—biological and psychological.

**Facilitator:** About the technology—what are the chances of the technology evolving to the point that we can travel huge distances? I heard Walter Kistler give a talk at the World Future Society in which he said, “Look, we’re never going to travel more than a tenth of the speed of light.”

**Dick:** Never is a long time.

**Facilitator:** That would mean we’re never going to go into space, but it overlooks the possibility of alternate means of transportation. What are your thoughts on that?

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**Lim:** Before we even go into the technology, we should really question the assumption that nothing can travel faster than the speed of light. Nothing can travel faster than the speed of light in our present universe, based on present knowledge. But there could possibly be other means to overcome this—like cosmic wormholes, a different dimension, and so on, things yet undiscovered.

**Tough:** Also, a tenth of the speed of light is not a bad speed.

**Lim:** You can always suspend animation so that time becomes nothing. You sleep today; you wake up two million years from now.

**Dick:** The problem with wormholes and things like that, as you saw in that movie *Contact*, is that it’s science fiction at this point. There is some reason to believe that there could be such a thing, but who knows which way it’s going to go over the next thousand years? Maybe it’s not possible.

**Koelle:** Beaming people—now there’s an interesting concept that may be feasible, but it takes a tremendous amount of energy that may not be available. Physically, there are many possibilities, but technically, it’s science fiction until something can be proven.

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**Tough:** Those looking at the future of space propulsion are moving away from the need to carry your fuel with you.

**Lim:** Laser beam propulsion.

**Dick:** There’s talk now of being able to pick up some kind of matter as you go and use that as your fuel—kind of a ramjet concept.

**Koelle:** Independent from that is another factor: funding. Space has no priority any more with the public. What will happen is that it will happen, but it will be very slow in gaining funding. As for mass missions, it will take a hundred years or more. Technically, you could do it today.

**Dick:** NASA’s already planning to launch an interstellar probe within 30 years.
Lim: So it takes another 30 years until you get the data?
Dick: Yes, that’s not a problem.
Lim: That’s a hundred years, almost!
Love: The probe we have up there currently is just working. Besides having some that are working brilliantly, we have some that are bumping into each other all the time. It’s a bit like Russia in chaos up there.
Dick: Yet we made it to the moon. We do reach out, despite the problems.
Lim: About two years ago, I read that there had been a breakthrough relating to beaming matter—you may remember what I’m talking about. If I recall, scientists at the University of Innsbruck reported their success in demonstrating quantum teleportation experimentally in the journal *Nature*. They had succeeded in teleporting the quantum state of one photon to another photon some distance away. I think that’s the beginning of the possibility of dematerialization and materialization—the kind of stuff science fiction writers talk about.
Tough: One of the concepts being studied now in the nanotechnology field is that presumably, within a few decades, we will learn how to build things atom by atom and molecule by molecule. Four or five years ago, that was sort of fringe and not mainstream science. In just four years it’s become very mainstream. A lot of the prestigious institutes are putting money into this, and Ford Motor is sponsoring research into this matter.
Lim: The Japanese are also very much interested in this.
Tough: If that happens, it means that you could produce flawless materials, very like materials that we have now but flawless. You could build, in a sense, perfect, very small spacecraft. And also very smart, because you can do more things with very smart computers when you can build atom by atom and molecule by molecule. Maybe within 30 or 40 years, we’re going to be building very smart and very small craft that can go a tenth of the speed of light—whatever speed that could get from here to the stars.
Koelle: Even if that’s the case, it will take maybe thousands of years until you get a positive response. You can send a hundred probes without a positive response.
Dick: We probably will send a hundred and, you’re right, we won’t get stuff back for quite a while. We can be patient.
Koelle: What’s the probability of their going off course?

*We’re looking for whatever is out there, not anything in particular…*

Dick: We’re looking for whatever is out there, not anything in particular—what kinds of planets are there.
Koelle: Am I to assume that’s what we are looking for?
Dick: No, no. Just exploring the cosmos.
Lim: I think our clearest hope is new science. In the 20th century, quantum theory and relativity are the two major theories that revolutionized our thinking about the universe. What makes you think there are not going to be more breakthroughs in the next millennium? Are we limited to just two revolutionary breakthroughs per century?
Tough: We can’t predict what those breakthroughs are going to be, so we can’t say how that’s going to affect the next thousand years.
Lim: To speculate in that fashion may be useless. But to conjecture about possibly traveling at the speed of light…
Koelle: The cosmos, as such, has no impact on humanity.
Dick: I wouldn’t say that.
Koelle: Only a small number of people are really interested and involved in that.
Tough: That’s the third thing: the understanding of our place in the cosmos. As we become part of something bigger and bigger, it affects everyone’s sense of who they are. It may serve to unify humankind.
Dick: In a more concrete sense, it could affect religion and theology, if it turns out there are extraterrestrials out there.
Koelle: That’s the difference in us. I see just the exploration as such.
Dick: It depends on how you define exploration. Is it separate from searching for extraterrestrials?

Koelle: Yes. That is another thing. Is that something we have to discuss? What would be the impact if extraterrestrial intelligence could be contacted? What would happen on Earth then?

Lim: We have to have a course of action based on possible responses—depending on whether they are hostile, friendly, or whatever. For all we know, our initial contact could be our last.

Dick: There are some historical analogs you can use, not the ones that you usually hear about: Cortez, Pizarro, etc. I don’t think the contact’s going to be physical; it’s going to be intellectual. You can make analogs with the Greeks; knowledge of the Greeks was brought to the Latins by the Arabs. I think it’s a much better analog. Also, consider what I call the biological universe, if the universe were full of life. If you consider that kind of a worldview, then you can make some comparisons with other worldviews, like the Copernican theory and Darwinian theory. That’s because there’s literature on how theories like those were conceived. You can’t make predictions based on that, but you can use them as guidelines.

Tough: Why do you think the contact won’t be physical?

Dick: Based on the evidence we have so far: UFOs and aliens.

Tough: Why is it more likely that we’re going to get a radio message than that we’re going to detect a probe?

Dick: That’s a fair statement.

Lim: Just like attempting to reach out.

Tough: More than 30 years, right?

Dick: If that is the case, then, depending on the form—whether it’s here on Earth or if they are in a probe or whatever—then you would have other analogs.

Tough: What’s your sense of a thousand years? Do you think we’ll still be on Earth and not exploring beyond the solar system?

Koelle: Not with human beings.

Facilitator: But maybe with probes?

Koelle: Yes. It’s quite possible that in a thousand years we’ll have colonies on the moon, on Mars, and eventually on a Jupiter moon.

Dick: I’m not sure that in a thousand years we won’t have sent out humans beyond the solar system, maybe genetically engineered astronauts.

Koelle: Redesigned humans.

Dick: A century ago, they never thought we would go into outer space.

Koelle: Who, humans?

Dick: They speculated that essentially it would be machines and humans would be like cyborgs.

Lim: Of course, if extraterrestrials did reach us, they could give us that boost.

Koelle: That’s an assumption that they are that far ahead of us. That’s not necessarily right.

Dick: Why? Just because our Sun is a very young star in our galaxy, other stars have to be millions of years older?

Koelle: What’s the lifetime of an intelligent civilization?

Dick: Nobody knows. My sense is that it’s millions of years.

Koelle: Why did the dinosaurs not develop an intelligent species? Two hundred million years was more than enough time. More than mammals had. They didn’t because the temperature was too high. Their living was too good. They never had to develop any provisions for food shortage or whatever.

Dick: More than that. For more than three billion years of life on Earth, there was nothing but bacteria here. It’s entirely possible that you have a universe full of bacteria but it hasn’t gotten beyond that.
**Lim:** Human intelligence is unique. Maybe that’s why it’s such a heavy responsibility to make sure that we make it.

**Koelle:** Perhaps intelligence developed because of climatic changes. Maybe the change in environment forced people to adapt to different conditions.

**Lim:** Maybe we should focus on the mind, not on the futility of the other civilizations in a finite system. That would give us the challenge to look outward. If Earth becomes inhospitable and the Sun burns up, all of civilization’s achievements will come to naught. Surely that would be a driving force, a tremendous motivation for us to put resources into space exploration.

**Dick:** That’s in the very long-term future. The Sun’s going to last another four billion years.

**Lim:** Yes, but you’ve got to begin building a foundation now, because the inhospitability question may be upon us within the next 400 years.

**Dick:** The inhospitability of the climate on Earth.

**Koelle:** In 90 million years.

**Lim:** Sooner than that, it’s going to be too much for mankind—in terms of population, in terms of food, in terms of whatever.

**Tough:** It may be that before four billion years pass, it’s just going to be too hot.

**Lim:** Don’t forget nuclear destruction. If we blow ourselves up…

**Dick:** Are we supposed to take a question back to the big group?

**Facilitator:** That’s right. We’re supposed to say, here’s what we know, here are problems and opportunities, here’s the trajectory that we see, and so on.

**Dick:** Oh, the group generates the big question.

**Facilitator:** Yes. We’re going to do that in the big group. What we want to do is really that third point. What are the key pieces of information that you want the rest of the group to know about in moving beyond the planet? We can keep going in this vein, or we could list opportunities and problems that we see over the next thousand years, or we could go on to what the key pieces of information are that we want to tell people about.

**Koelle:** The first thing we should explain is our title. We’re not talking about an option; we’re looking for an imperative for the survival of humanity, for the long-term survival of humanity. Intelligent life on Earth will be limited by two factors: first by climatic cycles. We get a new hot period, the Great Ice Ages cycle. It’s a 240-million-year cycle, and that’s the same as the period of the solar system around the center of the galaxy. And the dinosaurs did not die because of a meteor impact. That’s nonsense. But it may have been because the Great Ice Age started at that time. The temperature fell some 20 degrees centigrade; the dinosaurs couldn’t survive that change. Eggs were laid in the open, and they couldn’t sit on them.

**Dick:** There was an impact 65 million years ago. The evidence for that is very good.

**Koelle:** Yes, of course. But not the only one.

**Dick:** You don’t think that did it?

**Koelle:** It can’t be, because the birds survived. If there had been a period of darkness, the birds would have suffered the most, but they survived. So we’re dealing with climate change and potential asteroid impact.

**Part of what it means to be human is to explore…**

**Dick:** I don’t think it’s just human survival. I think it’s also an exploration. Part of what it means to be human is to explore, and that’s what we’ve always done. That’s more of a philosophical point.

**Facilitator:** I’m assuming there’s more than one reason that it’s an imperative.

**Lim:** So space exploration is an expression of the human spirit—the adventurer in us.

**Love:** I don’t know if I agree with any of this, but I’m really happy to let you go on.

**Dick:** You don’t agree with any of this?
Love: I don’t think so.
Dick: You don’t agree that we’re going to expand into space?
Love: First, I don’t see it as an imperative, and second, I have problems with your point about possibly destroying ourselves with nuclear war and therefore we have to go?
Tough: Right.
Love: I think that what happens in space seems to be as much of a muddle as what happens on Earth now. Okay, you could say in a thousand years we’re not going to be in a muddle.
Dick: We probably will, though.

We are very much located and feel affection for a particular place...if you are out in a spacecraft going who knows where, you’re going to lose that.

Love: Also, our place in the cosmos seems to be very much a topic now, and that was why I came to this group, because I was interested in that particular issue. We are very much located and feel affection for a particular place. It’s not just Earth; it’s a particular place on Earth. Often that is our home. I find that an aspect of what it is to be human, and if you are out in a spacecraft going who knows where, you’re going to lose that. What would it be like not to have a home; perhaps never to see it again; and to know that as you make the trip?
Dick: That’s a little different interpretation than I was thinking of when I said our place in the cosmos.
Love: Exactly.
Dick: Originally the question was concerning central physical place. We know that there are no central physical places out in the solar system or the galaxy—not central in any way as far as we know physically. So, are we central in any biological way? That again hooks up with the whole extraterrestrial thing. If there is life, where do we fit in the scale of things?
Lim: I think there might be an economic imperative to go into space. The cyclical problems of our world economy may be related to the fact that on Earth, resources are finite. In space, resources are infinite.
Dick: People are already talking about exploiting the asteroids.
Love: That’s the promise of paradise—infinit resources.
Dick: If there is money to be made off the platinum in the asteroids, somebody’s going to find a way to do it.
Koelle: Asteroid mining.
Lim: Also as energy source, to solve Earth’s energy problems.
Koelle: A new energy source.
Lim: We can have artificial Suns up there beaming nuclear energy down to Earth.
Tough: We might construct gigantic grids to capture sunlight and turn that into energy.
Lim: Nuclear fusion technology up there, generating energy for Earth—that’s possible.
Dick: I’m not sure why you have it up there instead of down here, though. Through nuclear fusion, you can do it on Earth.
Tough: Several-mile-wide grids?

...will we see a point at which it becomes a more widespread human yearning to move into space?

Facilitator: Here’s a question I would like to have you talk about for a couple of minutes: the funding issue. Though we around this table might consider something an imperative, the vast majority of the people in the world would say that it’s not. During the so-called space race, there was a limited set of people who said that it was an imperative. What will drive it? Will there always be a minority of people who feel this, or will we see a point at which it becomes a more widespread human yearning to move into space? What tips us over that point?
Lim: I think maybe mankind is living under the delusion of immortality, that things go on forever. There is a need to focus people’s attention on the finiteness of our condition.
Dick: We’d like to say that everybody in a philosophical sense wants to know what their place in the cosmos is, but if they’re starving in Kosovo, it’s not likely they care that much.
Lim: The age of destruction. The eve of destruction.

Tough: I think it’s the way that technology is going to progress that’s going to be the difference in how these things are perceived. To feed the hungry, to explore space—if technology is successful so that doing these things is cheap, it’s going to turn most of our economics on their heads, because it will be easy to make things that now are very cumbersome and slow and expensive for us to make.

Dick: One of the dichotomies mentioned yesterday was the have versus the have-nots. I don’t know if somebody is going to be talking about that today, but this is one area where it certainly applies.

Love: Can you use nanotechnology to make food?

Dick: Yes. That would certainly be one that would work.

Facilitator: There are all sorts of things. Would contact actually turn a lot of people the other direction to say that space is a scarier place than we thought, because now it’s full of potential threats rather than just emptiness?

Dick: What do you do, then? Sit on Earth and fortify yourself? Fortification with bigger guns?

Tough: Sounds like a lot of science fiction novels.

Dick: Movies, too. Independence Day and all that.

Facilitator: That’s the only trigger event I can think of that would tip the public to the sense that there is life of some kind far beyond what we thought.

Tough: Even the Mars discovery of the bacteria—within a day President Clinton was on TV raving about it. It didn’t have to be some guy with bug eyes speaking from a spacecraft; it was something as simple as bacteria on Mars from thousands of years ago.

Dick: The general reaction to that was amazing. I was on the beach in North Carolina, and it was the headline in a tiny newspaper there. They were quoting people, talking about the religious implications and all, and that’s just fossilized bacteria.

Lim: It shakes your security.

Koelle: Nevertheless, independent from that list of imperatives, it’s a funding issue, and these activities will not have priority in budget discussions for the time being. More problems will come up in the future probably, so that space will not get that support that we would like to see.

Lim: You need political groups to attain resources.

Koelle: Or something has to happen.

Tough: The other thing that’s happening is just the opposite. There’s this surge of energy through this Mars Society. They had their first conference a few months ago, right? The energy, the excitement around that is amazing.

Koelle: Yes, but it doesn’t help, does it?

Tough: Oh, it does help. In fact, they’ve succeeded through their lobbying in getting some parts of the Mars budget reinstated that Congress was going to take out. They have political clout already, but they may have to do it commercially. They may just bypass the government completely and do it commercially.

Dick: Well, certainly in a thousand years. And before then.

Tough: I think you’re right. We’re stuck now, but if you take a long-term perspective, we’re not going to be stuck forever for funding.

Lim: If you look at it in perspective, it’s as absurd as Queen Isabella not funding Columbus, and all the subsequent migrations to the New World not taking place.

Dick: It’s the economic imperative that’s going to drive it. If we can get out there with the asteroids and start mining those, all kinds of people are going to want in on it.

Lim: Think of the lure of Aztec gold.

Koelle: If any good economic reason shows up, then yes.

Dick: We know what the asteroids are made of, and we know that they’re economically a gold mine, so it’s just a matter of private companies being able to get out there. Certainly that’s going to come over the next hundred years.

Koelle: We’ve got to have an improvement in transportation, and nobody’s financing that development. That’s the problem. We can’t do it commercially
because it takes too long. There is no benefit, no return on investment.

**Dick:** What is it, then, that Walter Kistler is doing?

**Lim:** He breaks down the costs and makes it more cost-efficient.

**Koelle:** It's one step toward the goal.

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**Tough:** And that’s a commercial venture. I think governments may be bypassed in the future, and citizens and corporations are going to do it.

**Koelle:** We’ll start with small-scale corporations first.

**Dick:** So let’s see. Have we covered No. 2? What is likely to happen in the next thousand years?

**Facilitator:** We haven’t really sketched a path. We’ve certainly covered problems and opportunities. If we want to try to sketch it out, you’re going to create the kinds of things that can happen. I’m trying to think whether that’s possible. It’s like writing a short science fiction story.

**Tough:** We have mostly focused on space exploration in our discussion. We haven’t talked much about contact with other intelligent life in the universe, and we haven’t talked a lot about how it’s going to affect our understanding of our place in the cosmos.

**Dick:** Moving beyond the planet—when you say that phrase, the first thing you think about is space exploration, physically going out there. But I’m thinking in a broader sense, the consciousness. We realize we’re a part of the cosmos. That kind of consciousness we see already, but it’s going to increase as you learn more about what’s out there, more about other planetary systems, and more about whether there’s life. Then we’ll see what our place is. In the broader sense, I think our consciousness of outer space is part of moving beyond the planet. You don’t have to physically move beyond.

**Love:** We’re talking with minority and majority interests. One of the interests that have actually endured for thousands of years is astrology, New Age philosophy. You’ve been talking as if there isn’t that aspect of human nature as well. We’re talking purely the rational here.

**Dick:** What are you saying? The astrologers have moved beyond the planet?

**Love:** Of course they have; they’re channeling from there. But astrology is one aspect of understanding our place in the cosmos, one aspect of what it is to be human, looking out beyond the planet: to have this notion of what the world is like, which is totally irrational, and yet that’s a powerful opinion if you’re talking about the popular conceptions of space. Astrology is one of them, and the power of the planets. Our human life is part of it as well. It’s not what we’re talking about or what we want to talk about, but it’s an aspect of how we perceive our place in the cosmos and is real to a great many people.

**Facilitator:** It’s quite intriguing if you think about it. We’ve said that there isn’t much interest in space when, in fact, there has been thousands of years of interest in space.

**Lim:** Especially the concept of traveling at the speed of light. They’re not limited by the laws of physics!

**Dick:** You have extremes, too, like the Heaven’s Gate cult. They were certainly interested in space. They killed themselves because they thought they were going up there.

**Lim:** They might be there now! How do you know they aren’t?

**Tough:** Give me the evidence.

**Facilitator:** We’re back to Steven’s idea, that moving beyond the planet is more than just physical boundaries, some kind of consciousness beyond the confines of this planet.

**Dick:** Look at the whole *Star Wars* following, with people standing in line for a movie that’s not going to be starting for a month yet. It’s people being interested in space and what’s out there, the possibilities.

**Lim:** That’s correct.

**Koelle:** Yes, but it’s not sufficient.

**Dick:** But it’s a part of the culture.

**Lim:** That’s correct.

**Koelle:** True, but it doesn’t help us. You know what happened to the lunar missions, to fly to the moon. This did not happen because the public was interested. It happened because of the Cold War. The Cold War is over.

**Tough:** We need to get into another one.
Dick: It never would have happened without that, although there was a lot of public interest when it happened.

Koelle: Discussion, yes.

As with all great human endeavors, you never depend on a majority vote. I think it's going to happen the same way with space.

Lim: As with all great human endeavors, you never depend on a majority vote. I think it's going to happen the same way with space.

Koelle: More commercial interest.

Lim: Right. Don't be surprised if it's going to be a minority benefiting the majority.

Facilitator: Let's look at that last question: No. 4, fitting into the metaphor. We have a suggestion of the metaphor being the embryo, moving beyond the planets.

Lim: What our human potential is— I think we have a place among the stars.

Tough: What about the metaphor of laying eggs in different baskets? It's a big metaphor.

Lim: Spreading our wings?


...there is one common human yearning in every culture... everybody yearns for survival and for prosperity.

Facilitator: In the group that Rosaleen was in yesterday, Yersu Kim was talking about common values. He said that there is one common human yearning in every culture, as far as he could tell, and that is that everybody yearns for survival and for prosperity. I immediately thought of Star Trek's Mr. Spock, with his "Live long and prosper."

Lim: You have to ask yourself what the alternative is: for human civilization to stay put and do nothing?

We'll never reach our full potential if we do not get out of this closed system.

Dick: Of course, there will be objections that we should take care of our problems on Earth before we go out there. All the starving people and you're spending money on the space program. I think that's always going to be an objection.

Lim: It's investing in the long-term future. The foundations must be laid today.

Tough: Do you believe that our understanding of our place in the cosmos might change? What changes might take place?

Dick: It's closely related in my mind to the extraterrestrial thing: whether they're out there and if so, where we fit in.

Lim: Or whether we're alone.

Dick: Are we at the bottom, at the middle, or at the top? Given the age of the universe, compared to the age of the Earth and our species, it's likely we're at the bottom somewhere. If civilizations have a long lifetime—which, of course, we don't know—they have the potential to have a much longer lifetime than ours so far.

Tough: If we don't find life in the next thousand years, what does that do to us, in understanding our place in the universe?

Dick: That means we will spread throughout the universe and be the life.

Lim: It means we have an awesome responsibility for life in the entire universe.

Dick: Human destiny is different. Human destiny is spread life throughout the universe, or human destiny is part of galactic civilization. It's like Isaac Asimov versus Arthur C. Clarke. Isaac Asimov has no extraterrestrials in all his Foundation series. It's all humans spread out. Whereas with Arthur C. Clarke, everything he writes is about human interaction with extraterrestrials. Those are the two paradigms of different universes, I think.
Koelle: There’s a zero option that we can spread over only the solar system.

Dick: What option is the zero option?

Koelle: The one that we are limited to the solar system or spread into the universe or become part of the intergalactic intelligence.

Lim: It’s likely that we will have to redesign ourselves.

Dick: The way genetic engineering is going now, I’ve no doubt that we will.

Koelle: Microbiotechnology.

Dick: There has always been talk about suspended animation if you were going to interstellar destinations.

Tough: I would think genetic engineering might supersede that. We might have a mix of both. Beyond that, you were saying that our mind will be analog or turned into digital form. The actual information might be far away and instead of sending a biological something, use digital form to send to the person at the other end.

Lim: And all you need is to do what?

Tough: Slow-motion beaming.

Dick: What’s the range of beaming? Beam me up, Scotty.

Facilitator: Let’s break.
In this session, a small group of six participants discussed the critical factor WHAT WILL IT MEAN TO BE HUMAN?

Facilitator: Sesh Velamoor
Participants: Walter Truett Anderson
Howard F. Didsbury
Ashok Gangadean
Barbara Marx Hubbard
Yersu Kim

Sesh Velamoor (Facilitator): Do we want to set any rules on how we’re going to go forward, or should we just have a conversation and go with the flow?

Gangadean: I’ll say something about what we know in the reflexive way. How about if we decide what question should be looked at critically based on who is here. I see differences in terms of the communities of knowledge. One of the things I’ve been struggling with over the past 30 years is realizing that the analogies we have about knowledge of ourselves within a particular perspective are localized. But if we start our discussion with something that would allow us to hold multiple narratives and views together, we would get more of a global perspective, if there is such a thing. I’ll offer something that might get us started. I feel the traditions of religions and philosophies and sciences all seem to converge on pointing out how vital it is for us to look at the patterns of our thought in making our worlds. When we look at the state of the world, the violence and the good things, how can we connect them? What can we do? How can consciousness, the conduct of consciousness, and possibly awakening patterns of consciousness profoundly alter the creative issue of our future? That’s a theme to consider.

Anderson: I was going to suggest a different kind of framework that is not so much a comment on that but totally compatible with what was suggested a moment ago. In terms of what we know, at least from a Western perspective, what does it mean to be human? Where would we place the boundaries between the human and the nonhuman? How important do we consider those boundaries to be? If we are all doing our knowing business within a Darwinian context, then our idea of the distinction between the human and the nonhuman is much different from what it was in the Western world before some people accepted the idea that we are, in fact, closely related to the rest of all life.

Bruce Mazlish wrote a book some years ago called The Fourth Discontinuity. In it, he identified several discontinuities that seem to be emerging, ways that we find out that we are related to or are continuous with the evolutionary process, or in this case, not. The fourth discontinuity he identified was that we are no longer discontinuous from our technologies, our apparatus, our augmentations of ourselves. We are already finding that our thinking is not separate from our information storage in libraries and computers, and so forth. So that’s one kind of answer to the question, what do we know now?

Facilitator: I would like to bring what was just said into a question. If the human were a subject of study equivalent to a physical phenomenon, is it conceiv-
able that even as we struggle in the development of the social sciences, whether it’s sociology or psychology, would that field of knowledge accelerate? Would the study of the human accelerate to the point where there would be an increasing certainty about that word, increasing probability that we know more and more, whether it was the motivation of the mind or the consciousness, even in a reductionist sense? And if that’s the case, then can we get into what is the definition of a human that you would—and I hate to say this—engineer?

Kim: It seems to me there are several levels of this question regarding what it is to be human, because this supposition is framed in future tense. The question has a very direct relationship to a similar question, framed in present tense: what is it that makes us human? If one looks at different cultures, different cultures have different conceptions of what it is to be a human. Western culture sees an individual, a human, a person, as an entity that has a full right in its own as soon as it is born into a specific species. A human person has a dignity all its own just by being born into that species.

Whereas in—I’ll take one tradition with which I am more familiar—Confucian tradition, they say a human is not a person until he has done something. You’re not a full-fledged person until you have gone through a certain process of what might be called socialization. You have to be educated in a certain body of classics, and you have to be educated in rituals of poetry, and you have to be educated in your role as the center of relationships to others, to the world, and to society. What do advances in artificial intelligence and neurophysiology bring to this basic conception of what it is to be a human?

The first thing we must discuss is the question, are these different conceptions of what it is to be a human really a culture-conditioned issue, or are they related to some metaphysical debate about the nature or essence of a human being? If it is a culture-conditioned issue, then perhaps there is some hope for eliciting some kind of consensus on what it is to be a human.

Facilitator: To bring us back to No. 1, let me pose this question. Let’s assume for a minute we know what this prototype human is, whether it is strictly restricted to the cultural domain without getting into the esoteric, or remain the way we are and take the nobler instincts and say all we want to do is to reinforce those. I’d like to bring us back and ask, do we as a group believe that there will be a technology for humans, given what we know today, which is genetics, which is medicine, which is manipulation of the brain with implantations or artificial intelligence? Whatever the means are, can we see a logical extension of technology to intervene and create whatever that prototype is?

Hubbard: I want to respond and weave into what the others have said, too. Some very important points have already been made. Sometimes we just move to the next point before we build on what anybody says. I would like to suggest that in answering the question, What will it mean to be human?, we need to take the evolutionary perspective at the broadest possible perspective—beyond culture—and look at cosmo-genesis. We’re all made out of that process. By going through and seeing that the process of transformation at the atomic and molecular and cellular and planetary levels, we happen to be asking the question at the moment the planetary crisis exists. Whatever cultural definitions we had of ourselves could be considered gifts or contributions at their most altruistic. It’s true we are in relationship. It’s also true we are individual. It’s also true that we are logos. If we could take, not just our cultural, but our cosmological past and look at our cultures as different facets that I think they are, and then look at the scientific, technological, genetic aspects as an ongoing line to the evolutionary process that’s percolating in us now, it might be the best framework to weave all of this together.

Facilitator: I agree. You’re simply saying that the evolutionary process in its natural course, and the confluence of technologies, whatever they might be, will inevitably carry us toward a definition of human, whatever we choose it to be.
Hubbard: That’s correct, and that the human has to be seen as an evolving part of an evolving universe rather than as a static entity.

Didsbury: I want to make an observation. One distinct thing about being a human being is a sense of morality, of right and wrong. No matter what the culture is, if we have done something that we consider wrong, we have a sense of remorse. It seems to be quite universal, one characteristic of a human being.

Facilitator: So is there a moral imperative? In fact, E.O. Wilson would suggest that it is part of the evolutionary process that we evolve and that morality is part of the evolutionary process; it’s nothing above and beyond.

Didsbury: Then we always smile when he says that and push on.

Facilitator: That’s right.

Anderson: He’s right that some kind of morality is universal, but the forms it may take, of course, are highly variable.

Didsbury: That’s it. It may differ in the sense of, “I could have done otherwise.”

Facilitator: Do you see the potential, in terms of the evolutionary process and the technologies, for a resolution of these different worlds?

Gangadean: I see a convergence of several of the voices, if we’re sensitive to a wider global perspective that is intercultural and interideological in terms of the many narratives asking, is there a kind of distilled global essence across these in an evolutionary context?

The point is that we make our worlds. We co-create our phenomena and, therefore, other problems and the good things in the content of our culture. If the way we conduct our thoughts and world-making is integral to what we have, then the ultimate technology of being human turns upon finding a more human way to conduct our minds. The shift in mentality is a quantum shift in bringing out our humanity as human beings. So when you talk about technology, I would like to bring in that the human ultimate technology of making our worlds….

Facilitator: …is inherent in us.

Gangadean: Exactly. Therefore, a tradition such as Jesus would say: Unless you die you cannot be born again—the new covenant. To me, these are all metaphors for a new way of existence that, in the evolutionary story, is a blossoming of our true nature. So the blossoming of our true human nature as global beings turns upon the technology of thinking.

Facilitator: So, do I gather that it is an inevitability in your prognostication?

Hubbard: Inevitability toward….

Facilitator: Meaning: this mental concept of ourselves, augmented or not with whatever is allowing us to facilitate that evolution, is inevitable?

Gangadean: The way I would put it is not that it’s inevitable in the deterministic sense, but the pattern that begins to emerge across worlds is that there is a fundamental logos playing out there and that logos is so profound in its infinite scope and prisms that it is presiding over the narrative unfolding. In that sense we are at a crucial point where we can self-destruct, or we have the empowerment of awakening to have a future in which we can flourish. So it’s not inevitable in the sense that the outcome is a fait accompli. We could end it.

Facilitator: But in an evolutionary sense, is it conceivable that it can be otherwise, given the chances that we self-destruct and still life goes on? I cannot imagine that human life will be destroyed, no matter what the catastrophe.

Anderson: And if it is, life goes on.

Kim: You are saying that if humanity self-destructs there would still be some essence of a being, a human floating around independent of humanity, which has self-destructed itself? Is that what you are saying?
Facilitator: I’m simply suggesting that with six billion people on Earth, and more by the minute, the odds of any kind of catastrophe completely destroying human life is probably zero.

Didbury: I disagree.

Anderson: Let me come at that from another issue rather than debating whether it’s going to happen or is inevitable.

Facilitator: That’s a minor issue, really.

Anderson: But in terms of the first question, what do we know now? I think it’s a profoundly important development in human evolution that the concept, the possibility, of self-destruction has emerged into our global consciousness. It’s a great step for a species to get to the point where they can think of themselves as capable of ceasing to exist.

Hubbard: It’s something we do know now about ourselves. Just as a little aside, when Neanderthals buried food with their dead, it was a great breakthrough, because the individual saw his own death. Now we’re a species seeing our own death, and it’s a quantum driver—evolutionary driver—toward our own evolution. So it’s part of what we know now about ourselves. Are you asking what the real definition of human is? What the thought form is that we have about being human?

Gangadean: That’s vital to it.

Hubbard: That self-image is absolutely critical to what humans are because we are not fully fixed as a species yet?

Kim: But self-images are not singular. There are so many different self-images. The question, I think, is really, are these different self-images of what it is to be a human in some way related? These are metaphysical questions against a cultural view of what it is to be a human. My personal conviction is to do away with this metaphysical approach to what it is to be a human and try to remain within the cultural approaches to concepts regarding what it is to be a human.

Facilitator: At least for the moment, because they’re not mutually exclusive and one thing will have to lead to the other.

Hubbard: I would like to add to that. It’s a concept of entelechy or potential. On the personal level, each of us has untapped potential when we’re born, and there’s a drive in the organism to fulfill itself; it’s the acorn wanting to become the oak. And you have a culture. That potential comes up through the culture, but it isn’t the culture; it’s innate. I would like to offer that we, both as individuals and as a collective species, have a vast untapped potential pushing us from within that will express itself according to the culture we’re in. What drives me in my definition of humans is the feeling we’ve barely begun to discover the full-scale potential, and to do that, we need not only live on this planet but live among the stars. We need to learn to expand our lifespan, develop new capacities in genetics and astronautics and the global brain. It’s all here as part of our emerging potential; it’s transcultural, but it’s not necessarily metaphysical.

Kim: I’m in perfect agreement with you, but if to be human is fixed at the cultural level, if it is fixed at the evolutionary level, in a physical sense, I have some difficulty there. The notion of entelechy is a physical notion. You have an acorn. An acorn has in itself seeds that are sometimes ineffective in becoming a great oak tree. But I don’t know if it is the same with human beings.

Hubbard: I meant it a bit more flexibly.

Kim: Yes. If one looks at human beings from a cultural point of view, there are certain elements of what it is to be human.
Facilitator: I think what Professor Kim is saying here is that at a cultural level they are manipulable, even if there are differences—manipulable, in the sense that a synthesis might result in the kind of culture that you are looking for on a global basis simply by virtue of interaction in the process. Or, if we know enough on a scientific basis to say, here is a cultural norm that is acceptable, now let’s intervene. Whether it’s through the evolutionary process that you arrive at that conclusion, or even otherwise, a great council of graybeards will sit down and say this is what we want humans to be. What you’re getting at is, when you deal with it from the evolutionary and cultural level, it’s an easier proposition rather than getting into the metaphysical, because then, again, the potentialities are not clearly discernible or fall within the realm of possibility. Which is adequate for the next thousand years, is it not?

Gangadean: But that begs a question. When I speak of a logos playing out, I’m not attempting to fall into metaphysics. The point is that there are two models of cultural evolution. There’s one that disturbs me and there’s one that is promising. The one that disturbs me is the picture we have of cultures as separate entities, not having a common principle. And there’s the one that recognizes that, as diverse and open-ended and experimental as our many cultures’ language forms may be, there is nevertheless in them a common fundamental logos. That’s important in terms of the human being, because it seems to me that when you try to set aside the question of self-destructing, is there inevitability played out over these millennia in the human form emerging in its vast diversity?

I see a pattern when Jesus, following Moses, speaks about the true human being. I see this when Krishna teaches Arjuna about the awakening. I see it in Lao-Tsu—there is something in the human form, in all of its multifarious and open-endedness, where a pattern, a logos imprint, emerges from that core. That’s important to me because it’s open, that as we augment our intelligence, we extend our intelligence. We may go through deep changes biologically in these augmentations and yet, we could still recognize the deepest imprint of this logos of power. That’s what I’m envisioning.

Facilitator: We are not so much disagreeing as we are trying to construct a hierarchy of understanding. He’s approaching it in a very practical sense by trying to deal with the cultural logos first, in terms of the synthesis playing out, and pointing out that it is separable from the metaphysics of the issue.

Didsbury: Up to now, this discussion resembles a discourse that might have taken place at the time of St. Thomas Aquinas with great concern for terminology and precision in definition. The main topic seems to elude us. What do we know about a human being? First of all, we note a sense of morality combined with a repertoire of emotions wherever there’s a human being. Whether all the emotions are allowed expression or not is another matter. We’re talking about a human, and the emphasis here is upon reason, not emotions such as fear or a sense of awe. What distresses me is we’re getting involved in incredible terminology and plain, simple thinking takes flight.

Facilitator: This vein in the conversation is bringing us back down to Earth.

Didsbury: The question was, what do we know now? All I know is that 95% of all the books on the human brain have been written in the past ten years. This is virgin territory. So if we’re talking about a human being, we must name the culture. Yet, interestingly, I can attend a Hindu drama though I do not know much about Hinduism, but I can tell who the villain is in the drama. We all can see Antigone of antiquity and note what a fool she was. Being members of the same human race, there’s a commonality we recognize.

Facilitator: Coming back to that, then, maybe if we reapproach this issue and say, as we currently know human beings and humanity, there are positives and there are—I don’t know if I would call them nega-
Didsbury: The repertoire of emotions.

Facilitator: A repertoire of those things that do not necessarily contribute to a bright thousand-year future. Do we know enough to affect the negatives at a very down-to-earth level? Is there a science of man...?

Didsbury: Things that scared the wits out of us in the past we know something about today, and we're no longer scared.

Facilitator: Will we learn to manage?

Anderson: I see the idea of logos driving a larger process. I am reminded of an anecdote that all of you have heard at one time or another where J.B.S. Haldane, the famed biologist, was asked what he could infer about God from what he knew about biology. He thought about that and said, “He seems to have an inordinate fondness for beetles, because there are so many of them.” It’s obvious that is an observable result of the evolutionary process.

Even if we get nervous around words like logos, as I do, we can look at the phenomena that Barbara mentions about the evolution of the cosmos, and we can see that there’s some funny stuff going on that seems to have had a directionality up to now. But we don’t know what drives it, nor do we know where it goes from here. There is not that inevitability, though we have words in our language to describe the things that we don’t know. That’s the human condition. It continues to remain mysterious and open-ended, and we use words to describe it.

Facilitator: Let’s assume for a minute that if it is a progression in a sense from the cultural logos to the logos of human in a global sense and perhaps in an interplanetary sense, how do you see that progression taking place?

Kim: It seems to me there are four questions that are crucial in getting hold of a question such as, what is it to be a human? One of these is the very morals of society. Another is the creativity associated with being a human. One normally says that machines cannot be very intelligent or creative. So if we can say we’ve evolved, is it possible to create with different scientific devices a kind of moral sense? And if it is possible to have something resembling creativity with machines, then perhaps we have answered a great many questions.

Facilitator: In yesterday’s discussion, we talked about taking a minimalist approach to a human future over the next thousand years. We also focused our discussion on the negatives of prejudice. Instead of focusing on what humankind ought to be, we should focus on the tools and the technologies and the social science evolutions available. Can humankind manage those? Is that a satisfactory step for the next millennium?

Let’s not get caught up with the negative aspects that humankind has. We can leave it simply at prejudice, fear, anger, the capacity for destruction. Then ask ourselves, can we manage those negative aspects with the technologies available to us in the future? Is the answer to that yes? Otherwise, we need to move on. Maybe it is more logical to say, at the most intermediate and minimalist sense, if we took care to...
eliminate the negatives, then the technologies and the sciences exist to do that or will exist to do that. Any thoughts on that?

**Didsbury:** If, a thousand years from now, a human has a sense of humor, that will be exactly what I anticipate. I'll give you an example of human creativity. Recently, I went back to my 50th reunion at Yale. We had a remarkably able alumni dinner speaker—one of the big guns in the field of computing. He gave an excellent presentation of the future wonders accompanying the progress of computers. In the course of his lecture he seemed to suggest that by 2050 or 2075, from the standpoint of genuine creativity, the vast bulk of human beings may be superfluous! You could hear a pin drop on a Persian carpet. When he finished, he asked if anyone had a question. My hand went up and I said, “I am a novice in the computer world but I would like to cite a curious incident related to creativity.” Continuing, I noted that some months ago I was in Greenwich Village in New York City—where every night is Halloween—when down the street came a young man possessed of a remarkable muscular build wearing a T-shirt upon which was printed “Jesus is Coming” in bold letters and underneath in smaller letters “Look Busy.” Every one of my audience burst out laughing and showed broad smiles. I turned to our distinguished speaker and asked, “When will the computer be able to duplicate that example of creativity?” A joke!

We get so carried away with all kinds of terminology. Please note, if in a thousand years—the year 3000—somebody there hears this joke, the computer will translate “look busy” as if they are busy. It doesn’t mean that at all. Somebody mentioned creativity. Think, if you will, what genius it requires to invent a joke.

**Gangadean:** Speaking in the most pragmatic way, this is where the intercultural question is not just about local cultural explorations of human nature. We’re at a point now where we really need to come to terms with our intercultural relations. That’s where the question of the logos is not a metaphysical abstract, but immediate. From what I can see, the great teachers across traditions have been trying to teach us for millennia that we are creating this mess by the way we’re conducting ourselves.

**Facilitator:** Exactly. So is it a combination, then, over the next thousand years, that may bring about an acceleration of a dialogic? Technologies will be racing along. Are we optimistic about the next thousand years in terms of managing the negatives or even perhaps eliminating them? If so, this brings up complications. By eliminating or managing the negatives, we have to think about what form of government is going to impose this. Will there be pograms? Are you going to migrate parts of humanity into space? Because differences in humans exist. As long as differences exist in their capacity for morality or anger or hatred or humor, we can talk in terms of a thousand-year future, but to account for the entire range of humanity, we will have to muddle along. How do we do that?

**Hubbard:** I don’t think it’s enough to just say to eliminate the negative, because I would like to affirm the positive while I’m eliminating the negative. So what is the positive that we would be affirming? That comes from the realization that every teacher in every great culture, whether Lao-Tsu, Confucius, Jesus, or Buddha, has had a certain pattern of a higher way of being. Most of our cultures are formed around those great people. The pattern exists from the individuals who already broke through. They are foreshadowing the future of what is potential in us; otherwise, we wouldn’t build our cultures around them. So while we’re eliminating the negative, I don’t think we can eliminate the negative unless we experience the positive.

**Facilitator:** I’m allowing for that.

**Hubbard:** But you’re not emphasizing…and even more than dialogue…

**Facilitator:** The dialogic between cultures is focused on the positive.

**Hubbard:** More than dialogic. What we’re dialoguing about is something that’s implicit within our potential that has already been contemplated by the great teachers. Due to planetary crises, I think expanded consciousness is emerging in more and more of us, and that’s a very great positive.
Facilitator: In some respects, Barbara, what we know today is, yes, those traditions and teachings exist, and the positives that drive, the potentialities, and the arousal of the consciousness. While intuitively we may all experience that, in terms of the knowledge base that exists, those are not established facts. Even as science is grappling with them today, consciousness, mind, brain, the relationships of those three things, in even a reductionist sense, is precisely what everybody is working on. You refer to these primitive intuitions in your book. These primitive intuitions may very well be accurate, may very well be correct, but they’re not established fact. Unfortunate as it might be, the paradigm of science, the paradigm of knowing, in a reductionist sense, is a step we must pass through. It’s the fire that we must walk through.

Anderson: I can’t remember if it was Huxley or Waddington who talked about humanity as evolution become conscious of itself. Another thing we seem to observe about evolution, which is inseparable from us—we are it, it is us—is that, as one of those biologists put it, evolution evolves. It did that in the process of creating the first self-reproducing life-forms, and it did it again in creating speech...
Facilitator: With one modification. Let’s not forget the biological, natural evolutionary process.

Hubbard: That was the first point I made: cosmo genesis leading into biogenesis, leading into anthropogenesis. Then out of that come the cultures, and the species has been shaped by each culture. Now we’re coming into a new phase of cultural evolution itself because we’re global and we have seen our own extinction, and so we’re having to rise to the occasion in a really new way, which is all the new stuff.

Facilitator: Right. I think Professor Kim would prefer the term cultural synthesis, if I recall, from the slide.

Hubbard: Rather than globalization.

Facilitator: Because multiculturalism, making every culture survive all these battlefields that are being drawn, trivializes the process.

Anderson: I’d like to sort out the context of point 3. One of the things that’s been inherent in everything we’ve been saying about what it means to be human is, we seem to be the only species that asks that kind of question about ourselves: What does it mean to be the species? One of the things I think we can see, and it’s certainly inherent in what Ashok has been telling us, as well as Kim, is that there’s an enormous richness of answers to that question. The other thing we can assume is that we will continue, not only defining, but redefining the process of what it means to be human.

Hubbard: And to continue evolving. By placing ourselves in our metaphor, we are at a certain point of cultural synthesis, a certain point of seeing our own extinction, a certain point of asking the question about the next thousand years, which itself is an evolutionary event, that we should be here doing this. I put forward that what we know about humans from the new perspective is that we are a process that is evolving. There’s no way to define us in a static manner and say that’s who we are.

Gangadean: I think there’s agreement on that.

Facilitator: Alongside the cultural synthesis are the technologies. The sciences about humans are probably now evolving far more rapidly than at any time before, in terms of genetics or DNA or of the brain or information and augmentation.

Hubbard: That’s the new part. Beyond the cultural synthesis of what we’ve already come up with is the absolutely radically new part of seeing our own extinction and having capacities to self-engineer, mentally and biologically.

Facilitator: But in the short term, over the next 100 years, 200 years, what are the big problems?

Hubbard: Violence. The misuse of the power to destroy our own species and others...the destruction of our life-support systems.

Facilitator: How does the transition take place? How do transitions take place from nation-states and prejudice and between those who have and those who have not? Is that going to evolve itself out, or do we need some form of intervention from extraterrestrials who suddenly make us realize…? I don’t know. In terms of the process working itself out, it probably eventually will. How do we manage—that’s the wrong word…

Anderson: …the development.

Facilitator: What about the next 100, 200 years? What are the problems?

Didsbury: Work in the next hundred years to develop a global ethical code for all the world’s peoples. The founders of the great religions of humanity sought to answer one fundamental question: If you are going to have peaceful, harmonious group living, what are the things necessary to have people survive? Thanks to the telecommunications revolution and modern technology, it now seems possible to make this a reality. The great challenge: How to
arrange for such a quality of life for all of the inhabitants of Earth?

Facilitator: Let me interpose it into these terms, right or wrong. Let’s make this a case in point: Milosevic. How would we deal with a Milosevic? In the short term, I would say we must eradicate. No decision at all. In ten minutes. This is the difficulty of the process we’re dealing with today.

Kim: If one thinks in terms of 100 to 200 years, it will be essential. We have to start the process of negotiating different cultures, with different codes of values, and somehow come together to talk about the ultimate values and principles that enable different societies to deal with each other. Today, we have many means available to bring some kind of consensus, different spans and opinions regarding how to deal with the questions of humans and languages.

Facilitator: If you could do two things, what would you do for the next two hundred years? It must be some form of an action or an intervention or something that gets us along in this process. What would you do?

Anderson: I can name one, and I think it’s happening. We need to get a good deal more articulate about it. It’s inherent in a lot of the religious traditions and it has to do with identity. You mentioned Yugoslavs. It’s a battle of mistaken identities.

Facilitator: They are provincials and regionals.

Anderson: They are deluded into thinking they are Kosovars, they are Serbians. We need to see through that—and we need to see through it in a Western scientific sense in order for it to be heard as part of the world.

Facilitator: So what would you do? Ashok has a global dialogic institute.

Gangadean: Designed to address this very issue.

Facilitator: The essential scope of it is to create a quorum.

Anderson: I would do what I usually do, which is write books.

Facilitator: Authenticating it in a global sense. The simple issue becomes one of nation-states versus a global imperative.

Hubbard: What I would do, along with what Walt says, is I would have deep dialogue going not only with Milosevic, but with the people long before the great problems erupt. Then I would have a peace room as sophisticated as a war room. The peace room would track innovations, successes, and breakthroughs in every field, and it would put them on the internet and map them, connect them, and bring people together in the light of what’s already emerging as successful.

Facilitator: Going along those lines, what about on a grand scale over the next two hundred years? What might be implementable is a shadow government, a human shadow, global government: all concerned intellectuals, scientists, and so on.

Hubbard: Out of the Foundation’s work, there should be continual input by every participant here. What do we know that’s already working in the areas where we’re dealing with the problems? I would like to see that reservoir build, so we’re building on what is emergent, because evolution has emergent properties.

Facilitator: One powerful device that we have is the communication network that exists. It’s a perfect way to bypass all the institutional structures that would be an obstacle to the process, simply go directly to every citizen in the globe and say whatever it is they want to say.

Hubbard: I think the peace room should have a global outreach immediately.

Gangadean: This all comes together in answering your question in that there is a powerful weight of consensus about being kind, handed down to us through evolutionary means and moral teachers, which plays out to a dialogic way of being. The mate-
trial enactment of our moral heritage is leading us to this dialogic way of being. If we can’t deal with this issue in a practical and immediate way in the next few decades, the future is going to be a disaster.

**Facilitator:** Would anybody would like to add anything?

**Hubbard:** I would add one thing, which is a more synergistic democracy where people come together to express what they want to create and facilitate, and to cooperate rather than to vote.

**Facilitator:** Yes. So we’ve solved that problem. Walter, you are nominated to report. Okay?

**Anderson:** We need to acknowledge that we’ve really been speaking some different languages here and that reporting is a subjective business.

**Facilitator:** Yes, of course.
Each of the five small groups reported to the full session of participants the results of their discussions on key critical factors that will have an impact on the thousand-year future. Then, topics for metalevel questions about the future were discussed.

Facilitator: Glen Hiemstra
Participants: Plenary Session

“...live in the questions and little by little the answers will come and you will live them also.”
– Rainer Maria Rilke

Glen Hiemstra (Facilitator): We are going to hear the reports from the five groups and I’m going to suggest that we go in this order. The group who discussed More Capable Humans is going to go first. Then the group who talked about What It Will Mean to Be Human is going to go second. Then Moving Beyond the Planet will go third, then Artificial Intelligence, and then finally Evolution. The spokesperson for each group will give the report.

We want to listen to these reports and learn what we can from them so that we can identify three metadialogue questions. We're going to invite you to turn to somebody who’s sitting on either side of you or behind you and, in small groups of about three, generate a significant metalevel dialogue question. Then we’ll collect what you have, put them in front of us, and see if we can choose three. There are going to be a couple of alternative methods by which we might choose, and that will take us up to lunch. As we leave, you’ll have an opportunity to sign up for one of those three questions. The afternoon session will consist of one subset, perhaps eight or so people, with the room organized into a fishbowl setup and eight or so of you will discuss that one question while the rest of us listen. The second group will take the second question later in the afternoon, and the third group will take the third question tomorrow morning. We see this as the heart of what we’re trying to do: to get to the most significant metalevel questions. Your listening task is to listen to the information that’s shared in the next 45 minutes so that we can determine the best questions to discuss.

There’s a poem by the German poet Rilke; most of you probably know some of his work. He commented often on the future. I was once at a conference like this and somebody shared a powerful poem about questions that Rilke had written. He had been written a letter by a young poet who wanted some advice on how to get unstuck with his writing. Rilke wrote back the following, which was published as Letters to a Young Poet: “Do not ask for answers to be given you; if given, they would not be yours and you could not live them. Instead, live in the questions and little by little the answers will come and you will live them also.” Our job is to generate the best questions of our whole seminar in the next hour and then to live in those questions through three fishbowl discussions.

So the first report for the small groups is going to be from the group on More Capable Humans.

Cowan: The discussion yesterday produced this list of problems and we didn’t discuss them all. We organized the discussion a little differently: artificial intelligence, nanotechnology, bionics, genetic engineering, information knowledge equally. The group this morning broke the discussion into a slightly different structure. There was a discussion...
about what we know and, of course, that immediately got us into questions that are almost polemical—the nature/nurture question and so forth. Questions about the validity of IQ: is it going up or is it staying still or is it going down? Is brain plasticity great or is it nonexistent and fixed? Are neurons capable of regenerating themselves and multiplying? How plastic is the brain?

The problem with these questions is that many of them have been answered by social science with poor statistics because of all the difficulties of controlling the variables and the expense of doing significant studies over long periods. They can all be interpreted by various people in different ways, and then the definitive studies are few and far between. Whether there will be more definitive studies remains to be seen; it may just be that experience, as we ask these questions, will answer them.

Social policies by education: we discussed the advantages of extending the educational system to the early stage—age one month.

I guess we all had our own optimistic views that they’re taking a constructive path to the future, which would lead to a more capable human. But that’s where we began to divide. Social policy was certainly mentioned by everybody as an important aspect, but the question is how drastic and what kind of a cultural environment? Social policy by gene selection, of course, immediately raises certain issues that we didn’t discuss at any great length, but I would say that, at least at this time and in this cultural environment, would be regarded as politically incorrect. Social policies by education: We discussed the advantages of extending the educational system to the early stage—just to take a boundary condition, starting the schooling system at age one month. There are examples in Europe where there is more universal availability of care and education at the very early stages. This is not available in this country where the schooling system starts at kindergarten and Head Start at age three. But we must consider whether the first three years are so important that you can have almost irreversible consequences if you don’t pay attention to those first three years.

Then there was the question about the scientific and technology explosion and its impact on the capability of the human being. There, the sky’s the limit. You can extrapolate almost critically if you choose to be optimistic about it. On the other hand, if you choose to argue that this has no real impact on the quality of life, the intellectual and emotional aspects of life, then you can say that the technological revolution increases the noise level. There is both an optimistic and a pessimistic view. I would say that the material here represents an optimistic view: the effect of bionics and genetic engineering and manufactured items and the electronic interconnectedness of people so that information flows much more freely and rapidly—all of that cannot fail to have important consequences for capability.

Then there is the aspect of differentiating between human capability at the individual level and then setting that aside and asking what the capability is of the aggregate. Is that growing? Is there a collective brain, a collective intelligence being fostered now by instant communication everywhere, both auditory and visual, as well as written? Every aspect of communication is changing in a way that the social system simply hasn’t kept up with. Now everything is essentially happening within the living room and within the family instantaneously, and I don’t think that our systems of governance have even begun to catch up with that. But they will and this will presumably have a profound effect on the aggregate human capability that is lagging behind now. We are still primitive at the aggregate level.

This is a spectrum of dynamic projectories—the waterfall and the rocket. The idea of progress is not inevitable, so that we’re not necessarily flowing forward; we may be falling backward. That represents the spectrum, but there was the argument that regardless what we think, we can affect the future. There’s room for optimism even in the negative view, namely that some social policies could have a favorable effect. I would say that overall, if you like a unanimous or consensus view, it is possible to envision a world a thousand years from now in which humans are more capable and that there are some policies that will improve the probability of achieving that.

Facilitator: Great, thank you. Moving along, let’s go to the question of What It Will Mean to Be Human.
Anderson: We also had a free and frank exchange of views around the question of human self-definition. One of the things that we observed was that we seem to be the only species that worries about defining itself. Is it self-inherent in the human condition? We acknowledged that we were speaking several different languages during the course of the conversation—philosophical, spiritual, religious, evolutionary, scientific, rational, and, in some sense, political—and managing to more or less hear each other. Those different languages in themselves reflect different ways that humanity over the years has attempted to answer the question of what we are. Certainly, in the religious traditions, spiritual traditions are in some sense attempts to answer that question.

In the points we came up with regarding what it means to be human, one of the things we recognized is the continuing change of boundary definitions around humanity. Within the Darwinian context, for example, those of us who accept the Darwinian context accept the fuzziness of the boundary between ourselves and other life-forms on the planet, and the disappearance of that boundary is a fundamental part of our recent historical redefinition of humanity. As we think in terms of cosmic evolution, we think of ourselves as continuous with the process of the appearance of the evolution of the cosmos, and as we look at what’s happening with our technology, we are inseparable from our devices, the ones that we see through and speak through. It seems likely that that is an accelerating process, that we will be increasingly inseparable from the various augmentations of human body and mind.

It was pointed out that one of the things that seem to be essentially human is the presence of emotions. The continual presence of feelings may be defined entirely differently by different people and different cultures and different situations, but the existence of the emotional life itself seems to be universally and inherently human. We understand ourselves as inseparable from the evolutionary process, but we are in a sense “evolution become conscious of itself.”

The question of what it means to be human obviously has been answered in many different ways over the course of human culture. We know that at the moment, much of the action in response to this question is in the field of looking at the human brain and how it works. There are a vast number of books on the human brain that have been written in the last two years, and more are being written all the time. Some of them by our people here at the conference.

The question of the possibility of self-destruction of the species came up and we argued about it. Is it possible, is likely, is it not? One of the things we agreed on was that the kind of question that has emerged fairly recently in historical time says something about what it means to be human in the 1990s: that we are capable of raising such a question and taking it seriously is something inherent in the human condition. It’s inherent in what it means to be human that we ask these questions and we increasingly think about what it means in directionality, which is, of course, what we’re doing right here. Can we see a pattern, can we perceive a logos-driving logic or intelligence that shows us what that pattern is?

Our likely path: It was pointed out, and it always seems to come up in these conversations, that a lot of what we seem to be driven to think about in the near-term future is dealing with disasters, responding to threats, putting out fires, avoiding catastrophes. Clearly that, in terms of the likely path for some time to come, is going to be in large part coping with those things. The question was raised about the point at which—and to what degree—we could eliminate the negative and latch on to the affirmative and become more capable of intentionally setting goals and objectives and visions that are not just driven by avoiding catastrophe.

One of the big issues suggested was that identity itself emerges as a major human problem that has to be addressed in the near future.
goody-goody idealism, but something we can actually comprehend and work with? And then, so what? What processes are available? We talked about real kinds of projects that people are, in some cases, already undertaking or might undertake that might be some ways of moving along that path. Can we actually create creative capability? Can we bootstrap ourselves, so to speak, to work out better ways of asking and answering questions about the human condition than we have? What might that be like? Howard Didsbury pointed out that one piece of that is: can we do anything about honoring the importance of humor as an essential part of the human condition? If we are coterminous with the cosmos, it seems to have a sense of humor, which may be the only thing that will save us.

Key pieces of information that are inherent in this, the visual metaphor that we decided we liked, is the evolutionary spiral. Although in this case it seems to be going upward, we recognize there are ways that there can be an upward and downward spiral, and that clearly involves the evolution of the cosmos, the evolution of the human species, the increasingly complex cultural evolutions that now involve technologies, brain sciences, genetics, and so forth, that will play a part in the future evolution of the species. It keeps coming back to how we go about asking and answering the question of ourselves as a part of the evolutionary process, whether it’s capable of recognizing the possibility of its own extinction. It seems to have been asking this question almost from the beginning of human experience and has come up with one hell of a lot of answers so far. One of the things that we noticed about evolution is that, as one of the great evolutionists put it, “Evolution evolves.” It keeps changing its own rules, and clearly, a part of our own future evolution will involve ways of changing the nature of evolution itself.

Facilitator: Next, we’re going to hear about Moving Beyond the Planet from Allen.

It seems fairly likely that within the next thousand years, we’re going to make contact with more than one civilization in this galaxy.

Tough: Our group, in Moving Beyond the Planet, broke it down into three aspects, so it makes it fairly simple to organize it. Our first component, the one we talked about the most, was space exploration and space settlement. Going out into space to find what’s there, either personally or by probes, and eventually living in space, living in space stations, living on the moon, Mars, wherever.

We talked about three reasons for thinking this may happen. At the moment, funding and public opinion don’t seem to be highly supportive of these ventures, but if you take the thousand-year view, then presumably we’re going to get past this current stalling in funding for space exploration. The three reasons, we thought, that it’s quite likely to happen: one is the deep curiosity, the deep urge to explore that seems to be part of being human. It seems unlikely that we’re going to spend the next thousand years just staying on our planet and not exploring at least our own solar system, if not far beyond it. Also the human urge to push new frontiers: we always want to be somewhere different. As you people who live on the West Coast probably know, when you run out of frontiers, you tend to stagnate. So if we have a frontier in space, that’ll help us not to stagnate as a species.

The second reason for thinking that space exploration will occur is commercial reasons. Mining the asteroids. There are all kinds of valuable minerals on the asteroids. Tourism, possibly. Last month, I was talking to a man who was already hiring people to set up a hotel in space, not very far into space, but it’s a start. Within a thousand years, we may well have tourism to the moon or to Mars or wherever. As a matter of fact, imagine the excitement of the people who want to go to Mars. They just had their founding conference recently, and the excitement and the speed with which that excitement is picking up is encouraging. We may just end up bypassing governance and government funding, and it may be the commercial pop that takes us out into space in a big way.

The third reason is the idea that, if you have several settlements in space, then you’re not as vulnera-
ble to extinction. If a calamity occurs on Earth—such as an asteroid hits it, wiping out human civilization, or if we use too many nuclear weapons and produce a nuclear winter that ends human civilization on the planet—if you have several settlements that are fairly independent, one or more of them may survive. So the metaphor that we talked about was the familiar expression of “putting all your eggs in one basket.” We thought it was a good idea to put our eggs in quite a few baskets out there so that no one can be wiped out. In addition, of course, if you do have your eggs in several baskets out there, then you have several little social experiments going on. If the space settlements are somewhat independent of one another, then they’re going to head off in different directions, different kinds of governance, different kinds of social structure. It’s interesting to think about what laboratory experiments could be going on in these settlements, which could be on Mars or the moon, but it could also be free-floating—the Gerard O’Neil idea of rotating free-floating settlements with gravity, that have waterfalls and forests and all kinds of things that can make the settlement feel like Earth.

The second aspect that we talked about, of moving off the planet, was making contact with other intelligent life. It seems fairly likely that within the next thousand years, we’re going to make contact with more than one civilization in this galaxy. We’re probably going to do it in more than one way. There’s some argument in the field about how. I don’t think it’s an either/or situation at all; it’s going to happen in different ways over the next thousand years. We’ll probably get some radio messages, some optical messages through lasers. We’ll probably have some sort of close-by contact. Perhaps a nanotechnology probe. We may eventually detect or make contact with other way. Our group was somewhat pessimistic about flesh-and-blood travel, because it’s slow, but with hibernation or some other means, perhaps it would be possible. We weren’t so sure about that, but certainly if you have a small probe, a very, very smart probe, it could reach out. In fact, NASA’s trying to launch an interstellar probe within a few years. We’re probably a very young civilization, since our star is very young compared with other stars in the galaxy, so other civilizations are millions of years ahead of us. They may have sent a probe here long ago.

The third aspect: what’s going to happen to our understanding of our place in the cosmos? Obviously, these first two affect the third one. As we move out into space, there’s more of a sense that we’re creatures of the solar system rather than just creatures of this planet. If we move even farther into space, we may feel more that we’re part of the galaxy. If we make contact with other civilizations, then we’re going to start to feel like we’re a part of a galactic family, which may unify us in a sense; it may have an impact on these questions we’ve been talking about this morning about what it means to be human. We may see more sharply what it means to be human when we’re face-to-face with some sort of other intelligence.

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**We may find that a big part of our self-image in the future is that we’re a very adolescent civilization. We’re just starting to grow up…**

One person suggested we’re at an adolescent stage. We may find that a big part of our self-image in the future is that we’re a very adolescent civilization. We’re just starting to grow up, just starting to mature as we make contact with other civilizations that are thousands of years ahead of us in technology and knowledge and wisdom. It may shake us up a little with our own sense of superiority, since we look around at some of the animals on Earth and we think we’re so superior. It may be very sobering to make contact with other civilizations.

And finally, we talked about human destiny. It could go in two directions. If we don’t find any scientific evidence of other life in the universe in the next thousand years, then our human destiny will be to spread our life throughout the galaxy. We become the intelligence in the galaxy and our destiny will be to spread that. On the other hand, if we do make contact with some other intelligence, then our human destiny will be to cooperate with that, hopefully harmoniously—perhaps to cooperate on artistic or scientific or exploration projects or some other way we haven’t even thought of yet—so we’re working together in harmony with this other civilization and exchanging information and ideas. Obviously, we hope the second one comes true, but if the first one comes true instead, that’s also a good future.

**Facilitator:** Great, thank you. All right, let’s go next to Artificial Intelligence.
Pohl: What do we know about artificial intelligence? It was a little difficult to answer that, because we needed to know what we mean by intelligence. The question of artificial intelligence has been redefined regularly, as capacities that were formerly thought to be part of intelligence no longer are. Pattern recognition was one of the early problems, and we see pattern recognition now in every supermarket. It’s no longer artificial intelligence. I think it was Paul who said that the best definition of artificial intelligence is everything the machines can’t do yet. That’s probably where we’re at.

What is the likely path to the year 3000? We’re pretty sure that the likely path for computers is that they’ll get more complex and more capable and quite rapidly, nothing like an order of magnitude every two years. What effect this will have on artificial intelligence is a little harder to say, but there isn’t just one likely path or any number of them, some of which we can now define and many more that we can’t.

As for the problems and opportunities. Among the problems is the ethical question of do we want to build competitors with ourselves? If it’s possible to design and know machine intelligences of some sort that are either as capable as ourselves or more so, do we want them? Do we want the ability to create such competitors? Do we want slaves who will do all our work for us? Or possibly machines that could enslave us or keep us as pets? These are the questions that we raised. The other possibility is that we could use these artificially intelligent machines as mentors to help us think things through so that there would be no question of who was in control; they would just supply us with whatever we needed to expedite our own thinking.

After we were through with the panel, Paul took me aside and said, “By the way, are you aware that one of the problems of artificial intelligence—namely, how you communicate between the human being and the computer—is now being superseded by Microsoft, which is trying to work out direct implants in the brain?” That’s a scary thought.

As to our metaphor, we came up with the same waterfall as the first panel did, but I think it’s not quite correct. I think the proper metaphor would show that there are a lot of directions that we could take and one that may be catastrophically wrong, which may, in fact, cause us a great deal of agony. There are no question marks about the future after that because if we take that path, we’ve had it—in the sense that when Enrico Fermi and the others were building the first atomic pile at Stagg Field, they were taking the restraining rods out a centimeter at a time and checking it very carefully. If they got a little too far too fast, there would have been no more problems because they wouldn’t have been there anymore.

As to what we want other people to know, we never really discussed that, but we want you to know that there are many possibilities and many problems involved. There was also a lot of discussion about emotion and whether machines could feel it, whether it’s desirable for machines to feel it, what it would be like if they did. We never really resolved the question, but we concluded it was a question that needed to be addressed. I think that’s it.

Facilitator: The last group is on Evolution. If you’re a movie fan, the big movie right now is Matrix. The premise is that we create our intelligence, and our intelligence decides that human beings are essentially pests. It begins to wipe us out, then decides that it’ll keep us around for energy purposes until they put all humans in this co-animation and create an artificial world of matrix. So we think we’re still here. That’s the thesis, if people were wondering about that. The last group is Evolution.

Deacon: There are two starting points for this discussion, and the first starting point was immediately recognizing that the common use of evolution is biological evolution. It’s not quite the right story to be talking about the next thousand years. Evolution is a much slower process than we’ve known it to be in the past. A thousand years is just a twinkling in the eye of evolution. The other side of that story, however, is that it is a process that goes on irrespective of what
we do. It will happen no matter what. In fact, the understanding, the process of evolution, the nature of evolution and how it works, is actually a very crucial tool, because evolution is not progress. That was the first thing we hit upon, coming up with the things that evolution is not, because there are a lot of pop ideas about evolution that many of us evolutionists wanted to make sure were not part of the discussion. Evolution is not about getting better. Evolution is not about making better mousetraps. Evolution is what happens, the statistics of what happens, when things reproduce and compete.

Evolution is what happens, the statistics of what happens, when things reproduce and compete.

Under those circumstances, a lot of other things can go wrong and the term devolution was brought up a couple of times, but, in fact, devolution is part of evolution. There is no separate process. Evolution goes downhill probably much more than uphill and it’s very important to keep that in mind. We began with the recognition that most species, 99.9% or more, are extinct and that will be the process. Evolution is about clearing things away. It’s the tiny exception that has something else going on. That’s an important and sobering thought, because we’re about to intervene and that’s the real issue of what happens when you intervene in a process that is so troublesome in that regard.

The other thing that I wanted to say, and that Professor Tobias brought up, is that a thousand years is too much to think about biological evolution. However, it’s not too much to think about extinction and we’ve all heard about it again and again. Extinction can happen very rapidly, and we’ve known that it can happen very rapidly in the past. We can certainly be a part of it or experience it. So it’s certainly not out of the question. In that regard, it’s important.

This is the list of some of the things we felt were important to keep out of the discussion: the idea of progress, the idea of things getting better. You can’t just assume that if you let things go, that evolution is about getting better. Also, we wanted to be clear that evolution is not necessarily continuous; it doesn’t have to happen in that regard. It is also something that’s clearly not directed. Even though we can sometimes see directionality in hindsight, it’s not a sensible way to look at what’s going on. Perhaps the only sense of direction that makes sense, at least what I think, is irreversibility. There’s some sense of almost irreversibility in evolution. Also, it’s not always the case that evolution is adaptive, that things work better or that it’s optimal. There’s a lot of chance going on.

I wanted to mention one other aspect. We’ve heard a number of times about the concept of conscious evolution. In one sense, and this is my contribution, it’s somewhat of an oxymoron. We have to understand that what we do consciously intervenes with the statistical process that’s going on. If we’re lucky, the interventions will be useful and helpful, but not necessary, and we need to understand that evolution is everything else, in some sense, than what we do.

The next part is the opportunities. In one sense we have been involved in evolution for a very long time. We have been mucking with our own evolution for a long time and our species represents one that perhaps has had more of a say-so, but again, not a directional say-so, not a causal say-so.

We talked a lot about co-evolution and, in fact, the notion that what’s really important is not evolution as a biological process, but the dynamic of evolutionary processes in general, of which social evolution, technological change, and language change might all be part. A general dynamic, and that dynamic is the thing that we’re interested in, and then to learn about that dynamic gives us a tremendous tool to understand who we are, where we’re going, what the problems possibly are. Some of the possible advances that we can gain from this knowledge, I think, were about warnings. We spent a great deal of time talking about what it might be warning about. One of these that’s very important is that something about our evolution has to do with flexibility; we’re a very flexible species. We live in niches, and we have for a fairly long time. We modify those niches. In some sense, we don’t just live in the environment, we live in a large part of the environment that we have created or modified. Sometimes we intentionally modify for ways that make it more comfortable for us, but often times those modifications become the nest that we live in, that we’ve created or that our previous generations have created. That’s part of our environment. Evolution is about the amplification of the past as it gets passed into the future again and again—the regularities, the statistical amplification of those little messes we make come back to be part of our environment.
That brings up the final set of questions that really occupied us. What are the limits of this? Are we really all that flexible? What is the baggage we have brought into it both internally, as something you might call human nature—I like to call it humanity nature, because it’s social as well; it’s something that’s already been here around us, not just in us—passed into the future. How are we going to deal with that? One of the issues we spent a lot of time on is what happens when technology intervenes? How does it work out? What seems to happen? One of the interesting features about this, and one I brought up, in fact, had to do with what you do affects evolution, not only in the way that what Lamarck suggested—what you do in your life passes on to your genes differently—but by changing the world, you change selection in the future. We change the world radically all the time, and we’re living in the world that we’ve changed. The question is, will there be predictable results? One of the examples, which is not a human feature specifically, but a general primate feature, was Vitamin C. We need Vitamin C, because otherwise we get sick. Many mammals don’t. We need it because behaviorally some 35 million years ago, primates started eating a food source, fruit. They found a way to use their flexibility to eat a food source that had a lot of Vitamin C in it. We have the genes to make the vitamin, but those are just terribly damaged, and that damage has taken place over about 35 million years. The interesting thing about the problem is what it says: that what we do masks evolution in an interesting way. By having Vitamin C in our diet, we didn’t need to make it as primates. As a result, we lost that ability or had that ability weakened. Devolution went randomly away from it. I think that’s a nice metaphor for the technology, for what we do as human beings modifying the world. It will affect our biology ultimately. It’s very hard to predict what that effect will be. The troublesome thing about evolution is that there are so many possible amplified effects, it’s hard to make predictions about what’s going to happen. The more we know about how the process works, the better off we are at making sense of it.

The final piece of this is that we’ve created environments that are not like the environment that we’ve all been in. Many people have pointed this out. Are we flexible enough to make it through all these environments we’ve created or have the environments we’ve created begun to modify us, not in an evolutionary sense, but in a social sense, in a developmental sense? Somebody talked about how, during development, every experience affects us. We’re being exposed to an early experience in cities. Most of us are in cities right now very different from the environment that our bodies and minds evolved in. Does that affect us? Are we plastic enough to respond to that or is some of the violence, some of the antagonism, some of the difficulty in setting up government a result of actually creating minds that are out of sync with themselves in some sense, because they’re out of balance with their evolutionary past? Could we use our knowledge of evolution to do a better job of creating the early experience that might bring us back into a sort of balance with ourselves?

The metaphor! I almost forgot. It’s not well depicted here. There’s no river up there, is there? One of the standard metaphors in evolution is a landscape or carving through a landscape. I think it’s a very nice metaphor and I think the river metaphor can be adapted to it. But rather than looking at the river as being us, look at the landscape as being us, being humanity, being our biological predispositions, our cultural domains, the things that we’ve created and left. What’s happening is that there are rivers carving it up, and that carving process shapes what we are. The river flows downhill, takes adventitious routes, goes irregular ways. It’s very hard to predict, but as it carves down, the deeper the channels, the more likely things tend to fall into those channels and the harder it is to get out of those channels. In some sense, it’s a model of a river not going anywhere in particular, so that there’s no direction, there’s no end, there’s no obvious flow to it, but there is a history to it and a carving and shaping of us. What we’re about to see is how that carving and shaping process changes.

Facilitator: Now we’re going to do the hard part, or maybe it’s the easy part, I’m not sure which. The process is going to be straightforward. What I’d like you to do is turn your chairs so that you’re clustered in groups of three. It can be people on either side of you or somebody behind you. I’m going to give you five minutes, which should be enough for you to generate one of the most important dialogue questions for this afternoon and for tomorrow morning. What are
the right questions to ask that are metalevel, the biggest questions that would help us begin to grasp the deeper level of this concept of the next thousand years? Your question might come from one of the areas of discussion we just heard, or it may put together several of them. We’d like you to generate at least one question. I think the thing to do is, in your trio if somebody would say, “Well, here’s a question,” then the others of you add to it, refine it a bit. Then I’m going to collect one question per group, collecting different questions until we have them all, and I don’t know whether we’ll have half a dozen or a dozen. Then we’ll select three for these dialogues this afternoon. So, in five minutes, what are the significant questions that you think we ought to discuss?

(Following is the discussion in the large group following the three-person groupings.)

**Anderson:** What will be the future relationship between human evolution and the evolution of global environments?

**Pohl:** Is that “will” or “should”?

**Facilitator:** Good. We have 90 minutes for these discussions, so that’ll help.

**Didsbury:** How to create a global ethical system.

**Facilitator:** How to create a global ethical system. Yours is similar to one of the others.

**Gamble:** This is more of a gloss, really. We agree very much with what the relationship will be between human evolution and the evolution of the global environment. Our gloss was, how do we use the knowledge of the past and—here we use our metaphor—how do we use the knowledge of the past to inform the future landscapes of our human social projects? And a small subquestion: what is desirable and positive?

**Facilitator:** Who has a different question? A simple one.

**Kim:** We made this question in the positive sense. Education should contribute to the optimal realization of the potentialities of the human genome, with a special reference to the cultivation and maximizing of flexibility.

**Facilitator:** Do you want to expand on it?

**Tobias:** We felt that education has hardly had any serious focus of attention in the entire seminar so far. One group touched on it, while another group gave a passing nod in that direction. We felt that it should be a major focus. We know about the flexibility; let’s educate for flexibility. Let’s make education part of our planning, our foreseeing of the year 3000.

**Facilitator:** Great. And we have another question.
Deacon: Yes. Just an enlargement, actually, close to one of the last ones your group made. We talked a lot about these possibilities, not just what they are, but how to come to the most cost-effective and realistic strategies to getting to these points. That includes the ethical issue—how we can induce ethical behavior. How can we arrive at physical well-being and psychological well-being? That may involve everything from education to rearing to moving off the planet. Those are all ways we might influence that, but the key is finding a strategy that is both doable and cost-effective.

Facilitator: Are there any more? Yes, we have one more?

Calvin: How do we avoid outdriving our headlights, causing changes in societies and systems that cannot be corrected before crashes are triggered? The theme is that the future is arriving much more quickly than it used to, that our ability to perceive the future is probably not keeping up with it, and we’re getting ourselves into a situation where we may make irreversible changes that cause population crashes.
Guidelines for Key Questions Discussions

Moving to the next phase of the seminar, three meta-level questions about the future were determined by the full session of participants and guidelines were given for the “fishbowl” discussions.

Facilitator: Glen Hiemstra
Participants: Plenary Session

...these are the metalevel questions, the biggest questions we can ask to help us grasp the important concepts of the next thousand years.

Glen Hiemstra (Facilitator): If we spread them out, it looks like we’ve got about five major questions. Again, these are the metalevel questions, the biggest questions we can ask to help us grasp the important concepts of the next thousand years.

The first big question is, what will be the future relationship between human evolution and the evolution of global environments? This question had several subpoints. The second one is consciousness intervenes in the evolution process—and I understand there’s been some controversy about that—how will human nature transform? Will there be the ultimate future? What do we need to know to try to direct our evolution in a positive direction? Cost-effective strategies. How do we induce ethical behavior? How do we influence well-being? All that got added in. So that has to do with the capability of conscious evolution and what that means. This one is really the relationship of ourselves to evolution.

This question is, how do we use our knowledge of the past to project the landscapes of the future? What is a desirable or positive future? The question of education. And how do we avoid outdriving our headlights? So we’ve got 1, 2, 3, 4, 5. What can we put together?

Let’s try putting them together and see what we come up with. There are going to be three choices. Choose one. The way we’re going to decide, as we leave for lunch, is we’ve got a Post-It here. I want you to put your name on it for which choice you would like to participate in. We’ll number the questions for you. Be sure you put your name on it. Let’s number the three questions. We will work on the questions over lunch and see if we can sharpen them. I’d like you to indicate just one choice. If we have too many people in one, we’ll just divide you up arbitrarily so we have an even number in the three groups. When we reconvene, we’ll take the first question and we’ll put that group in the center and you’ll have 90 minutes to talk about it while the rest of us listen.

So Question No. 1 is, what will be the relationship between human evolution and the evolution of global environments? This includes climate change, increasing environmental information, capability of intervention, and the question of whether there are limits to our capabilities.

Question No. 2, conscious evolution and all the aspects related to that, including how do we use the knowledge of the past to project the landscape of the future?

Question No. 3 is the tie of global ethics and education.

In this phase of the seminar, each group will dedicate itself to the discussion of the problems and opportunities related to its one key question while the rest of us listen. We call these “fishbowl” sessions. Near the end of the session, those listening will have an opportunity to ask questions of the panel.
The first of the three metalevel questions concerning the long-term future of humanity was, WHAT DO WE MEAN BY CONSCIOUS EVOLUTION? A group of nine participants discussed this major question in a “fishbowl” setting, observed and listened to by the rest of the scholars.

Facilitators: Clement Bezold, with introductory comments by Glen Hiemstra
Participants: Terrence Deacon
Steven J. Dick
Clive Gamble
Ashok Gangadean
Jerome C. Glenn
Francis Heylighen
Barbara Marx Hubbard
Rosaleen Love
R. Spencer Wells

Hubbard: What is our real purpose here? What is our real purpose in this conversation with each other?
Hiemstra: The purpose of the conversation is to discover the deepest level of understanding we can about the implication of this question for the next thousand years. We don’t have a prescriptive set of outcomes; we don’t have to have a list of anything at the end of this. This is just to take it as deeply as you can.

As consciousness intervenes in the evolutionary process, how will human nature self-transform?

Clement Bezold (Facilitator): This discussion is about conscious evolution. We’re given the question of conscious evolution, thinking about it over the next thousand years. We have a number of parts, A, B, and C, and I’ll walk you through those and we’ll add a couple of other questions.

As consciousness intervenes in the evolutionary process, how will human nature self-transform? One of the things we’ll talk about is, what do we mean by conscious evolution and self-transformation? Try to define that for the group.
Second, what would be the optimal futures the human race could create? What would be the optimal futures, including the definition of what our futures are and then what, in general, do we think that is? What do we imagine that means?
And third, what do we need to know to direct our evolution in a positive direction?
Those are the three prime questions we’re going to address in the next 90 minutes. Now, in terms of the conversation, we’ve added a couple of challenges to the way we do our questions. We’re going to ask ourselves, in addition to the prime question, two qualifying sets of questions. One is, how do we use our knowledge of the past to project the landscape of future landscapes, in terms of this position? In effect, how do we make sure we’re learning from history in relation to that? The second is the issue of cost-effective strategies.
That’s a big mouthful, but that’s what we want to try to press ourselves to do. Once we define conscious evolution, what are positive futures? Does history tell us anything? How far can we get? Then, in terms of our ability to learn from the past, what about cost-effective strategies?
Let’s start by saying what we mean by conscious evolution. Let’s try to put on the table what definitions you would give to conscious evolution.
Deacon: I’d make a quick distinction between the use of the word evolution in conscious evolution and the use of the word in biological evolution.
Facilitator: What I heard you say before is that you can’t talk about evolution in a thousand years from a biological perspective. It’s too short of a period to
talk about conscious or directed evolution, from what you said before.

Deacon: To take the restrictive notion that we use in biology of evolution, that’s right. Evolution is not progress; it’s not what you’ve done. It’s the statistics of what happens in our reproducing system.

Facilitator: So we’re not talking about classic biologic evolution, because by that definition, we wouldn’t have anything to talk about.

Deacon: That’s right. I think there is a sense that is becoming very popular and a word that we have not heard yet, but it’s also because it has both difficulties and advantages: the word meme. It’s an analogy, and in some ways a bad analogy, between genes and ideas. Nevertheless, it’s a talking analogy that’s useful, because what it says is that ideas replicate themselves over time. Practices, too, replicate themselves over time. Habits replicate themselves over time. And that has an evolutionary-like dynamic to it. It’s not always conscious, directed, or plannable, and it has a lot to do with relatively indirect processes. For example, the context it finds itself in has a lot to do with issues of what you might call infectivity, much more biological issues, so that this would help understand why some ideas may be very troublesome. Some practices might be very troublesome, and, nevertheless, spread very rapidly.

Facilitator: How would you define, from your perspective, the term conscious evolution?

Conscious evolution means something on the order of: Can we restrict the possible alternatives in a way that we find appropriate for our interests?

Deacon: There’s a distinction we haven’t made, and that is between the evolution of consciousness and conscious evolution. Conscious evolution means something on the order of: Can we restrict the possible alternatives in a way that we find appropriate for our interests? Can we manipulate the statistics of how things get passed on into the future in such a way that we feel that we’re getting something out of it that we like? That’s what I understand, and you should correct me if you think that’s not what it means.

Facilitator: We’ll get other definitions.

Deacon: So I would turn that around and ask what the evolution of consciousness is, which I think is an equivalent part of the story. Will the nature of our experience of self, the nature of our experience of being a social person, change as a result of our intervention, as well as the result of things that happen spontaneously? If the answer is yes, then we will not be the same kind of conscious beings, and our societies will not be the same kinds of beings that they are now.

Facilitator: So, there are two components. Steve, do you want to add or clarify or put in a different definition?

Dick: I’m still looking for a clarification of the term conscious evolution. Does it include, for example, the conscious decision to move beyond the planet? Is it any conscious decision that you make to do something that you think is for the improvement of humanity? Is that what conscious evolution is? Is it a conscious decision or is it more than that?

Hubbard: I think the evolution of consciousness has been going on for billions of years, perhaps since the first cell. But conscious evolution is relatively new, in my understanding of it, and it includes a couple of things. One, we have become conscious of evolution and the genius of cosmo-genesis; the universe is still evolving and there are certain patterns about things that we can understand about how evolution works. We can enter the process of evolution more consciously, even though we’ve always been affecting evolution. It’s becoming conscious.

The next part of it is, as we begin to understand the invisible technologies of creation, like the atom, or the gene, or the brain, we can, through understanding E=MC², make a bomb, and that bomb could eventually destroy the world. It’s a scale that’s greater than before. Understanding our own genetic code, we can make new life-forms, we can extend our life; we can make monsters. It’s at a new scale and, if we can go live in space and explore and develop the infinite universe, that’s at a new scale. Each one of those new capacities is leading to the ability to put
human intention into the way nature evolves. I’d like to refer to Eric Chaisson, because he’s been very illuminating to me in this concept. He says there have been two great events in the history of the universe. One was when matter gained charge of radiative energy.

The second, he says, was when technologically competent humans began to understand matter sufficiently to put human intent into matter. At that point, according to him, we’re shifting from matter dominance to life dominance. So I put cosmic conscious evolution as happening relatively recently. It’s our generation’s task to learn how to do it ethically and wisely. And if we do, we have an immeasurable future.

Facilitator: We’re still talking about what it means to us in terms of conscious evolution.

Gangadean: For me, looking at evolution philosophically in diverse traditions, the most striking feature of consciousness is its reflexivity, its recursive power to turn on self in terms of awareness. So I see the connection between the evolution of consciousness and conscious evolution. They’re not separated; they come together because conscious evolution is a natural outgrowth of the deep pulse of consciousness that is the reflexive awareness. As I see the various traditions reflecting on themselves in a waterfall perspective, one of the most striking things in the evolution of consciousness is that the great teachers have seen that as we mature, we go through certain stages of consciousness or technology of thinking or patterns of thought, and at the early stage, it appears when we’re egocentrically oriented in processing ourselves in the world. Now, when I refer to the “great teachers,” I mean Confucius, Buddha, Moses, Jesus, Socrates, the visionaries more than 2,500 years ago, who saw that there was a more mature way to conduct our minds in this reflexive process. So we are not cut off from the object of thought. That is the essence of conscious reflexivity, and humanity has reached a point of maturity where we have to move together out of that immature stage into a more mature pattern.

Facilitator: The second part of this definition is, how will human nature self-transform? Is what you described of a more mature way of thought?

Gangadean: Buddha saw that existence is suffering and, diagnosing that as the egocentric pathology and fixation of thought, he saw that there was an old truth, that there was a way to get over that. There’s a way to let go of egocentric thinking and to enter into a higher dialectic of what he called co-arising, or relativity, where the mind is moving with the flow of reality more profoundly. That is the maturing of our human nature. So it constitutes a deep shift, a life-transforming one.

Facilitator: So here we’re talking about conscious evolution, including human transformation, in the directions that you’ve just identified.

Gangadean: Yes.

Facilitator: So that’s one path of defining this. Let me ask the other participants: Are there other definitions of conscious evolution either parallel to or different from what we have on the table so far?

Wells: Just mechanistically, it sounds as if what we’re doing is introducing the concept of directionality to evolution, so we’re adding on to the biological in evolution and taking it one step further.

Facilitator: I think Jerry’s intervention at the beginning was to say that you can’t have directed evolution; we’re saying that’s biological evolution, and we’re not talking about something different. But in terms of conscious evolution, are there other meanings or definitions that we want to get on the table?

Gamble: I’d just like to fight for further discussion later, perhaps, on this notion of the individual and exactly when that egocentric view comes in. I see a difference between a relational view between people and this view of the individual being created and emerging. The latter is very recent and, indeed, the other one has been around a long time. It’s something we are rediscovering at this moment. It’s not another definition of these particular problems, but it’s something that I’d like to flag for later discussion.

Heylighen: Until now, we have been speaking about consciousness as though it’s either egocentric or holistic, but I think it’s a little more complicated. We should also take into account the idea of different
levels of hierarchy where the complexity grows. If you look at evolution, you see that it started with very simple things, with elementary particles, atoms, molecules, cells, organisms, animals, humans. And you see, if you wish, consciousness growing each time, but often growing with discrete steps. There’s an essential difference between a plant and an animal. A plant is not aware of its surroundings; an animal is. Simple animals are purely instinctive; their reactions are built in. Higher animals can learn, and they can change their view of the world. Human beings together are at a higher level because they have symbolic thought. So there are certain steps in consciousness and, if we speak about conscious evolution, we should consider what might be the possible next step that would bring us to a higher level of evolution beyond the human level that exists at the moment.

Facilitator: Part of our conversation today could then focus on, over the next thousand years, what are our next discrete steps?

Hubbard: That’s a very good point.

Glenn: The term consciousness is defined many ways, in many cultures, in many periods. The only common denominator—and it’s a lower common denominator, but it’s one that I have found that works, at least minimally—is awareness of awareness. So conscious evolution to me would be the awareness that we can evolve. Some don’t believe we can, some believe we can. So conscious evolution would be the awareness that we can evolve. That’s a pretty profound perception. Now, if we spend our time being aware of how to do that collectively, then we’ve got some of what you’re talking about as well. If I add to that notion, why now? Why not one thousand years ago, or two thousand years ago? Before I answer that, let me say something first. If you look into a mirror, you are aware of yourself; you are self-aware. The technology of the mirror caught you in the act of being yourself. But you could fool yourself without the mirror. With computers, if you hit the wrong key, it doesn’t work; you can’t fool the computer. I could fool a person, but it’s hard to fool a computer. So the technology we’ve evolved now has made us aware that we can change and consciously use tools in making that change. The interplay of this consciousness and technology is an important draw.

Hubbard: I’d like to add to the “why conscious evolution now” comment. One, we’ve discovered the process of evolution and discovered cosmo-genesis quite recently. Second, the crises we’re facing are at a scale that we see our own extinction. So if we don’t become conscious of how to overcome that extinction, we’ll become extinct. To do it, we have to evolve consciously. It won’t happen automatically if we keep going the way we’re going, so we’re being forced to become conscious of conscious evolution. And the third is our new capacities—the biological revolution, the fact that we can create worlds in space, little new worlds, the fact that we can create artificial intelligence, possibly artificial life. Those new capacities don’t just happen automatically. We are doing them and, if we do them wrong, they can destroy us, but if we do them right, they give us an unknown future. So the new cosmology, the new crises, and the new capacities are forcing conscious evolution and the quantum discrete jump might occur as Teilhard said, when the noosphere, the thinking layer of Earth, gets its collective eyes. That would mean that each of us is part of a thinking whole system linked by the internet and global satellites. We’ve never experienced this before. Could the quantum jump be whole-system consciousness?

Facilitator: If we use that, are there other definitions or comments on the definition?

Deacon: I’m probably the one who still finds it to be almost an oxymoron, even though I suggested there might be an out-to-the-meme notion. The meme notion was actually introduced to talk about the evolution of ideas that is, in fact, not conscious. I want to be clear that a good part of the development of ideas and the development of science and technology is not directed by someone’s end goal impression of the world. And I don’t think that will change. The vast
majority of social change and idea generation will not be thought out in advance and laid out in front of us. We have to be aware of that as part of the conscious evolution side of it; we have to be very much aware that the world goes on within us and without us. And the stuff that goes on without us is usually much bigger and has much subtler hands with which to manipulate the world. I find it a danger to fall into what I would refer to as the engineering fallacy, that one can engineer evolution. I’m not sure that’s true. We can selectively breed a few species and maybe selectively change our environment. I’m very worried about engineering evolution.

Facilitator: Is this a conversation about engineering evolution? In the biological notion, classic evolution says we can’t do it. But is this conversation about that?

Gangadean: Your point is well-taken. There is something deeper that we might imagine playing out in evolution. We needn’t, however, assume—it would be difficult to assume—that it’s a pessimistic force playing out, because there are many traditions and thinkers looking back at our evolution in a self-conscious way, finding that there is a living vital force underlying all evolution. It’s on the table—is it a mechanistic unfolding taking place? Is consciousness coming later and, therefore, any act of consciousness has to be willfully delivered engineering? Or can it be that there’s an intelligence, a deep, profound intelligent force, deeper than we’ve imagined, playing out in evolution…?

Heylighen: There are some mechanisms or principles that may bridge the gap between evolution—something uncontrolled that we don’t really understand, on the one hand, and some kind of conscious feeling, on the other. In this hierarchical view, you have different levels. When a new level emerges, it’s in a certain sense a level that allows more control. Normally, evolution works by variation and selection. Donald Campbell has identified what he calls a vicarious selector, which is an internal system that makes selections instead of the environment. We learn, for example, that if something is sweet, it is probably good to eat. The sweetness is a vicarious selector; it allows us to select certain things to eat. We just taste them and on the basis of the taste we decide whether or not we can eat them. If we did not have that, we could easily be poisoned. And by having these vicarious selectors, we, in a sense, incorporate a powerful selective environment. We incorporate part of evolution and because of that we become, in a sense, less dependent on it. And that is an ongoing natural process whereby we internalize more and more of the environment that does the selection, and that gives us more power. We’ll never have complete power, of course; the environment is always much more complex than we are. But our power to steer evolution gets close. That is part of evolution itself, that the power to steer evolution grows.

Facilitator: So whether it’s our power to steer evolution consciously or vicariously, or by listening to some deeper music that’s already there, this is part of what we’re playing with in these times.

Glenn: Socrates came up with this idea of participating in the ideal forms. You didn’t have, in a sense, this participation. I think we are going to be able to participate in conscious evolution to some degree. To me, it was fire and compassion that changed the game for us. We’ve already done that; it’s past tense. We’ve participated in fire; we’ve participated in compassion, and that changed a bit. Now, we can participate more.

Facilitator: If we think about the next thousand years and, Francis, I’ll put you on the spot to speculate
about it, what might be the discrete next steps in terms of conscious evolution?

Heylighen: If we describe our present level of consciousness, we might say it’s symbolic consciousness, it’s language, it’s the capability to express things in symbols. Perhaps there are methods to combine those symbols, to discover new situations and, by combining these units of consciousness, we can imagine situations we have never actually experienced. On the other hand, we are limited in the sense that we view those symbols. They have evolved linguistically, culturally, but we ourselves usually do not control the concepts we use. We learn those concepts from culture at large and that process of culture development is largely unconscious. Our challenge is to get a better grasp on that process. For example, in computers you have what’s called machine learning. That means that you have thousands of different data and you look for patterns. These patterns might represent new concepts and new relationships, which, because of the complexity of the patterns, we ourselves would never have found. But by searching through that data, the computer can find patterns that may give us new concepts. So in a sense, we’ve gone up a stage where we can consciously control the process of creating new concepts. That is one of the discrete steps. It’s not only using concepts to discover new situations, but creating new concepts, creating new views of reality.

Facilitator: Is that close to creating your own memes?

Heylighen: Yes.

Dick: I’ll just continue the discussion even more. Another possible discrete advance would be the discovery of extraterrestrial intelligence, and I bring that up to point out the more general possibility that our conscious evolution may not be entirely under our control. If we do make contact with other life beyond Earth, they may have their own agenda. And that could happen at any time. Astronomers think that the likelihood is fairly high that there is life out there, although you can argue about the evidence for that and most of us don’t think that it’s actually here yet, but there are a number of different forms in which we might make contact with extraterrestrial intelligence. That’s another way that our consciousness would certainly take a step forward.

Hubbard: I wanted to build on the idea of the memes. It is interesting that memes usually have us and we don’t know that they do, and so, if you become a Communist or a fundamentalist, those memes have you. But we’re getting to the point of being conscious of the memes and, therefore, we’re moving toward consciously choosing the memes that will lead to results of behavior we want. That is a quantum jump. It’s a metaconsciousness of the ideas we hold having an effect on us. I mentioned to Bob Citron a while ago that I thought we may be developing a memetic code. You think of how much time it took to develop a genetic code to build a body. But a memetic code would be built of ideas in every system of the living social body that would eventually be selected because they lead to greater capacity, greater creativity, greater sustainability. So I would like to put forward the idea that a part of conscious evolution would be the conscious development of a memetic code that would be constantly evolving and constantly selected for.

Another thought about consciousness. A lot of things that have been mystical are becoming very practical, like the environmental consciousness. Only mystics used to say that everything’s related; we’re all members of one body. But now, we’ve seen our Earth from space and we’ve seen that if too many people drive a car, other people don’t breathe, and so on. The mystical consciousness is becoming a practical necessity, and as the information system connects us, if there is an internal evolution of consciousness as well as an external connectedness, we might be at the threshold of a mass experience of connectedness.

Facilitator: Barbara, let me say for the group that you’ve described memes that we would want to select for.

Our third question that we’re going to come back to is, what do we do to try to direct evolution in a
positive direction? I'll ask you later if there are memes that we want to select that would do that.

**Gamble:** I always find consciousness a little fuzzy, so for the moment, I’d like to explore things that we do well as humans and try to put it into a comfortable framework. This would take into account the long run of human evolution and the various ideas of what has changed and what has evolved with humans. The two hypotheses at the moment may crystallize some of the discussion here, although people may not immediately agree with some of the terminology. First, we’re trying to explain why we’ve gone from a brain about a third of our size, 500 cc, to about 1,500 cc. Huge encephalization has occurred in the last three or four million years. One view about this is that it’s all driven by a kind of social intelligence, a social-brain hypothesis with a kind of Machiavellian intelligence (the sort of thing this particular table would like to get away from). This viewpoint would claim that intelligence, consciousness—whatever you want to call it—has evolved because what we’re trying to do is manipulate everyone else around this table into our own view of how the world works. This doesn’t work in evolutionary terms, because if I’ve got this strategy, and you’ve got another strategy, then we’re canceling each other out. So the social Machiavellian idea basically puts the selection process in our own hands, rather than in the hands of an external environment, but it may not be so good.

Now the other view of why we ended up with this big brain with this bigger computational power would suggest that the easy thing to do is to deceive. The difficult thing to do computationally is to get people to cooperate. We’ve realized that what we’re supremely well-equipped to do is to deal with this cooperation, but what we don’t yet know is what mechanisms enable us to agree on intentions, so that I know their intentions are similar to ours before social interaction takes place. It’s that kind of mutual tacit agreement that is, when you think about it, an incredibly complex thing to work out.

**Facilitator:** In effect, what you said is that our brains allow us to deceive or manipulate the other person to get the other person to cooperate. If you look out over the next thousand years, would there be some next steps?

**Gamble:** I don’t think the brain is going to get much bigger. I think what will happen is that we’re going to come up with more ways to understand what we’re doing with it, and that’s where I would see the development. I don’t see these discrete jumps. I’m unhappy with the language of higher and lower orders, because I don’t think that evolution makes those judgments. Things either survive or they don’t. Using terms like better or higher or lower is actually confusing the issue.

**Glenn:** One note on the Machiavellian versus cooperation principles is what we have in our media. One-way media, such as television, radio, and newspapers, hold an audience with conflict, drama, and good versus evil. Interactive media, like the internet, hold an audience by cooperation.

**Gangadean:** I feel misunderstood in terms of the question of choice between Machiavellian and Hume-like cooperative. How well are we humans cooperating? When we look across the spectrum of our cultures on the world today, when we look across the fields of liberal arts, what I see are so many different fractures and pulls and fragmentations across our languages, cultures, and ideologies. I see violence of all sorts. That’s not cooperation, and whatever our brain has been evolving, I think we’re facing a deep crisis. A third option between a Machiavellian scenario and a corporate Hume-like convention that is not going to work is to move to a deeper global foundation between our worlds. And that’s what strikes me as I stand back and look across the spectrum of cultures over 2,500 years.

That, to me, is the greater breakthrough, and it puts the question of extraterrestrial intelligence in a new perspective because we need terrestrial understanding. It will be a great breakthrough if we could tap the code that makes our present intelligence now on Earth and even allows us to understand other species. Unless we can do that, how can we then decode the language of any extraterrestrials?

**Deacon:** I wanted to make two comments. One is about conflict. Evolution as we talked about it as a mechanism is built upon pitting things against each
other. Evolution is about the conflict. Even that wonderful example of bees and flowers—bees pollinating flowers and flowers giving bees nectar—is a story in which each has been trying to get the upper hand of the other. I don't necessarily think we need to have a fuzzy view of evolution in which it's all good and nice, or that we want our future to be one that's conflict-free, in which we're not facing real difficulty, because it's out of that conflict that come the complexities. That's the one thing I want to make clear. I don't necessarily want to say the future should be conflict-free and wonderful and everybody's going to be joined at the hip.

The second thing I want to say is about the conflict side of it. I think the engineering story, to me, leaves many more options for Machiavelli than for cooperation. It's very important for us to recognize that and take it seriously. When people talk about education and broadening consciousness by changing what we get, for example, I think of a story by Ursula K. Le Guin, a science fiction writer who wrote about the perfect religious inculcator. People land on another planet. They find this device and try to figure out what it does. What it does is change your mind to make you believe something without question, because one of the technologies of understanding the brain is the perfect inculcator, the perfect ideology. We're already seeing the effects of this in the media today. There are more people probably watching religious TV than almost any other shows out there. This is the evolution of very powerful kinds of advertisement, of manipulation. These memes are evolving because some people want them to evolve in that direction and that's a sense of conscious evolution.

**Gamble:** A quick response to Ashok. What we're disagreeing about here is really a question of scale. From my perspective, whether it's Machiavellian or Humean or a mix of both, we're still dealing with very small population units. As you see population increasing, even through prehistory, early history and so on, you have to acknowledge that the Humean model is actually working well. It's been a remarkable ability to keep on growing and to organize even larger units at successive stages. So there really is a question of scale. And with that question of scale, it becomes interesting that it is no longer individuals dealing with individuals. It's population units talking to different population units and how those are constituted and what sort of ethical and moral basis they have, which I think is actually the key element in moving to a new form of organization.

**Facilitator:** If we think about the next thousand years and conscious evolution, with all of the grandeur and complexity that we've been talking about, if we think about the optimal futures for the next thousand years, what do they look like? The specific question is, what would the optimal futures be that the human race could create? “The optimal futures that the human race could procreate” is the exact phrase.

**Gangadean:** I cannot imagine that the optimal future is that we'll remain on Earth, even if we do solve all of our problems. I think we need to move beyond the planet, as one of the groups argued this morning, and at the same time solve the problems on Earth. It's one of the human imperatives to move beyond the Earth and I think it's one of the things that being human most means, to explore and to find what's out there. I think that has to be one of the elements of the optimal future.

**Wells:** When we're thinking about selecting for certain memes and behaviors that are optimal, we need to bear in mind something that Bill Calvin brought up this morning, this idea of pleiotropy. When it's applied to genetics, it's the idea that a single gene can have multiple effects, and the same thing can happen with the memes. Most people would agree that the idea of human mobility is desirable. People can move around and meet each other. But if one of the effects of that is that we create fossil fuels that then pollute the environment, then maybe that's not so good. We need to be aware of these secondary effects as we strive for the optimal future.

**Gangadean:** As a follow-up to the line I have been presenting, based on seeing the scenarios unfold over the millennia, if we're on the threshold of a breakthrough to a more corporate awakening of collective consciousness, and if this has indeed been long in coming and envisioned by the great teachers, I think this would begin to fulfill the blossoming of our human essence and human nature individually and corporately. What I begin to see as I look forward in this, and not to underline how painful it's going to continue to be for these two great forces in culture at...
this moment: the emerging dialogic, awakening forces, and the more egocentric, monocentric patterns—it’s going to be difficult. It’s deeply encoded within us. I think it’s going to happen in the long run.

And what is going to come out of this is that the key, one of the deepest values we have as humans, is our individual flourishing. Not individual in an egocentric sense, but in an integral sense, because the word *individual* means nondivided. So it means integral; to become an integral individual is going to mean using this higher form of intelligence and modes of thinking called dialogic consciousness.

I would say that the optimal evolution over the next millennium would be the emergence of a shared culture that celebrates individuality and differences, and does not mean you’re joined at the hip. It’s not going to be conflict-free, but it’s not going to have the kind of violence that has been coming out of the domination of egocentric thinking. It’s going to be a very open, challenging environment, because when we touch reality, it’s profoundly and infinitely open. So there’s going to be no end of challenges and frontiers and horizons to explore. That thrill that would drive a higher form of evolution is going to be there. But what would be the most important optimal evolution as we mature together is a culture in which humans can be in deep communication and celebrating our common ground, yet having our individuality and unique creativity. I think it’s possible.

**Hubbard:** Now, we are already an emerging species out of *Homo sapiens sapiens* and that species is not yet named, but I call it *Homo universalis*. The optimal future would include us emerging as a universal humanity. That would mean we’ve been able to restore this Earth, that we’ve been able to free people from hunger, we’ve been able to control our population growth, we’ve been able to shift our high technology from defense and war to the building of new worlds in space. It would mean that within even the next hundred years we become a solar system species, and then probably within the end of the third millennium we would have repopulated the solar system, we would have restored the Earth, we would have become a galactic species. We’ll find that with what we call *unitive consciousness*, which has been still very irregular, people will have broken through into more cosmic awareness, will become a new norm. I think we’ll stay connected.

**Love:** Is there anything else to say? Perhaps I could take a view of agreeing, with the aim of living with difference and being able to manage that difference cooperatively. I also want the sense of being immersed in a web of life. I think in the initial bit about conscious evolution going up, we’ve only once touched on, or twice touched on, that web of life that flows indifferent to our presence. You mentioned that there’s a lot of it out there and it’s not human and it manages in many cases very well without us. Managing better than us in some sense brings to mind a moral lesson of cooperation. Think of fish: how do fish live when they’re not eating each other? While being predator for prey, they also move in schools, in accord with others. I’d like to bring out another theme in thinking about conscious evolution and the direction it might take for the next thousand years. In talking about the manipulation of nonhuman forms of life, we seem to be assuming we can do it, and get away with it, and get it right. I do wonder about that.

**Deacon:** I want to take advantage of the request to go beyond what I’ve thought before, and respond also to your notion of hierarchy. I realized that we are all thinking of ourselves, of my own consciousness. But in fact, when I think about brains—being a neurobiologist, I tend to do that—the cells that make up my thought processes are certainly not aware of what’s going on. They have information processing going on and the cells are taking in inputs and putting out outputs. The collective response of that process is experience that I have with me; I’m not my neurons. But we need to recognize that stage in this process. Quite clearly, a lot of these neurons are competing with each other for signal properties, trying to gain...
the upper hand in passing on their signals. That competition may then be rugged and rough, part of production of a higher-order cognitive process, higher-order information processing. My suspicion is that what we’re really looking forward to, it’s probably already happening and we don’t know it. We are in a sense the neurons that are not aware of the higher-order cognitive process. We may never be aware of it; we may ultimately be like neurons manipulated by the higher-order cognitive process that are in different specific detailed individual needs. That’s already happening and that’s the higher-order meme evolution, but in a sense it has something like the consciousness of the internet, the consciousness of the whole society, and noosphere. Is the noosphere one that’s going to involve us in knowing that we’re in the noosphere, or, in fact, are we just going to be the cells of the noosphere?

**Glenn:** I would like to be one of those growing neurons of conscious-technology civilization that has adapted to space. Biologists will certainly agree that if you’re in water, you adapt differently than when you’re on land. So if we do go off the Earth, leave the Sun, and become one with the universe, why would we assume that we’re “Spam in the can”? Why wouldn’t we assume that we will adapt to being in free space? Now it’s pretty hard to do that with cytoplasm, at least as far as I understand cytoplasm properties. However, maybe we could evolve as a continuum of consciousness and technology to space adapted so that we have our own gossamer wings. Oh, and to exchange ways according to extraterrestrial contact. It’s just, I suspect, a bigger, more exciting game.

**Heylighen:** If you think about the optimal future, people think in terms of scenarios. The most important question, first, is, what do we mean by optimal? Which are the values? Which are the things we find good that we want to maximize? Which are the things that we find bad that we want to minimize? To do that on the level of a thousand years in the future, we have to think in abstract terms and the only guideline I see at the moment is evolution itself. What does evolution do? Evolution is natural selection, and natural selection means selection of those who can survive. So the first thing we should do is maximize our chances of survival, minimize the chances of anything that might destroy humanity. But that’s negative. The other thing that is inherent in evolution that is not as explicit as survival is development. Development means increasing the capability to cope with all possible unforeseen situations, increasing the capability to adapt.

And that is another thing that is important; that means that we have to strive for more intelligence, for more creativity, for more diversity. One of the important aspects is to have sufficient diversity, varieties of different ideas, so that if one fails, there’s a whole backup of different possibilities. So we should try to maximize variety, maximize intelligence, maximize capabilities of survival. But if we want to look a little more down to earth, we can also go back to the old idea of the greatest happiness for the greatest number. Happiness is actually when an organism feels okay in its situation, when nothing is going wrong or there are no threats, when there is no pain, when there is no disease. So happiness, in a sense, is an emotional signal that organismically, logically, evolutionarily, the organism is fit. So if we want to maximize our evolutionary fitness for humanity as a world, that also means maximizing happiness. Those two concepts, although they seem totally different, are actually the same. So you can formulate the optimal state in two ways: maximizing our evolutionary fitness and maximizing the happiness of all those individual cells.

**Hubbard:** That’s a beautiful point.

**Gamble:** To try to answer the question, I’d like to go back to thinking about how we actually know people, because that’s what we’re dealing with if we’re trying to look for optimal solutions. It’s a kind of an understanding and knowledge of people back to the individual. At the moment, we have our greatest knowledge of people in an immediate context around this table, and obviously that’s layered like sediment in terms of how long the interaction has been with that person, the life histories, and so on. But that’s also a sliding scale, because as you move further away, you end up with an anonymous social relationship whereby it’s easy to drop bombs on people because you’re not particularly interested in them. Therefore, what you will see in this thousand years of evolution is a kind of extension of this imme-
diacy of knowing people into what, at the moment, is that anonymous realm of human relations. If I wanted to be optimistic on that long-term future and look for that optimality, then I’d be looking for transference of the way that we deal with relationships at the immediate level.

Wells: I don’t think it’s just a case of distance leading to dissonance and people not getting along with each other. The Serbs and Albanians encounter each other every day and don’t get along. It’s mostly a question of accepting the diversity, as Francis mentioned before, and incorporating that into our idea of what we should be as humans. Diversity is a central part of evolution, and it’s difficult to conceive of a human future without diversity of ideas in humans. We cannot just say, “These are the things we need.” We need to have that diversity, because there are things that we can’t perceive now that we may need to react to in the future. And that goes for memes as well as genes.

Hubbard: One quick comment. It was a really important point to bring up the idea of happiness and what actually does produce it. In the study of the flow state that has been done and Maslow’s study of self-actualizing people, productive, joyful, creative people, Maslow said that without exception self-actualizing people have chosen vocation. It seems that to be happy, we’re so wired we have to find that creative self-expression and give it in such a way that it is both a benefit to us as individuals and to someone else at least. So what I see as an optimal future would be that deeper life purpose, in which the creative expression of each person would be brought forth and find where it connects into a social need. I see a society with immense creativity both on Earth and in space.

Facilitator: The last question is, what do we need to know to try to move in the directions that you’ve just set on the table, to direct our evolution in positive directions?

Heylighen: We introduced the concept of memes, and I think that is very important, because at the moment, the main evolutionary process has stopped; it is no longer taking place on the level of genes, which evolve quite slowly, but on the level of the memes, which evolve within years or sometimes even hours. So we should first of all understand better the dynamics of memetic evolution, because some of these memes can be very nasty. They can be memes like suicide cults, Stalinism, the memes that made the Serbs think that they are superior to others. There also are a number of very good memes, for example, ecological consciousness, or most of the scientific concepts we are using. What we should understand is how we can promote the spreading of the good memes and suppress the spreading of the bad memes. How do we distinguish between the two? There are a number of models that we can develop from evolution in general. There are some analogies with biological evolution that can be used. Some of them do not apply to memes, while some of them do. But together with a number of other people, I have created a journal of memetics, because I think that will be important to help us steer evolution in a positive rather than a negative way.

Facilitator: Do you have two, three, or four options for reinforcing the good memes? Anything specific?

Heylighen: What you need to do first is list the criteria that distinguish a successful meme; for example, some of the criteria that I started to develop are: It should be distinctive. It should be clearly recognizable. It should be perfectly novel so that it attracts attention. It should be useful. People should have the feeling that if they get this idea, they can do something with it and make a change in their lives. It should not contradict what people already believe as truth. It should perfectly, as best as possible, fit in with what they already believe. It should preferably have as many people believe in it as possible, because a minority will find it very difficult to fight a majority. It should possibly be self-enforced and it should reinforce itself. There are a number of criteria such as those that apply to any meme, good ones as well as bad ones. And the first step is to recognize it when it’s happening so that you can do something about it. The second step is to use these criteria to reinforce the good ones.

Dick: This attracts me not only as a historian of science and a historian of ideas, but also as a memetic historian, even though I didn’t know it. Yes. That means that there’s a rich source of literature out there on the nature and the transmission of memes in the history of science and the history of ideas that, in terms of history, should be tapped into.
I’d like to see us develop an evolutionary agenda of the memes that we would need in order to move toward what we consider to be attractive.

Hubbard: If I were going to say how we could guide evolution in a positive direction, there would be a couple of things that we’d need to do. One, what is a positive direction? I would like to see a continual feed into that from every participant in all the seminars so that it starts building and enriching itself. We’ve just thrown a couple of ideas in there, but if everyone in this room and everyone else pitches in, we could create a magnetic attraction based on many people’s inputs to what they consider to be desirable.

The second thing is, I’d like to see us develop an evolutionary agenda of the memes that we would need in order to move toward what we consider to be attractive. We would design the evolutionary agenda starting on all these critical problems, starting with environmental and human survival, and all the way on up to growth needs and transcendent needs.

How do we enter a more powerful dialogic awareness and rationality that can hold multiple memes together in a nonviolent way?

Deacon: I’m going to continue my negative perspective. We do have a very solid agreement about the goals, what we would like to see. I want to talk about the memes issue: how to get there? What’s the most effective sensible way? I want to use the following prediction. My prediction is that what I call Machiavellian conscious evolution is much more likely. The likelihood is, in looking at television, ideological systems, the way educational systems inculcate information, manipulation of people’s beliefs, people’s consciousness, people’s intentions, all this is the way things are working. Evolution is about the race being to the swift and the ruthless, and to some extent, unless we’re aware of it, consciously aware of how obvious and likely it is, the Machiavellian conscious evolution will take place.

So what’s the method if we want to go the other direction? The method is an immune system: an immune system against those memes that are most troublesome. But how do you do that, because you don’t know what they’re going to be? How do you get an immune system that can predict any disease? You can’t predict any disease, but you’ve got to have enough variety bubbling up in the system to match it. And that variety comes from a couple of things. One, arguing around tables like this. It comes from critical thinking. Being critical and being willing to live with doubt. Being willing to think that maybe what I’ve been taught, maybe what I believe, maybe what I think, maybe what I believe with all my soul, is not quite it. Those are the kinds of immune system memes that I think we need. And that may be one of the most powerful memes that we have. The immune system doesn’t have to be done from the top down. It can be done on the internet; it can be done on small levels. I think maybe it’s a hope.

Hubbard: I think we are developing an immune system. For example, there are neo-Nazis resident in most cultures today. I saw a TV show on it recently. But you can see that we are trying to suppress that. And ethnic cleansing; once this horror is over, if anybody mentions ethnic cleansing, we know it has to be suppressed. So that is happening.

Glenn: One of the strategies is a knowledge question we’ll need to know. Is what we’re doing what we need to know or is it strategies?

Facilitator: Is it what we need to know to move in a positive direction?
Glenn: Well, one would be how do we get the right information to the right person at the right time in the right form? It’s a tall order, but that’s the kind of stuff that noble ideas are made of. The question of how to get a new software into the world system was an impossible request about 20 years ago. Now it’s normal. Those who don’t do it are being inefficient. Meetings like this are relatively efficient, but I would hope that they’re not the best in the future. Maybe we can actually have more dialogic conversation done very fast, very diversified throughout the whole human species.

I’m tired of this conversation between those who say, “You want to make the change, the strategy is consciousness based,” and those who say, “No, the strategy is technology based.” As far as I’m concerned, I have two hands. I am conscious and I am technology, and I’d like to see our strategy include the notion of having mystics, and I don’t mean a cult. Cults are the ones with the dogma, while mystics have the experience. I like to see the conversation done well between the mystic and the technocrat in our world. I’m not sure the worldview of the technocrat is great, but the attitudes of the mystics are always great. I like the attitude toward nature, but I’m not sure if I want the mystics to manage my Y2K problem.

Gamble: We’re a kind of international human court of human memes where we actually sit in judgment of these poor things, banish them if we don’t like them. I don’t disagree with either in a way; we seem to be nicely juxtaposed here between alternatives. But what we want to know, what we need to know is that the individual doesn’t stop at the skin. We go beyond this compartment, which comes in a package that is the way that we’ve conceived of ourselves. But it does go beyond that, because there’s no point in having this package unless it’s constituted with other individuals and other people. Otherwise, we cease to be human; we might as well be ants or computers sitting there trying to talk to each other. We’ve got to get through that skin barrier and what we need to know of the strategies.

Deacon: I get the sense that the individuality that’s most troubling is beyond the skin level. I’m Serbian, I’m Bosnian, I’m German, I’m Russian, I’m Jewish, I’m Islamic. That’s already beyond the skin and it’s still a problem.

Gamble: It may be beyond the skin at that level. I suppose it’s a case of recognizing that the way we constitute the relationships, as soon as we’re beyond that, is that, in fact, there’s much more of a mutual relationship than we usually are willing to agree to.

Facilitator: Let’s throw it open for questions.

Koelle: We’ve been discussing the desirable future development, but what about the past thousand years? Do you see a positive development or not? And if yes, isn’t that related to a very small leader? Facilitator: In terms of evolution, are the masses of humanity better off now than in the year 1000?

Glenn: When you could sit on top of the Acropolis before they put the fence up, I sat there one night and I asked that question. Looking down two thousand years with a little geographic referent, and seeing these poor houses, poor people of today, I thought, Gee, that’s really terrible. Here’s a beautiful structure. And then it suddenly dawned on me: you know what? That structure wasn’t for the people. That structure was for the gods. So yes, there’s squalor right here next to the beautiful structure, but I’d rather be those people in their squalor now than those people looking at this house of the gods in the situation that it was then. So I would say that there has been extraordinary social progress.

Koelle: Social, yes, but that was not the main issue.

Facilitator: Genetically, in terms of human beings, are we different than a thousand years ago? In terms of consciousness. Would anybody say that we are?

Deacon: Genetically, that’s a pretty easy one. No.

Gangadean: It depends on two different perspectives looking at the past. We tend to say we can’t really revise the past. If we look at the past and see egocentric ways of fixed linear process, it is dead and fixed.
But the highest research and philosophies teach us, in terms of relativity, that every moment in temporality is open. There’s a way to look back at the past with a wider lens and see a different and more enriched scenario unfolding from our point of view. I see two dramas speaking at the same time. I see the yes-and-no answer. Beyond our skin, we are still trapped in this fixated way of thinking that has been peaking and intensifying in the drama, and the plot thickens. But we’d be blind if we don’t also see the painful struggle; for example, the American story that is still in the midst of trying to find democratic space where more people can be free and live as individuals in pursuit of happiness. We’re in the midst of it, but I think there’s evidence, too, of evolution taking place on the planet. So we get the best take on it when we see both of these scenarios unfolding together. That’s what makes our time so exciting and dangerous. Which way is it going to go?

**Dick:** That’s certainly true in terms of understanding our place in the cosmos. We’ve evolved in that way. We know we’re not the center of the universe in any physical way, and the question is whether we’re central in the biological way.

**Deacon:** Biologically, are we better off? If we talk about medicine, nutrition, distribution of food, and a whole range of issues at that level, we are better off. Now, given the fact that how we got it is by having monocultures and massive agriculture and strip mining and a range of other things, will that be a sustainable way of being biologically better off? That’s an open question.

**Facilitator:** Other questions?

**Dator:** I’m surprised there was no more than a passing reference to genetic engineering or at least the completion of the Human Genome Project in any discussion of the future of evolution, because what was said here is that we’re the same as we were genetically a thousand years ago. I don’t think we’ll be that way 50 years from now, much less a thousand years from now. Genes are just becoming one more technology, and while we seem bent against using the Machiavellian perspective here, nonetheless, it is a technology that is going to be tremendously powerful.

**Hubbard:** As we learn to be physically universal and live beyond the planet, we’re going to find all these biological new possibilities of cloning, and life extensions will become necessary for survival. People who are involved in the ethical judgment on the new capacities say it’s unnatural, but it may be the very nature of humans to be able to transcend the biosphere. I was a friend of Timothy Leary, and he had all these wonderful theories about “S.M.I.L.E.”—space migration, intelligence, increased life extension—being the next stage of the caterpillar to the butterfly. So it’s not weird; I think that it’s natural, but we haven’t seen the next stage of nature yet.

**Facilitator:** Is there a set of rules for judging genetic engineering on Earth in terms of optimizing our species? If we assume that we’re going to do it, are there any rules for judging or directing?

**Wells:** We’ve been doing it for about 12,000 years. Selective breeding of animals and plants has been going on for a long time. The difference now is that things are going on much more quickly. Within the next five or ten years, we’re going to have the ability to diagnose a lot of genetic diseases very rapidly. It’s going to be a standard part of going to the doctor. So I think diagnosis is where the first changes are going to take place. The question of whether we’re going to engineer a better genetic future for ourselves is something that goes beyond genetics and beyond what geneticists alone can decide; this is something that
we need to decide as a group, as humans. We have been genetically engineering things for a long time; do we also want to genetically engineer ourselves?

**Deacon:** It’s unlikely that we won’t apply it to us. There is a whole biosphere out there that we’re certainly much more likely to alter. It’s one of the major factors, and we’re already doing it, of course. As you say, we’ve done it in a haphazard way over tens of thousands of years, perhaps. We’re already seeing the first genetically engineered fruits and vegetables showing up. The issue now is that we’re doing it within species. Of course, genetic engineering is about taking information from anywhere in the biosphere you can get it, or making it up yourself, and passing it around. One of the problems is that it would be very hard at one point to identify species any longer. The whole question about diversity will be swamped by the impossibility of even assessing diversity as we begin to play with genetics. I think that makes it a very complicated issue, so complicated that it undermines my ability to even ask the questions.

**Facilitator:** Does that become guidance for the Foundation in looking at the next thousand years? Does that become an even more important question?

**Deacon:** I think that’s right. I think, in fact, it is one of the most important questions, because it’s changing everything we know about biology. When you do that, all bets are off. We might want to ask ourselves, do we have the human nature we want? Obviously, gene manipulators might turn it against us or toward us. Is there some way to arrive at a sense of what may be a little modified, or do we want to leave it alone? Are we happy with the way it is? That’s an interesting question that might come into this discussion.

**Anderson:** I wanted to ask a question about consciousness. Within the context of what Clive Gamble mentioned, the evolution and the increasing size of the human brain we all know about. As we also know, that which we call consciousness is a fairly small part of that organ or collection of organs, depending on how you prefer to describe the brain. It seems fairly clear that it’s a good thing that consciousness is a small part of the total brain, because the rest does a lot of work and consciousness is an ongoing semipolished draft of other stuff that goes on there. So, one point is that consciousness is limited and that limitation appears to be a very good adaptation by our species, though we go to some effort to fudge the gap between the conscious and the unconscious. Consciousness is the tip of the iceberg of brain function. Then there’s the unconscious, which is another piece of it, and all kinds of societies have had various capabilities to get between the conscious and the unconscious. And then there’s the other thing that we’ve been evolving for a long time. We’ve expanded the unconscious by having all kinds of data systems and symbolic systems that help us consciously process things, and clearly that’s evolving with computers and technology. My question to the group would be, how do you see the evolution of consciousness vis-à-vis the brain unconscious or vis-à-vis the technological unconscious that we’re developing? Is it desirable for consciousness to increase? Those are some of the questions I’d like to have you talk about.

**Deacon:** A story that I remember from my first psychology class was a parable of the centipede that starts worrying about which leg to put first. The moral there is very clear: if you start worrying about which leg comes first, you fall down, you can’t move, you’re stuck. There are some things that, if you don’t render them unconsciously, become a terrible problem. So I think that’s a very important point. I always tell students in my introductory classes that I think most of the brain is designed to make things unconscious. The purpose of that is to take what’s out there and make it so you don’t have to process it actively. For example, I don’t have to worry when I’ve swallowed saliva accumulating in my mouth. That’s the kind of thing that we have to make an unconscious occurrence or it gets in the way. The key to this may be the expansion of our ability to make things unconscious. The key is that the things that you make unconscious are the things that can go on unmodified, happen on their own autonomously, and you rely on them to work.

**Gangadean:** I find myself coming out on the opposite side of that. It’s not that the gray capacity is designed more and more unconscious and decreases as consciousness diminishes. On the contrary, the scenario I see is that we’re just beginning to arise at the horizon of awakening awareness and we haven’t even begun to tap the potential of the brain to support the
kind of consciousness we’re capable of. In the Zen experience, the point so far is we’ve been dwarfed and stunted by our egos and by holding back our brainpower and not allowing ourselves to open up to the infinity. So, being “in the moment” is the challenge of coping with the infinite presence that’s before you in a finite way. The tip of the iceberg is really the brain, not the other way around, not consciousness. We’re just beginning, it seems to me, to reach this blossoming of awareness and the technology that would open up horizons that we’ve never dreamt of before.

**Hubbard:** I’d like to add to that from my current reading of Jung. For him, the unconscious was God, it was source, it was nature, and only a small bit of that is conscious within ourselves and beyond ourselves. He pointed out that the great task of the 21st century is to incarnate the dark side of God. This is an interesting thought, because nature is violent, and human nature, combined with its memetic drive for immortality (that is, immortality of our ideas), is even more violent. But it has intrigued me about the evolution of consciousness: What would it mean to take hold of that dark side, which is not necessarily evil in nature, but becomes evil in human nature? Can we become aware enough of that dark side to work consciously toward wholeness? It’s not just the trinity of God the Father, God the Son, and God the Holy Spirit, but also the Satanic—that in us that is causing the problem has to be incarnated into a new level of wholeness. Jung says this is the work of the third millennium. I’d just like to put that out as a very great challenge.

**Glenn:** To me, the whole governing system of civilization becomes like the autonomic nervous system is to the human body. I think the capacity creates an autonomic nervous system, like the unconscious in that sense. So I take the middle ground.

**Heylighen:** I would also like to take the side of Terry. Indeed the tendency that makes more and more things unconscious and automatic can be easily explained; namely, the best way to cope with complexities is to delegate. You cannot have one system monitoring everything that is going on. What typically happens in evolution is that the system becomes modularized in a number of subsystems, and each subsystem is responsible for a particular function. There is a higher-order system that supervises them, but that system intervenes only when something cannot be handled at the lower order. For example, the swallowing of saliva. You swallow saliva unconsciously, but if something gets into your throat and you can’t swallow, then consciousness takes over and you become conscious that there is something stuck. So you do need to delegate things to lower-order systems. When I speak about the growth of consciousness, I speak in terms of a pyramid becoming wider below, but also becoming higher at the top. Higher consciousness is at the highest level that you wish, but it also means that there are many more subsystems below, to which things are delegated. This means that the highest-order system is not conscious of all the details at the lower level. It’s unconscious of the stomach producing acid and it’s unconscious of the heart beating. It can become conscious if something goes wrong. Most of the time, the higher-order system should not be listening to whether the heart is beating. It should be thinking about the higher-order world and problems.

**Facilitator:** Phillip Tobias gets the last question.

**Tobias:** May I plead the case of the Bushmen, the Australian aborigines, and the other five and a half billion people on Earth? Does the panel consider that genetic engineering is going to be more than just a few experiments and their results applied in small groups in small areas, which will show the world how jolly good the scientists are, how terrific the achievers in human genetics are? Is it ever going to be an influence on the survival of Homo sapiens on Earth? My question is loaded. I obviously don’t think so. I don’t think that six billion people’s survival and adaptability can be conceivably affected favorably by genetic engineering. Is it not the case that we should accept our limitations as a universal species, Homo universalis if you like, and say that this is just one of the way-out, most advanced technological developments in biology today, and that it’s not really going to affect human survival at the universal level? It’s a question I throw out to the panel.

**Wells:** We’ve got to distinguish between diagnosis and manipulation. If you’re talking about will we be able to use diagnostic techniques....
**Tobias:** No, I’m not.

**Wells:** You’re actually talking about manipulation. I agree with you. We are talking here ultimately about cost-effective strategies. That would be far too expensive. I agree it won’t be widely applied. But the diagnostic techniques might be, because they’re much cheaper and you can still achieve engineering advances. I think that maybe they’re not advances, but changes using diagnostic techniques, and maybe that’s the sort of thing that will be applied.

**Love:** As you were speaking, because I’m Australian, I was thinking in terms of the Australian indigenous people, whose life expectancy is a lot less than that of other Australians, and their diseases. It seems to me that there might be ways of looking at juvenile-onset diabetes that can be precisely tied to using new technologies that may, in fact, be very effective and work well in that particular type of population.

**Hubbard:** Regarding *Homo universalis*, it’s interesting to me that DNA was discovered in the 1950s and the Apollo program was in the 1960s. It could be that those are organically connected new capacities. Very few people on Earth right now are going to go into space. But in the long-distance future, if we live on Earth and in space, many of our distant relatives will be in space. Perhaps people on Earth should not use genetic engineering within this biosphere. But how many people might need to use it a thousand years from now as we undertake long-distance space travel? My point is, not that we should apply it, but that we should learn it to make it available if we do need it.

**Glenn:** It’s encouraging to hear that the diagnostic techniques would also be more cost-effective and cheaper worldwide. I worked in the Peace Corps and I’ve seen tuberculosis. I’m very sensitive to the kind of question you asked. Having said that, the conference is looking at a thousand years. It’s inconceivable to me that there will not be advances way beyond all of our collective intelligences right now.

**Deacon:** I think the same. Let me give you a little bit of technology here. I work with transgenic species and am involved in creating transgenic species. It’s done with viruses. We’ve learned to manufacture viruses. The viruses we use now are all man-made. Now, you have to understand the power of infectivity of viruses; these are not just the things that one needs to use in the laboratory. They’re the kind of thing that could be diffused over very large populations very inexpensively and not necessarily for the good of those who get them. That’s both a powerful tool for spreading across millions and millions easily, and a powerful tool to be wary of. I think that the future has all of those possibilities, the pluses and the minuses.

**Facilitator:** Thanks to the panel for a great job! We’ll reassemble in 20 minutes.
In the second fishbowl discussion, seven participants grappled with the second major question: WHAT WILL BE THE RELATIONSHIP BETWEEN HUMAN EVOLUTION AND THE EVOLUTION OF THE GLOBAL ENVIRONMENT?

Facilitator: Glen Hiemstra
Participants: Walter Truett Anderson  
William H. Calvin  
James Dator  
William W. Kellogg  
Dietrich Koelle  
Phillip Tobias  
Paul J. Werbos

Glen Hiemstra (Facilitator): Let me review the question and the ground rules. We're going to take about 80 minutes for the conversation and then about 20 or 30 minutes for questions. The basic question is: What will be the relationship between human evolution and the evolution of the global environment? The subquestions related to that are: What about climate change? Can we control or adapt? What is our capability for intervention? Are there limits to the capabilities regarding evolution and the environment? And will our increasing environmental information-gathering capability lead to desirable outcomes? We'll start with what we mean by the lead question, what will be the relationship between human evolution and the evolution of the global environment?

Here are the ground rules. Listen to each other; try to avoid long speeches; sometime during the conversation, say something you haven’t said before—really try to take this to a deeper level; and make sure the conversation is intelligible to others. There's one more that I want to add. Paul mentioned as you were gathering here that one of the most interesting things he got out of the last conversation actually occurred in the hallway. I have a friend who organizes conferences, and he once created a corridor conference in which there were mainly gatherings in the corridor. It seems to me that an interesting ground rule would be, let's try to get on the table the kinds of things that we would say in the corridor after the conversation, the things that we wish we had said while we were here.

Let's begin with the question of what will the relationship be between human evolution and the evolution of the global environment?

What about climate change? Can we control or adapt? What is our capability for intervention?

...general evolution has been in the direction of increasing human capability to intervene in one way or another in the evolution of the other species...

Anderson: I'd say that general evolution has been in the direction of increasing human capability to intervene in one way or another in the evolution of the other species and to manipulate environments. Often deliberately, often accidentally, sometimes good, sometimes bad, but the general trend has been in that direction, and my guess would be that the trend will be increasing intervention in the environment, increasing manipulation of the environment. What I see happening is that we're building a worldwide information-gathering system that is, among other things, doing a wonderful job of bringing us the bad news. We're becoming increasingly sensitive to everything that's happening on the planet, which is going to drive us increasingly to respond to that kind of information.
Werbos: I interpret this question slightly differently, thinking in terms of what humans are going to do and what we can do to the environment in the next thousand years. Of course, the global environment is a complex system, so I don’t want to describe it as if it were one variable. In the first place, there are two major components: the biosphere environment and the global matrix. When we talk about climate change, we’re really talking about carbon dioxide, greenhouse gases, ozone, and all that, and that’s very critical. And then the biological stuff is a lot more complicated. It’s clear that, in terms of the biosphere, we’re dealing with an extremely complex system, and the more we manipulate things genetically and biochemically, the more we have this problem that we’re driving faster than our headlights. So it’s a question, not only a database, but a knowledge base, and not only satellite data, but molecular data.

The other part, the matrix, is probably what I know more, while the rest of you know more about the biosphere details. In terms of the matrix, it’s clear that there are technologies coming down the pike that would allow us to have a tremendous effect in reducing things like carbon dioxide and greenhouse gases.

Kellogg: What do you mean by “the matrix,” Paul?

Werbos: The nonliving part of the environment, like the CO₂ and the ozone.

Calvin: The culture medium.

Werbos: If you think of the Earth as a body, then the cells are the cells and the matrix is that other stuff they live in. So in a biosphere, there are the organisms and then there is the nonliving thing they live in, the matrix. In that part, life is a little simpler. It’s easier to measure CO₂ than it is to measure the genetic composition of thousands of species. There are new technologies coming down the pike that could have a major impact if we focus on things like long-term research and development and technology breakthroughs rather than spending billions of dollars in reducing CO₂ by 5% by using obsolete technologies, which is a current problem we’re looking at.

Tobias: My inclination is first to look at the past and then look ahead. In the time that mankind has been on Earth, 85% has been severely restricted by environmental constraints. When a major change of environment occurs, a major extinction happens and new species appear. An interesting example is that for over a million years, two hominid species coexisted in South Africa, Kenya, Tanzania, and Ethiopia. They were in peaceful coexistence, as far as we can tell; at least, the fossil remains show no signs of interaustralopithecine violence or interhominid violence. They lived side by side, despite having a similar resource base. Then something happened about 1.2 million years ago and the australopithecines disappeared, and Homo, the other contemporary, had the resource base all to himself and became the only major hominid lineage. So something happened, and we know that about that time there was a fairly substantial change of climate in Africa.

Facilitator: What was the nature of the climate change?

Tobias: The nature of the climate change was the uplifting of the eastern and southern plates of Africa with cooling and drying. Vegetation was hit, and finding food resources became a tremendous challenge for the two groups. They became competitive with each other. One group acquired mastery of fire at the same time, and that could have been an additional cultural factor superadded to the climatic change. Under the sudden adverse onslaught of the deteriorating climate, we find the extinction of a line of hominids that had been there for at least one and a half million years previously. That’s one example that human evolution has been heavily environmentally determined.

Elisabeth Vrba says that all evolution is climate-driven. I don’t go quite as far as Elisabeth—she leaves out a lot of other little factors like culture and so on—but it is a very important factor. Once culture comes to predominate, then we have an interesting difference. It seems that more and more from about a million years ago, culture dictates survival through a range of cultural devices and tools. This is what, I...
suspect, has been the mark of evolution up until the present. It is, therefore, reasonable to prognosticate that what’s going to happen increasingly in the next thousand years is that we are going to be much less susceptible to environmental changes except for crises like mud slips down Mt. Rainier or explosions of Mt. St. Helens and that kind of thing. With critical exceptions, the human evolution is going to be largely culture driven, and increasingly, we’re going to be able to wear our culture like an overcoat against the ravages of the climate of the global environment. We’ll be largely immune to it where we have adequate culture to protect us.

**In some 90 million years, we will reach maximum temperatures...and that may be the end of mankind on Earth.**

**Kellogg:** Phillip has expressed an optimistic position from the point of view of people themselves. I would like to point out that these people, even though they may be very adaptable, are going to be up against some great problems. Besides climate change, global warming will continue as long as we continue to burn fossil fuels, and we will continue to burn fossil fuels until they run out. The question is, when will they run out? We don’t know exactly, but going back to Harrison Brown’s *Challenge of Man’s Future*, it may be in the next century or two. Coal will last longer. Coal will probably go for several more centuries, mainly in the U.S., Asia, and Australia. There is probably several centuries’ worth of coal, but even that will give out. After that, human ingenuity will step in. The renewal energy from the Sun so far has been a minor consideration in the sense that it doesn’t contribute a great fraction to the energy that runs our society right now. So I think that one of the main problems that society will face will be an adjustment of how it gets the energy to run it.

The other point that seems very important is that, as we become more clever, we will not be any brighter than we are now. If we see our civilization growing to the point where we can go to the moon and occupy Mars—and I doubt if we’ll go any farther than that physically—we will certainly learn a great deal more, and technology will take enormous leaps forward. We can’t even conceive of all the technological leaps that we will take in the centuries ahead. I suspect that we’ll still be the same genetically, we will still be people with essentially the same gene pool. If we don’t change our makeup, we’ll be up against a planet that is not as hospitable as it is now. We will be forced to do things that we don’t have to do now. That is almost a certainty.

**Koelle:** I would come back to the climate problem, which has already been explained to a certain extent. The human race as it exists now, with our intelligence, is a product of the environment. It has been developed under the environment and, therefore, we should emphasize and not ignore that in considering the future development. To make that clear, the most important factor is the 240-million-year temperature cycle that leads to the great ice ages with global temperatures down to some 5° C. This cycle is identical to the rotation period of the Solar System around the center of our galaxy, the Milky Way. The interglacial peak temperatures at the other extreme reached 25° to 30° C, by example, during the dinosaur period. This temperature level, by the way, also prevented the development of an intelligent dinosaur species. There was time enough—more than 150 million years—but it did not happen. Why? The reason is very simple: They had no need. The dinosaurs lived in a paradise environment in which they had plenty of food anytime. However, as the last Great Ice Age started some 65 million years ago with a temperature drop of some 20° C, which the dinosaurs could not adapt to, their breeding technique (open nests) finally prevented the development of the eggs at the low temperatures. Reptiles and birds could survive this climatic change because reptiles place their eggs underground and birds keep the eggs warm with their bodies.

The famous and much publicized meteoroid impact also happened some 65 million years ago, but it did not cause the extinction of the dinosaurs. (If that would be the case, why did the birds and reptiles survive?)

I would like to come back to the consequences in the future: With the 240-million-year-cycle, we have to expect another temperature maximum on Earth
in about 90 million years, with higher temperatures than anytime before. This may eventually mark the end of mankind on Earth. Or at least a restriction to the polar regions, or going underground, or the transfer of major human presence to the planet Mars.

**Dator:** My role at this conference is to try to problematize the notion of humanity, and every time I try it, people turn the subject back to humanity’s glory again. I got on this panel because if there’s any reason for us to think seriously about the future of humanity as a good thing, it is in relationship to what we seem to be doing to the planet at the present time. I think that one of the things we have an obligation to at least discuss here is that it would be a wonderful thing for humanity to go out of existence and that the next hundred years is probably when that will happen.

**Kellogg:** Wonderful for what?

**Dator:** For everybody else, for all the rest of life, because I’m impressed by what little I know. Being from a warm climate and all, I don’t know much, but whenever humans show up, there goes the neighborhood. You indicated that’s where we arose to begin with; as long as there was plenty of everything and there was no competition, we didn’t bother. But as soon as there was a shortage, we seemed immediately to get pretty good at exterminating everyone else. I’m very pro-human, pro-humanity, but what we do is to destroy nature and to create artificiality instead. I think we need to glorify this particular characteristic, at least acknowledge this particular characteristic of humanity. Walter Truett Anderson said it all in the title of the book *To Govern Evolution: The Primary Challenge for the 21st Century and Beyond*. I quote from that book in some stuff I’m doing: “Be careful what you tame, because once you tame it, you have to be responsible for it forever.” We are increasingly taming the environment and will continue to do so over the 21st century and through to the year 3000. Therefore, we have to be responsible for it forever.

**Calvin:** We are as gods, we may as well get good at it.

**Dator:** That’s it.

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**Some things happened many times in the past very quickly, and we may very well experience another one of them in the next thousand years.**

**Calvin:** What I want to say about climate differs from what’s been said before. Not so much in time scale, but in terms of time resolution. Many things have happened in the last ten years that have made us realize that some things happened very quickly. Some things happened many times in the past very quickly, and we may very well experience another one of them in the next thousand years. Imagine if you had a moving average of the stock market that averaged together two years’ worth of data. You could form a long-term generalization that the stock market usually goes up and so forth, but you’d miss a great deal of the action.

This is more or less what’s happened with our proxy measures of climate in the past. We’ve had cores of ocean bottoms and lake bottoms that have taken the accumulated sediments and measured them. Unfortunately, these sediments, when they were laid down on the ocean bottom, got stirred by the worms and the flatfish and averaged together about a thousand years’ worth of data. So we’ve missed all those interesting things that happened and were over and done with in a thousand years.

We now have, thanks to ice cores of Greenland, a year-by-year tree ring-like record that goes back about 115,000 years. We now know that there have been abrupt coolings, where within five or ten years we’ve dropped back to what are basically ice age temperatures. You don’t get the ice back that quickly. These things typically warm back up again—also abruptly in five or ten years—within a few centuries. Now, we miss these things because of all the stirring action of the worms and other turbulence.

We now know that there have been all those abrupt warmings and coolings. You can also get abrupt coolings from other things, such as volcanoes and Antarctic ice sheets collapsing, but this is clearly a mechanism that’s biphasic; it flips up just as fast as it goes down.

It is generally agreed that the Gulf Stream is involved in these flips. The Gulf Stream carries warm water into very high latitudes in the North Atlantic, but sometimes the mechanism fails. It fails because you have to flush that warm water after it’s been
cooled down by all the cold Canadian air blowing across to Europe. The wind picks up both heat and moisture while leaving the salt behind. You wind up with a heavy hypersaline surface layer that sinks. If you stop that flushing mechanism, you also completely rearrange the Earth's climates, so it's not just Europe that gets cold. All of the habitable parts of the Earth are likely to be in big trouble within five to ten years.

Now, this gives you a very different perspective on things. It says that every couple of thousand years, on the average in the last 100,000, there has been one of these abrupt flips and they happened many times. The records suggest that they may go back—but we don't have good time resolutions—to at least 1.1 million years ago. So to think that these might be in our future is not very farfetched. What we don't know at the moment is what the threshold condition is for this flushing failure in the North Atlantic. We don't know whether we're on the verge of one tomorrow or whether it's likely to stay stable for another thousand years. Obviously, one of the big things on our futuristic agenda is our capacity for intervention, and we've already been talking about how we intervened in the greenhouse warming.

To intervene in the stability of this mechanism causing abrupt coolings is also quite possible. It depends upon a lot of data collection about these salt-flushing sites in the Greenland and Labrador seas, and that's with a lot of traditional oceanography. It certainly is one of the things I consider to be a hot item for an agenda for the future: how would we stabilize human climate? This is something where we might not be able to do anything about the weather, we might not be able to do anything about global warming very effectively, but we might be able to head off the next abrupt climate change.

Let me tell you a bit of what the next one will be like. Basically, Europe is at Canadian and Siberian latitudes. It is warm and agriculturally productive because of all the moisture and warmth that it gets off the Gulf Stream. Otherwise, it’s pretty much like Canada. Canada supports with its agriculture only about 30 million people, while European agriculture supports about 650 million. You can do a rough calculation that says that if it fails, Europe alone could support only about one person out of the current 23. This is a setup for massive warfare over the remaining resources. It behooves us to find a way to stabilize this and to do it in a way so that people have confidence in it, so they don't begin warfare when they think they're on the verge of it. This is an example of where the time resolution that we have has now alerted us to a possibility, not only that we might face an extremely disruptive human population crash, but it's also beginning to tell us what we might do in order to buy time.

Facilitator: What could we do?
Calvin: Our current understanding is that the power behind this conveyor belt that runs the Gulf Stream current comes from several sources, the main one of which is the sinking of salt from the North Atlantic. Basically, when you take warm water, about 10-12 degrees, up past Ireland, it splits into two branches. A westbound current goes west around the tip of Greenland and then sinks in the Labrador Sea, while the other one goes on north as the Norwegian current and sinks in the Greenland Norwegian Sea. They sink, in part, in giant whirlpools that are about 15 kilometers across, with a slow rotary motion that takes the surface water down to the bottom. It runs down the bottom of the ocean south all the way down to South America.

It's the disruption of this conveyor belt that looks like the big problem. You need to stabilize the flushing mechanism so that it’s not susceptible to fresh water added to the surface, which is the way the flushing fails.

Global warming can set off a failure like this in the following way: if you evaporate more, if the tropics get hotter in global warming, if they evaporate more moisture from the surface, it is carried to the high latitudes both north and south and falls as rain in the ocean, which you would not think would cause any trouble. In most places, it doesn't. But if it falls in these flushing sites in the Labrador and the Greenland Norwegian seas, it can kill off the whole circulation there. There are four computer models that show this in detail, where a two-to-fourfold CO₂ increase over the next several hundred years produces enough high-latitude rain in the oceans to kill off the flushing mechanism.

Now, there are some simple things that you can imagine doing about it. If the sites are limited in number, you can create rain shadows by seeding clouds and making the rain fall elsewhere. That's one
way. The other place that fresh water comes from is runoff from Greenland melting. Greenland is right next to both of these critical sites. So regulating the fresh water runoff from Greenland is obviously high on the agenda. You don’t want it to come out in big floods the way it does if an ice dam collapses in a day—you get a year’s worth of fresh water coming out all at once. That, too, is very simple. You just prevent the ice dams from building up more than a week’s worth of water. Once they form, you go in with a team of explosive experts and plant a little dynamite and you blow it up. Those are two very simple 19th century technologies that could be applied to this, and undoubtedly we will invent better ones. But a great deal of this depends on good computer modeling; you want to know whether your intervention will cause more trouble than it will cure. Our ability to both understand the system and test out interventions in the computer and on a small scale in some noncritical place holds a great deal of promise. This is a fancy nonlinear mechanism, but in theory it’s simple. With this fresh-water problem, that’s something you might be able to do something about, even with 19th century technologies.

Anderson: Could I just make a couple of comments on what Bill has said? Part of what he talked about is the inseparability from advanced information collecting and computer modeling—some continued advances in high-technology information processing are essential to whether we decide this is a problem and what we want to do about it. The global warming issue, which has rapidly emerged as a major human concern, is inseparable from advanced information technologies, and not only from the information that we’ve gathered, but from the various kinds of models that we’ve been able to devise to make guesses about where it might go. It’s similar to the ozone-depletion issue. Nobody walks outside and looks up and says, “Hey, there’s a hole in the ozone.” It’s based on various kinds of information detection and data processing systems. So a piece of the present and the future is going to be that human evolution and our relationship between us and the biosphere is going to be mediated by our friends, the information technologies.

One other thing. The business of the concept of governance was mentioned, and I think it’s essential that we think about governance in relation to these issues and to think about it in a more sophisticated way than we might. It’s necessary that we think about what kinds and how decisions are made, and governance is a part of decision making. In conversations like this, it often happens when people are speculating or deliberating about large-scale human issues, to say that we should do this or that, as if some group of wise leaders or even stupid leaders were going to sit down and arrive at a decision. The number of human decisions that have ever been made by people coming together and agreeing about something and then implementing it is a clear, flat zero. Nevertheless, there is a possibility that part of our future evolution will have to wrestle with much more large-scale decisions and implementations.

At the same time, I want to point out that a lot of our decisions having to do with our relationship between us and our evolution and the environment of the biosphere are made in more complex ways that we don’t fully understand. If, as I think will happen in the coming century, the human species for the first time in its evolution, or in the evolution of any species that we know, turns around its own population growth more or less deliberately, it will be because of an enormous series of information processing and personal decisions and cultural changes that have made an enormous human decision take place in an almost indescribable fashion. So I want to say that a part of what we need to think about when we talk about anything that involves large-scale human decisions is what kind of model of governance are we talking about or likely to need to talk about?

Werbos: I’m glad somebody spoke up for the other organisms. That’s a bigger and more complicated problem that requires a lot more scientific research. But I’m just going to go back to the matrix stuff, the climate change. Climate change is not the only matrix/environmental variable we’ve got to worry
Beyond that, there are the questions of solar power, producing alcohol fuels in deserts, for example. Certainly, fuel-cell cars could use methanol very efficiently for power and then a lot of other stuff we need can be done by electricity. Why doesn’t solar seem to be a major option? The biggest reason is price. There are plenty of deserts in the world; we could generate a huge amount of electricity if weren’t for price. Is it possible there could be breakthroughs in the price of solar energy? In my view, there are at least two plausible breakthroughs. One is this scenario of robots making robots making solar cells, which we may have a workshop on in a few months. It’s a far-out idea, but it’s not crazy. It does introduce scary notions about whether we’re going to have a silicon life competitor. There are things we’ve got to worry about there, but it is a possibility and you could reduce the price of solar cells dramatically.

The other notion is the satellite solar power for the base-load electricity. In fact, these are not competing alternatives, because ordinary Earth-based solar is good for peaking power and something like solar-powered satellites would be good for base-load power, and those are totally different markets. There’s a lot that has to be proven about satellite solar power, but it is one of the options we have to look at. By focusing on these kinds of advanced technologies, we might be able to solve at least one of these matrix problems, but not all of them. There’s a whole list of other ones we don’t understand yet, but there are ways that we can deal with these things.

Calvin: Some of you may be thinking that if we solve the CO2 problem, we might be able to head off the next abrupt cooling because of the paradox of gradual greenhouse warming causing abrupt cooling via this fresh water mechanism, but it’s not at all clear that’s the typical way these abrupt coolings happen. We can solve our greenhouse problem and still have the problem of how to stabilize the current. They’re related problems, but you’ve got to treat them separately.

Werbos: There’s also the fragility of our current economy with respect to major climatic changes.

Calvin: Yes.
Kellogg: I’m glad that Bill Calvin brought up the question of the oceans that I skipped over. I sometimes wish that instead of a meteorologist, I had become an oceanographer. It’d be much more fun to go to sea. Obviously, the oceans are a very important part of the climate system. You’re quite right in pointing that out and, in fact, I wrote a paper a couple of years ago on why the Earth didn’t warm up between 1940 and 1975. All that heat that was being generated by the greenhouse effect was going into the deep ocean.

I would like to make a couple of points. One is that I don’t think we’ll ever be able to control the forces of nature involved in the ocean, the atmosphere, and the Earth’s crust. I just don’t believe that we can do that, even in the next thousand years. However, we can predict what will happen. We can predict how much the sea level will rise. We can predict how much the temperature will rise as a result of the greenhouse effect. I think we can predict these things and that will be helpful. That is the main point I want to make right now and I’ll have some more later on. I was very glad to hear the optimistic view that maybe the governments of the world will get together and do something about the carbon dioxide question, but I think it’ll take care of itself because we’ll run out of fossil fuels.

Facilitator: So what do we have? You said that the relationship between human evolution and the evolution of the global environment is very tight, but the relationship is much more adaptive and we may need to adapt to major changes sooner and more often than we typically have thought. Walter made the argument that there is no historical precedent for deciding to do such a thing on a large cooperative scale. It has to happen in other kinds of ways. And Bill has made the argument that we not only could intervene and we should, but that it’s imperative that we intervene in the next thousand years.

Calvin: It’s the reaction-time problem.

Facilitator: Right. So the question is, what then? Do we argue for intervening? Do we argue for a search for the best interventions? Where do you take that from here?

Dator: I’d like to make two comments. One is about just that sort of question. I don’t see it as a question of whether we should or should not intervene. We’ve been intervening forever, and we’re doing it in incredibly massive and irresponsible ways. The other is, I’d like to engage with Walter in the comment that he made about the number of times being zero that humans have gotten together and thought about something and done it that it’s worked out.

Anderson: The whole world.

Dator: But we haven’t had the opportunity to do it with the whole world very much.

Werbos: What about Montreal?

Dator: Well, those are the things I was thinking about, the establishing of the United Nations itself and other things. I wouldn’t be quite that pessimistic. One of the things I wanted to point out, among the many aspects of artificiality in the world is, in fact, more than several hundred years ago when the founding fathers of the U.S. Constitution imagined creating a government that was sort of a novel idea, an unprecedented idea, in a place where it didn’t really seem logical that you could create a nation out of those 13 colonies that had been so independent. Really, of all the things that we’ve tried to do consciously and creatively and collectively, governing is one of the latest. We’re novices at that.
very new idea. I would like to be optimistic, so one of the things that I might be optimistic about is that, in fact, we will learn how to govern ourselves better. There’s one and half cheers for consciousness and intention, although I’m basically pessimistic about human intelligence.

Facilitator: Why are you optimistic about that?
Dator: Because I want to be.

Facilitator: Why do you want to be if we’re a cancer on the planet?
Dator: I didn’t say that was my conclusion; I just said this organization had really skewed the attendance toward some of the biggest ethnocentric people I’ve ever seen. All of us think we’re so great, and we’re not. We are problematic. The whole history of the humanities is story after story about how we screw things up because we think we’re so great. That really needs to be acknowledged, not only for our potential brethren that we wipe out, but also for the last great ape and the last great primate that will go out of existence in the 21st century except for a few in zoos, and even there, barring genetic engineering and all the rest, we really do horrible things, not only to each other, but to all of life. Nonetheless, that’s what we are.

Werbos: It’s not only the species history that backs up some of this. I forget who said it—Spengler or whoever—that at a certain point every great civilization gets so proud, they believe they’re immune to the laws of history. That’s when you know the laws of history are going to kill them. There’s some talk about self-fulfilling optimistic prophecies and self-defeating negative prophecies, but a lot of times it works the opposite way. When I worked in the energy business, if we were really afraid the price of oil was going to go through the roof, we would work hard to conserve. And if a government agency told us, “Now we’re all sure the price of oil is going to be low forever,” then all of a sudden that might cause the consumption behavior that would send it back up. So there is a role of questioning ourselves. The minute we feel confident that we are so different from every other country and people in history, that’s the moment we’ve got to be scared. That’s when we’ve got to worry.

Anderson: To come back to what Jim said, his point that people have occasionally been able to get together: obviously, the world is full of occasions when people get together and agree on things and do them. What I have not seen yet on a global basis is people getting together, agreeing on something of a major evolutionary direction, and then following through on it. When was it that we signed that peace pact? Somewhere in the early 20th century. We didn’t follow through too well on that. We certainly made the decision and we felt pretty good about it. It just turned out it had very little to do with subsequent events.

Kellogg: It was after World War I.

Anderson: I make that point not because I want to point out the futility of our ability to deal with things, because that capacity is very high. It’s just that if we’re going to understand that and the ways we are likely to be dealing with it in the centuries ahead, we have to begin to develop a much more multicentric and complex understanding of how things may change as they change in a global civilization. My feeling is that those changes will have to do with information systems, with a lot of decisions that get made by a lot of people, with probably a lot of other people violently disagreeing, and yet having the consequence of making transitions in the way we do things. We’re going to make major changes in reproductive policies, in energy policies, in a range of things, and there will probably be some of those big deals when everybody gets together to make decisions in the process, but the overall thing is going to be much more complex than that. We haven’t gotten too good at that.

For those creatures utterly dependent on the environment… if you change that environment, the only answer for them is extinction.

Tobias: I’m a very simple person. I’d like to pause and ask ourselves, where is this discussion going? There are two kinds of polarities around the table. One is the environment emphasis and the other—which I may be the sole representative; I’m not sure—which is looking at the other side, the human aspect. We have several problems. Is the environment going to change? In what ways? Can we determine and predict which way it’s going to change? Second, is the man-made environment changing? To what extent will human intervention be involved in those dreadful things that Jim has told us about? To what extent is
human intervention changing the environment adversely? Given that, let’s inject the human factor back into the picture.

First, the simplest level is the toughest, I guess. Can we predict which way these two sets of changes are going? Second, what can we do to intervene? Obviously, we can intervene, we can prevent, we can modify best with those things that we have already jolted out of kilter, the man-made set of changes. But can we intervene in the nonhuman-generated set of changes that Bill was telling us about? Given those two things, there will be environmental change. What will living organisms, including ourselves, do? For those creatures utterly dependent on the environment, who have sacrificed adaptability for adaptedness and are so closely genetically adapted to the environment, if you change that environment, the only answer for them is extinction. Adaptability is inversely proportional to present adaptedness.

Some of us Homo sapiens, or Homo universalis if you wish, are less rigidly dependent upon a narrow range of environmental constraints. We are able through our flexible behavior to survive with a spectrum of different kinds of reactions: if it gets cold, we put on an overcoat. That’s a behavioral reaction. We wear our culture like putting on an overcoat. Maximum flexibility is our greatest chance of survival, despite the changes that are inevitable.

It seems to me that our species has it good by being so unadapted; we’ve specialized in being unspecialized. We are highly adapted, but we have a mechanism—and I believe it’s written up here in our surplus neurons in these big brains of ours—by which we are immune to a large extent to the challenges of survival. We have developed a mechanism for retaining adaptability while being highly adapted. This is almost unique in the animal kingdom. It’s the glory of human evolution that we have reached this kind of situation. I just wanted to put the human element back into the picture. Now, back to the geosphere and the cosmosphere and the technosphere, please.

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Koelle: I agree with what you said, but the environment, especially temperature increase, does not threaten the life of human beings by itself. It will, however, cause a number of economic problems...

Koelle: Yes.

Calvin: I have no doubt that after one of these abrupt climate changes, humans will survive it in some places. There will be a downsizing of population. I think it played a large role in the evolution of our big brains in the past, though I don’t think a future one would do a thing for it, because I think agriculture and transportation will survive. What it does is to do in our civilization. It downsizes us into a lot of despotic countries that hate each other. How long will it take us to recover from that? I’m not worried about Homo sapiens, per se, surviving. I’m worried about what we call civilization surviving.

Werbos: I am worried about Homo sapiens surviving. There are lots of exciting things we can do, and our adaptive brains and our noosphere of things that we should be very proud of and fully utilize, but we have...
to be realistic. If we are too narcissistic about the glories of humanity and how the whole universe is going to bow down to this species, we’ve got to get real. Our species sinks or swims depending on whether we work. The bottom line is, we’re facing some very tough problems.

Our brains are highly adaptive, but the economy that we have produced over millions of years is a lot more fragile than what existed before. There are people who tell me that if you had been a hunter/gatherer, you could work four hours a day and you’d have a fine life. We can’t all do that today. Why? Because the population is high. You might say, “Well, in case of trouble, why don’t we just have a 95% population buyback? That’ll put things back in balance again.” That doesn’t work too well when half the countries in the world have nuclear missiles. The ability of the human race to utterly eliminate itself should not be underestimated. That’s really what a lot of this adds up to. We haven’t talked a lot about weapons of mass destruction here, but they have been growing as a technology at the same time other things have been growing as technology. There are really serious problems if we can’t maintain a balance.

The present agricultural system of the world is much more fragile than we realize. I visited a farmer once who was about to go out of business. He said, “I just can’t keep the family farm going because I can’t buy the seed anymore.” I remember asking him, “Don’t you grow your own?” He answered, “You don’t understand; the grain companies have a copyright on the seed. You’ve got to pay a certain price.” The system is very vulnerable, much more centralized and delicate. It’s highly adapted, as opposed to adaptive. It hasn’t gone through these fluctuations of major catastrophes. There’s a lot of vulnerability out there that we have to be aware of. I’m not saying we can’t solve these problems, but we have to be conscious of this theme. We have to wake up and try to figure out what we’re doing. That doesn’t necessarily mean a global government, but somehow we have to find a way to be conscious of what we’re up against and what we have to do to deal with it. That is, by the way, one reason why I applaud this organization as an effort in that direction.

Kellogg: I’d just like to make one more footnote, simply because it comes up so often. We know that the human race has gone through ice ages. One of the main reasons, according to the theory, is that the Earth’s orbit around the Sun changes and the inclination of the polar spin axis changes. So when will the next ice age be? According to the best calculations of what’s going to happen to the planetary orbits, you can expect the next ice age 8,000 years from now—the first one of several. Fortunately, 8,000 years is beyond the thousand years we’re discussing.

Calvin: Unfortunately, that’s a calculation about ice volumes, not temperatures. Obviously, an abrupt cooling that lasts long enough creates some ice sheets. But usually there’s an abrupt warming—indeed some chatter back and forth—that does a lot of ecosystem damage, long before any substantial amount of ice builds up. The last warm period in the ice ages, about 120,000 years ago, had in the middle of it a big cooling glitch. It lasted about 1,500 years. Sea levels went down by about four meters, and—1,500 years later—came up by about six meters. It’s that sort of thing that happened in the middle of our last warm period. These abrupt coolings are also what terminate the warm periods. It takes a longer time for the ice to come back, but we could, in fact, be flipped back into ice age cooling and drying conditions in ten years.

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Dator: Because I live on a tiny island in the middle of nowhere, surrounded by other islands that have gone out of existence because of human stupidity, I come back to the fact that we’re not as intelligent as we think we are. Easter Island was mentioned in someone’s statement about the future. Easter Island is one of the wonderful places where Westerners can’t be blamed for the extinction of something. The indigenous people did it themselves. They were part of the Polynesian outflux of explorers. It’s a wonderful analogy for the future of humanity into space to see the ways in which small groups of starships, self-contained vessels, move from island to island, changing culture, changing genetic characteristics. It’s a very good analogy, but it isn’t the only example of a Pacific island that became overpopulated and obliterated all resources. There are lots of these islands in the Pacific. If we were to look statistically at humans, they probably have failed more frequently than they have succeeded. But again, I’m optimistic that
through this Foundation, getting people together to think about these issues, we’ll be able to come up with solutions.

I also want to say something about governance. I am not, and I know Walt is not, interested in something that would be called global government in the sense of a single organization up on high. The concept of governance suggests decentralized networking. Still, there has to be a place for global conversations to take place and for some sort of global decision-making as well, and that requires us to use not only our consciousness and intelligence, but also our sense of visions as well as our sense of urgency about these issues.

Facilitator: We’re going to take one more comment and then we’ll go to questions.

Anderson: I hate to argue with Jim Dator because he always quotes my book, but I want to personally declare independence from the whole dialogue about whether humanity is awful or just narcissistic. It just doesn’t do much for me either way. As far as I’m concerned, humanity is an evolutionary process. If we had not evolved to the point where we could muck about, something else would have and we just have to learn our way through them. That’s what we’re about. That’s what evolution is about and that’s what we’re here for. It seems to me that all kinds of organisms manipulate their environments one way or another and if you don’t believe me, take a look at what your dog does to your backyard.

It’s increasingly evident that all kinds of indigenous people have manipulated their environments, sometimes destructively, sometimes creatively. We’ve learned in recent years that the Indians in California participated in oak farming. In what we thought was purely natural terrain, they selectively burned and weeded to maintain a good acorn crop to support the highest Indian population of any region in the U.S. We’re learning, too, that there is no such thing as environmental stability. Ecosystems change, whether they change naturally or because of our intervention. We don’t know how not to intervene and we are clearly, whether stumbling or rushing, passing into another era where we’re much more aware of and intentional about those. The fact that Bill Calvin is here, as far as I’m concerned, is just one of many scenarios that illustrate the place we’re in.

Facilitator: When we looked at these two questions, of course, we knew we would take a flight into the evolution of consciousness and the conscious evolution and then we’d come back to Earth in this panel and be somewhat more grounded. Let’s see what questions you have.

Itzkoff: This discussion illustrates to me what I’ve been talking about in terms of a methodological futurism. The number of challenges to our existence on the planet over the next thousand years is almost infinite. We come down to the fact that, yes, many of them may be solvable, but that depends upon our universal and joint decision-making to act, to face up to these problems. And that means high intelligence and high education. It seems to me that this is the great demand for us over the next thousand years: to create a world population in which demigods and tyrants and other emotional leaders do not lead their populations against the principles of reason that we will come up with to solve these problems. I think this is where we have to put our efforts.

Facilitator: Your response?

Werbos: Well, semifrivolous. We should applaud Walter Kistler for his sacrifice in financing this foundation. It’s at least one step.

Gamble: Just a comment for Bill. One of the solutions to ice age problems has always been an ebb and flow, a movement of populations into and out of places like Europe, for example—northern Europe under ice age conditions, when ice sheets came down as far as London. That’s always been the long-term strategy of humans to cope with those sorts of changes. The general discussions about seeing ebb and flow on a galactic level are actually entirely appropriate for this. I’m also really intrigued that yesterday when we came up with the questions that we were going to talk about this morning, global governance was one of them, but no one elected to do it. What we heard about here was an enormous amount about global governance, and what we’ve heard about this afternoon is a lot about global governance. As an instance of that, on these long-term climate cycles, suppose we built conveyor belts. You know that’s bad news for Europe, but it might be very good news for Algeria or somewhere else. You can see a sit-
uation, if you change precipitation patterns, that may well be. So how is global governance going to deal with that? Is it going to be just maintaining the status quo or is it going to be something else?

Facilitator: Back to you, Bill.

Calvin: First of all, at least in the past, when these things happened, it’s been bad news for habitable portions of the globe. Antarctica and some islands in the South Atlantic are the only exceptions. It’s not just Europe that gets hit. Second, when cooling lasts long enough, you eventually get ice sheets all the way to London. That’s the slow part of the time scale and I agree that people cope with that by moving around. When the temperature changes within ten years, though, you can’t manage that without an enormous downsizing via all the apocalyptic four horsemen, with famine, pestilence, war, and death.

Gamble: Extinction is just another form of ebb and flow.

Calvin: Yes, but it’s us!

Hubbard: Does anybody think that there is such a thing as a planetary life-cycle? That the problems we’re facing—over-population, pollution, and limits to growth on a finite system—may be natural? We know that in X billions of years the Sun will expand and destroy all of the planets. We’ve never seen another planet go through this, but it is possible that this is an organic and natural crisis of a planetary life-cycle hitting its limits to growth, with its intelligent species normalizing it.

Werbos: In a sense, all things are natural. This follows the laws of nature, and extinction is a natural part of life as well as continued evolution. I’ve heard people talk about complex dynamic systems and some people sometimes make it sound as if every complex dynamic system must go to a point of equilibrium. But the bottom line is, every complex system is different, and different initial conditions take you to different endpoints. The process, on a larger scale, is, of course, natural in a larger galactic sense. Species live, species die, but as Bill says, this time it’s us.

Calvin: So a bird in the hand is worth two in the bush.

Anderson: In response to Barbara’s question, we are dealing with a sample of one. Until Allen Tough and his chums get in touch with all the other guys out there, we have a limited database on how planets that have life evolving into technology and planetary consciousness deal with their problems. We’re discovering that we have some capability to make choices about how we construct realities. We have a fair amount of intentionality and the beginnings of some rudimentary skills about using those. So does that look like a good story and what do we get from it?

Tough: When I think about the relationship between humanity and the planet, the thing I worry about most is warfare and weapons. We already have nuclear weapons; the supply of what we already have would devastate the planet. We have viruses and other biological weapons. Some governments talk as though they don’t exist when, in fact, they are in storehouses already. And peek ahead 30, 40, 50 years, when we may have the power to manufacture anything we want by adding molecules. Think of the kinds of weapons we could make at that point. Think 100 years ahead; think 200 years ahead. I’m really worried, because as long as warfare continues, a lot of the other worries pale in comparison. I’d like to get the panel’s reactions. We haven’t heard very much about the impact of weapons, of that side of human technology on the planet.

Werbos: I certainly agree with you that this is a central problem. In some sense, we haven’t given it the amount of time that it deserves when we’re worried about the extinction of the human race. The problem is, I don’t know anyone who really has a complete structured answer because it involves such complex things. The bits I hear about chemical and biological weapons make me wonder sometimes if it wouldn’t be better if 99% of the world doesn’t hear, doesn’t talk, and doesn’t know, because it isn’t clear that a lot of talk would make the problem any better. It’s a severe problem and there are a lot of dimensions to it.
Pohl: One footnote to that. Herman Kahn, who, you all remember, had a schema thinking about the unthinkable, global nuclear war, also showed that if you ran out a model of global war, that some people don't die. Would the living envy the dead?

Werbos: There's something else Herman Kahn once said. He was asked about nuclear weapons and people's inhibitions from using them. I don't agree with what he said, but it sure got to me. He said that people used to say about crossbows that they were too terrible to use and no civilization would use them. For about 15 or 20 years, there was a kind of cold war when nobody would use them, but that ended. There'll come a point when the first person will start using them and the barrier will be broken. The next guy who uses them says it's not his fault, the other guy did it, so he has to. India's nuclear missiles are an example of this kind of domino effect. Once it becomes legitimized and is available, I mean, what happens when every teenager can blow up the city he lives in? What can you do?

Facilitator: I don't like where this is going.

Dator: I'm going to say something good about humans. I agree entirely with the thrust of everything that's been said so far, but also, from listening to my previous panel's discussion, I believe humans have the capability of both killing and cooperating. I don't see one as being primary over the other. Now, certainly, with the weapons we have, our ability to kill seems frightening and final for humanity as a whole and, therefore, we need to be concerned about it. But I don't think we give enough credit for the peaceful, cooperative, nonviolent nature and character. Some people in this audience have killed other people. Some of you have been in the military and perhaps have seen someone die as a result of your action. Others of you might be murderers and we just don't know about it. Some of you might be child abusers or wife abusers. But my guess is that most people in this room have never killed anybody. Most people in this room have not, more than on one or two occasions, ever beat someone up, and we have lived an amazing amount of our lives without killing or maiming others. During the time I was president of the World Futures Studies Federation, I traveled to lots of countries, usually countries my government didn't want me to go to. I would go on the basis of a telephone call I would get in the middle of the night, believing that there would be someone to greet me, and there always was. I never once got mugged; I never once got put into prison; instead, all sorts of incredible things have happened in my lifetime that have been utterly peaceful and nonviolent. Again, I know we can all give examples of violence and murder, but I'm really impressed with what a very peaceful, loving, sharing, caring group of folks we are at the present. Certainly, we can focus on that capability for the future.

Calvin: The problem really is the power of the feud. There's a great amplification; it's just the way that a madman with only his fists or a knife can't do as much damage as somebody with a machine gun. We're entering into an age in which the ability to produce viruses is going to be like the high school chemistry set, except we'll have a far greater range than just blowing up our parents' basement.

Facilitator: This is about the environment and evolution of humanity. Someone pointed out that a lot of population reduction has come in spite of policy. I look at things like Natural Step, which companies around the world are using as a way of refining their operations. Natural Step is a Swedish-based program about running a company in ecologically consistent principles. The first three are system principles that you'd expect, ecological system principles, and the fourth is just an efficient use of resources. What is your forecast considering that the marketplace currently is a problematic source of direction?

Anderson: The two themes I keep harping about are governance and information. They're closely related and I'm reminded of that again, because so much of what we're concerned about has to do with not just information, in one way or another, but with feedback. How do we get information? How does it feed back to people in ways that affect what they do? Governance, as you know, comes from the same Greek root as cybernetics, and it has very much to do with those kinds of processes. As we look at the situation we're facing today, we can conceive of any number of instances in which people are going to be feedback information at the level of governance. They're going to come together out of Montreal or wherever, and...
agree on global policies, which will in turn feed back to the nations, which will in turn create policies, which will do what governments classically do: create incentives and disincentives for what people do. Now, markets are another kind of feedback system. They are subject to manipulation in various ways. There’s never really the perfect level playing field in the markets. So, there are all kinds of ways that the kinds of initiatives you’ve mentioned will play a large part in our large-scale global governance vis-à-vis environmental issues, as well as other initiatives. Although I’m not much of a free-market libertarian, you have to pay some attention to arguments that come from those for whom markets and other profit-oriented responses can produce socially desirable outcomes.

Werbos: I mentioned a few technologies that are critical to addressing things like this climate problem, which in turn affect people’s standard of living, which in turn affects the likelihood of peace and war. Whether people are starving has a big effect on whether they have to fight each other. I think Wall Street type of investment is absolutely critical to at least half of the technological developments that are critical today. For good or ill, the action is more in New York than it is in Washington, and that isn’t because they’re wiser. If there’s something I’m going to pray about, it’s that these people in Wall Street are going to have it together. There are a lot of problems in Wall Street; there are a lot of problems in Washington. Somebody asked me my opinion of governance the other day, and I said, “You can come up with the most perfect government/political system in the world, but if you staff it with chimpanzees, you’re not going to get much result.” What it boils down to is: it is the knowledge, the vision of the individual human beings who staff the organization that is critical.

In the international financial world, there are problems. George Soros has a book out titled The Crisis of Global Capitalism. It’s worth studying. There is a lot of technical, mathematical support beneath the stuff he describes in everyday terms. Soros is worried, but he sees a lot of ways that systems might be improved. I’m not sure I agree with his solutions entirely, but he does describe a lot of what the current challenges are. One of the challenges is that a lot of people are abusing the neural net algorithms I developed 20 years ago, and technical analysis, which is not adequately taking as input a serious long-term analysis of where the future is going. If people were smart enough and used these and other analytical tools correctly, I think the marketplace would work a lot better. So that’s one of the challenges in governance: to try to help these people make better decisions.

Deacon: I wanted to go back to Bill’s notion of headlights, because one way to deal with the problems is, of course, to get brighter headlights. That’s what we’re about here, getting brighter headlights so we can see farther. The key to that, of course, is information, part of the other half of your governance and information parallel. One thing we keep coming back to here is the ability to simulate. We’re getting better at it. But when I look at the future, the biggest watchword for me is the law of unintended effects. At this point, we’re going to be forever interacting with extraordinarily complex systems, whether they’re biotic systems, neurological systems, or ecosystems. In complex systems, you’ve got to be able to model the effects as well as you can, because so many of the effects are going to be unexpected when you intervene, especially if you intervene in a big way. So, quite clearly, one of the most important features is to learn how to do that better and to learn how to better communicate that information elsewhere.

Two things are beginning to show that it works. One is the modeling of nuclear winter, the arguments about mutually assured destruction, which really could be what it sounds like. I think it did play a role, maybe not the role, but a role in broadly informing us that, in fact, we might not want to make the first move. Whether we stopped it altogether is certainly an open question. Second, many of the discussions about the climate—and that’s why this is a wonderful group to bring this up in—are a second area in which we can come up with good models in simulations. I
think that’s where a lot of effort should be placed and then, of course, getting the common person to understand it.

Glenn: We don’t have to believe the models. We’re all going to live in more complex systems; we have to replace strategy with strategic consciousness because things change so fast. Don’t confuse reality and models. What about the runaway greenhouse effect? How are we doing with that research? I haven't heard much about it in this conversation. In the past, we used to talk about points of inflection. Two solar-power satellites were mentioned as one of the strategies to beat the greenhouse effect. How are we doing with knowledge about the upper atmosphere?

Facilitator: Two quick answers on those if you can.

Kellogg: The question of what will happen as we go on burning fossil fuels: there’s an international climate advisory body, the Intergovernmental Panel on Climate Change (the IPCC) made up of a couple of thousand leading scientists from all parts of the world, which created several global climate models to see what would happen to the climate if mankind went on using fossil fuels at the present rate—a “business as usual” scenario. That’s assuming that the countries of the world won’t do anything about limiting their use of fossil fuels, which seems to be consistent with what they have done in the past. The countries of the world simply can’t bring themselves to overcome the enormous vested interest in their countries, which would defend the use of fossil fuels to the limit. Of course, this would, they concluded, lead to a catastrophic global warming, rising sea level, and so forth.

Calvin: The question about the runaway greenhouse effect is, there are basically two major greenhouse gases: water vapor, which is about two-thirds of the total, and CO₂, which is about a quarter of the total. CO₂ is about the only one under our control. These abrupt coolings appear to involve substantial changes in the water vapor level, too. It’s a complicated interaction. The only part that anybody’s been able to model is just the pure CO₂ effect in turn raising the water vapor via tropical evaporation. You get in this model about a degree or so of warming just from the pure greenhouse effect of the CO₂ increase, but you get another degree and a half or two and a half from the additional vapor that’s evaporated as a consequence. Then you’ve got all these factors about cloud cover that you’ve got to factor in. But, yes, you can get some runaway effect from it. It does have this fire extinguisher effect of tripping an abrupt cooling, which does not exactly cancel it out; like with fire extinguishers, you ruin the contents of the room.

Facilitator: One last comment.

Werbos: This comment about the Montreal convention is of some significance. I tend to agree with what I recently heard from one of the industry associations in the U.S. Their argument was that you can make deep production cuts, like 50% or more, starting, let’s say, 15 years from now on a large scale, on a small scale ten years from now. But these conventions are concocted by lawyers to provide schedules that impose spending all this money on short-term solutions that don’t solve the problem, diverting money away from the real long-term solution. It’s grossly inefficient, hugely expensive, and doesn’t solve the problem. That’s the viewpoint of industry. They’re not saying they don’t want to do CO₂; they’re saying this is a bad mechanism for addressing a long-term problem.

Back to what Jerry said: How do you guarantee the investment in the long-term stuff? That’s the key. The short-term stuff may not matter so much anyway. On Jerry’s comment on solar-power satellites, my understanding is that the issues about upper atmosphere, rectennas, transmission—they’re about 80% to 85% resolved. There really isn’t a problem there or the problems are overblown. The major supposed showstoppers have pretty much disappeared. However, there are some remaining problems, in my view, for the Earth launch version; the transportation cost to Earth orbit is still too high to make this pay. It may be possible to reduce that cost of transportation of Earth orbit. Walter and I could both talk for an hour about that.

The other thing is that for the space materials version, there are uncertainties whether you can have robots making robots making solar cells, but there’s talk of a $25 million a year program starting to explore those uncertainties. I hope that money will address the technical possibilities to resolve the uncertainties. Unfortunately, there’s a good chance the money will be wasted on demonstrations of what
we already know. It’s clear the possibility is very seri-
ous, but there’s a lot of research needed to make it
real, and that is more of a government area. That isn’t
a Wall Street area.

**Facilitator:** That’s it! I am never surprised and always
surprised at how these things fit together.
How Can a Global Ethical System Be Created and Implemented?

Key Question No.3

The third day of the seminar opened with a brief opportunity for participants to share their experiences of the meetings so far, followed by the fishbowl discussion of the third overriding question: HOW CAN A GLOBAL ETHICAL SYSTEM BE CREATED AND IMPLEMENTED?

Facilitator: Sesh Velamoor
Moderator: Karen Armstead
Participants: George Cowan
Howard F. Didsbury
Seymour Itzkoff
Yersu Kim
Meng-Kin Lim
Frederik Pohl
Allen Tough

Karen Armstead (Moderator): Good morning. Wasn’t yesterday phenomenal? I don’t want to take time away from the groups this morning, but is there anyone who’d like to comment—just on a response to yesterday?

Hubbard: One thought I’ve been contemplating is that this is the first of a series for a thousand years. It sank in this morning. I felt different when I acknowledged that what’s being launched here would go on and on. I think it’s very helpful to us to realize the intention of the Foundation and then to imagine how you are laying a foundation for the future. Whether or not it was ever directed before we got here, it is being directed to some degree now.

Werbos: We discussed a lot of subjects yesterday, enough to keep us busy for a while. Jerry Glenn mentioned something earlier—are we really talking about 2100 and 2200? What about the stuff that’s not in the next hundred years that we’re missing? We did briefly mention the issue of fundamental breakthroughs in physics, quantum foundations, which might just change the game. That is a part of the larger picture that at least some of us should be thinking about.

Moderator: It’s important that we keep remembering that the purpose is the next thousand years, not just the next hundred. Let me bring you up to speed on what we are going to be doing today. First, we are going to have the third group that will conclude the major questions. There’ll be dialogue and question and answer times. After that, we will help you in our process to create synthesis, determine where, out of all of this, is the common synthesis, and how you can link this into a statement for your own minds, reflecting the combination of the muse and the synthesis process.

Sesh Velamoor (Facilitator): Let’s get started. To go over the rules again: make sure you understand what others are saying before responding. Make your conversation as intelligible to others as possible, avoid long speeches, and say something you’ve never said before. We should try to do that today. In the questions and answers, let one person choose to answer so that we can get more questions in, unless, of course, we are compelled to add a comment or to answer or violently disagree with the answer that was given.

With that in mind, what we need to do today is to approach the subject of how to create a global ethical system. I would like to repeat what Barbara said earlier: it’s very important to note this is a process—the first step of many of these dialogues. We don’t need to feel compelled to go through all this. If at some point we need to explore something in depth, let’s do so. But to start with, the dialogue can be constructed within the six areas we have outlined here. One is, why global ethics? Second, what is global and what is ethics? We need to understand the two separately so...
that we can bring the concept back together. Third, what would be in the ethical domains over the next thousand years? It’s easy to construct what constitutes the domains today, but a thousand years from now, what other things are likely to happen that will get included in the consideration of ethics on a global basis? Fourth, what approach to the development of global ethics? How do you do this, given the fact that we still haven’t gotten rid of nation-states and nobody has voted for a dictator? There has to be some collaborative process, so how do you get there? And once you have the ability to define something that is global ethics, how do you implement it? And finally, I’d like the panel to take a shot at visualizing and articulating a statement of global ethics that they think would be appropriate. So with that, let’s start here. Why global ethics?

Didsbury: The fundamental reason we need a system of global ethics today is that we are now in a position to consider the entire planet and all its various cultures. Naturally, in doing this we face a number of problems, but one problem is, do we have a concept of what is good or bad universally shared by all members of the human family when it comes to what may be a threat to the survival of Earth? A point that is crucial here in advocating a global ethic is not to give the impression we are attempting to establish a new religion. The great religions of the world—and everybody in the room realizes this—teach virtually the same moral code. What we’re doing is trying to create an ethical code that does not appear to be a threat to traditional religions but a code of universal principles for the preservation of a hospitable environment and a social order in which future generations may thrive.

Facilitator: So why global ethics? One other thing we should attempt is if that answer is generally acceptable to the panel, then there is no need to reinvent the statement in terms of an answer to that question, but maybe just go a little deeper into what’s being said.

We have a sudden explosion of interest in global ethics in the 1990s. One of the reasons is the speed with which our world is changing.

Kim: I think to understand this question now, probably we should try to place this in historical context. For instance, 30 or 40 years ago, I doubt very much that if we had a meeting such as this, anybody would have proposed that global ethics should be one of the important topics. What is it that makes us agree that global ethics is one of the important topics as we consider humanity in the next thousand years? First of all, many of the problems that humanity faces have become global. They transcend the boundaries of nation-states, which have been traditionally the centers of power and the efficacy in governments. Since we are used to dealing with problems with our national borders, with the powers of national governments, we need something more than what we have been accustomed to having as we try to solve the problems that different societies are facing. So, the global nature of the problems. And why has the question of global ethics become increasingly important? I have gone through some of the literature on global ethics, and it is striking that most of the work has come out during the 1990s. There is hardly any work on global ethics from the 1980s or 1970s. We have a sudden explosion of interest in global ethics in the 1990s. One of the reasons is the speed with which our world is changing. Many of the changes are of such a novel nature that the traditional methods of dealing with them, traditional bases on which many of the problems facing humanity have been dealt with, are no longer valid. We must have some new bases on which we can deal with the problems of human survival and prospering in the face of new realities. I think this is why we are concerning ourselves with the question of global ethics. In history, as far as really serious attempts at constructing some kind of global ethics are concerned, as far as I know, there have been two cases. One is the stoic philosophy, while the other is a classical Confucian philosophy. In the case of stoicism, I think those who are interested in how to deal with a world that has become global, containing so many different other peoples and countries and civilizations with the expansion of the empire, would be interested because it would be a
case of similar concentration. You have a similar situation in the case of the Confucius synthesis of ethical value.

**Pohl:** I’d like to talk about it in a more personal way. My wife is a very bright woman. We were being interviewed for TV a while ago, and the interviewer said to her with no warning at all, “Is there a unifying thread to all of the things that your husband writes?” Without stopping to think, she said, “Yes, he thinks everybody should play nicely together.” I believe that is the basic ethical statement. We should play nicely together and we need to do so on a global basis because, as has been pointed out, we’re all in touch with each other all the time.

**Cowan:** I certainly agree with the thoughts that have been expressed, but I wonder whether a global ethic can be achieved in a complementary way to existing religions, because if you examine them, some make a virtue of killing nonbelievers. So the ethical values may not really be all that compatible. In particular, I wonder whether our approaches in achieving a global ethic can set aside questions of rewards in heaven and punishment in hell and talk about temporal matters. That’s really what we’re concerned with. I would not downplay the importance of finding difficult combinations with other ethical systems and perhaps doing violence to some of them, and helping to eradicate them.

**Facilitator:** If we can get back to why some more. Why global ethics?

**Tough:** For me, the why comes out of looking around at the world as it is now. Obviously, we have an extraordinarily strong need for some different ethical system. We’re ruining the planet. Environmental quality’s going downhill. We’re fighting one another with bombs and other weapons, while individuals, corporations, and nations are behaving in selfish and shortsighted ways. We need something to shock us out of this. If we don’t start behaving smarter, then we may well go down the drain. I think the need is extraordinary.

**Lim:** I agree. It’s much better to play nicely together and while we have this violence tripping us, we need global ethics because the alternative is the law of the jungle. If we allow this to be the only rule that governs our development, then our chances of self-destruction are very high indeed. So we must go for a better alternative.

Remember, it’s very important for humanity to develop to its full potential. And just what is that full potential? I like the imagery that Barbara shared earlier, of “planetary-genesis.” Really, the Earth is our womb and humanity is still in gestation. Our full potential is when we fully develop and take our place among the stars. If that’s the case, it is very important for us to develop into a higher form of civilization, one that is worthy and deserving enough. I think ethics is very important because if we just develop biologically and technologically, we will become biologically perfect, technologically a giant, but morally a dwarf—and certainly undeserving to take our place among the stars.

Let’s look at the notion of global ethics in contrast to, and in terms of, local ethics. As George was pointing out, most religions have their own definitions of ethics, morality, legal codes, and so on. So it’s not that there is an absence of ethics or morals; it’s simply that the nature of the problem goes back to what Bill Calvin was saying yesterday about climate change—the Gulf Stream originating in the Americas having an effect in Norway: It’s been there all along but only now are we realizing its larger, global significance. Is that a way to look at why global ethics is suddenly a need? Can we not stretch local ethics to test what is applicable to global problems?

**Facilitator:** The origins of all these world religions were local, and they assumed that was the universe of the population.

**Kim:** You’re quite right that there have been many different systems of universal ethics, and with universalistic pretensions. But when we talk of global ethics, we may be thinking of something different. Every society, every culture, every tradition has its own way of dealing with the problems of survival and how to
prosper in a given environment. This consists of different values, different institutions, and different attitudes. This set of values and attitudes together make up a particular society’s way of dealing with the tasks of survival; these are ethical systems, or perhaps the global ethics that is valued in that particular society. We are talking about global ethics today in increasingly urgent terms because the human society is becoming increasingly one, in the sense that many of the problems are shared. The problems that different societies today share are more and more of the same kind. This is why what has been the problem of life and death for particular societies has become the question of life and death for the whole global society. This is the sense in which I think we are talking about global ethics and why the problems that humanity as a whole is facing are the starting points to speak of global ethics.

Pohl: I think it’s a mistake to consider religion and ethics as the same thing, or even that they need to be discussed in the same context. Most religions do not attempt to define an ethic; they defined a set of rules to please a god and that had to do with diet or going to church and nothing at all to do with ethics.

Lim: One other reason for global ethics: Ethics has to do with sharing a finite pie. If resources are infinite, if there’s no food shortage, and so on, there’s really no need for ethics because there’s no need to decide how the pie will be shared. Global ethics is necessary because we share a finite, global pie.

Facilitator: Let’s move on quickly to global. What is global? I think we already ventured into that. What is global and what is ethics? Frederik brought up a very good point in that not all ethics is religion and not all religion is ethics.

Kim: I’d like to differ with your notion of a universal. I’m not sure that we would be using the same set of values and precepts if we were to encounter extraterrestrial beings and we wanted to form a committee of some kind. I think ethics is possible only within a community, where there is a consensus on broadly defined interests. We have absolutely no idea what would be the interests of extraterrestrial beings we might be encountering next year, or three years from now, or 200 years from now. To want to forge a system of ethics that would be valid for all times and for all places is, I think, one of the arrogances of which we have been guilty many times. This is why I like the word global better than universal, because the latter refers to something that is valued beyond time and space and without any exception. I’m not sure we are, as finite beings, ever capable of reaching that kind of knowledge or perception. I think global is a very good word because it does point to a certain limited spatial configuration. I don’t mean just spatial configuration but configuration of time and place, and it limits the validity of certain things that we would like to say to a particular context. I think that would be good enough to aim for.

Facilitator: So it’s contained on the planet and hopefully in the next thousand-year time frame, with the past taken into account—that might be a good boundary to draw around the issue of global. Maybe we can get to what is ethics. I think Allen wants to reopen the issue of extraterrestrials, so we’ll give him a moment.

Tough: Whether or not it’s possible, there have been, in fact, some efforts to talk about ethics that would apply to our relationship with extraterrestrials, and it would apply, in fact, to all relationships in the galaxy. It’s called metalaw, probably because it was developed by lawyers, and it does make you think of our own relations here on Earth. Most of the principles have to do with respecting life, not killing—that’s one of my fears, that we’ll shoot extraterrestrials before we try to communicate with them. Oh, and to deal with not interfering with one another. One of the interesting twists in metalaw is a twist on the ethical principle that many of us have learned, which is do unto others as you would have them do unto you. That doesn’t work with an extraterrestrial; it doesn’t work with someone with a different biology. For example, I want someone to give me a glass of water, but if I give a glass of water to an extraterrestrial, it...
may kill the being because of its different biology. What metalaw does is to turn that into *do unto others as they would have you do unto them*. Go with what they want rather than what we would want.

**Facilitator:** Maybe we can switch to what ethics is, because I think that’s a slightly more important and more interesting question. What is ethics? In the context of what you just said, do unto others as others would want done unto them, that might be one point of view. But what about posing it in this sense, that any intervention in evolution is a violation. Is that an ethical departure?

**Didsbury:** Then we’re in trouble. It needs more of a definition than that.

**Facilitator:** Well, what is ethics?

**Kim:** I don’t want to belabor this point, but one does make some differentiation between ethical and moral. Of course, ethics is perhaps a much wider domain than a domain of morals. My view on what ethics is, particularly in relation to the question of global ethics, is that it’s not really a list of moral precepts as you find in the Ten Commandments. I’m not sure that they would be useful in enabling us to deal with many of the problems we are facing together. What ethics should be in the context of global ethics should be a set of ideas, values, and attitudes that would be adequate to deal with the problems we are facing. I’m grossly simplifying it. If one understands ethics in this way, we have a perfect access to deal with the questions you are presenting. What are the problems that the intervention in the process of evolution brings with itself and how does it relate to the question of survival and prospering of humankind?

**Facilitator:** So you are subscribing to the idea of a fluid interpretation, over periods of time, taking into account the problems and contingencies that have to be dealt with rather than getting lost in the debate of what is universal and what is metalaw?

**Kim:** I’d like to make the conceptual boundaries of these concepts a bit more fluid and try to bring them more in relation to the actual problems.

**Didsbury:** We are confusing two things. Morality implies sin. We’re talking about ethics.

**Facilitator:** So what is ethics, in your opinion?

**Didsbury:** What is it? Honesty, don’t lie, don’t cheat, don’t steal, don’t rob. Whether the gods exist or not, those are still valid things to do.

**Facilitator:** In an absolute sense?

**Didsbury:** I was educated as a Catholic. Eating meat on Friday was a sin at one time. We’re making an enormous problem here; we’re making it more complicated than it really is. Morality implies a religious conception of the gods. This is not the same thing as ethics, by any stretch of the imagination. I just gave you a list of some. You mentioned how death is handled in societies. You’ll find a remarkable similarity. There’s generally mourning. If you’re in a slave society though, you might find the occasion to rejoice because the person is no longer a slave. But if we’re talking about ethics, that’s one thing. As soon as you mention morality, you’re talking, by inference, about potential immorality, looking at dirty pictures, etc. That’s a totally different thing. We’re talking about ethics.

**Facilitator:** Would those ground rules take into account and help solve the problems we’re talking about? Pollution, resources, climate change?

**Didsbury:** Yes. We’re supposed to be talking about education, if we ever get there. I would imagine that in schools we would like to tell “the little monsters” as they grow up, “We have a physical environment that deserves care and we should do what we can not to litter.” We tell them what not to do or what to do depending upon the situation. Depending upon their actions we advise them as to the proper action they should follow. We don’t say, “Do what you are told because otherwise God is offended.” Instead we say it’s because they’re ruining the environment for themselves and others. It’s because they’re screwing up the backyard or the park. I get the impression we’re making this a huge topic, which is, in fact, glorified common sense.

**Facilitator:** But it’s so uncommon.

**Didsbury:** You got it.

**Pohl:** We have a different view of education. You have talked about educating people in what they should do, in terms of understanding what it is they do so they can decide whether to do it. I think, in the same sense, we talked about the Ten Commandments. I think that’s nine commandments too many. What we...
need to do is find a basic ethical statement. Not necessarily a Golden Rule, but something as simple as *don't bug me and I won't bug you*.

**Facilitator:** Again, the question is, what is ethics?

**Cowan:** What is ethics? If we were at the Santa Fe Institute, somebody would already be at the blackboard saying, what's our utility function? They use symbolic logic and the moment they can write an equation, they'll write one—which is a good thing because people focus on it. So I'll ask the question: what's the utility function, what are we trying to optimize? In the pragmatic sense, in getting away from the moral/religious issues, what we're trying to optimize is the sense of harmony and agreement among the world's people. On the other hand, I hesitate to use the word *optimize* because if we could optimize it, the world would be a very boring place. I can't imagine a world in which everybody agrees and gets along harmoniously with everybody else. There has to be a level of conflict, up to the discomfort level but not to the blood-shedding level, so I'm not quite sure how to state the utility function.

**Lim:** We need to go beyond a pragmatic set of rules that is externally imposed on the individual. Ethics deals with human conduct and behavior, in particular how we relate to one another. I think we need to go beyond a set of rules to what is inside of us. Ethics must spring from within, just like integrity must spring from within. Here's an example: Everybody knows Singapore is a “fine” city. You get fined for spitting; you get fined for littering. This rule—$1,000 fine for littering or spitting—has been in place for about 15 years. In the initial one to two years after we implemented this law, an interesting phenomenon happened. Singaporeans stopped littering and stopped spitting. But you know, a causeway links the island of Singapore to peninsular Malaysia. Driving to Johor Bahru on the Malaysian side is like driving from Seattle to Vancouver. On weekends, traffic is bumper to bumper. It turned out that Singaporeans were visiting Malaysia in droves—to shop, eat, have fun, and guess what—do their littering and spitting. It did not escape the notice of the locals or the Malaysian press!

But there's hope yet—even if it takes a generation. Ethical evolution, or becoming better human beings, will take generations. There are, of course, risks of failure with any goal that is so long term, so some of us may be tempted to hasten the process by tinkering with the human genome. Perhaps by screening out specific genes we can make everybody less greedy, less envious, and less violent? But I think that is not the way to go. There's value in being competitive. There's value in having a self-defense mechanism. The danger with genetically engineering ourselves into nonviolent and very agreeable beings is we may render ourselves defenseless against some hostile extraterrestrial contact in the future. I think we all agree that competition is good—it brings out the best in us, although it also brings out the worst in us. So the challenge is really to accept that we will have to live with this capacity for self-destruction but consciously move toward some sense of self-restraint. That is what we should aim for. Global ethics is about humanity getting its act together, not about pleasing some deity or getting to heaven. We need a practical vision of internalized values, getting our act together, and focusing on the really important issue of self-development, of realizing our cosmic potential.

**Facilitator:** Perhaps the term *enlightened self-interest*, if that's possible. I think there's confusion here in terms of what George and Yersu were saying as opposed to what we interpreted that to mean. You were talking about something being inborn. We are not contesting the fact that at some point in time the transformation to ethical behavior is internalized. What I think they were referring to is the fact that what you become ethical about is narrowed, taking into account sets of things that you expect in a certain set of behaviors, because the transformation might be easier, as opposed to approaching it from the point of view of the idealized conception of transformations that we must all make. *Don't litter*, for example, might be a very good minimal example
of how to teach someone and educate them to think: that’s good, that’s ethical behavior, that is acceptable—and it’s not some grandiose agenda for controlling or incorporating ethical behavior.

Cowan: I think you stated it very well. I would like to say that in the minimalist approach—which I think is one we should be thinking about—something we should discourage is missionary zeal. We evolve within ourselves our own set of rules. I agree with what you say. I don’t think they should be externally imposed, particularly not by missionary zeal. It’s not my function to save you, and heaven deliver me from people who think it’s their function to save me—but I do think we need to share ideas about what kind of a world we want to live in.

Pohl: It’s useful to share and not impose our ideas.

Kim: I agree with you that the precepts should not be some pragmatic rules imposed from outside of yourself. It should be something you can identify yourself from the innermost part of yourself and agree to and make the basis of your actions. The problem is that the question as to the innateness of moral principles is very much a point of contention among philosophers. I’d rather talk about the internalization of these rules and precepts. Through a process of education—as Mr. Tobias insisted on adding an educational dimension to this—and perhaps you will say that education is something that is being imposed on you, but this process of internalization should be conducted in a very long-term perspective that would involve a great many things to be educated about in your life. It may be a lifelong process. I’d like to call it a conversation of mankind; it’s a never-ending conversation, where at certain times there may be points of equilibrium, and a large number of people do agree on certain ethical precepts, not as something that is imposed upon you. They don’t really touch our reality, and since it doesn’t touch our reality, what you say may be completely different; we use the same words, but what you say may be something completely different from what I understand you to be saying. So it’s essential in this conversation of mankind that we make sure that language does not go on holiday.

Facilitator: For the duration, I think it would be very helpful if we just refer to the little monsters and we’ll have Howard on our side. What would be in the ethical domains over the next thousand years? This should be fairly straightforward.

Tough: I’ve been dealing with this question ever since I found out I was going to be on this panel. It’s a fact: everyone talks about the need for a global ethical system, but there haven’t been many efforts to actually sit down and put one together, so I’ve been enjoying thinking what would be part of this. I’ve dealt with six or seven things I think will be part of it, not only now but for a thousand years. One is something about service to humanity. Altruism, trying to contribute, trying to build a better world. Putting the survival and flourishing of human civilization ahead of personal, selfish concerns, at least for part of one’s life. I think some of these ethics apply not only to individuals but to organizations, corporations, and governments as well.

Facilitator: Sorry, Allen, I need to interrupt you here. I think you’re jumping one step ahead. I should clarify what I was trying to get at, which was, what are the areas of human endeavor that require an ethical norm or a standard? For example, over the next thousand years, genetics: should we be thinking about some ethical norms within the context of the technology of genetics? Space, space exploration, or extraterrestrials: should we be thinking about population control or climate change? I’m thinking about those aspects in a practical, limited sense that would fall within the areas that would require some form of ethical norms being developed. Then go on to what those behaviors would be. So I’m looking at that first. Anybody want to start on that?

Tough: I think I’m answering that.

Facilitator: Then go ahead.
thing that we do? Another for me is, obviously, the environment or sustainability that I agree with. There’s going to have to be something on the list about caring for the planet. Obviously, something about warfare and weapons is going to be in there. No armed violence or something along that line, which is present in most of the religious lists of ethics already, although religions don’t always practice what they preach. Another one is something about adding to knowledge, trying to tackle some of the big questions. This is not usually included in a list of ethics, but it’s something that we should include because of its essential value for most of us in this room. We wouldn’t be at this meeting if we didn’t think it was important to share ideas and to try to develop insights.

Facilitator: Behavior for obtaining the gaining and the accumulation of knowledge.

Tough: Right. Not all of humankind treasures new ideas. Another area for me is something around successful interaction with other civilizations, because that’s going happen in the next thousand years—probably with several civilizations. We need to have some ethical principles about how we do that. And finally, speaking truth, but in a couple of senses—one is Howard’s sense of not telling lies, but also speaking truth in a sense of speaking up when we know something or believe something that we think the world needs to hear. Donella Meadows, in her book Beyond the Limits, talks about the need for all of us to speak truth. Environmental questions, for example. If we see things happening we think need to be addressed, we should speak up about that, because there’s a lot of self-censoring and not speaking up. For me, speaking truth is not just avoiding lies but also this larger thing. Those are some of the domains.

Cowan: I find myself straying away from the subject because, to me, the metatheme is that the forces that shape human behavior and our ethical beliefs are obviously a chapter in that book. We’ve touched on genetics already; that’s another chapter. They are related to one another—what freedoms of action you have with respect to shaping human behavior by resorting to genetic techniques. That’s an ethical question, if you’d like, and a very lively one now, because it’s clearly realized that this is not only possible but even being practiced. There’s also another set of constraints that has all sorts of ethical relationships, and that’s our whole system of law. And there are different sets of law; every culture has a different legal code and I’m not sure whether all of them are compatible with what we would consider to be a rational ethical system. Like all complex systems that shape human behavior, the ethical chapter is not unrelated to all the other chapters. I would like to add the notion that we be permitted to refer to other things that shape human behavior, like custom, which has ethical values built into it; etiquette, which has ethical values built in; ideology, which has a great deal of ethical value, and, of course, religion, because the way to make people observe a dietary code back in the early days was to make it a part of the taboo. So many things that people should do have been incorporated into a religious code. They are all related and I would like to cross-reference, when we talk about ethics, to the other courses that shape human behavior, most of which actually have ethical content.

Facilitator: Of course, everything is connected to everything else. If we were confronted within the context of some urgency, without being trivial about excluding something, we should perhaps make an attempt to say what the five, six, seven—I don’t know how many—items that absolutely must have some norms as it relates to ethical behavior outlined, rather than simply listing 52 of them with equal status. Even though I agree, George, completely, that they all interact and who knows? The butterfly could create the tornado, I don’t know.

Kim: This is my proposal regarding the domains in which there should be some kind of global consensus on ethical principles. If one looks at the problems we are confronting and their possible ethical implications, I think there are, broadly speaking, four areas in which there should be some kind of consensus, some ethical principles. One concerns the human relationship to the Earth or to nature.

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this rubric. The second rubric would be the relationship between individual and community. Do you give absolute priority to the rights of individuals, or do communities also have some legitimate rights of their own? This is, of course, one of the main sources of conflict prevalent today. I'm not sure these are in order of importance, but certainly, the third area would be an area that one could describe as the problem of justice, or equity. The disparity between the have and have-nots, and between those who are in and who are out, and how to deal with that is our question, and what ethical principles are needed. I think the last one, but perhaps most important, concerns the question of human fulfillment. What do you see as fulfillment as a human being? Phrased differently, this could be a question regarding what is happiness. What constitutes happiness for you? What constitutes meaning of life for you? Depending on the position you take on this last question, many of the principles that would constitute the first three would automatically follow. Automatically is too strong a word, but they would be closely connected, and they would be very much colored by what you view as the end in life or the fulfillment of your life.

**Facilitator:** Any quick inputs?

**Lim:** Global ethics for anything that has impact on other fellow occupants of planet Earth and how resources are being shared—resources meaning food, land, the sea, and so on. Anything that affects fellow occupants and, second, anything that affects future generations. I think that for many of us, that would include genetic engineering and the environment.

**Facilitator:** So we have an assortment and at this point, maybe we can go to the area of what approaches we might take to get to this system of ethics.

**Didsbury:** Isn't that education?

**Facilitator:** And if it is education, is it simply sitting the monsters down and telling them what to do?

**Global ethics for anything that has impact on other fellow occupants of planet Earth and how resources are being shared…**

**Pohl:** This isn't education, this is training, which is a whole other thing. At the present time, education has three main faults. One, it doesn’t begin early enough; two, it doesn’t go on long enough; and three, it’s goal-oriented. I think seminars and symposia like this are much more educational than most university courses. We need to be able to do something like the ancient Greeks did: have groups of people sit around and listen to someone who can ask them questions and then try to answer them and, thus, lead them to want to know more. It’s hard to teach somebody who doesn’t want to learn. My wife is a university professor, and she reminds me of this all the time. If people want to learn, then they’re easy to teach, and there’s a whole lot that could be said about that. But the way in which education relates to ethics is that you need to understand what’s in the world before you know how properly to behave in it.

**Facilitator:** This is education at all levels, all ages, all populations? If we started with just the little monsters, it might take three generations and then it might be too late.

**Tough:** I want to mention three approaches that have been taken. I’m not saying these are right. One is about six years ago, when the Parliament of the World’s Religions was meeting in Chicago. Hans Kung looked at all of the world’s religions, not just the major ones, and tried to find out what ethical principles they had in common. This was not a negotiation process; he was not trying to get them to agree on something. He was looking to see what the common elements were, and he came up with four, which he has put into several books since then. So that’s one approach, to see what the common elements are. The second approach comes from Sir John Templeton of the Templeton Foundation, who has recently been looking at spiritual laws that appear in different religions, and he has a list of 170-some spiritual laws he’s distilled. Somebody earlier mentioned the need for forgiving and forgetting, and that’s one of his: to break the vicious cycle of retaliation and revenge, eventually one side has to forgive and forget.

**Pohl:** Or be exterminated?
Tough: Right. So that’s another approach, these laws or principles. The other one that is not in the same league is a little effort I’ve done. I have a manuscript on the World Wide Web called A Message from Future Generations. What I’ve tried to do there is to think about principles or values that might be universal through the galaxy. It’s a very grand attempt, but it actually boiled down to just four of these things that I think any civilization anywhere would probably value.

Cowan: You came up with four?

Tough: You have to read the manuscript on the Web.

Facilitator: Yersu, maybe you could describe the project that you just completed and abstract the approach you took.

Kim: You have enumerated some of the more important methodological approaches to the question of global ethics. I think it can all be described as a kind of empirical approach, because Hans Kung has looked at all the interesting religions, or religions of the world, and tried to extract the principles that he thinks have been present in all of them. I talked to him about this and asked how he went about doing this, and it seems his method is not really as empirical as it sounds. He apparently took down what he thought might be the major ethical principles and tried to see if any of the religions actually contradicted some of the principles. This is not a really honest empirical approach. It’s an empirical verification of what you have created. And what you create on a website—that is described as the Delphi method, in which everybody with a certain background is entitled to give opinions about certain things, consider judgment on certain things. I’m not sure how to really describe or to name this approach. I suppose that’s why it has been given that name. But one approach you have not mentioned is called the transcendental method. The transcendental method is one that is typically exemplified in today’s philosophical discourse. This is the method that, given certain goals, tells you what conditions would have to be fulfilled in order to reach this goal. This is a simplified description of the transcendental method. For instance, given the rationality of man, what are the principles that can be accepted by human beings as being universal? He comes up with his version of the Golden Rule, and five different principles come up, including truthfulness and so forth. But his method has been criticized by a number of people—that the basic, unspoken presupposition is the existence of a liberal democratic social order in which this kind of condition can be fulfilled. I would like to take the alternative off the modified version of the transcendental method. You start from the problems that you face, connect to the problems....

Facilitator: If I could interrupt. Maybe if you could first define the UNESCO project, what it was, and then....

Kim: You identify the problems, and this is, of course, done on the assumption that identifying problems is in some sense easier than identifying the values. An empirical question is something on which agreement, at least in principle, is possible. So you list the number of basic problems, and in order to deal with these problems in a way that is to some extent adequate, you need certain things. Among them are, of course, ethical values. What are the ethical values that would be necessary to deal with these problems adequately? This is an imminent approach to the transcendental method, and this at least, I think, has proven to be fairly productive.

Facilitator: What is the project about?

Kim: The UNESCO project on Universal Ethics is an effort to identify a set of ethical values and principles that would help humanity deal with some of the basic problems it will be facing in the 21st century. Our time frame there is much shorter than the time frame here, but I’m not sure that the time frame of a hundred years is really that different from a time frame of a thousand years. It may be in some cases. In order to arrive at this set of ethical principles, which would be needed to deal with the problems we are facing, we have gone through a number of different processes and come to a preliminary conclusion that probably will be considered by the General Conference of UNESCO and maybe by the United Nations. We’ll have to see how this will eventually play itself out. What remains is further refining this ethical document and the process of education in a very large sense, the process of conversation of mankind. The document we have produced is referred to, for the time being, as A Common Framework for the Ethics of the 21st Century.
Cowan: Is that document available?
Kim: In draft form, yes.
Facilitator: Yersu has agreed to give me a copy, and whoever is interested. I'll certainly make sure you get a copy.
Cowan: I was going to make one more comment. I agreed very much and have said almost precisely the same words as the statement that Frederik made, that so far as education is concerned, it doesn’t begin early enough, and it doesn’t last long enough. It should be a process that doesn’t stop when you leave college but continues. In fact, you’re perhaps better equipped by the time you’ve been through college to continue it, but most people stop the process and find it painful for one reason or another to pick it up again.

Pohl: I need to make a correction. I didn’t say that the problem with education is that it’s not goal-oriented, but that it is goal-oriented. People go to college to learn how to make a living rather than learning how to live.

Facilitator: I’d like to go around the table, and in 30 seconds each, please tell us, are you optimistic or pessimistic? And perhaps take a crack at a three-line sentence of a statement of ethics.
Lim: Successful civilizations are those that transmit time-tested, intergenerational ethics. Otherwise, their societies would have broken down long ago. I think what is missing now is a confluence of all those “secrets to survival” that have come down through different civilization streams. We ought to have conferences on finding a confluence and the UNESCO effort is an example. We also want to do it with the next thousand-year timeframe in mind.
Tough: To me, global ethics boils down to caring about the well-being of future generations.
Facilitator: Are you optimistic?
Pohl: I think any proper commandment should begin with “thou shalt” rather than “thou shalt not.”
Kim: I think optimism is really dependent upon how well we carry out the education of whatever document we come up with.
Didsbury: Ethics didn’t exist when Robinson Crusoe was by himself. When Friday shows up, that’s when you have an ethical situation. How we treat others, that’s the crucial thing. And if we can get the little monsters early enough, I’m very optimistic.
Facilitator: Thank you very much. We’re ready for questions from the inquisitors. Once again, the questions are open and they can come from any quarter. We have a slight modification about the answer. If you choose to answer, please raise your hand and I’ll yield the microphone to you. At that point, we’ll go on to the next question, unless someone else on the panel would like to modify the answer, cancel the answer, or give another answer altogether.
Dietrich Koelle: I would like to know what system means in this respect. Is this a set of standards, or is this the implementation of standards? A global implementation?
Facilitator: To repeat the question, what do we mean by the word system in a global ethical system? Is it inclusive of the ethical standards? Is it a method of implementation, or the strategies? Who wants to take it?
Didsbury: I do. It is a set of standards. That’s all.
Facilitator: Anybody else?

Dator: To the extent this was a discussion of a global ethical system, my question is an unfair one. But to the extent we’re at a conference dealing with the next thousand years, it’s important. To the extent there is worth thinking about the next thousand years, there’s a fundamental problem. I’m glad that Allen brought up the work on, or at least mentioned the concept of, future generations. I recently learned something else ethically, as an adult, concerning obligations for future generations: the extraordinary difficulty first of identifying what the needs of future generations are, in contrast to our needs now. I
would hope that the discussion could get beyond a
discussion of global ethics, which is to say the ethics
of people living now on Earth, and face the difficulty
of dealing with ethics appropriate for future genera-
tions. Here’s what I see to be the methodological dif-
ficulty, and this is the question I’m asking. It seems to
me that all ethics is based upon experience. We don’t
have ethical rules telling us to do or not do things we
cannot do. We only have rules that tell us to do or not
do things we can do. The problem is that new tech-
nology primarily brings in new abilities to act, which
changes our behavior, which changes our conscious-
ness, which challenges our ethics based upon previ-
ous ways of behaving. So to the extent we can
imagine that there are new ways to behave in the
future, I don’t think we are capable now of assessing
the needs of future generations or developing a
future-oriented ethic, unless we can find some way
through simulation or other ways to experience what
behavior will be like under new technological or
other capabilities. I think about this especially in
terms of the Human Genome Project, which does
require an ethical consideration before some of the
dilemmas actually face us, and that’s to be com-
mended. I think there are some people around here
who have been directly involved in trying to deal
with that question. But it’s been my experience that
we don’t know what a technology is like, how it really
changes us, until we use it, and at that point, it’s too
late. We are changed by then as a consequence of that
new technology. Do you understand the problem
that I am articulating and what I’m trying to ask you?

Facilitator: I think you’re asking if ethics can be pre-
emptive.

Dator: Yes. Am I correct, first of all, in saying that it
is based upon behavior, and therefore as technology
changes behavior, we can’t anticipate future ethical
needs or systems until we’ve experienced the tech-
nology?

Facilitator: Is it preemptive or is it reactive essentially
in its nature?

Lim: I agree it can be preemptive. It is ideally preemp-
tive. If I may elaborate, I’m an admirer of the Ameri-
can way of life, American society. I think that the
greatness of this country has to do with the Constitu-
tion that was drawn up by the founding fathers. They
set the ground rules as to the values you now uphold
before any of you were born, and you are beneficia-
ries of that foresight. I picked up a book by John
Rawls, a 600-page book entitled A Theory of Justice,
in which he asked questions concerning rule making.
It becomes an unjust set of rules if those who draw
the rules favor themselves. So he postulated a more
ideal situation in which we rediscover the initial con-
ditions. In other words, we should imagine ourselves
before we were born, conducting our discussions
behind what he called a veil of ignorance. This means
we do not yet know whether we will be born into this
world as black, white, or yellow; lame, blind, or
whole. It is in such a state—not knowing our own
lot—that we should be deciding the rules of this
world, into which we wish to be born. In the same
way, I think it’s very important that as we look for-
ward to our future cosmic venture and destiny, and
as we evolve our ethical system with that view in
mind, we should be discussing the rules of the game
and what values are important—e.g., how humans
should relate to one another both here and out there,
and how humans should relate to extraterrestrials—
before it becomes fact. So I’m one for a preemptive
approach, a proactive approach.

Facilitator: Any modifications, qualifications?

Tough: I think Meng-Kin Lim raises a very insightful
and profound question. You mentioned simulation,
which is certainly one way to deal with it. Jim Dator
himself worked with state judiciary and a lot of these
decisions first arise there, I gather. A lot of these tech-
nologies hit them long before they hit the state legis-
latures or the federal system, so that you get in there
on the cutting edge and work with judges on looking
ahead to those things. Generally, I agree with what
Fred said about “thou shalt” being a lot more proper
than “thou shalt not” for commandments. But when
you look ahead to ethics and future generations, it’s a
lot easier to do the “shall nots,” because there are some things we should avoid. Obviously, future generations don’t want a bleak, barren, devastated planet. They probably don’t want any more weapons than we have now capable of eliminating humankind. So it’s fairly easy to think of the things that future generations don’t want that would limit their options and opportunities. I end up thinking about equal opportunity for future generations. We want them to have opportunities for their own choices that are equal to our own. Obviously, we can’t make decisions for them; you’re right, we can’t know their values or their goals. But we can at least avoid limiting their choices.

Cowan: First of all, I believe that the ethical code of the next generation and the generation after that is going to change with new developments, and that new developments will raise new ethical questions. With respect to the specific question that was raised about the questions that new research in genes has created: those questions are being addressed by the legal code so that it will be a set of “shall nots.” I would also like to say, with respect to “thou shalt not,” that there is in all complex systems with degrees of freedom an imperative to create a set of “thou shalt nots,” because there are so many degrees of freedom, and so many options, that without the “shall nots,” the system would look chaotic and disorderly. So any system you look at that you know to be complex and that’s behaving in an orderly fashion, you can be sure there’s much more control by “thou shalt nots” than by “thou shalt.”

Anderson: Picking up on the first part of your last comment, George, that the next generation will probably have a different code of ethics. There’s a large body of theory relevant to what we’re talking about—theory and research around the area of what’s called moral development, which has to do with how the psychosocial relationships of peoples to the rest of the world change as they develop. Those developments sometimes get arrested, but the basic thrust of a lot of the theory is that if people have an opportunity to grow and fulfill themselves, they continually develop new ethical systems as they do that. There’s also a fair amount of thinking available about the ethical evolution of societies, the changes that societies go through. It’s clearly part of an environment of this conversation in the Western world right now, to some extent the whole world, that there is a tremendous amount of ethicizing and moralizing going on, all kinds of exercises and activities of various kinds wrestling with moral issues. We can also see a lot of evidence of major cultural shifts in relation to various kinds of ethics and morality in the United States. Over the past few decades, there have been tremendous changes evolving away from our puritanical values in relation to sex. It’s interesting that the subject of sex hasn’t come up here in this conversation. Very clearly, there has been a change. You’re right about the need for some “thou shalt nots,” but at the same time, I think the letting go of a lot of our puritanical feelings about sexual behavior, deviation, and so forth has been a very healthy trend and I hope it continues. If it does the third millennium may be a lot of fun. I may be too old to enjoy it, but anyway…I would like to raise to anybody who’d like to respond that maybe the question we need to be dealing with is not how to create an ethical system—that is, something that sits there—but how do we facilitate an ongoing process of vigorous grappling with ethical issues in the context of whatever situations may emerge? Facilitate that, accelerate it, encourage it, nourish it, whatever.

Facilitator: This is what I mean by do you have a preemptive ethic or do you react? Who wanted to address the question that Walter raised?

Kim: I’m not sure that the distinction between setting up a set of ethical values and the activity of trying to encourage certain tendencies within a society are really two different kinds of activities. We know that ethical systems can sometimes be proposed by an individual person as well as a group of people that constitutes a set of the religious movement. There are even ethical systems proposed by international bodies such as UNESCO or the UN. I think the underlying premise in these various activities is an attempt to influence the ongoing tendencies in certain societies in what each of these different proposals think of as being desirable. So, perhaps it’s just different ways of trying to steer a course of events in ethical terms in the direction that we think is desirable. Perhaps it’s not such a confrontation of difference between these two different approaches. Of course, in any proposal
regarding ethical principles and values, we are bound as humans to our present situation. You try to transcend the limits by trying to think ahead. So, although ethics by nature is future-oriented, it is always forced to be in the present. I’m not sure that the fact that we cannot know what the aspirations of the future generations or the problems that the future generations would be facing in some way invalidates ethical efforts of the present generation.

Facilitator: Clem, you had a question?

Bezold: This deals with your comment that ethics is about scarce resources and dealing with that. I’d like you to speculate about the next thousand years, about the issue of scarce resources and distribution. Most of the ethics we’ve talked about are relationships, but not distributive justice ethics. The question for me is: if you think of the last 150 years as an experiment of Communism, trying to say there’s an approach to justice that hasn’t worked; the market looks like it’s won, but lots of people say it hasn’t done its job—in terms of looking forward, say in 300, 500 years, how will ethics have dealt with humanity, especially the bottom part of humanity’s capacity to thrive?

Lim: First, I think it’s one more argument for going into space: scarce resources on Earth, infinite resources in space. Second, communism hasn’t worked—yes, that’s true, but that doesn’t mean the opposite extreme, unbridled capitalism, is the answer. I think it’s useful to have different points of view represented in the great human dialogue on global ethics. The more the world is compacted together, the more we will interact and the closer we will be to a clearer picture of “what ought to be,” based on consensus. I think it will become increasingly clear that ethics should lead in the distribution of resources.

Your question about distribution of resources is pertinent because there’s a lot of angst and resentment out there against the First World, which, having exploited much of the world’s resources and is now consuming 70-80% of the world’s limited energy supplies, is dictating to a Third World struggling to catch up, the rules concerning resource use and other matters such as conservation of rain forests. I think we need a level playing field for those kinds of discussions, as otherwise, it will remain a matter of the strong do what they will, the weak do what they must. How about mentally transporting ourselves behind an imaginary veil of ignorance? I think that’s the way to go.

Bezold: Who had a question? Terry?

Deacon: I found this conversation very dissatisfying. I’ve been trying to make sense of it. I deal with what I consider to be ethical paradoxes daily in my work; I kill monkeys in my work. I find that an ethical paradox because I deal with incredible animals. I’m struggling with fetal neural-transplantation issues all the time. I am challenged by ethicists, by religious people constantly. These are answers I don’t have and I don’t think we have ethical systems yet to deal with them.

So the first thing I want to say is that the good news is ethical dialogue is absolutely crucial when we carry that out. But the second thing it makes very clear is that we cannot just come up with systems. Systems aren’t it. In fact, the question you asked really hits home. How do we inculcate ethical behavior? The way I look at it, you don’t need rules about not eating feces. You need rules about things you tend to do. If you can make ethical behavior so intrinsic in other ways, then of course you don’t need to have ethical systems. You don’t need to have rules at all about that stuff. So, my question to pursue, and I pursued a couple of examples, is to carry this down. What is the basis of that? I like Lim’s notion of the internal, because we all recognize that ethical people behave by virtue of something internal, not because they have a series of rules that they follow. They are not trying to follow this list; they are doing something internal. So what is the internal? That’s what we’ve been struggling at. I want to take a couple of shots at it. I think the way I’ll put it is this, that the departure from ethical behavior is directly proportional to one’s degree of detachment from the subjective expe-
experience. The more detached you can be, the more likely it is you can add to the list. That’s not a positive definition, but I want to start there. I think what it tells us is very important. The key to this is a kind of intersubjectivity. When I really feel what you feel or think I understand and recognize it, I behave very differently. The key to that, of course, is communication. It’s the experience of being a little monster in the playbox, actually getting that vision. It’s not “this is the rule”; it’s the vision “if I were in that situation.”

The key to education is not education necessarily, but getting that vision passed on. That’s what religious principles have done. So my answer to that vision is to get it internalized by, obviously, communication. Dialogue is part of that process. Also, one of the things we’re looking for in the future is, I think, a world in which communication is exploding. That’s a very positive sign. So that’s a real possibility. Also, that leads to the final question, the long-term question, and that is the alien question. That’s one of the great questions to ask. How do we behave toward alien minds? I don’t mean aliens necessarily from outer space, although I think we are going to meet lots of alien minds in the very near future. How do we behave toward them? What do we need to find out how it’s ethical to behave towards them? I think it’s just as difficult, and yet I think that one internal rule about intersubjectivity probably captures it all.

Facilitator: That opens a can of worms in one sense. If that is what the objective is, then the question in my mind would be: this is not my opinion; can you teach everybody that?

Deacon: The idea is teaching is the wrong way around.

Facilitator: Can you internalize that vision with everybody? What about differences in people?

Deacon: It’s providing experiences. I think you were close to that.

Tough: I think Terry’s notion is very good. If we can’t relate to the people who will be affected by our behavior, then it’s a lot easier to behave badly. That will happen to future generations. If we can’t listen to them; we can’t see them on television pleading their case; then they really don’t exist for us in any real sense. That’s why it’s so easy to ignore their rights, I think.

Deacon: That explains this ecosystem.

Tough: Yes. A little simulation helps. I have my students go into the future, be the voices of future generations, have a meeting, and talk to one another. They get into that exercise very easily. I think it has a profound effect on people to actually be a member of future generations for an hour or so.

Pohl: I’m not so sure that I agree with you, Terry, about the usefulness of communication. I think what happens with communications is all too often you turn on your computer and get 26 pages of dirty jokes, which is a form of communication but not really. There’s much too much communication going on that does not result in any additional knowledge.

Tobias: I just want to make the very trite comment that we’re not really here to reinvent the wheel. In the latter part of the conversation this morning, we came round but it took a long time before we got around to the realization or the expression of the fact that there are many ethical systems in the world today. Allen cited the analysis by Hans Kung and, however defective his methodology might be, he picked on all the religions that he could study and tried to distill out of them the common factors, if you like, of an ethical nature. But I won’t. That’s a worthwhile undertaking, if you will, with more effective methodology. I would also like to draw attention to the fact that there are many ethical systems already in the world and many of them would be applicable to tomorrow, with modification on their applications. These are what one might call secular ethical systems. For instance, the Universal Declaration of Human Rights. The founding fathers of the UN sat 50-odd years ago in San Francisco and spoke about this, building on Churchill’s and Roosevelt’s four freedoms that they had thought up on a battleship in the middle of the North Atlantic. Now, they came up with this very sublime document. It’s a set of goals; that’s what a system is: it’s a set of goals. How much any individual can internalize these is a factor of human variability, human sensitivity, human decency, whatever that means, but it’s the system that we are asked to talk about. I will draw attention to another one. The sublime messages in the mission statement of UNESCO. Now, I’m very sad that the United States is not in
UNESCO at the moment and I sincerely hope that some of you will be a spearhead to get the U.S. back into that remarkable organization that Yersu is a part of. As I mentioned last night, I am leading my country's own foray in UNESCO. Its mission statement is a code of ethics of a kind. So is that of the World Medical Association, which lays down rules in relation to some of the personally agonizing situations that Terry faces in some of his experiments, with open windows, with also pangs of conscience. There are existing secular codes of ethics and I believe many of these will be applicable. In sum, what we need is a distillation of the common factors, maybe not the lowest common denominator, but the highest common factors of all of these existing systems, religious and secular, in order to see whether we have a baseline on which to build a global ethical system for the future. There's a lot of groundwork done already; we're not starting from scratch. There have been in fact thousands of years of groundwork. Let's build on it. In India 8,000 years ago, many of the things we are looking to in the next thousand years were already being set forth in the codes of ethics at that time. So let's build on these.

Facilitator: One more, quickly.

Hubbard: I remember giving a conference once in Los Angeles for people who had been burning down the Watts district. They were all the gang leaders of Los Angeles. I was put into the room with the blacks, the Asians, the Mexicans. They looked at me skeptically and said, what's different between you and the rest of the social workers? I said, my difference is I believe we're heading for universal life, but we won't get there unless we cooperate. It was amazing what happened. They all decided to come to the conference. They went into their own mythologies and they said, we've always known this; we've always thought this. Suddenly, it wasn't about not fighting or not doing something. My proposal here is that, since we are at this level of directing evolution, whether we like it or not, the mission is a deeper thing, and the potentiality is what attracts us—which then makes the ethical systems line up toward something that people actually want. When people want something, they will behave much better than if they don't want it. I'm asking the panel the relationship between the deeper purpose and potentiality of our human species in the next thousand years and ethical systems and behavior.

Facilitator: The thought crossed my mind there—but I think you were quoting Maslow yesterday and the hierarchy of needs. Somebody who has already met physiological, safety, love, and esteem needs can concentrate on self-actualization. What I want in the Third World may be on the physiological level. So the gap to bridge is considerable. How do I relate potentiality to my need to eat?

Hubbard: I think you need the whole hierarchy to really get along.

Facilitator: Jerome, you have your hand up before.

Glenn: I agree with just about everything that's said and I'd like to stick it up on a website somewhere. I especially focused on what Dr. Kim was referring to about the issues involved, as well as what Jim was saying about future capacities, especially by technology. Why not have a list of future capacities? They're clearly not here now. It's a list of these numbers, and the capacity described may be criticized and improved on. Then there's a space in which comments are added so we build up a future law, so to speak, or future body of opinion. What is the range of opinion on the ethics of this to capacity? And it's an ongoing driving dialogue that no matter what the future capacities are, you stick it in there and keep track of the information, and periodically condense it down and encourage maybe law students or the general public to review this as part of their education. Here are ethical issues that you are not facing now but maybe will in your career or 30 years from now. It may take you 30 years to make up your mind.

Kim: This question of future potentiality is very important in thinking about any set of ethical values and principles that we would like to design or identify for humanity for the next thousand years. One of the issues that we have to bear in mind in this connection is that the ethical system, the ethical thought, has to be based on our capabilities that we have today in order to be accepted as something that could help us in dealing with the problems we are facing today. There are elements that have to be taken into consideration, and your future capabilities will be relevant.
to the ethical questions. It's not always easy to identify. It would be very nice if one could identify what the future capabilities of human beings will be that will be relevant to the ethical behavior of human beings in the future. It would enormously simplify the task of putting together ethical values and principles. I think the ethicists will have to learn a great deal more from what scientists are doing in different fields as to what human capabilities will be in the future. But scientists will also have to learn from ethicists what the parameters are in which these future capabilities could affect the ethical behavior of human beings. Perhaps the conversation of mankind should start right from there, between ethicists and scientists. There are many who combine these two capacities in one person. But it is important that we keep in mind what the future capabilities will be. We also have to bear in mind that this is a very difficult question to get a handle on.

**Calvin:** We haven't heard anything about the biological foundations of ethics. There is a lot of information starting to come out of studies of the great apes, for example. There are behaviors that we find alarmingly similar to some of ours. For example, infanticide by stepfathers; gang behavior, where five from one population beat up on one adjacent group and leave them for dead, which we see in the chimpanzees. We are starting to understand some of these in terms of the context that brings out that behavior. For example, you see it in chimpanzees but not in other apes. What's the difference? Is it really genes or is it the fact that some apes don't split up into a lot of small groups during the dry season? These are basic questions where we can learn something about the basic situational setup that brings out these behaviors. And of course, we have the opportunity to use the principles that we understand to create a much more effective way of educating against those behaviors. If ethics is all about overcoming the biological tendencies to look after yourselves and your near relatives to the exclusion of everyone else, understanding these biological bases and building our education and ethics on top of them is going to be important.

**Heylighen:** I would like to come back to the idea of the ethical system and the list of “shalt says.” The problem with the “shalt says” is that these tend to be lists that grow without reserve. You add something and add something and add something. For example, recently there seems to have been some kind of a consensus that there should not be human cloning, that it does not fit into an ethical system. There is no ethical system that says anything about cloning. People have suggested that we should start from a positive thing, a value. Let's say we want to maximize the viability of humanity as a whole and within this survival we want to maximize the quality of life. Now that is a positive thing and then we can derive all sorts of positive things, but those positive values also imply “shalt says.” Now you've turned what seemed to be a purely moral, ethical question into a scientific one. If you agree upon the general value, then you can use scientific methods to determine what particular type of behavior endangers survival and the quality of life. You can't find lots of ethical roots—to give one example, the quality of life. There has been a lot of research about happiness and what the factors are that correlate with it. It turns out that happiness in different nations correlates exactly with the things that are in the Declaration of Human Rights. People are happier in nations where there's equality between male and female, where there is minimal strife, where there is freedom of expression, where there is peace. Can these experiences be deduced empirically from the general value of maximizing happiness, maximizing quality of life?

**Just looking at the world situation today… I get the impression we need a level of cooperation that's much higher than present business as usual.**

**Werbos:** My comments are similar. I think Barbara was trying to say something similar before, as was Fred, about the positive and negative. When I was young, they told us morality is “thou shalt not” and ethics is what you are trying to do. It is a positive thing. But this word ethics—we still have a language problem about it. It has occurred to me that a bunch of lawyers coming up with rules for people isn’t the origin of the word ethics, thank God. Look at some of the things that nation-states have to cooperate on. If we adopt a psychology that says we'll come up with rules for being good and then we'll just stay within those rules, and then do business as usual, we're never going to get anywhere. My bet is we're going to have a lot of conflict because we're all thinking about business as usual. I think our real need here is exactly as Fred said. Our real need here is not to emphasize the “thou shalt nots,” but to emphasize the “thou shalt,” the problems that we have to solve, the things
we need to work on together. These are goals rather than constraints. Now, coming back into systems theory language, there’s an old style of control that’s based on constraints and points and set points. That works when you’re dealing with a simple dynamical system. But when you are trying to deal with an inherently dynamical or chaotic system, there comes a point when systems theory needs to move to a second kind of control, which is value-based control rather than constraint-based control. I think a lot of what we need to do here is perceive common reality and values and goals rather than so many constraints. If we don’t pay more attention to these goals, it’s going to be really hard for the nations of the world to take the steps to bring some of these points in line. Just looking at the world situation today, dealing with weapons of mass destruction, I get the impression we need a level of cooperation that’s much higher than present business as usual. I don’t think constraints are enough. We have to have an active sense of purpose to sit down and say what are we going to do.

Facilitator: Thank you very much. Next on the agenda.

Bezold: Our next task is to address: what synthesis do you hear emerging from this conversation? This one and the preceding two meetings. Before we get into the technical aspects of that, I want to say in terms of the graphic recording, we are creating a visual memory of the meeting and I want to encourage you to look at what’s already been created before we finish tomorrow. In terms of the synthesis, there’s good news and bad news. The good news is I’ve asked five people to think about it to stimulate our conversation. The good news and bad news is we may only get to those five, so you can reflect on this as we come back tomorrow. We’ve picked five people from different sectors of our community. Francis, we’ll start with you.

If there are domains in which the ethical systems agree, then we should strive to develop some methodology…to resolve any disagreements.

Heylighen: As a synthesis, what I see, acknowledging precepts in thinking about the future, we need to look at the positive and the negative. The positive is we need to have some kind of a goal, some kind of a purpose, something to strive for, and that implies a long-term vision. In the session on conscious evolution, there seemed to be some kind of a consensus that we want to increase the capabilities of humanity, increase the level of consciousness, increase intelligence, increase the sense of values, ethical behavior. So we want in a sense to maximize the human potential, something like what has been called self-actualization, and we want to do that at the global level. That is a positive thing. On the negative side, we also want to survive, and to survive means to eliminate all the dangers that could endanger that survival. Those dangers are mostly in the area of the environment. The second panel discussed several possible things. For example, the fact that the Gulf Stream might someday be hampered, which would create an enormous climate problem and then bring pressure on the economy and, through that, on societies. Then I’ll pose the classical problems of nuclear war, of biological warfare. There are different problems of pollution. So one thing we should certainly do is to, as much as possible, foresee the potential dangers, including those that at this moment nobody has talked about but are lurking somewhere in the background, like the idea of the Gulf Stream. We have to look at all these possible dangers and, if possible, take precautionary action. Then the next topic was the global ethical system, which is the one where there was the least of a complete sense of what we should do. Everybody agreed more or less with everybody but it was basically because they remained so vague. If I wanted to form my own conclusion, it would be the conclusion that I had made more or less before, and which also Paul Werbos made, which was that we need a positive view. From that positive view, we can derive some negative warnings, some “shalt nots,” things that we should try to avoid. One source we have for both the positive and the negative is the existing religions, the existing secular systems, like the Declaration of Human Rights. There are a lot of ethical guidelines available, but how workable are they? If there are domains in which the ethical systems agree, then we should strive to develop some methodology, maybe even scientific methodology, to resolve any disagreements. A final part of the discussion today was that it’s not sufficient to only have an agreement on the global ethical system. We should also educate people to follow those ethical systems, ideally educate them and situate these ethical rules so that they become automatic; they become internalized; they are not some rules written down in a code of conduct, like some kind of a policeman who is
looking to see whether you are following all these rules. Those rules should be natural and automatic, things that you do without thinking about it.

Facilitator: Great, thank you. Clive?

Gamble: I found these three sessions extremely interesting. Synthesis is beyond me at this moment. Last week, Paul said that many of the best comments were made in the corridor. At coffee time, I was looking at the graphic representations that we’ve got in that corridor. The only way I could make sense of this was to see that. It’s cave art out there. This is our Lascaux. I think I would disagree with you, Clem. These aren’t visual memories; these are actually visual representations of what we believe is going on. I can see ourselves moving here from a kind of a dialogue to actually an iconic representation of what we’re trying to do. It seems to me that does sum it up, because the oldest art that we have is 30,000 years old, and the way we approach it is to try to get us into that thousand years into the future. The way that we’ve often tried to approach understanding the art of Lascaux is to see it as a giant crossword puzzle. I sometimes get the feeling that what we’re trying to do with this thousand-year jump into the future is to also apply a kind of puzzle-solving to it. We don’t actually know what the clues are, though; we don’t even know how many clues there are. But I wonder whether that’s actually the right way, because whether that’s the way we go about the world, what we don’t seem to be very good at—and this has come out of the three sessions—is we’re not actually very good as statisticians. What we’d like to do is to jump to huge conclusions from very small samples. This is what we’re trying to do in this thousand-year leap. It comes back to this idea that what we’re really good at with human consciousness is actually guessing the intentions of others so you can act with them in one of these corporate exercises of social life. What has come out for me from this particular synthesis, in trying to get inside the minds of those who were painting like Lascaux, is the rules in making this huge leap from partial data to synthesis and not prediction, but to a kind of vision of that world. So what I’d like to leave you with is one word that pulls this together, which is this particular word of dwelling. That’s what we’ve been discussing in these three sessions, this notion of dwelling—that we’re dwelling not just in the world but simultaneously with it and of it, and we carry along together in this thousand-year project. So I’ll leave us with that one word. The project we’re involved with is this dwelling that brings everything into one organic hulk.

Facilitator: Thank you.

Deacon: I love the image of the art and the icons and our attempts to bring this knowledge into an image. That’s really what I was about to go into and I am going to put it in a different way. I’m going to use a phrase that I just invented sitting here. We’re faced with what I will call the simulation imperative at all levels. Let me describe to you what I mean. With the expansion of knowledge and the power that we have to change things that go with that comes the responsibility. Responsibility is not something that every creature has. When Bill Calvin mentioned chimpanzees, I thought of a grisly image I’ve seen on tape of chimpanzees collectively descending upon a small Calabas monkey, ripping him apart and eating him. I don’t hold chimpanzees responsible in the same way I would if you did that. It’s a very important issue, because chimpanzees can’t simulate in their own minds what that monkey was experiencing. That’s why we have insanity pleas, as crude and clumsy as they are. That’s the simulation imperative in a microscope. I want to give you the bigger pictures of the simulation imperative. We heard about it in terms of evolution. We’re about to interfere with evolution, a process that has what I would call the law of unintended effects, big time. And we’re going to experience those. To be responsible, we have to be good simulators. We have to build the best models we possibly can. We don’t have to be right; we just have to do the best we can. The same thing about the envi-
ronment. We heard yesterday about all these problems having to do with what we do if the Gulf Stream gives us this problem. We have to have good simulations before we do anything. That’s acting responsibly. To have the best possible simulations in the end may be to act out of those expected, anticipated, predicted things. Finally, what I was trying to get at goes back to my chimpanzee analogy. That what makes us good ethicists internally is when we can simulate best the effects we have on other subjective experiences. I think this is what allows it to become a potential universal—when we become good simulators of what it means to be conscious; good simulators of what it means to have a mind, to be sentient. Whether you’re a device or a creature from another planet, we will make appropriate ethical decisions. We will be responsible for our future, responsible for our actions. Simulations are pictures. They are incomplete; they are not quite all there. But we can make our pictures better over time. I see that as the mission of this group and the mission of this process, and why it’s an interim process.

Facilitator: Thank you. Jerry?

Glenn: One of the key syntheses is collective intelligence being acknowledged as something being formed in our species. Collective intelligence is obviously not universal, but we are in the process of laying the foundations for that. It’s a factor that will influence the next thousand years: how we put together that intelligence. It does not mean that we’re all the same, though. Different neurons are different neurons and that has emergent behavior, which some people will argue as global mind. If we are talking about global mind, extrapolated to what we are talking about, we are creating a global mind, a global conscious-technology, a universal awareness. If we are going to increase its intelligence, then we have to learn how to respond to the feedback. You know, if you get feedback and don’t respond to it, you don’t get smarter. So if humanity is to get more intelligent, or if the collective intelligence is to get more intelligent, we not only have to create and continue the collective intelligence, we have to have mechanisms to respond to that feedback. So I want to thank very much the Foundation for allowing us shortsighted domesticated primates to share in its foresight about these things.

Facilitator: Thanks.

Dator: What I want to say is more about the process than about what came out of the process. I appreciate very much the sort of simulation imperative that you talked about. I have been involved in future studies for a long time; I’m not surprised that so many of us found it difficult to get into the future and to be more comfortable in talking about the present. But I also spent many hours awake, or at least I had dreams last night directly related to Phillip Tobias’s talk. I found myself digging with him and worried about the guy falling down and all the rest. That really plagued me, and the way that story captivated all of you. I certainly was engaged as well. After the end of two hours, how were we still right there with them, digging every step of the way? We are so much more comfortable in the past, in the archaeology of the past, the uncertainty of the past, than we are with the uncertainty of the future. Why are we willing to grant that his interpretation, very partial, is going to be repudiated by every other person in the same field? They’re all going to say his interpretation is wrong, and yet we don’t care. We appreciate the fact that he’s trying to determine the past. But we won’t make the same attempt to interpret the future as well. The reason is that most of us, even though we are future-oriented in many ways, are relatively untrained in thinking about the future, inexperienced in thinking about the future. Just as I’ve got lots of ideas about that creature that Tobias is attempting to uncover, I’m reluctant to offer my opinions as equal weight to his, because he has spent all his life trying to interpret that stuff. We all have ideas about the past and we all have ideas about the future, but I think we can get more robust ideas about the future. I think we need to try to think about ways in which we can encourage all of us to really spend a little more time in the
future. One way is through the simulation imperative that was mentioned. We might consider in the future trying to place whatever the next generations of this group might be into future scenarios and ask them to deal with the ethical or the political matters of the time. I say this because what we have done in the past two or three days has not gotten us to the year 2000, much less to the year 3000, in my judgment. I think one way in which this can be done is simply to get folks to be in the future and deal with it, just as last night we were in the past and really enjoyed it. I would just ask each of you to think of these things. If I were to say that the future—whether I mean the year 2000 or the year 3000—is composed of three things, first of all, we might argue as to whether the three things I’m going to name are sufficient. But second, I’m going to ask you what percentage of the future you think these three things are composed of. One is eternal things, continuations, things that have always been part of the human experience, things that we know were true in the earliest time and we therefore are confident will be true forever, or at least for the year 3000. So that would be one thing.

Now why should we think about the year 3000 rather than just worrying about creating a global ethics for now? Why should we go through this extraordinarily unnatural act? Because I’m convinced it’s an unnatural act; it’s a very difficult thing for us to do. We are not conditioned by any of our experience to do the sorts of things that we are required to do. One is—and this has not been sufficiently articulated when we’ve talked about future generations—we are doing things to future generations. That’s what makes it ethically unfair. If it is the case that all ethics is based on reciprocity, and that’s what I heard—it’s “I try to do something for you so you won’t do something bad to me.” If that’s the basis, then it’s enormously unfair that we affect future generations without trying to figure out what they would like to tell us about what we are doing for them. That seems to me a tremendously important reason, that we are now increasingly able to affect those lives of future generations in ways not previously possible. That presents a new ethical dilemma for us. Ultimately, the point of all of this is to ask what to do now, not just to speculate about the future, but also to say: what it is we should do personally as a result of having spent some time thinking about these things? What sort of changes do we need in laws and in education? Whatever it might be. So it’s not just to think about the future, but ultimately how we live our lives in result to it.

**Bezold:** Well done. You may not know that Jim and Sohail have done lots of work with the judiciary in the U.S., and Jim’s opening comment reminded me that once he was praising one state for its approach to environmental concerns as the best he’d seen. He went on and on, and then added, “But you know, it only goes 20 minutes into the future.”

**Dator:** I’m not allowed to go back to that state.

**Bezold:** In effect, what we’re doing is beginning to say what the synthesis is in what we’re learning. Tomorrow, we’re going to meet in our small groups again. In effect, we’ll look at what things are beginning to come to a closure on the meeting, what observations we have. The other thing to begin thinking about is each of us being able to make a closing statement at the end. Short statements, shorter than what we just heard here. So in terms of a synthesis, any reactions or comments to the synthesis? In effect, we tried to walk out to the year 3000 and Jim just said we didn’t get very far. That’s probably true. But we’ve gotten a lot done in terms of the meeting. From my perspective, we’ve had incredible experiences. We’ve gotten
great people putting a variety of insights on the table and a variety of people, some of whom actually admitted they learned here—which, given the quality of people who walked in the door and their expertise, is a significant observation as well.

Cowan: I have been confused by the jumping back and forth between the individual and the year 3000, and society and the year 3000. I arrive at one set of notions about the year 3000 if I think of the individual, and another if I think about society and how it will be shaped by individuals. For example, it seems to be implicit from much of our discussion that society will be shaped as a democracy. Probably by an increasingly informed 51%, and I gather that’s implicit. On the other hand, it can still be dictated by an increasing split between those who know and those who don’t, and therefore, a smaller and smaller group of people. This makes a big difference in my thinking about the year 3000.

Bezold: Since you are raising the subject of things that we haven’t talked about yet, for the groups tomorrow, what are the implicit assumptions that we would need to answer to move forward? Just put some of those on the table in the first ten minutes or so of our work. But we also want you to do personal reflections in terms of where we are. Glen?

Hiemstra: Yes. This is the assignment prior to tomorrow morning. In the design of the seminar, we imagined you filling out a personal reflection sheet. We rewrote that last night and we think that we’ll capture a tool, capture some of your own thoughts, and prepare you for the final discussion tomorrow. I have a piece of paper to hand out to each of you. It has several questions on it and we would like you to complete it and return it to us tomorrow in your first group session. The questions are: How have these discussions affected your view of the thousand-year future, if they have? What have you learned, or what has changed in your views? Has anything? What do you intend to learn going forward from this seminar? Finally, what must be done to secure humanity’s long-term future? And the second part of that question: What suggestions would you give to the Foundation to assist in securing that future?
On the final morning of the seminar, participants received instructions for the day's discussions before reconvening in the original three affinity groups.

Facilitators: Sesh Velamoor  
Clement Bezold  
Glen Hiemstra

Moderator: Karen Armstead

Participants: Plenary Session

Karen Armstead (Moderator): The agenda for this morning is that we will have some announcements, and then you will work in your original groups until 10:15. Clem will go through what you will be doing. At 10:30, you'll come back here for summary presentations by Clem, Glen, and Sesh, your three facilitators. Then we’ll go into our concluding remarks about 11:45. That is the basic flow of the morning. Clem will now tell you about the morning discussion and how we hope this first hour together gives you a solid time to share.

Clement Bezold (Facilitator): We will talk in groups about the questions you’ve been working on and how these discussions may have affected your view of self and your future. In particular, we would like you to explore the key factors that will shape the next thousand years. Second, please discuss what has changed in your views, if anything. Third, what you intend to learn going forward. Fourth, what must be done to secure humanity’s future as it relates to problems and opportunities. And fifth, what suggestions you would give to the Foundation to assist in securing humanity’s future over the next thousand years.

Sesh Velamoor (Facilitator): Group No. 1 will be Walt Anderson, Terry Deacon, Clive Gamble, Barbara Marx Hubbard, Phillip Tobias, and Allen Tough.

Group No. 2, which meets with Glen, will be George Cowan, Jim Dator, Howard Didsbury, Seymour Itzkoff, Yersu Kim, Rosaleen Love, and Frederik Pohl.

Group No. 3 will consist of Bill Calvin, Steve Dick, Jerry Glenn, Francis Heylighen, Will Kellogg, Dietrich Koelle, Meng-Kin Lim, Spencer Wells, and Paul Werbos.

How has the information shared here affected your view of the future in the next thousand years?

Glen Hiemstra (Facilitator): As we thought about what to do in this last session, it seemed like a useful time to compare some of your responses to the questions this symposium has generated. How has the information shared here affected your view of the future in the next thousand years? In particular, what critical factors do you see? We would also like to know what, if anything, has changed your view? What do you intend to learn going forward as a result of our discussions here? Did you hear some things, meet some people, or learn some information that will drive you to want to learn something you didn’t know before? What must be done to secure humanity’s future in the next thousand years, and, in particular, are there problems we should pay attention to or opportunities we should take advantage of? What suggestions would you give the Foundation to assist in securing humanity’s next thousand years? And finally, what is the role of the Foundation? What do you think the Foundation ought to be doing?
Final Discussion of Group No. 1
Addressing the Seminar Questions

Group No. 1, of the original three affinity groups, reunited for further work on the critical questions of the seminar.

Facilitator: Sesh Velamoor
Participants: Walter Truett Anderson
Terrence Deacon
Clive Gamble
Barbara Marx Hubbard
Phillip Tobias
Allen Tough

Seminar Questions:
1. What are the factors that are critical to the long-term future of humanity?
2. What do we know about the past and present of these factors and their most likely trajectories?
3. What are the problems and opportunities associated with these factors as they relate to the long-term future of humanity?

Sesh Velamoor (Facilitator): Let’s clarify the objectives for this morning’s time. There are the three questions that we started with at the very beginning: What are the factors? What are the trajectories? Third, what are the problems and opportunities? I am going to emphasize questions 1 and 3: What are the factors that are critical for the long-term future of humanity, and what are the problems and opportunities? Rather than a long descriptive discourse on those factors, I’d like to start out by going around the table and simply listing the factors 1, 2, 3, as we would see them to be. But before we do that, I’d like us to each take a moment and address the question, what has changed in your views, if anything, from where we started and in your lifelong work? With the last three days and the context, the scholarship, the views, the points, everything expressed, what has changed, if anything, in your views? You can simply say nothing has changed. If that is the case then please articulate what are your views.

Gamble: I don’t think it’s so much changed as it is actually having acquired a view. Not being a futurist, never having attended a meeting like this before, never having really seriously considered these sorts of questions, the sort of issues that Barbara has raised and Walt’s been raising throughout the conference—it’s been very educational for me. So I’ve acquired a view. I came as a bit of a blank sheet of paper, looking back on it now. I came here with no expectations.

Facilitator: Walter?

Anderson: What has happened with me is not so much that I have acquired a view, but it has gone from a very sketchy rough draft of ideas about the long-term future to a still vastly incomplete but somewhat more robust—to use that wonderful academic word—set of ideas about the possibility of thinking in a thousand-year framework. And I’m pleased.

Facilitator: Barbara?

Hubbard: Since I have spent a lot of time thinking about the long-term future, what happened to me is I got short-ranged, more short-range. I was pulled back from the ease with which I could imagine to the density of the present and the facets of very important insights that are required for me to continue to...
think long-range. So I would say the near-present, near-future got densified for me. I’m still feeling sometimes I can’t remember what anybody said about anything, and then it will come back again, so it hasn’t jelled. There’s such a mix here. But I would say it was the rendering complex of the near-term future.

Facilitator: Came at you with full force.

Hubbard: At full force and also the difficulty of collective envisionment. That really doesn’t come naturally to us.

Facilitator: Maybe we can address one in terms of the focus. I know I am going to be a little bit more like a business planner with a quarterly objective that has to be met. I’m asking, what are the factors that emerged in your mind? What do you think emerged as the factors in general across the whole flow of the discussions?

Gamble: I think, for me, one key factor that emerged is a very simple one: optimism. Without optimism there isn’t any future for humanity. I came away with a very strong feeling that there are a lot of problems along the way but the optimism towards some kind of vision of that future is possible.

Hubbard: I certainly thought a lot about global ethics and the question of how would the human species share ethics without some sense of shared direction. Ethics has never been just merely survival; it’s always based on a transcendent sense of a higher authority, particularly the religious ethics. So one of the new ideas for me was how to relate an internal guidance system that would be ethical with a sense of the collective potential that attracts us. I hadn’t made that link before as a factor. To get a global ethics I think you need a global vision of some sort that attracts us enough to want to do it. It can’t be imposed on us.

Facilitator: There’s a force to it, a unilateral inside-out flow that is essentially good and benign; somehow putting a boundary from the outside on it to be operant.

Hubbard: …that attracts us. A strange attractor would be required for global ethics. That I had never thought about. That was a new idea to me.

Facilitator: To go back to what Yersu was saying: maybe a set of problems and a set of values that can be synchronized with the inner views.

Hubbard: Yes. Phillip was sitting next to me during that and he said it works when you have a mission.

Facilitator: Right.

Hubbard: I wouldn’t use the word mission for a vision for humanity.

Facilitator: But all clearly laid out.

Hubbard: Clearly enough as heaven used to be.

Facilitator: Okay. Walter.

Anderson: A big factor for me is what I have frequently described as the tension between the given and the made, and my general feeling about the long-range course of human evolution has been that we’ve been consistently moving away from the given toward the made. That is, people experience most of their cultures and their values and beliefs and their institutions as having been ordained by God or by the ancestors. Similarly, the physical environment has just been there and what we are increasingly discovering is that people can construct….

Facilitator: So it’s the human articulation of whatever is important, of value.

Anderson: Yes. What was in the back of my mind as I listened to various things that people were saying—like what Bill Calvin said about the climate changes—is where does that sit on that spectrum?
What we know or we tend to assume with most of the talk about global warming and ozone depletion and so forth is that these are things made by us, albeit inadvertently. My thoughts are often trying to see where things fit, and then closely related to it, of course, are the questions about what’s controllable and what isn’t and what’s manageable and what isn’t. Somebody raised the question that given certain kinds of threats can we in any sense intervene or control them or do we have to just adapt to them? That’s kind of a long-winded way of trying to describe something that really is a single factor.

Facilitator: Allen, what has changed in your views, if anything, based on the last three days of interaction?

Tough: I think I’ve become more focused on, not the cerebral, but the need for empathy and caring for future generations. We talked about all these other factors and they’re all important, but the thing that strikes me as really, really important—and something that we haven’t talked about here—and that is the need for people to somehow have empathy for future generations. To get in their shoes, to know that they’re going to be real. We think they’re just sort of a concept, but a hundred years from now there are going to be real people living here on this planet. To have caring for them; to care about them; to not only get into their shoes in the sense of empathy but to have a kind of caring. It would become almost a spiritual thing or a love thing or certainly an emotional thing rather than just the head stuff that has been so common in the meeting.

Facilitator: Would that be something, Barbara, that you were referring to as an external pointer that you can direct—like saying future generations are simply an aspect of this long-term future that you would then direct your inner....

Hubbard: Certainly. Yes. I want to define the future as extended parenting. I love my child so I will think 15 years ahead easily. If I loved the coming, not only the present, generations as well as the future, my love would carry me like a parent who would do almost anything. It’s really amazing if you think of it as extended parenting.

Facilitator: Right.

Hubbard: But I had an additional thing that was quantum transformation: not only that they would be just like us and we would be caring for them, but that something new is coming that I’d like to add to that.

Gamble: I want to put a little gloss on one point. I think I’d come down to the factor of creativity, in that life is a creative process. It always has been in terms of creating the given and the made and so on. I think it’s exploring that creativity into the future that is extremely important in terms of a factor. It’s not setting a limit to it; it’s understanding how that creative process works and will work on such a long-term future that I think is really a challenge.

Facilitator: So, what has emerged as the factors that are critical for the long-term future? With the last three, did you see a set of things that emerged? If so, what were they? Some are listed already. There were optimism, global ethics.

Tough: I am trying to add one I think we missed.

Facilitator: Which is empathy for the future generations?

Hubbard: Yes.

Facilitator: Okay. I’d like to go back to what Barbara said a little while ago about her capacity to imagine the future, but then the point that this gathering brought forth, the complexity in terms of the present. I would like us to elaborate on that a little bit. What aspects, what elements of the present fit into this complex turnaround?

Hubbard: One of the questions that was very discerning of what Walter said is to what degree do we and can we actually direct evolution, given the unintended results of almost everything? I had more or less thought that we were increasing in our capacity to direct evolution, but I have a deeper question now. Given the complexity and the unintended results, is this accurate? As a factor it makes a huge difference as to whether or not we can direct it or we are fooling ourselves that we can direct it.

Facilitator: Right.
There is no reason...to get stymied by the law of unintended consequences because all consequences are, more or less.

**Tough:** I think that fits among things that relate to Terry’s notion of the simulation imperative. There is no reason, as far as I can see, to get stymied by the law of unintended consequences because all consequences are, more or less. That uncertainty is what we live with.

**Hubbard:** That’s true; right.

**Anderson:** The potential to get friendly with that does not mean that that becomes a justification for intellectual carelessness. You have to think ahead as carefully as you can with the knowledge that however carefully you think, there’s uncertainty; there are surprises out there.

**Facilitator:** Would that be a factor? A critical element of getting to the future is the simulation imperative? Does that belong on that board?

**Anderson:** The simulation imperative, to me, has to do with the larger question. The certainty/uncertainty factor would be, I think, a more overarching way of describing the various issues.

**Facilitator:** Would that be a factor? A critical element of getting to the future is the simulation imperative? Does that belong on that board?

**Anderson:** The simulation imperative, to me, has to do with the larger question. The certainty/uncertainty factor would be, I think, a more overarching way of describing the various issues.

**Facilitator:** Anything else that would describe the dilemmas of the present? Let me state it that way. What are the dilemmas of the present that must be taken into account, no matter if it is the year 2000 and we are a thousand years away? What are the dilemmas of the present? I think you stated one extremely well, which is, is it conceivable given the complexity of everything we’re looking at? Can we really direct evolution?

**Tough:** For me a dilemma is the sort of conflict that, especially in Western cultures—I don’t know about other cultures—but it’s important for us to have individual freedom, freedom of thought, the freedom to become self-fulfilled, and so on. At the same time, the world needs service from us; the world needs us to make sacrifices; it needs us to devote our time to certain causes. I think that’s a real dilemma for each of us individually, for our organizations, and our government. How do you somehow bring together the…?

**Facilitator:** The collective need versus the individual prerogative?

**Tough:** Yes. So it no longer feels like a tug in each of us.

**Anderson:** I think power is a big dilemma. Do we have the power to, as Barbara puts it, consciously manage evolution in some sense? If we do, is that a good thing or bad thing? Can we accept it or should we…. I see an awful lot of what I’d call denial—people trying to back away from the frightening aspects of that power by saying, Well, we should just leave nature alone, and that sort of thing. I think the confrontation with power is an enormous dilemma.

**Hubbard:** That raises another question that I don’t think we fully addressed, that may be a very critical factor—the nature of human beings. What is it in us that makes us misuse power so frequently, whatever scale it is? Of course, the scale is just bigger. I asked the question privately in our small groups: what’s wrong with us? Is something really wrong with us that we could treat the other as not-self to the degree that we are able to do that? Is that an abnormality? We don’t know, because we’ve never seen another species that’s “intelligent predator No. 1” on the planet. So, a critical dilemma for me is the nature of that self-centeredness that allows us to behave this way, and can we overcome it? If so, by what means do we know that we could?

**Facilitator:** It goes back to the idea that if the community today is global, two thousand years ago it was a tribe or whatever. The fact is, what is wrong with us is usually operant when we are dealing with somebody outside the tribe. There is a magnitude of dealing with each other within the tribe that is not acceptable, but those are easily regulated.

**Hubbard:** Right, exactly.
**How do you transfer our sense of reason, which operates well within our own groups, to that of a human family?**

**Facilitator:** The greater question is how do I deal with somebody that I think is not my own? That is where most of the dilemma of what is evil comes out because that is what makes you capable of destroying an entire population or an entire species. It is not what you perceive to be in your self-interest. It goes back to what we were talking about: how do you get the idea that this is a globalizing or that this is the family, our family, humanity’s family—if you’re successfully able to do that. Whether it’s education or technologically implanting something in our brains...maybe what we need to do is to invent an enemy; maybe the threat of extraterrestrial invasion. I often think about the fact that people keep talking about these so-called UFOs and invasions having taken place already, landings already taken place. Perhaps the exact opposite strategy might do it, which is to say: we now know that there have been landings and they have evil intentions. Wouldn’t that bring all of us together all of a sudden? Could we state this as a dilemma? How do you transfer our sense of reason, which operates well within our own groups, to that of a human family?

**Facilitator:** Going back to the idea of whether we can direct evolution, is it conceivable that the evolutionary process is eventually going to take us there whether.... The problematic issue is, it is not going to be an ideal journey. It’s not going to be a journey within the time frames we would like, which is where the designing of the future comes in. So the dilemma is, can you really design that future and bypass human nature, as you call it?

**Hubbard:** Here’s an even more wonderful dilemma, which is, is there a design? I’ve had a lot of discussions here with people who feel there’s absolutely no design in nature.

**Facilitator:** Yes.

**Hubbard:** I’m saying it looks like it’s going towards complexity-consciousness and freedom. Where I’ve gotten my hopefulness about the future is a tendency in evolution. I have felt that the reason it’s going to work, why I would come down on the side of optimism, is that there are so many of us who have that tendency inside ourselves.

**Facilitator:** Yes.

**Hubbard:** We’re not evolving in a neutral universe. That’s a question: does the universe have a tendency toward greater empathy, greater con-nectiveness, and greater love or not?

**Facilitator:** In a retroactive sense, Barbara, it appears that way.

**Hubbard:** Retroactively. Yes.

**Facilitator:** Looking backwards it seems like, yes, complexification or the fact that the scope of our minds is enlarging, our territorial range and view are enlarging; all the other things are true. But the evolutionary process is not some optimizing process. It is a trial and error method. It’s a moment-to-moment adjustment. Actually it stumbles along, basically.

**Hubbard:** They’re both true.

**Tough:** I think a dilemma that is closely related to Barbara’s…. You live in the United Kingdom; several people here live in the United States; Rosaleen lives in...
Australia; I live in Canada. Those are four countries in which the material style of living is enormously high compared to any period in human history. People basically have enormous freedom, enormous wealth, and so that’s half the dilemma. The other half is an enormous sense of meaningless. Of….

Facilitator: Alienation.

Tough: You know: What’s my life all about? What’s the point of it?—which I think ties in with the notion of do we live in a universe with a design, do we live in a universe that is going somewhere? Many don’t even think we live in a society that’s going anywhere: the environment’s going downhill; there’s a war going on—we can watch it on TV every night. So the wealth, the freedom of choice, the political democracy don’t somehow seem to be leading to a personal sense of meaning.

Facilitator: But I come from another culture, where there are cultural and wisdom traditions that have existed for 5,000 years, and people on the streets in Bombay are asking, how am I going to get the next meal? Even though I have this wonderful tradition that is like a big—what would be the right description for this—albatross around my neck.

Tough: So you don’t think they have a sense of meaning either?

Facilitator: It’s not that they have lost their sense of meaning but they’re starving to death. So it might really be too much meaning. In India we have an expression—at least my mother used to say—”you can think all you want and wrap a wet towel around your stomach,” because apparently that kills your appetite.

Gamble: If we’re going to be Homo universalis, then in the shorter term of this thousand years, you could take the vision that everyone in China would come up to a similar level as everyone in the four nations that we’ve just mentioned.

Facilitator: It’s possible, though.

Gamble: Regarding Allen’s point, then there would be a greater feeling of greater good engendered.

Anderson: Before we jump to the question of whether it’s possible or not, I think it’s always useful to turn around and look at the significance of our asking that kind of a question. What I think it tells us is something very important about what you might call globalization: we are seeing a kind of a globalization of wealth and poverty. That is, we no longer are threatened just by who’s poor in our town or even in our country, but we perceive the issue in global terms. You stated it in global terms. I think that that way of looking at the issue is relatively new.

Facilitator: …itself is progress in one sense.

Anderson: In a way it is, yes. And as that way of looking at things progresses, it could impel us, could impel people to do some very wonderful things. The idea of massive reactions and revolutions of the have-nots against the haves is certainly thinkable unless something is done.

Facilitator: Any other elements to the complexities or the dilemmas of the present?

Hubbard: Another question that wasn’t raised—and I’m getting more questions than remembrances here—is something that has come out of the work of Paul Ray in which he says there are 44 million cultural creatives in the U.S. alone. That is, people whose values are already shifting towards planetary consciousness. And there are even more in Europe, he says. We didn’t raise the question, how many people actually are in the process of shifting their consciousness right now? I tend clearly to overemphasize how many of us, but if it’s really one-fifth of the American population who would in some way or another feel connected to a larger whole, some spiritual and some only in social terms, I wonder if we’re not already an emerging Homo universalis. We haven’t felt our kinship, because we’re not the head of anything—because people in this consciousness never get to be the head of a nation or a religion, or even want to be. So if we don’t show up in the leader-
ship statistics—but perhaps the new leadership is everywhere because leading means you’re going somewhere, not just maintaining power within the existing system.

**Tough:** As a footnote, I personally have great doubts about the validity of Paul’s….

**Hubbard:** You do? You think it’s not that many people or…?

**Tough:** I think Paul set out to find something he wanted to find and found it, which is not uncommon.

**Hubbard:** Do you believe that there is a rising group consciousness?

**Tough:** I think it needs to be stated a whole lot more economically than Paul stated it.

**Facilitator:** That’s a safe statement: a rising group consciousness. Then nobody can argue with you. But what is that number, because 44 million out of 6 billion is not a very big number.

**Hubbard:** No, just in the U.S.

**Gamble:** It’s like Eric Wolf—who sadly just died recently—who wrote that wonderful book, *Europe and the People without History*, in which he’s celebrated all those people who…you know, the leaders get their headlines and they get their monuments and whatever, but the vast bulk carries on in these longer-term processes and in this way of creating and making the world. It’s almost as if we’ve got something a little bit analogous to that, because it’s not within any of the political systems or recognition systems that we have come to understand as what give things direction.

**Hubbard:** Right.

**Facilitator:** I would agree with that.

**Hubbard:** Most of us in a planetary consciousness are not powerful in the existing definition of power, but in the long term, I think we are. I think that’s a factor.

**Facilitator:** Yes, I would agree. I think bypassing the powers but accessing as many people as you can adds to the power of the globalizing actually.

**Hubbard:** Sohail was saying at breakfast that all you need is ten percent of any group in order for a shift to occur.

**Facilitator:** Right.

**Hubbard:** That would be a lot more easily accessible within the world where people have freedom, at least.

**Facilitator:** In a sense when we addressed the issue of what are the dilemmas and the complexities of the present, we went into the problems and opportunities. Would you like to elaborate on that?

**Tough:** I think the question of what must be done to secure humanity’s future is a really good way.

**Hubbard:** I’d like to jump in on what we’ve just been saying: to connect through a communication as many people as possible who are already shifting in their awareness.

**Facilitator:** Into a global awareness.

**Hubbard:** To connect and facilitate our greater creativity among ourselves.

**Facilitator:** Communication. Could we enlarge that to what Tobias was so passionate about, education? Not education in a paternalistic sense but simply diffuse the fact that….

**Hubbard:** Even deeper than educating—that sounds as though we’re going to tell them.

**Anderson:** Learning.

**Hubbard:** There’s a big community of consciousness. Often, perfectly ordinary people—kids—are already in an emerging global consciousness, but there’s no consensual reality connecting this or asking people what they think and would like to do within that global consciousness. In other words, a facilitation of the emerging community of awareness: that would be a huge step forward.

I think that connect is a key word. Again, it’s getting over that chasm or that sense of otherness, so that “they are us, we are them.”

**Tough:** Because you have connection, as you were saying—I’ll pick up on that—the title of connection with future generations. I think that connect is a key word. Again, it’s getting over that chasm or that sense of otherness, so that “they are us, we are them.” There are many techniques, emotional/spiritual kinds of techniques for people to feel connected to this group of people who are going to be around here a hundred or a thousand years from now.
Hubbard: So we might put as a factor to increase empathy, with nature, with each other, and with future generations.

Tough: Yes, but it can’t be just cerebral; it’s a heart thing, too, you know.

Hubbard: Feeling. Increase empathy, at all levels: personal, with nature, with one another, and with future generations.

Facilitator: It seems like we’re saying that anything you can do, anything any of us can do that makes the process more effective—the process of aiding and abetting a consciousness—is in the collective good.

Hubbard: Yes.

Gamble: It’s an experiment in communities, isn’t it? What we’re arguing against is a kind of Noah’s Ark thing. We have an institution that will float into the future and we put humanity on it, having constructed it out of very good materials in the present. What we are saying is, that’s not going to work at all. What we are hoping is for community: this idea of different forms of communities that are not so power-oriented as we understand them at the moment, but which take into account the technological changes that actually empower people through belonging to whole, very different, and varied forms of communities. In a sense, many more people are continually constructing Noah’s Ark rather than trusting in one prototype. That, I think, brings us back to the sort of future that makes me optimistic—one based on variation and diversity, which means that some of these communities will hit the rocks and some of them will develop leaks. That’s bound to happen, but many more will keep on going downstream.

Facilitator: Another way of putting it is to increase our probabilities in terms of making sure there is enough diversity and differences in approach.

Facilitator: Let me come back again. We started with the idea of discussing it in the evolutionary context. That is not something we are going to—we can intervene; we can probably influence. Barbara is now beginning to wonder if we can direct, because I think that’s a far more inclusive term. If we give on the fact that you cannot mess with the process; it is an evolutionary process. Anything and everything you do along that evolutionary process, without—how do I put it—something that is a design, that we presume as humans to go create as an objective or a mission and then go execute and implement. That is where most of the difficulties arise, because diversity is not really conducive to a very focused goal-oriented movement towards some objective.

Gamble: Just trying to crystallize Barbara’s position, and to continue the metaphor of the Ark floating along, and many different ones: they’ve all got rudders, but I suppose the question is, is it a handled rudder? For me, there is no hand on the rudder. But there are constraints, which, unless the waves change around, will make the thing go through the water rather than just around in a circle.

Anderson: It would suggest to me that one of the things that must be done is to deliberately learn some different ways of thinking and talking, because we continually come back to the idea of making some kind of a plan. Then we steer in that direction and something always jumps up that we weren’t expecting. There are other models. I’m not just inventing the concept; there are models of planning that are much more an ongoing narrative way of thinking about planning. It’s not directionless entirely, but it’s a whole lot different than the five-year-plan approach.

Facilitator: That’s exactly the thought that crossed my mind: half the world’s population being directed by this motivation to have seven-year plans and five-year plans, and almost all of them have not succeeded. If anything, they have become a huge impediment to progress.

Anderson: There’s a lot to learn from that.

Facilitator: The other way to state it is, as Clive was pointing out, the floating of the Ark is like a random walk. The hand on the oar is like pointing to a straight path. Maybe all we then say is anything that will at times make it less random.

Hubbard: Well, our choice and our conscious deliberations do make it less random. There’s just no doubt about that.
Facilitator: It seems like it’s an achievable way of getting there.

Hubbard: Look at us here: we’re making this process less random. I wanted to add another factor, along with the connecting and diversification, but within connecting of the emerging community of global consciousness. It’s never done and I don’t know why—which is that we should be conscious of what’s already emerging that works. In health, in education, in management, in all the processes around, in planning. There are literally myriads of successful social innovations all over the planetary system. Very rarely do we focus on them, connect them, and communicate them. I would love to see the Foundation For the Future.

Facilitator: Okay, that brings us right in here. How can the Foundation assist in the process?

Hubbard: That would be one of the things I would recommend.

Facilitator: To be a repository for diffusing all of the social innovations? Describe it.

Hubbard: It would form a matrix in which people could identify and connect what they already know is emergent. The idea of emergent properties is really an exciting thought for me in evolution. It’s not that we are planning everything, but we notice it.

Facilitator: What is emergent and not contested?

Hubbard: And pragmatically successful in terms of peoples’ lives. One of the things that we would do is, we would ask every participant in every seminar and we would send out the word through the internet: what do you know that really works? Describe it. And why does it work and how does it work? You begin to get a pattern of social evolution.

Facilitator: Simply adding to the quotient of awareness, yes.

Hubbard: And then we can act more consciously based on that.

Facilitator: Fits perfectly with the mission of the Foundation.

Anderson: It was suggested to me after the ethics discussion that one thing that might be a bit of Foundation work would be trying to articulate codes of ethics within all those different domains: environmental, etc., etc. Not in the sense of handing down the law, but in the sense of opening up dialogues.

Facilitator: Suggestions?

Anderson: You’re trying to get more country ties along the lines of some of the things that Allen brought up, as an ongoing project of framing ethical codes across a wide range of domains and behaviors.

Gamble: One thing I learned in the last three days is that there are methodologies for the future, and I don’t know about them. I would really like to attend a consciousness-raising seminar as to what those methodologies really are—much more nuts and bolts. That’s a kind of personal thing, but I would imagine that that’s a much wider concern.

Tough: That relates to something that I mentioned on my personal reflections: that most of those methodologies tend to be relatively short-term. I know people, for example, in some areas of work that just won’t mess with something beyond, say, twenty years or so. What that leads me to think is that there is a lot of room for a re-examination of the existing future.

Gamble: The other thing I wrote down here is that I thought the Foundation could play a pivotal role in developing the notion or the vision that the future is knowable, because the future is a human project, comparable to human projects in the past. I think most people still regard the future as unknowable, and therefore it has a certain terror about it. In a sense I think the future is part of being alive, part of the current creation of any human project.

Facilitator: It seems like it's an achievable way of getting there.

Hubbard: Look at us here: we’re making this process less random. I wanted to add another factor, along with the connecting and diversification, but within connecting of the emerging community of global consciousness. It’s never done and I don’t know why—which is that we should be conscious of what’s already emerging that works. In health, in education, in management, in all the processes around, in planning. There are literally myriads of successful social innovations all over the planetary system. Very rarely do we focus on them, connect them, and communicate them. I would love to see the Foundation For the Future.

Facilitator: Okay, that brings us right in here. How can the Foundation assist in the process?

Hubbard: That would be one of the things I would recommend.

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Facilitator: Simply adding to the quotient of awareness, yes.

Hubbard: And then we can act more consciously based on that.
Facilitator: Any other thoughts on that? Focused on the Foundation?

Tough: You might want to expand on methodologies within the context of what Walt spoke of. It’s not so obvious now.

Facilitator: Methodologies pertaining to future....

Anderson: Long-range future.

Facilitator: Long-range future, for observing, studying, analyzing....

Tough: Conceptualizing.

Facilitator: Not predicting and not forecasting.

Tough: Absolutely, none of those two.

Facilitator: Analyzing, observing, understanding, conceptualizing.

Tough: Do we have imaging in there?

Hubbard: That’s a great word that we didn’t use quite enough, I think: the word imagine.

Tough: I have two things, Sesh, especially for this fifth one. One is that the Foundation should keep on doing the wonderful things that it’s already begun—and that’s said very sincerely. I think what the Foundation is already doing is really fantastic. You’ve changed the landscape already of thinking about all this. The other thing is that I think you should build alliances with a few other organizations around the world that are taking a very, very long-term perspective. The Future Generations Group in Malta is one.

Facilitator: We’ve started to do that, but we haven’t really been very successful in actually getting something going with them.

Tough: And the Future Generations Alliance Foundation in Kyoto. And Long Now.

Gamble: Building those alliances would be an example of Barbara’s self-emergent properties, but at a small, understandable scale in terms of bringing together those various communities that have a common interest in the future.

Hubbard: Yes. That would be part of it.

Gamble: It would be a good practical test of how it’s going to work. That, in fact, might be part of the methodology.

Hubbard: Yes.

Facilitator: Okay. I think we had a wonderful session. Thank you.
In this session, affinity Group No. 2 gathered to discuss the three critical questions and how the seminar meetings had changed or influenced their views.

**Facilitator:** Glen Hiemstra

**Participants:** George Cowan, James Dator, Howard F. Didsbury, Seymour Itzkoff, Yersu Kim, Rosaleen Love, Frederik Pohl

**Seminar Questions:**
1. What are the factors that are critical to the long-term future of humanity?
2. What do we know about the past and present of these factors and their most likely trajectories?
3. What are the problems and opportunities associated with these factors as they relate to the long-term future of humanity?

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**Glen Hiemstra (Facilitator):** The model we agreed to try in this session is, rather than breaking down Questions 1, 2, 3, 4, 5, and organizing them, we’re putting the five areas up and just inviting you to respond to any of them. And I’d like to respond to question No. 1—how this has changed my views. Here are some thoughts on that, and if somebody else has a response to that, we can just follow that dialogue for a while. At some point, I’ll pause the conversation to see if any of the areas of focus are blank. Then I might ask you for some specific responses to those, but rather than being too systematic about it, we’ll just see which ones you’d like to talk about the most. Who would like to dive in with a response to one of those questions?

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**Kim:** I’d like to take all of these questions together and say a few things, particularly what has changed in my view about the future relating to optimism versus pessimism. Those of us who are professionally involved with thinking about the future tend to be rather optimistic. One of the things that has struck me during the last two or three days is the real recognized danger to our future that could come from the unpreparedness of human beings with regard to coming changes. There has been some talk about the natural catastrophes that could change the prospects for humanity for the future. There could be a number of very serious man-made catastrophes that could hit the whole of humanity in a very serious way.

One catastrophe that has been of concern to me during the last couple of days is the emergence of what could be called a new form of Ludditism—reaction to the phenomenal changes occurring at such speed in today’s world. I am assuming that the speed and quantity of changes would be magnified in the coming years. There are an increasing number of people who simply cannot cope with the changes that are occurring, partly as a result of developments in science and technology. This number increases daily. At some point in the very near future, it could reach a critical stage, where the inability of the masses to deal with the new changes could become a political force. Essentially, it would be impossible for those who are involved in the decision-making process to be able to make use of these changes for the betterment of human conditions.

**Facilitator:** Do you think of this as global or regional?
Kim: Global as well as regional. Even in advanced industrial countries, even in those places where I think the forces of neo-Ludditism are great, these forces are increasing rather than decreasing. The mode of governments today is largely democratic; democracy is spreading, although there are some pockets where democracy has not been realized. With the spread of human rights, I think the idea of democracy is definitely on the rise. How would these two forces, the increase in neo-Ludditism and the increase in democratic forms of government, actually affect the decision-making process regarding our future? This could be a serious kind of impediment, a very serious kind of catastrophe, as far as the ability of those of us who would like to make positive uses of the technological changes is concerned.

Itzkoff: I’ll complicate this discussion with two or three sentences. When the time comes to define who the Luddites are and who the Progressives are, that’s going to be a big problem. Who are the Luddites? Who will define who the Luddites are and who the Progressives are?

Dator: I’d like to pick up on that by reinforcing what you said and by adding another dimension. It’s not only the more democratic, but the more market-oriented we’ve become—so it’s both our political and our economic system. As a person who has consulted with governmental organizations about the future for about 30 years, my observation has been that the more democratic and the more market-oriented a community becomes, the less future-oriented it becomes. Both of those are wonderful mechanisms for determining what people want now, but neither has adequately built into it a concern about the future. In a sense, it fits into what you’re saying because who knows whether Ludditism is a good idea. Maybe some of these technological developments are good or bad, but at least the major mechanisms we have at the present focus too much on present generations and totally inadequately on future ones. What’s urgently needed is creating economic and political systems that are future-oriented and help us as we decide to act now, to act in regard to our responsibility to future generations.

Facilitator: So we should move that one to secure humanity’s future. I’ll summarize by saying that we need to balance the needs of future generations to present generations.

Didsbury: I’d like to supplement what Jim has said. I would describe the process we see as the death of the future in a hedonistic society. That’s one of the problems we have in the United States today. Everyone is so busy, so distracted, busy making money; everything is for sale. Who the hell cares for posterity? Posterity doesn’t vote in the next election!

Facilitator: I don’t want to generate a whole new set of ideas, but do you think, somehow, once we pass the year 2001, that things could turn around for any reason? Just because of the passing of that year?

Didsbury: Not in the slightest, not in a highly developed society such as ours. This is one of the reasons why much of the Muslim world and “backward areas” are so fearful of a United States social model spreading around the world. The model is so attractive and so tempting and its impact frightening. I would like to add one other factor about what’s affected our view. I sense a kind of widespread despair with humanity as it is today. Hence, we have to improve it. We have to produce a new model of human beings. In this connection there have been some wonderful ideas presented here—increased intelligence and an exciting sense of the grandness of things to come. One of my concerns is that the result of these interventions into human evolution may ultimately lead to two classifications of human beings: those of us who are bright to begin with and also financially able will avail ourselves and our offspring of all the grand things coming down the scientific and technological pike. Then there is the rest of humanity without the wit or means to avail themselves of the means to become an “improved human being.” We may have the superhumans of 3000 and...
the “regular,” old-version of human being, peopling the planet. A rather horrendous vision that scares me.

**Itzkoff:** Howard, that doesn’t follow at all from what we’ve been saying—that we were more improved human beings. I haven’t heard anyone say that only *some* human beings will benefit and not everyone. That’s the whole idea of universal culture.

**Didsbury:** What will the economic foundations be to provide this, if we cared? We have 45 million people in the United States today who don’t have health insurance. Imagine the elaborate political and economic undertaking on Earth of raising the entire human family.

**Pohl:** I think that’s where the Foundation’s despair comes in—that there are people like us around the world who live in a pretty fortunate environment and can do pretty much what we want. And then there are a much larger number of people whose lives are fairly hopeless. There is no future for them, and unless we can find some way of ameliorating the differences between the *haves* and *have-nots*, I don’t see a future.

**Facilitator:** That was the very first thing we said in our first session. We talked about the chasm between the *haves* and *have-nots*.

**Cowan:** I would like to deepen the problem. What I sense is that, even if you have material prosperity, people who have it are increasingly aware that their lives have no significance. That is a terrible thing, because we search for, and try to find, significance in various ways. The *have-nots* have no basis for achieving something that satisfies them. Perhaps one of the questions we should have examined, that we didn’t, was how do you provide people, even those with material wealth, with a basis for feeling, or satisfying the need for significance?

**Pohl:** I don’t have any sympathy for those people. They’re the ones who make their lives empty. They have all the opportunities in the world.

**Cowan:** But they go to work and they do jobs that are meaningless. Really, I’ve employed some of them. We’re directed to; we’re supposed to share; we’re directed to do that. You have to, by law, employ some of these people, and their lives are meaningless. They know it, and it’s a terrible thing

**Facilitator:** We didn’t capture that in our questions. I want to pause for a second. I think that was an interesting idea. The idea of….

**Cowan:** The idea of personal significance.

**Facilitator:** So, securing humanity’s future might fit under adding or discovering ways to find significance.

...it’s a scientific millenarianism that’s coming through; that the new millennium will bring all these good things from science, but we have to change.

**Love:** That’s what I think Howard picked up on, that there is a millenarian feeling in this group, that it’s a scientific millenarianism that’s coming through; that the new millennium will bring all these good things from science, but we have to change. This is a really significant point in time. Science will allow for the genetic modification of the brain, modifications of the technological innovations that will, in fact, bring that kind of salvation.

**Facilitator:** Did that just come off your paper or out of thin air? Is there a way to stick it on one of the five questions? It was good: a new kind of millenarianism.

**Love:** It would be how these discussions have affected my interpretation of the future.

**Facilitator:** There is a scientific millenarianism.

**Itzkoff:** In many ways, our analysis of the future has to be based on our understanding of the past, because that’s where we were. Not that it’s going to repeat itself exactly. What about the Roman Empire, about repeating in the patterns we see today? The underground was growing Christianity, almost like a psychological cancer, and gradually over a period of 200 years, that underground took over the fabric of
Roman society and brought us into the Middle Ages. There is the sense that when Rome no longer gave meaning to the symbols of Roman culture, when they grew empty after many hundreds of years of repeating themselves, it was then that things came to an end.

**Kim:** I’m not sure that the parameters of the tension between the haves and have-nots would be the same as the parameters of Luddites and anti-Luddites.

**Facilitator:** No.

**Kim:** If you look at the Luddite movement of the 19th century, it was not necessarily led by people who were ignorant of what was happening. Who were the downtrodden of the 19th century societies? They were, in a way, the elites, and these elites, although they were fully capable of making use of what was happening, decided this was not desirable. The way you deal with scientific technological developments can be influenced so much by the values you hold regarding these new technologies and sciences.

For instance, look at the development of Chinese science. In the year 1500, Chinese science may have been more advanced than Western science, but in the case of Chinese science, there were people who had the power to decide. They decided some things should not be developed any further, and some things should be. This was a kind of arbitrary intervention. This value-based intervention, in the course of scientific development, stunted the kind of scientific development that took place in the West. This is one type of development that science went through in the Far East. What this indicates is that there are values that decision-makers have, regarding how the developments in science and technology should be used, that have such an important and decisive influence on the development of science itself. That leads me to the importance of some consensus on basic ethical values. At the bottom of these discussions and problems, we need to be serious about building a consensus of some kind regarding basic values.

**Cowan:** With respect to Luddites, history says that in every generation, people have been divided into those who valued the past and had no faith in the idea of progress, and those who valued the idea of progress and were optimistic about the future. They have had different political party names. You can identify them today by party divisions, by income breakdown, and by the people who want to return to the glorious 19th century, that wonderful time when everybody lived in beautiful circumstances. Then there are those who want to better the future. That’s been true of all history, even of the Greek philosophers. You can divide them. Heraclitus was thrown out of the club because he believed in dynamism, and he was a radical left. That division has always existed.

**Kim:** But to add to that is this division between the progressives and conservatives; conservatives and the sort of superiority of progressives—that is a recent phenomenon. Look at the other, older civilizations and I’m not sure there are many civilizations where the idea of progress was a really great force.

**Cowan:** It’s a modern idea.

*…the Luddite instinct is so deeply ingrained in the basics of the human condition that we have to take account of it.*

**Kim:** It’s a very modern Western idea. And whether this will continue for the next thousand years, maybe 10,000 years, I’m not too sure, because the Luddite instinct is so deeply ingrained in the basics of the human condition that we have to take account of it.

**Itzkoff:** This is the paradox inherent in Marxism because Karl Marx, while recognizing the progressive character of the industrial system as it developed in the 19th century, realized that it had destroyed something in many ways finer. There was a community; there were the Middle Ages. The word he coined for this destruction of the old community was *alienation*. His whole revolutionary thesis was based on the fact that we’ve got to go beyond industrialism, into some kind of utopia, and at the same time have roots in that older community he saw dissolving around him. So it’s exactly what you are saying: it’s a kind of revolving, reflexive dialogue between modernity and certain things basic to human beings culturally and historically.

**Cowan:** I’m going to leave shortly; I have to catch a shuttle. I’m not quite sure what to address but I did want to say something, since you’re trying to get statements.

**Facilitator:** Address any of them you want.
Cowan: Uppermost in my mind is whether this meeting has affected the things I want to read and the people I want to talk to. Some meetings you go to tend to narrow your views and other meetings you go to tend to broaden them. I have to say that this meeting has broadened my views. I think I'm more optimistic about the value of such an exercise than I would have been before I came here. But did it broaden my own perspective? Am I on a steep learning curve, or am I not? I believe I am, and happy to be there. That, to me, is the measure of the success of this meeting. All the talk about what and how come down to one thing: how do you shape the future? The only thing you can do is to shape the present. You cannot read a blueprint for the next century, even for your children. If you do, you can be sure that they're going to be anti- whatever the blueprint says. A blueprint is going to have a negative effect.

So how do you affect the future? I see three things. The first was strengthening the ethical foundation toward a more ecumenical or secular ethics, which is a new thing. I hadn't given that much thought, but I think a concerted focus on that would be very valuable. Second, I've always had great faith in education, and, in particular, very early education. I continue to be interested and hopeful about the possibility of making a significant change by focusing on very early education. I'm not talking about replacing a mother, but adding to a mother and father's influence. Finally, I have felt that in the present circumstances and in the present ethical environment, we could not profitably talk about enriching the gene pool because that seems to have something to do with gene selection. There may, in fact, be benign forces and even politically acceptable forces that will lead to enrichment of the gene pool...

Facilitator: Thank you. Before you go, did you have anything about a suggestion for Question No. 5—any suggestions for the Foundation?

Cowan: I suggested that, in addition to the graphic techniques, which are beautiful, you could express, for example, the flowing river in a differential equation, except that it will be a different force. If you write one, you differentiate with respect to time. That's a dynamic concept; it incorporates the symbolic logic with a flowing river in an equation. I can do that right now. But you could also do it with respect to every force: things that don't shape rivers but nevertheless will shape the future. You would have a set of differential equations that you can't possibly solve, but I think they would focus the discussion more accurately. That simply takes people who are used to writing that kind of thing.

Facilitator: All right. I'll take that. Thank you.

Cowan: By the way, I have tremendously enjoyed meeting everybody.

Facilitator: It was great to have you here. Let's glance at our paper here and see where the gaps are. Thinking of your own responses, and maybe taking us in another direction, can anyone offer a suggestion?

Love: Millenarianism. About the millennium. At least, until I think of a better word.

Facilitator: It's a very good word. It's just hard to say.

Dator: While we're doing that, can I just make a comment? I certainly will be overjoyed when the year 2000 is over. It's been a huge plague on futurists—absolutely horrible. I feel about it like I felt about the year 1984. I'm sorry George Orwell named that book 1984 because it really focused on an evil aspect of the future. It did more harm to the future than almost any other book. And the year 2000 has been a stultifying thing. So finally, it's going to be over.

Facilitator: My comment on that was similar. It was actually serious because I think there are so many mental blocks around the year 2000 and the year 2001.

Dator: Absolutely. It is still used as the future, right this minute.

Facilitator: Suggestions for the Foundation? What do you intend to learn, what has been affected in your view?
Love: I want to rewrite Question No. 1, if I could do that.

Facilitator: Rewrite No. 1? Sure.

Didsbury: In fact, they reminded us that we haven’t invited you to do that enough.

Love: Widespread view of society as millenarianism. How this has affected my view is that there seems to be in this meeting a new kind of millenarianism that is scientific.

Facilitator: So cross out securing human society and say a new kind of…

Love: Scientific millenarianism.

We should buy some insurance policies against some events that are unlikely, but if they did happen, they would be terminal, such as a large meteorite.

Dator: One thing I wanted to add was to secure humanity’s future. We should buy some insurance policies against some events that are unlikely, but if they did happen, they would be terminal, such as a large meteorite. I think it would be a good idea for the space program to get serious about finding ways of intervening if such an object were detected.

Facilitator: Securing humanity’s future—do we buy insurance policies against…space-bound catastrophes?

Dator: Put more effort to detect them than they are doing at the present, more systematic effort.

Pohl: What do you mean, detect them? We usually detect them on their way past us, not as they approach us.

Didsbury: And the advent of new infectious diseases.

Facilitator: An insurance policy?

Didsbury: A friend of mine has just done a paper. He is one of the authorities on infectious disease and they’re in the wings. AIDS is only one that’s appeared thus far.

Facilitator: Who wants to talk about catastrophes or new disease?

Itzkoff: I’d like to talk about Questions No. 1 and 5 myself, about how these discussions have affected my view.

Itzkoff: Not being a futurist, but interested in the future in terms of what I’ve been teaching and writing about, I’m now aware that this is an extremely generic term. It denotes more than my view of how many motifs and pathways there are in dealing with this issue. In that sense, it’s been a very broadening experience for me. This meeting has been sponsored by the Foundation. My assumption is that the Foundation is attempting to seat itself as a medium for addressing this issue. I see this meeting as a kind of experiment to see what the ideas are and what the issues are. I’ve never met such a diverse group of people in my life, in terms of their fields of interest, and intellectually all brilliant as well as being interesting and good people. But my thinking is that as the Foundation begins to unwind its preliminary meetings, and given that the problems are both diverse and important, I think there’s going to have to be a focus at some point in the future. You are going to have to say, this is where we want to put all our effort, our wealth, our brains, and so on. If the Foundation tries to cover too many bases, it’s going to vitiate its influence. I think we need many focus points of influence in dealing with the future. You can’t deal with all of them.

Facilitator: So, pick a focus and do specific things on that.

Itzkoff: The leaders of the Foundation have to use this information for themselves, in a sense: seeing what people are talking about, what the issues are, and where they want to put their emotional and intellectual efforts.

Kim: Regarding No. 5, about the role of the Foundation, I would like to see the Foundation take a lead in bringing together certain values. There are many scattered attempts by different organizations, different institutes, and different foundations, but many of them have a particular agenda to address. As far as I can see, except for the scientific millenarianism, the Foundation For the Future does not have such an agenda to put forth. A concentrated effort in this
direction by the Foundation would be a good thing. Of course, the efforts of international organizations like UNESCO and United Nations—they are useful but they have certain built-in limitations, because everything that is done under their aegis has to be approved by member states. If you have 180 member states, you’re bound to have some kind of opposition, so you have to steer your course carefully, and that sometimes limits the validity and effectiveness of the necessary intellectual work.

Facilitator: I don’t know that we can take the lead in the process of coming together....

Kim: In the consensus-building process.

Facilitator: Consensus-building around....

Kim: Around the basic ethical values and principles needed to deal with humanity.

Facilitator: Ethical values and principles. I have a question on that: can the Foundation really do that in a "values-free" way?

Dator: The main thing I have learned, especially coming out of a reinforced hazy feeling, is that there is a need to focus the process a little more. Coming out of yesterday’s discussion, you may remember my remarks about the difficulty of assessing the needs of future generations, or the way in which new technologies will become the agents of change, or the new behaviors and new consciousness that new technologies will allow. With that in mind, how can we, before we have those technologies, with our ethical and experiential limitations, engage in setting up an ethical standard for evaluation? That dilemma has encouraged me to suggest that, in fact, the ethics of and for the future is not a set of standards or a set of criteria, but the process itself. It’s the continuing recognition that we need to discuss in as broad a sense as possible what the implications and consequences of these new technologies are. I say this especially in terms of the Luddite point that you’ve raised, that the forces against scientific millenarianism are vast and growing, and fears about the future because of technological change, especially genetic engineering and artificial intelligence and all the rest, will become quite great. Yet we should not encourage the development of standards that let us decide this is the way and that is the way, but rather, to broaden and lengthen the discussion of these issues. It is a good thing to encourage this Foundation to take a lead in bringing many of the voices together and keeping them in discussion, rather than trying to come up with a set of guidelines that won’t work at the end of the discussion.

Kim: The process, of course, should be an open-ended one where different views can be discussed and different inputs evaluated.

Dator: Right. I usually distinguish between law and politics. As a political scientist, I may favor politics over law. Law tries to freeze things and then evaluate everything else on the basis of whoever happened to win a political battle. In politics, things are constantly being discussed, and it’s never resolved. An issue is always in the process of evolving. I think that an ethical system that recognizes that it itself is continuously evolving....

Kim: You say a continuous process, but at some points in time as things evolve, there are certain periods in which you have some kind of effective equilibrium, where there seems to be a consensus on values and about the future.

Dator: I don’t see that happening any time soon, but I do agree that does happen and has happened historically.

Facilitator: One more time?

Didsbury: Obviously, we can’t do everything in the first meeting, or the second, or the third, but an area that should be explored with respect to the future is the possibility of a global federated government. Then all the problems we’ve had with the United Nations would evaporate because we would have people on Earth paying a percentage of their taxes to this global federation, so you wouldn’t have to go through this routine. It’s time to think about it.

Pohl: We tend to consider that nations are divinely ordained and they will always be nations, but actually, if there were fewer nations, if there were no nations, we would have a lot less strife. The United States has a number of different areas with different people, but we don’t start wars against each other, because we don’t have a concept of national sovereignty within the United States.
Itzkoff: Historically, I think nations are the product of ethnicities—tribes that have bred together and have had their own language and culture and history. As they expand in space and time and number, they become nations. In order to hypothesize that kind of structure, you have to say ethnicity will wither away in time. This I don’t believe. There will constantly be new ethnicities being brought to the surface. These ethnicities will want to live together and share their values together, even while they may be part of some kind of a universal political and economic structure. I worry about the talk of global political, military, and other structures.

Kim: But this transethnic political entity has merit. In some ways, we already have those mechanisms of governments: in the field of trade, in international finance, and so forth. We have this. We simply don’t have the form of government that pervades all aspects of human life. Of course, ethnicity is the basis of nation-states as we understand them today, but the idea of a nation-state itself is not a very old one. There should be ways to absorb this fact of ethnicity into a world government or world system.

Pohl: Ethnicity may be the enemy. Think of Yugoslavia. I had occasion to visit it a number of times and I thought it was an interesting country filled with a lot of Yugoslavs who got along fairly well—until they started describing themselves as independent nations and killing each other.

Kim: In the United States, you have more than Serbs and Albanians; you have a whole slew of ethnic diversity, and yet the system works. I understand there are other factors that enable this country to function, but I’m sure the world government would not be based on principles that had worked in the past. We’d have to invent some new principles and modalities that would enable all the ethnic groups to work together. One of the ways this could be possible is consensus on values.

Didsbury: A global government where there is diversity from region to region is not impossible to create if we get a goodly number of people to give it some serious thought and work for its attainment.

One thing that is alarming is that with all of us around the table, there has been no criticism. It is said that democracy is spreading. Note: you must add an example of which democracy we’re talking about. I assume we’re talking about Anglo-Saxon democracy where there is respect for the individual, where the notion of this year’s majority may be next year’s minority is taken for granted and vice versa. That’s a very different thing from a government in which personal liberty is a mystery and if the majority doesn’t like a particular group they can be ignored or badly handled. Because the term democratic appears in the press and on television in a country does not mean it is necessarily a genuine democracy.
governed by a network of political assumptions such as: personal freedom, free institutions, and the rule of law.

**It is a mistake to think that running an election is the same as having a democracy, with no emphasis on the rights of the individual.**

**Pohl:** It is a mistake to think that running an election is the same as having a democracy, with no emphasis on the rights of the individual.

**Facilitator:** We probably have time for one last comment about the five questions, and then we’re going to discuss what changes you would suggest. It’s a preview of what you might be putting on your evaluation sheets. We wanted to capture a bit of group input about that, so I’ll toss out an invitation for any last comments.

**Pohl:** I haven’t discovered anything that I hadn’t already suspected. I have learned incrementally about a lot of things.

**Facilitator:** You learned incrementally about a lot of things, but there were no breakthroughs.

...a new buzz phrase that’s come out of all this is the term simulation imperative.

**Love:** For me, I think a new buzz phrase that’s come out of all this is the term simulation imperative.

**Didsbury:** The simulation imperative. Yes, that was nice.

**Facilitator:** Let’s draw two columns now. In one column, let’s put what worked the best in the seminar in your point of view. Anything is fair game. Then, in the other column, let’s put what changes you would suggest for the next time.

**Pohl:** I think what worked best is the fact that we were all here. If we had been on a plane that crashed on a desert island and been required to spend three or four days with no format and no instruction at all, we would have had a similar experience; we would have learned a great deal.

**Itzkoff:** We had a lot of time to get to know people in more informal settings while we were here.

**Facilitator:** That was a good thing?

**Itzkoff:** Yes.

**Pohl:** This is why I can’t really make suggestions about what the organization should do, because, in a sense, the less it does, the better it works.

**Facilitator:** That’s a new concept, and actually an interesting one. There are some meeting technologies called open space, in which, basically, you put the group in a room and you say: Okay, create a conference. You’ve got three days.

**Dator:** Thinking about the future requires a little more than that. If we bring together people who have spent a lot of time thinking about the future, then that would work, but I look at it from another point of view. We are a very diverse group, with different experiences and different cultures. If we’d been brought together to think about the year 1000 or the year 0 and what they were like, we would all have our ideas and we would be able to talk about it. But whether a person who had spent his life thinking about the year 1000 and researching it, the group would feel….

**Facilitator:** I was just summarizing.

**Dator:** I am not disagreeing with what was said. I just think that given the subject matter of the future, it requires some structure—preparation, at least.

**Itzkoff:** There are many ways to structure it. You can structure it in terms of subject matter. You can structure it in terms of people. You can structure it in terms of how we have been doing things—facilitators, illustrators.

**Dator:** That’s true. I agree entirely.

**Itzkoff:** I’m curious: in terms of what your thoughts are, which way would you head?

**Dator:** I think all of those are very good ways. I don’t think we could use the open technology. That’s what I was referring to—just getting us together and saying: Okay, what do you want to talk about? That isn’t going to work.

**Itzkoff:** I agree with that. I would second that.

**Facilitator:** So if you were going to say… have structure? Yes, having structure worked. Better structure worked better.
Dator: Can I also make one suggestion for change? I am glad to have these sessions recorded, but we’ve got to find a way to make the recording of it less intrusive. That might mean trying to see that the facility where we hold our next sessions is already set up for audiovisual. It needs to be a little more invisible to us.

Love: Very bright lights.

Pohl: Again, it goes back to a minimal kind of structure that might amount to simply having a table like this, with people sitting around it, discussing things. The other kind of interaction—when you’re sitting in a bar and talking to people directly across from you and the other three or four people at your table—does not give the same sort of breadth. Yes, definitely. Structure should be present but rudimentary.

Kim: Structure also in limiting the range of topics. I think that the wide-ranging nature of this particular conference has something to do with the fact that this is perhaps the first major conference your Foundation has organized. But in order to have a little more depth and discussion and debate, it would be useful to limit the range of topics that you bring to the discussion.

Itzkoff: Too many 30-second sound bites.

Facilitator: You’d have to pick some over time, and have a series of conferences. But it’s a challenge to get at the whole system while limiting topics.

Didsbury: I would suggest that under no circumstances have any session run as long as 90 minutes, because the audience suffers from overload. I recommend the sessions be held in the morning, followed by a longer lunch period so contributors can talk about the topics just discussed. Then, either after dinner or before dinner, have a get-together where the participants would have a roundtable discussion. The way things are set up now, participants suffer from overload. I can’t possibly be the only person who drifted off in the 90-minute sessions.

Love: What worked for me is being in the presence of so many people who, like myself, claim to be futurists. I found that to be a fascinating aspect of this experience. I especially enjoyed sitting back in those fishbowl sessions, watching the facilitators try to get people back from the Roman Empire forward to the next thousand years—and admiring those skills. I feel I’ve learned a lot from their techniques, the useful phrases, things I’ll use in the future. In fact, it really inspired me. I would love to go to a conference where it’s all futurists.

Facilitator: That’s important. You will have a chance to make all the specific suggestions that you can. The Organizing Committee is meeting tomorrow morning to review the feedback that you’ve given and to start the process of refining techniques for the next session in September.

When you're talking about something as complex as a thousand years of human experience, what topics are you going to eliminate?

Pohl: When you're talking about something as complex as a thousand years of human experience, what topics are you going to eliminate?
Final Discussion of Group No. 3
Addressing the Seminar Questions

**Group No. 3 reassembled to discuss the critical questions and how the multidisciplinary sessions had changed the way they think about the future.**

**Facilitator:** Clement Bezold

**Participants:**
- William H. Calvin
- Steven J. Dick
- Jerome C. Glenn
- Francis Heylighen
- William W. Kellogg
- Dietrich Koelle
- Meng-Kin Lim
- R. Spencer Wells
- Paul J. Werbos

**Seminar Questions:**
1. What are the factors that are critical to the long-term future of humanity?
2. What do we know about the past and present of these factors and their most likely trajectories?
3. What are the problems and opportunities associated with these factors as they relate to the long-term future of humanity?

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**Dick:** It has been very difficult to focus on a thousand years. You have to constantly remind yourself to think a thousand years ahead, not just one hundred or two hundred. Has that affected your discussion of the factors?

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**Kellogg:** As a physical scientist involved with the environment, I don’t think that far in the future, particularly the effect on the structure of the human race. Some of the discussions about the genomes were far beyond my studies and generally unsatisfactory. I’m glad I didn’t try to learn this on my own. I would have thought that the human race would go on as it is, but I guess I may be wrong.

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**Facilitator:** That’s a big observation.

**Calvin:** I have a very similar view and I’ve been through this type of genetic speculation before. The future will be much stranger than I thought. We will have the potential to genetically engineer viruses that can wipe out whole populations, and to create adults quite unlike the ones we’re familiar with.

**Glenn:** So you’re worried?

**Calvin:** Yes.

**Werbos:** How many people feel slightly or substantially more optimistic, pessimistic, or about the same after these discussions?

**Facilitator:** We’ll ask it in three parts. The first is, how many people feel more certain about the next thousand years after these discussions?

Okay, it’s six for more uncertain, one more certain, two unchanged because they were uncertain to begin...
Section VII.E.3: Transcripts • Final Discussion of Group No. 3 (Addressing the Seminar Questions)

with. Have your views of anything changed? You've already said it has affected your views of the individual, populations, and the ocean.

Glenn: Yes, it increased my awareness of the ocean's threat, and the galactic cycle.

Koelle: The ocean's general climatic uncertainty is one factor. The climatic machine is a very complex system that we cannot control. If the temperature doesn't remain constant it's going to kill us, and it's never been constant in the past.

Werbos: The rate of change is a variable in determining social stress. If you have a million years to adapt, then nobody worries. If you've got five years, that's different.

Facilitator: That didn't get enough attention. Okay, did anyone else change his views?

Werbos: Terry Deacon talked about low-cost kits that would allow parents in the Third World countries to decide the sex of their children. I was greatly influenced by his statement.

Facilitator: Because they'll all pick boys or girls and...?

Werbos: It will have multiple effects. One is a cheap and voluntary way to reduce population growth in China and India, but there will be further social effects if you have to live through an 80% male population. That will definitely affect a lot of things. But basically it's a positive thing. His comment about viruses producing involuntary genetic change, even being used as weapons, was depressing. In all, I learned two or three depressing possibilities and one thing that's encouraging, if uncertain.

Dick: The panel on global ethics impressed me with the fact that we need to advance our ethics as well as the technical aspects. I dwell more on the technical. But keeping the thousand-year horizon in mind, it may not be global ethics in terms of the Earth, but interstellar galactic ethics.

Facilitator: I was struck by your comment that we may be under observation by extraterrestrials who could judge us to be immature. They may think we are a virus and keep us contained in the solar system.

Glenn: Plan's working, isn't it?

Facilitator: Other things about views changing? What do you intend to learn going forward?

Werbos: One more comment about our views changing: it's very hard for humans to think about the long-term future in a coherent way and try to incorporate that into their lives. That's one of the lessons of the workshop.

Koelle: Especially since we're covering more or less everything. The structure of the workshops and the backgrounds of the participants are not necessarily broad enough to cover all the issues.

Facilitator: As you reflect on the Foundation's work, we'll come back to that. The dilemma is, if you think all the factors are important, how do you cover everything thoroughly? Anything else that you intend to learn going forward?

Glenn: You need a short range to balance the long range.

Facilitator: Thank you, Jerry.

Heylighen: I wouldn't say I want to learn something specific but I want to get a wider picture, because, as you said, there are so many factors. The first thing you have to do is make a huge list of all possible things that might affect the future, then try to reduce it, and continue following the research on the few factors that I hadn't known about before—the climatic flip-flop and the brain mechanisms that Terry Deacon spoke of.

Facilitator: Good.
Kellogg: I am still convinced that Earth will not be able to continue supporting our enormous population. We’ll run out of things; we’re already overfishing the oceans and changing the climate. Those are small things, indicative of our future as we continue to devastate the planet. The wild card will be how people adapt as the planet degrades. I don’t know whether it’s optimistic or pessimistic to say that the human race will modify itself in a very big way to deal with this new world.

Wells: Absolutely. I’m intrigued by this whole idea of conscious evolution. Evolution is typically thought of as being reactive rather than proactive. It seems to me that the future is a moving target, and to set ourselves thousand-year goals that we should be evolving toward would be impossible.

Dick: We need to discuss the interactions among the factors. What factors will predominate and what is their relative importance? That’s another difficult thing to do.

Facilitator: If you were designing a meeting, how would you look at the interaction of the factors?

Dick: It could be a brainstorming session, tentatively ranking the factors. Who knows what may predominate over the next thousand years, but it can generate some good discussions.

Koelle: Everybody thinks his subject is the most important.

Glenn: There are a variety of methods for ranking them. One is cross-impact analysis. You could set up a grid with the five factors and analyze how one affects the other in importance and degree of impact. It’s not completely objective, but it’s an organized way of structuring their relative importance.

Facilitator: Have any of you used Cowan’s utility function approach?

Werbos: Utility functions, sure.

Facilitator: Would that be relevant for what we are talking about here?

Several: Yes.

Heylighen: Simulations are much more complex than they used to be, but they are still extremely small scale compared to the complexity of something like predicting the thousand-year future of the planet.

Facilitator: How do you feel about Terry Deacon’s simulation imperative? That simulation forces you to be explicit about relationships.

Calvin: You can’t make big jumps; they should be done incrementally.

Glenn: There is a CD-ROM available that has 16 categories of futurists’ methods for ranking. It includes cross-impacting. You can use a variety of methods in combination to clarify your analysis.

Koelle: But the problem is, you can’t do that in a seminar.

Glenn: It could have been included in the questionnaire that was sent to us before we met.

Facilitator: In fact, we’re talking now about trying to develop some thousand-year trajectories as a basis for the next meeting, so put on your feedback sheets any of the ones that you think are particularly useful for design. Keep that in mind as you fill out the feedback sheets. I agree it would have been easier if we had had a synthesis of what your answers would be.

Koelle: It would be better to have a half-hour introduction on certain subjects by experts in that particular field.

Facilitator: That occurred to me in the conversation about global ethics yesterday.

Koelle: Yes, we have some subjects that we dealt with very nicely, and some we ignored. I’m on the technical side. We had no discussions on population growth or energy problems.

Werbos: A lot of what we discussed about the year 3000 is an extrapolation of the same kinds of issues facing us in 2100, but a couple of issues are different. The possibility of fundamental breakthroughs in areas like physics and biology didn’t receive much attention due to the lack of time. The natural selection pressures affecting the human race were discounted. That seemed a little premature, and we talked a lot about conscious evolution.

Facilitator: If you go back to your first breakthrough, what would be on your list to think about?
Werbos: Whether new physics would make interstellar travel possible. Of course, we don’t know the answer, but if it’s discussed and various options and possibilities sound sufficiently interesting, maybe it could be done.

Facilitator: What other kinds of breakthroughs could become possible over the next thousand years?

Koelle: Breakthroughs are speculation. They may or may not happen.

Facilitator: But over the next thousand years; now it’s a hundred-year conversation.

Koelle: Right, but how do we take that into account?

Werbos: If you think there’s a possibility of a breakthrough you might invest money in research. Am I organizing research, paradigms, and systems in a way that encourages breakthrougs, or is this more likely to stay hypothetical? That’s one aspect.

Facilitator: Actually, the levels of uncertainties in certain problems and opportunities would be a great discussion topic.

Kellogg: A breakthrough, almost by definition, is something that we don’t anticipate. But isn’t your question how to design our research so that it will lead to breakthroughs?

Glenn: Create enabling laboratories. The breakthroughs still require knowledge. For example, Newton and the law of gravity. You don’t invest in apples to get a breakthrough, but you invest in the knowledge that creates Newton’s brain, and he comes to a conclusion about gravity. You can create an enabling environment. You can also create a culture that says a creative thought is a good one versus one that says it’s silly.

Koelle: Is that feasible in a seminar?

Facilitator: Yes, given the right conditions. One of the techniques for our next seminar is to set up some of those trajectory scenarios before we meet. So, back to our questions. How about problems and opportunities?

In the past, warring groups have temporarily united when confronted with a bigger external threat...extraterrestrials from space would be a useful invention.

Calvin: Something like this might cause a social breakthrough. In the past, warring groups have temporarily united when confronted with a bigger external threat. In that sense, extraterrestrials from space would be a useful invention.

Facilitator: The Independence Day scenario.

Werbos: Coming back to the year 2100 horizon, suppose we developed telescopes—and we’re working on them right now—that were powerful enough to detect the presence of life on Earth-sized planets around other stars. We would announce their existence, but we wouldn’t know their intelligence level. This would open up many possibilities. There would be a huge amount of speculation as to how intelligent and how threatening that newly discovered life-form would be.

Dick: In one option, human destiny is to fill the universe with life. In the other, it’s to communicate with all the life that’s already there.

Werbos: We should be able to develop the technology to do that in ten years.

Glenn: This sounds like the old competition between transportation and communication. They ended up doing both on this planet with CB radios in cars. So we’ll probably do both.

Facilitator: So do we populate the universe, or do we communicate with the intelligent life there?

Interstellar travel becomes much more important if you are going to populate the universe.

Dick: Interstellar travel becomes much more important if you are going to populate the universe. But if there’s a universe full of extraterrestrial intelligence, then that has much broader applications for humanity because of all the things that it implies.
Facilitator: In terms of what we can learn from it, or because we feel threatened?

Dick: That gets back to what I was saying about priorities. If there’s an asteroid that wipes out the Earth, then we don’t have to worry about the other problems. But if we find ourselves in communication with intelligent extraterrestrial life and are able to absorb all their knowledge and wisdom, that’s going to affect everything. So that’s a large, general factor.

Koelle: That’s a very keen assumption.

Dick: You have to consider probabilities if you want to narrow it down.

Koelle: Fine. Contact is one thing. Second, how can you assume that you would get their knowledge or transference?

Dick: You can’t assume it. You have to talk about different scenarios.

Werbos: You don’t know how friendly they’re going to be.

Dick: That’s right.

Facilitator: We don’t know if they will be any more mature than we are.

Glenn: Which brings me to another factor. Do we, or do we not, use weapons of mass destruction effectively?

Facilitator: Here or there?

Glenn: Here. There’s a variety of scenarios, but do we use weapons of mass destruction effectively? If we do, then all that’s wrong.

Facilitator: If we use them, can we expect somebody else to use them on us?

Glenn: No! I’m talking about domesticated primates.

Werbos: To kill ourselves off.

Glenn: Yes. You’re talking about factors. You’ve got breakthroughs in physics and extraterrestrial contact in a variety of ways. Well, one factor is the effective use of mass destruction weapons, if we use them.

Facilitator: This reminds me of Isaac Asimov’s book. I think it was called Disasters. He rated the disasters in order of importance, in terms of killing off humanity as a species, and then the planet as a whole.

Lim: The book is called A Choice of Catastrophes.

Dick: There’s an even better one by John Leslie, a philosopher, called The End of the World: The Science and Ethics of Human Extinction. He also prioritizes them. It’s come out within the last couple of years.

Facilitator: You can bring a hypothetical forecast for trajectories, with the factors ranked by importance, to a meeting and discuss them in terms of opportunities to secure humanity’s future for the next thousand years. What opportunities has the conversation elicited or reinforced for you?

Lim: We need to distill from, and synthesize, the individual trajectories of different civilizations into one general trajectory for mankind. We can hope to see only fifty to one hundred years into the future, and after that, it becomes pure speculation. So for the distant future, as was mentioned, we need to synthesize paradigms. We’ve covered such diverse topics as the cosmos, conscious evolution, and the human condition. Once we have a consensus on the paradigms, we can try to influence others.

Glenn: Of course, we’d like to have interactivity between paradigms and the specifics because they would change our paradigms.

Several: And should change.

Lim: Quite right. We should come to an understanding so that all futures research would be directed, in a broad sense, toward that goal.

Wells: If we include everything, then there’s no point in synthesizing, and if we weed out too much, then it’s so diffuse that it’s worthless.

Werbos: It would be nice if we could feel that we were working on different pieces of the same picture instead of competing pictures. I visualize networks when I think about these issues, and not all of them are relevant to me personally, but at least I see the connections and this part of the network that we’re discussing now. On the other hand, in some of the discussions yesterday on ethics, I could see a contradiction between the ways the topic was approached. Some people said, “Let’s have rules on how to be good boys,” versus the other session where they said, “God, if we don’t do this, we’re all going to die.” I
don’t see how these rules for being good boys are going to keep us alive. Maybe we need to resolve where we are in the larger picture, and when we are losing something because of an inherent contradiction.

Facilitator: What would you want to do for the next seminar?

Glenn: A normal scenario exercise through a repeating questionnaire. We’ve done this with about 300 people around the world, so it’s not an academic exercise.

Facilitator: Can you explain?

Glenn: That scenario exercise is done. The Committee might want to review it and adapt it for their purposes. Then they would do a quick literature or process review, and build on it. For my exercise, we sent out a variety of norms in order to make a normative paradigm, and then had people evaluate them. We ended up with the key norms. It’s a process to get at the question.

Facilitator: Would that provide an initial base for today’s conversation?

Werbos: I don’t want to make any strong statements about how to do this, but one possibility is to do a diagram of the interconnected factors. Then the Foundation would solicit feedback from the people here, and others, and come up with a more precise consensus of how the dynamics work. The consensus would be resubmitted back to the original people and reevaluated until the sectors could be pulled together with more substance.

Facilitator: We’ll have to think about that.

Heylighen: We had discussed many of these factors in the abstract to arrive at the most important ones. It’s some kind of broad picture and then you look at the details and have specialists fill in their areas of expertise, and continue to correct and fill in the picture. If you don’t do something like these two suggestions—top down and bottom up—you might end up with something that’s so vague and so general that it becomes almost trivial. Everybody will agree about that. You would say that the ultimate goal should be survival of humanity. If you go from a general theory and go down to the complete picture, you’ll have a continuous interaction between the general and the comprehensive.

Werbos: In a formal mathematical model, you come up with a simple description and see how it differs from reality, progressively adding complexity where you know it’s justified. But this is not a formal modeling exercise. The last thing we want to create is a differential equation model. This is closer to an inferential model of the future. Maybe some of the lessons of the formal mathematical approach might be applied in creating an inferential model of cause and effect.

Facilitator: Our inferential model is absent a structure from which to hang, so it’s a meeting/methodology issue. But if we take just what we found on your society, you went through a chain and ended up with society. Global ethics have a lot to do with society. But then I hear you say that in each of those ladders, from Adam to society, the detail is the different types of society, the different operating characteristics. Is that what you want to look at: the different operating characteristics of society?

Heylighen: I want to see how societies emerge from the lower level and which things might emerge from society. You see some kind of a process where you have emerging complexity through some process of evolution. If you understand the logic, you might use that to build an abstract model that lacks details. You search for the details and verify them. I think that’s the way that science in general works.

Wells: No, I think science does work like that in some cases. The early stages of most sciences are observation. It’s only when you begin to collect these observations that you see certain unified themes.

Heylighen: But the more popular view of science is to emphasize observations rather than the theory, while it’s often the opposite way. It also depends on the
type of science—in biology, for example, you usually start with observations. In physics, you usually start with a theory and then you go to the observations.

**Lim:** Concerning that framework, to what extent are we helpless and subject to selection and competition for life? You cannot deny that competition is necessary to progress, but competition also requires that there’s some carving away. Eventually humanity’s destiny is something less than what we were talking about originally. Are we just talking about DNA?

**Calvin:** On the social scale, complexity is not necessarily what we get. We might get a vast simplification. If there’s so much power out there, in computer networks and such, that the immature or the demented can misuse it, there may be enormous pressure to be restrictive and to have a societal structure that makes it safe for people to live in the cities without being exposed to terrorism. That could give rise to a vast simplification of the social structure. A very top-down, heavy-handed one, probably.

**Glenn:** But they break sooner or later.

**Facilitator:** We haven’t imagined the nonauthoritarian, secure future yet. That’s a breakthrough set of possibilities that we haven’t even begun to speculate on.

**Dick:** We’re not talking about the long-term future of humanity, but scenarios, many possible scenarios. We can’t determine the long-term future, but we can determine long-term scenarios. And we haven’t discussed the importance of history. History is the sum of human experience and in talking about the trajectory over the next thousand years, we need to think about the trajectory over the past. That limits it to some extent.

**Facilitator:** Let’s switch to the question of suggestions for the Foundation. What could the Foundation do to assist in securing humanity over the next thousand years?

**Glenn:** Create those alternative scenarios.

**Dick:** Make use of history.

**Koelle:** Second, have a more specialized structure for some of the issues. A two-day workshop on specialties.

**Facilitator:** Yes, that will be coming.

**Glenn:** While keeping up to date on what’s already going on. It’s ludicrous if someone says we’re going to take a look at the future, when you know three months ago, there was a meeting that was far superior, and everyone knows it.

**Koelle:** That’s a good point. Does somebody in the Foundation keep track of similar work?

**Facilitator:** No, I don’t think there’s an equivalent of a research director.

**Glenn:** You mean here at the Foundation?

**Facilitator:** Yes.

**Werbos:** Oh, I thought you meant a contact outside the system.

**Facilitator:** No. What else would you advise the Foundation?

**Heylighen:** To condense the collected information into an understandable form so it’s available to as many people as possible, both on a worldwide website where the information is complete and published as books and articles. At least have the information in one central place, in a high-quality form.

**Facilitator:** Other suggestions?

**Lim:** Regarding the image of the Foundation. The world has lots of groups believing in creation. The Foundation, judging from its brochures, has pitched itself as pro-evolution, almost anticreationist. Most contemporary religions would find their teachings compatible with a theistic evolution that does not have to reject the notion of God. That’s important because, ultimately, if the Foundation is to have an impact on world leaders and the masses, an anticreationist stance might unnecessarily alienate a large segment of the world’s population. Perhaps the Foundation might want to stay somewhere in the
middle, so that participation has nothing to do with one's belief in God and creation.

**Glenn:** But that's the case now.

**Lim:** I mean the perception the Foundation gives of itself.

**Glenn:** My philosophy in dealing with 60 different countries is you don't even address the issue unless you have to.

**Dick:** But the Foundation's icon is the cosmic evolution, which, in theistic terms, can be anything.

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I would distinguish between creationism and religions. There are a lot of religions that have no problem with evolution.

**Heylighen:** I would distinguish between creationism and religions. There are a lot of religions that have no problem with evolution.

**Glenn:** What percentage of the world's population really believes in a six-day creation?

**Wells:** You're not talking about just Christian creation; you want to include other ideologies.

**Calvin:** It's fundamentalist.

**Heylighen:** The position of the Christians is that they are against evolution?

**Glenn:** Yes. And in the Islamic religion, we learn from the whole universe, so it's a constant learning process. There's a fundamental group in all the religions; that's true, but it's a smaller percentage than most people think. There's a sympathy to fundamentalism in ethics because the rate of change is going so fast. They're saying: Let's hold it for a second and think about what we are doing here. That's not the same as a higher power saying that science is wrong. I find that people confuse these two groups.

**Heylighen:** At least we believe in scientific methodology.

**Lim:** Yes. Focus on that.

**Facilitator:** That's why the cosmic evolution icon is perfect. We don't have to answer questions on the nature of consciousness before the Big Bang.

**Glenn:** That's right.

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**Facilitator:** Which might actually be an interesting question for a two-day seminar. Any other advice to the Foundation?

**Glenn:** I didn't like being in a meeting with such hard-core creationists. Why did we need to discuss whether to take the long-range future seriously? That should have been dealt with somewhere else. And we jokingly said it couldn't be done very well. Okay, fine. If you want to do a hundred-year future, then have a hundred-year future. If you want to do a contemporary critical analysis, then that's fine. But if you say a thousand years, then let's do it. My feedback to the Foundation is that participant selection is as important as process design. Too much time in this meeting has been in justifying the mission.

**Facilitator:** Okay.

**Kellogg:** I took part in the Delphi Study at the Rand Corporation many years ago. The idea was to get a group of people to pontificate about certain futures, and then distill the wisdom out of it. I noticed that if the people responded individually, such as writing out their best guesses to questions regarding the future, then you got a set of answers. But if you put them together in the same group, you got the opinion of the dominant personality. Maybe that dominant personality was the brightest one, and there was nothing wrong with his opinion, but it would be very difficult to follow the dynamics of a dialogue.

**Glenn:** Maybe both ways should be tried in the same meeting. The Delphi method with individual responses and discussions. Sometimes it takes a dominant personality to make a decision that will forward the discussion. The two different results can be cross-referenced. Then the weakness of one is the strength of the other.

**Dick:** You could make a case that the next seminar should be entirely independent of us and see if they come up with the same thing.

**Facilitator:** I think we can, and the next time they can stand on a much better platform. I'm sensitive to Jerry's criticism. For years, our institute discounted Delphs until we saw people like Jerry and Bill Hallal. But let's switch onto the next issue. What did you like about this workshop and what would you change?

**Koelle:** Would the next seminar have the same setup in principle?
Facilitator: The Foundation will probably be doing two seminars a year for the next thousand years. But in the near term, there will be a meeting in September that will feed into the year 2000 meeting. So, you can aim this toward the next seminar.

Koelle: The results depend very much on the expertise of people who attend. Remember our first meeting, where we tried to establish the problems? The time was much too short—in one hour, you cannot establish all the problems and then select five factors to represent them.

Facilitator: So you'd give time adequate for the task?

Koelle: Yes, if you follow the same procedure and the next seminar isn't restricted to certain subjects.

Facilitator: And we can synthesize and feed back participants' input before the meeting.

Dick: I had a similar, more specific comment. A lot of time and the focus of this meeting were on the three questions, which was fine. But we spent about ten minutes deciding on those three questions. There needs to be a better method or more time spent on choosing them.

Koelle: Yes, definitely.

Calvin: Choose them for the next meeting. How about picking exotic sites for the meetings, like the edge of a volcano?

Koelle: More time for the task, more time for the task selection.

Facilitator: More time for dialogue selection.

Koelle: Less time for dialogue selection.

Glenn: The management of this workshop was excellent. Considering it's a relatively strong-minded gathering, it was extremely civilized and well-paced. It drove us and gave us a lot of positive feedback. And the idea of doing a couple rounds of questionnaires, rather than getting certain information in meetings, is great.

Koelle: Would you address the same problems in the next seminar, or are you planning to go on to other problems?

Facilitator: That depends on the advice that comes out of here. The seminar should benefit from the learning, both the input and the process, that has gone on here. They may take these pieces and go further, or there may be other ones. Any other feedback?

Heylighen: I thought that some of the people here felt quite at home, while others did not. Based on a reputation, it's difficult to know beforehand how effective or interesting a person will be in a meeting. I have no idea how the selections were made, but I suppose there is space for some improvement.

Facilitator: So we need a screen for people who can't listen to others?

Heylighen: No.

Glenn: For example, you can use questionnaires or a literature search to pick out those who might work well together. People had different orientations to the question of how to approach predicting the long-range future. They could have been grouped together through a preparation process before the beginning of the seminar.

Heylighen: That's true. If you have the topics beforehand, people could select those that interest them the most.

Facilitator: All right. It's been great spending time with this group. We'll carry this forward. Bob will make sure I get it right when I present it.
In the closing session of the seminar, the three facilitators presented summations of the final affinity group discussions, followed by final reflections from participants and closing remarks from the leaders of the Foundation For the Future.

Facilitators: Sesh Velamoor
Glen Hiemstra
Clement Bezold

Moderator: Karen Armstead

Participants: Plenary Session

Foundation Officers: Walter P. Kistler
Robert A. Citron

Closing Session

Sesh Velamoor (Facilitator): We’re ready to reconvene. I’m sure the other groups will have some fabulous things to say, but the session we just had was absolutely wonderful. Let me get started again with reference to the questions. First, we started with personal reflections on how the conference had gone in terms of the participants’ own frames of reference and what had changed for them, if anything. I think Allen Tough felt even more strongly that the concept of thinking about future generations has to be an extremely important signpost in whatever we think or do or plan about the long-term future. Let me read what Clive Gamble said: “I came as a blank sheet of paper. Realized collective end reasoning does not come easily.” But now he is prepared to say that he had never considered many of the issues that came up here. For him, it’s been educational. Walter Anderson came away from having a sketchy rough draft of ideas about the future to a more robust set of ideas about thinking in a thousand-year framework. And Barbara—it was actually a profound expression that Barbara made. She said: “I got more short-ranged.” She pulled back from her future focus. She said imagining came so easily to her that when she started to think about everything that was focused on the present, she realized that she needed to pull back a little. Not a lot, a little. She used an expression concerning the “density of the present,” and the facets of the important insights required for thinkers for the long range. I think that’s a wonderful transformation.

Then we went on to discuss what the group considered to be critical factors that had to be the basis on which we think about our long-term future, what some of the requirements are. The first one: without optimism, there is no need to do any of this. A shared system of global ethics. How do we relate an internal, ethical guidance system with a collective view of what is desirable, acceptable, required? We have to get used to the idea that big changes have to take place, and we must have the capacity to cope with the fact that we will constantly move between certainty and uncertainty. Creativity, I think, was Clive’s suggestion: really explore it into the future, understand the fact that the creative process will lie at the heart of any success as it relates to the long-term future. And, once again, Allen saw the applicability of the same notion here as well as the care and consideration of future generations. Walter made the point that so far we have been dealing with the ideas of visions or belief systems or wisdom traditions in terms of the given, whether it is the Ten Commandments or the Prophecies or the visions of the great leaders. We are now confronted with the possibility of those things being made by ourselves, and that is something of critical importance in considering the long-term future.

Anderson: That’s better than I did. But there is the environmental dimension as well as the cultural.
Velamoor: And inclusive of not only the visionary aspects of wisdom handed down, but also that the environment and the cultural aspects must be taken into account in the context of what we consider to be given and not what we have the opportunity to create.

When we started talking about problems and opportunities, we got around to the idea of maybe having an easier time articulating this in terms of the dilemmas of the present. We came up with many things, but perhaps where we need to start is with the idea of evolution itself. Is it something we can direct? Again, I think coming from Barbara, she said that the conference made her think, given the considerations of the issues of the present, whether it is conceivable that there is such a thing as directing evolution. Discussion took place along this vein and Clive used the metaphor of Noah’s Ark to describe what should be a frame of reference that we should use going into the future, thinking about the future. Evolution left alone is Noah’s Ark simply floating.

But human involvement in the evolutionary process has something to do with this, so if we conceive that the evolutionary process is an evolutionary process, there’s not much we’re going to change. What we can do perhaps is, instead of accepting the evolutionary process as being a random walk, make it less random. So the thousand-year future or thinking about the thousand-year future is an effort in making Noah’s Ark less random.

Another dilemma of the present, having to do with what Terry Deacon pointed out are the problems and opportunities, and the way to put them into context, is the simulation imperative. As Walter said, we must improve our skills in doing simulations given all the variations and variables, because that’s the only way. In other words, we are stuck with the scientific method. There is no escape from the fact that simulation requires taking the present into account to the best of our ability rather than simply choosing some objective and hoping that it’s going to happen.

Another dilemma of the present is the nature of human beings. What does the future hold in taking into account, or putting into consideration, all the thinking about the future as it relates to the nature of human beings? Barbara commented that quite often, when she goes into groups, she asks a question—Barbara, what was the question?

Hubbard: Why do we tend to misuse power?

Velamoor: And why do human beings tend more to do with…?

Hubbard: The feeling of separation from each other, and can we overcome that separation within ourselves in order to handle this power?

Velamoor: You used a single phrase for a question. Why do we screw up so much? Or something to that effect.

Hubbard: What’s wrong with us?

…we must promote whatever we can do to increase and maintain diversity and differentiation, because that’s what feeds the mill of evolution…

Velamoor: What’s wrong with us. A thousand-year future simply cannot avoid that issue. You must take that into account: what’s wrong with us. That is a huge dilemma. While we are all noble, we are also savages. On the one hand, the tendencies for atomization, as Professor Tobias pointed out, the notion of individuals, the notion of rights, the notion of privileges, the notion of being autonomous, and yet the imperative of dealing in the collective. In terms of looking at what is good for the larger group, all of that is a dilemma for the present. Finally, the idea of power and responsibility and institutions and organizations and individuals and how to hold the area of power and responsibility.

What could the Foundation do? I think we came up with some pretty good ideas.

In terms of securing the future, it looked like what the group was saying is that the idea of communication, the idea of learning, the idea of understanding is probably the most important thing we can do to secure the future. The more people on Earth know about it, the better off we will be. That has to do with increasing the connectivity of individuals, the empathy, or, as Frederik would say, whatever it takes to be nice and pleasant with each other. Increasing the probabilities is an important point that Clive made; in fact, probably the most important way evolution
succeeds is in making sure that diversity and difference do indeed exist. So we must promote whatever we can do to increase and maintain diversity and differentiation, because that’s what feeds the mill of evolution, and this would increase the probability that we will be around for the thousand-year future. In addition, find the common way to talk about these things, meaning a language or a system or a model that bypasses cultures and biases and value systems to some objective way of dealing with it.

What could the Foundation do? Suggestions included building alliances with groups already involved in the long-term future. I pointed out that we were doing that, but some recommendations were Malta, Kyoto, and the Long Now Institute for Social Innovation to increase the critical mass of the groups of people dealing with the long-term future. Another suggestion was for the Foundation to be a repository, a clearinghouse for all of the methodologies being used around the world by individuals, institutions, and organizations as they relate to the study of the future.

A third recommendation was—and this was Barbara’s point—that there are all kinds of experiments going on in almost every area around the world connecting people or relating to communications or education or community involvement or whatever—for the Foundation to see if it could not again be a collection/distribution point for these innovations taking place around the world.

Finally, Walter’s point was that in practically every profession there are codes of ethics already being defined. The Foundation could be a source for making these available so that it would be a helpful tool for whoever is entrusted with the responsibility of defining global ethics, which really came out to be one of the most important things as far as the thousand-year future was concerned.

And finally, I jumped to the ceiling, touched it, and came back down when they said to keep doing the wonderful things we are already doing. Thank you.

Glen Hiemstra (Facilitator): I will report for Group No. 2. That was George Cowan, Jim Dator, Howard Didsbury, Ashok Gangadean—who has gone home, Seymour Itzkoff, Yersu Kim, Rosaleen Love, and Frederik Pohl. We said some things that I found both interesting and valuable. We tackled the five questions and our participants generally agreed that they did not come to earthshaking new learning. There was some incremental learning for most, perhaps all. There was a sense of value in the effort to look back and look forward, and a sense of hope that we can learn how to do this better. Yet there were fascinating new things learned, including the discovery that perhaps for some of our group there are more dangers in the next thousand years than we have admitted or paid attention to prior to this meeting. That was a discovery that seemed worth paying attention to.

The second thing that was fascinating was a worry that arose for some—and we had quite a discussion about this—that there are a growing number of Luddites or neo-Luddites. A worry that there may be conflict between people here who express a lot of faith in the future despite the dangers and neo-Luddites around the world who…fear the future…
ethics, with the focus on the process of talking about the ethics as the real key.

We also returned to the starting point for this group. When the group first met several days ago and was asked what the key factors were, the first thing was the gap between the haves and the have-nots. This time, we came back to that and highlighted the need to approach that problem around the world. It was perhaps expressed best by Howard, who commented that there probably would be a great number of developments to benefit wealthy, smart people. He also questioned whether that would be widespread, although others in the group argued that it would be. That was a useful point.

To secure humanity’s future, we must focus on the importance of basic ethical values and the processes for doing so. We must balance the needs of future generations as well as past generations. We have to indemnify against this problem of haves and have-nots. An interesting point was made that even among the haves, there is a great sense of lack of significance and lack of faith in the future. There is a sense that we have given up on the future, even with so many people who are affluent with the capacity to gain access to the kinds of technological and scientific developments we are talking about. Even then, there is still a lack of faith in the future from those people, and the question was a matter of how we can inculcate a sense of significance and faith and hope in the future.

Then a separate but not insignificant point in securing the future was a question of whether we needed to buy insurance policies against catastrophes like meteors and widespread diseases. In terms of what the Foundation can do, maybe we really do need to make more specific efforts to develop insurance policies for such situations.

I’ve mentioned that the Foundation could focus on consensus-building around ethical values and principles, with a focus on that process. There was a second thing that the Foundation could do. While the group saw that there was a certain value in having an eclectic group of people with a range of expertise discuss what the key factors are for the future, they also agreed there was a certain limit in the value of that. A certain number of these meetings are fine, but at some point, the Foundation may benefit the most from focusing on a few factors and pulling in groups of experts, even though that does have the danger of the loss of the systemic view. There will still be the need to take a more in-depth look at some factors, and that was a point that most agreed to.

At some point, one of the specific factors raised was the need to take a hard look at global governments. Maybe the Foundation would like to take that on, because other kinds of institutions find it more politically dangerous to do so, whereas an organization like this may be able to tackle that issue and deal with it in a way that works.

I think that covers it. We were also invited to make any closing comments. I would say that it was a real honor for me to have the chance to play the roles that I did. I have long believed that if human beings don’t go back enough in memory or far enough forward in hope, our present will be impoverished. This was a wonderful experience. With the weaknesses and strengths that we clearly had in this meeting, it was a wonderful experience in demonstrating the value of attempting to go back as far as we can and as far ahead as we can so we can discover a richer present. It has been a great privilege to do that with you. Thank you.

Clement Bezold (Facilitator): In our group, we went around and asked how our views had been affected. One participant commented how difficult it was to focus on the next thousand years. Some said they had been more worried about the future before they came to this meeting, while others said that their views specifically about humanity and about the evolution of humans had been advanced. We agreed that the future would be strange, and the thousand-year future would be much stranger than we thought coming in. We took a poll about whether we were more or less certain about the thousand years than when we started. In the group, one person was more certain, six were more uncertain, and two were unchanged.

Hiemstra: Change could be average, remember?
Bezold: Change could be average, right. In terms of factors, some people commented that there was enough to worry about that we should really be scared. We talked about the oceans, climate control, social stresses, and the potential rate of change being a factor. We mentioned genetic influences, both in terms of reducing populations and in terms of global ethics about what to do with population. We talked about weapons as a major factor, ethics advancement, and even the difficulty of learning what to do as a factor.

In terms of what we intended to learn going forward, we agreed to get a wider view and cluster what we've learned, in effect starting with a new and broader list. Other things to learn included conscious evolution, focusing on what factors will dominate. Another factor was that Earth can't continue as it is, as we're running out of resources. We discussed the likelihood of brain mechanisms evolving. We mentioned ethics advancement; one of the factors involved in that included a question of whether it would be global ethics or intergalactic ethics, and that in itself was a factor.

We discussed problems and opportunities. There are a variety of both. We discussed what human destiny issues are and whether we can understand those more clearly. That would be helpful in sorting those out. We discussed raising the importance of interstellar travel. We questioned whether we should learn from it or be threatened by it. Both are issues that are, in fact, problems and opportunities.

We spoke of a great opportunity existing, but we questioned how we would pull it together, to distill ideas, synthesize them, and broaden trajectories.

We spoke of a great opportunity existing, but we questioned how we would pull it together, to distill ideas, synthesize them, and broaden trajectories. We have an opportunity in these conversations and beyond to really understand the next thousand years in how to do that. We also talked about one level that may or may not be specific—forecasts in understanding about paradigms or major models for thinking things through. We talked about whether we can move toward a worldview of shared understanding and recognizing that we're all working on the same pieces.

The other issue we discussed was about there being a variety of opportunities for creating breakthroughs. We talked about fundamental issues, like breakthroughs in fundamental physics, that might make faster-than-light travel possible. It raised the idea that there is a list of breakthroughs of things that are as yet unknown and things that are a little more known—what do you do about those? Jerry Glenn made the comment that you create enabling environments, and if you knew that Isaac Newton was going to discover gravity by having an apple fall on his head, you wouldn't necessarily fund having more apples around. But you would fund a creative, enabling environment that made people more ready to discover them. So, that's a whole set of priority issues.

In terms of suggestions for the Foundation, we talked about a cross-review of the critical factors and also having subject introductions by experts—how you would put those on the table in meetings like these or in general so that people know that they're out there. Issues of natural selection and other scientific work need to be dwelt upon, as well as more on conscious evolution: build on this scenario's data and then go further. There's an argument whether to start with the top down or whether to use more specifics when we're probing. Those are different approaches to go through.

We discussed whether we should have an inferential model for the future. We discussed whether the Foundation should actually encourage multiple modeling activities. There was an argument about creationists and religion, and whether that was something that you don't need to deal with on one level. On another level, the advice was for the Foundation not to position itself so that those opposed feel it necessary to write it off—but there is all the difficulty that implies.

There was an argument that we should make effective use of history, the last thousand years up to this thousand years, as we look at the trajectories. There was another topic in terms of participant selection. One of the issues raised is the difficulty of talking about the next thousand years when you have to justify doing it, and that part of the selection for
people at the meeting is that they want to look at the next thousand years and understand that’s part of the task.

We decided we needed to convince the Foundation of the importance of covering more conclusions without losing the richness of this discussion. Also, we needed to keep on track in terms of what was going on out there. The Foundation should consider the capability of making that better known in the various areas that it takes.

Then there are cautions in the sense of how you know what’s most important. Further, we discussed that the Foundation could condense information, and that’s possible in two ways. One is to make known what’s going on, become a bulletin board for the best thinking going on about the long-term future. The other way to condense information is to disseminate the information in its own articles and books.

In terms of the suggestions for the meeting itself, people liked the questionnaire, and they liked the way the meeting kept moving. They liked the people who attended. There was excellent seminar management in terms of the facility and the pace: it was well-paced and well-driven. In terms of suggestions for change, they came up with more time for the selection of tasks in terms of the dialogue, more time to determine if we are looking at the right tasks. Decide ahead of time what the important issues are from participant feedback. In effect, synthesize the participant feedback and use that as a way of starting the group a couple of steps ahead.

Other suggestions included more exotic locations—the rim of a volcano was one suggestion. Improved selections. Again, the question of, if we’re looking out a thousand years, how do we make sure that people are open and willing to do that? Produce a content piece ahead of time but keep it concise. Those are just some of the suggestions, and again this was a warm-up for the individual stuff.

In terms of my own closing comments, both as a facilitator and an Organizing Committee member, I love facilitating meetings; it’s the opportunity to bring out wisdom, and what a group to work with! This has been just fantastic. With those of you whom I knew before and those whom I didn’t, it’s been a real treat, and I’ve learned much and been heartened by the range of things that we can know. So as a facilitator it’s been great.

As a member of the Organizing Committee, we’re very committed to the Foundation For the Future because we think it will make a significant contribution. I think that this has been an important first step without any discomfort about going out the thousand years, and a real significant one. It will contribute to the next seminar; it will contribute to the Symposium next year, and my sense is that the Foundation’s commitment to look at the next thousand years is special. It’s been great. Thanks.

Karen Armstead (Moderator): The last thing I want us to do is spend a few minutes during which any of you who would like to make comments to the group can do so, and then we’ll close. We’re not going to keep you in here while you are thinking about these other issues, but I would like to have you have some time, if you’re finished, to be thinking about this. We are also asking you to be mindful of the time and not say too much. If you want to say anything specifically to someone, please do it personally afterward. Your final thoughts do not have to be specifically about any of the topics. Would someone like to make a comment to the rest of the group?

Anderson: Well, this seems perfect. At breakfast, Fred Pohl raised the question of what a conference like this would have been like in the year 1000, thinking about the future. We reflected on some of the realities of that time: no serious concept of evolution, no discovery of the New World, no Copernican Revolution. The landscape they lived in was entirely different from the one we live in now, and the process that we are evolving in now is that the universe seems to keep getting bigger and we keep looking further into the past and we keep looking further into the future. We have emerged out of our holes into a much wider, and in some ways frightening, big world of time and space. This is a part of all that.
Calvin: I have no doubt that if I were transported back a thousand years, I would recognize familiar personality types among the princes and peasants I met. I don’t have that feeling about a thousand years into the future. I am quite sure that if I saw their newborns that they would look just like newborns today; the biology wouldn't have changed. But the adolescents and the adults would have attitudes, concerns, and values very different from now. On the other hand, they would be us, transformed by our values, our technology, and the institutions that we’ve created. Those institutions would be those we create for softening conflict and institutions that we create for having visions and addressing concerns about the future.

Hubbard: I have to comment on my deep appreciation of the relationships that I experienced here. I’m sure others did as well. Although this is the last time this group will meet, I hope that there will be many different groups that the Foundation brings together to keep the meaningful relationships going.

Moderator: That’s great. Let me respond that it’s not the last time this group will meet. We hopefully will see all of you again in 2000. In addition, there are ways you will be supported through communications, email and otherwise. Supporting your ongoing dialogue is a critical part of what we would like to see happen, and I know you’ll hear more.

Dator: We must find some way in which we can tie ourselves more directly along the lines that we just heard about to future generations and to people a thousand years from now. I am reminded of something that I learned from one of my Hawaiian graduate students. Throughout the entire course, she had talked about the importance of genealogy. In Hawaii, certain people are very good at knowing their own genealogy and they are very proud that they know it, and they hold as inferior those Hawaiians who don’t. What does that have to do with the future, you may ask? It was utterly uninteresting to me, since I know nothing about my genealogy, and since I don’t, I am uninterested in anybody else talking about it. But when she made her final presentation in terms of the importance to the future, she pointed out something very interesting that has happened recently. There has been a great Hawaiian cultural renaissance and a concern about the overthrow of the Hawaiian kingdom a hundred years ago. A lot of attention has been paid to that, and there has been a reinventing of the past in Hawaiian culture that’s extremely important and very volatile. One of the things that is happening is more and more Hawaiians are tracing their genealogy to find out about their ancestors around the time of the overthrow, and find out which side they were on. A lot of them have gotten surprising news on that score, and they aren’t quite as proud of their ancestors at that particular moment as they thought they would be.

And that, finally, is the key I’ve been looking for. We need to be concerned about our genealogy and what future generations will think of us in terms of what we’ve done today. So I’d like to suggest that the Foundation somehow start a genealogy among us so that in a thousand years, they could look back at what we were doing today and the future generations could determine whether we did a great thing.

Dick: I know at times I sounded like a broken record, but I think it’s important in thinking about a thousand-year horizon that we consider cosmic evolution. I think cosmic evolution would be perfect as an icon of the Foundation. In the next thousand years, we will know more and more about where we fit in and how very commendable that would be.

Gamble: I came to the seminar with very little idea about what I was going to get out of it because I rarely consider the future on this kind of time scale. I think what I got out of it is very much that the future on a thousand-year time scale is potentially knowable, which is a concept I am actually trying to come to terms with. To put it into some sort of context, in the East End of London we’re finishing this Millennium Dome, which is our national celebration of the year 2000. There has been tremendous discussion as to what should go into this dome. What is going into
it is completely short-term in the exhibits and a very immediate experience to have people go away with a good buzz. One of the things that I was advocating should go into this dome was some sense of history and achievement as to how we got to build a dome in the first place and how that sense of genealogy that Jim just talked about was going in there. I’d like to conclude by saying that I think it’s a pity that it wasn’t a group like this planning what should go into the dome on the sort of time scale that we’ve been discussing in the last few days.

**Moderator:** Anyone else? I want to say that we have two people here at the Foundation who led this whole process. Donna Hines has provided, in my mind, where all this took place—the exterior, the facilities, the connections, and the nice treatment you had. The person who has done the other significant part is Sesh Velamoor, who has been the person responsible for the content, in the sense that he envisioned it and understood it and worked with it. Carolyn Hobart has supported him in this process. The two of them, in addition to the other staff, deserve considerable credit. This has been a very ambitious undertaking conceptually, not just the logistics, and I think we need to give due credit.

**Velamoor:** And none of this would be possible if it weren’t for two people who are already at the year 3000, looking back and saying, “Come on, dummies! Let’s get going!” It’s been my privilege and pleasure to have been associated with those two people for many years, Walter Kistler and Bob Citron. They are the heart and soul of the Foundation.

Before I give the microphone over to Bob and Walter for the closing remarks, I want to make sure that our Organizing Committee members stand up to be recognized for the content of this. The credit doesn’t belong to me; it belongs to these brilliant minds that sat around tables for meeting after meeting after meeting to help us get to where we are today. Thank you again.

**Citron:** I’m glad that Karen and Sesh went through all the thank-you’s because I wouldn’t have done it just the same. I always leave out important people. Walter and I are very pleased with the results of the first seminar. As I said the first day, this is the first of what we hope will perhaps be 1,000 or 2,000 seminars during the next thousand years. This is a momentous event for us. It accomplished virtually everything that we had hoped—not solving the problems that will have the most impact on the future of humanity, but just the methodology of putting on a meeting like this and trying to squeeze out the essence of what to do over the next centuries.

I think we did a good job of laying the base for that. Just getting a sense of who the participants are, what your thoughts are, what your feelings are about the most important factors, and having the dialogue progress were more important to us than any of the outcomes. It’s an interim process and we’ll be doing this year in and year out for decades and for centuries. As soon as we end this, I want Walter to express his feelings also, but we had a lot of requests and I’ve sat through many meetings with people asking questions about the Foundation, what we are planning to do, what it is we are in the process of doing. So we thought we’d take a few minutes, opening it up to questions that you might have about the Foundation. I’ll give you a brief overview of what we’re doing.

Humanity 3000 is a very significant program of the Foundation, but it’s only one of five that we have started. We have a research grant program where we accept proposals for research on the factors affecting the long-term future of humanity, and we give grants in that program. That’s an ongoing project that is just getting under way now. We have an education program for science teachers; we have our first workshop in Seattle for some dozens of science teachers, sponsored by the Foundation and run by Tufts University’s Wright Center for Science Education. The Science Teachers Workshop is on the importance of the concept of cosmic evolution in science education. We also have the Kistler Prize Program getting under way, which you’ll all hear more about. Walter Kistler has endowed a prize of $100,000 each year, with an award ceremony similar to the Nobel Prize cere-
mony, for the individual or group of individuals or institution that has made, in the judgment of a panel of experts in the field of genetics and genetics-related research, the most outstanding contribution in that field.

We also just established about six months ago a new center called the Center for Human Evolution and have already had two important workshops. The first two workshops were on the evolution of human intelligence, and we are planning to convene a series of additional workshops. We’re also planning to have workshops on a number of these factors as they’re identified during the seminars. As we go forward, we have a workshop in July in Hawaii, with about a dozen scholars, astronomers, and cosmologists—people interested in the search for extraterrestrial intelligence. The Hawaii workshop will focus on the impact of extraterrestrial intelligence, or what the impact of communication with extraterrestrial intelligence will be on human culture in coming centuries or millennia. We are planning to have a workshop on nanotechnology, and as different factors are identified by you and the other participants, we will focus on specific workshops of experts to look at subjects from a scientific point of view and let the experts propose research in that field or fields. Walter, would you like to add any closing remarks?

Kistler: I’d like again to thank the participants in this meeting. Thank you very much for the interest you showed, that you made the effort to be here. That’s very gratifying for us at the Foundation. We think we exceeded our goals and we are very happy about the results. We hope that you, as participants, have felt the same way.

There may be a question in some of your minds about whether we achieved what we set out to achieve. Did we define the factors clearly; did we find the trajectory of all of humanity’s future? Some of you may feel we are not quite there yet and certainly we are not, but we’ve only just begun. We wouldn’t even like to have solved all the problems at this point. What would we do at the next meeting? So that’s why we are not at all questioning whether we are satisfied. In fact, we are happy at the questions that have arisen, and we hope you feel the same way.

In looking at the future and the past fifty years or so, the gap between the haves and have-nots has clearly become delineated, and I anticipate that there will be the tendency for this gap to increase. Normally, in the past, the ones who are smart and more capable have been able to get even smarter and even more capable through more education. In the future, who knows how that’s going to work? It is possible that through genetic engineering, the rich and smart will be the ones who can afford all the coming benefits, while those who are backward, less capable, and less than wealthy may be less able to get all these benefits. So the gap is bound to become even greater, and that may be one question we have to think about. It’s a problem that will stay with us and will continue to be an unending struggle inside the human community. I’ll leave you with that. Thank you again.

Citron: Does anyone have any additional questions of Walter or me about the Foundation or our plans for the future? I was delighted to see that among the suggestions about what the Foundation should be doing, 80% are already either in the process or in our plans…
Appendix I

Seminar Agenda

April 10, 1999
Foundation Offices in Bellevue, WA

• Reception and opening remarks.
• Introduction of the Foundation For the Future and its mission.
  Walter P. Kistler
  President

• Introduction of Foundation For the Future programs, Foundation Board of Advisors, Humanity 3000 Organizing Committee, and Foundation staff.
  Robert Citron
  Executive Director

• Expectations for Humanity 3000.
  Sesh Velamoor
  Deputy Director, Programs

April 11, 1999
The Inn at Semi-Ah-Moo

• Opening remarks: Seminar design, seminar rules, participant roles, and seminar outcomes defined.
  Sesh Velamoor

• Each participant addresses the large group: self-introduction, personal statement on long-term future and greatest concerns and opportunities.

• Three preassigned groups of participants meet separately to identify factors critical to the long-term future. Each group identifies three to five factors and associated topic areas that need further discussion. Each group develops a working draft for presentation to the large group.

• Plenary Session: Five-minute presentations of working drafts by each of the three groups. Discussion and synthesis of working drafts.

• Identification of consensus topic areas drawn from lists provided by the groups.

• Participants sign up for small groups of five persons each that will focus on six separate topics.
April 12, 1999
The Inn at Semi-Ah-Moo

• Plenary Session: Summary of Day 1 proceedings and agenda for Day 2.
• Participants meet in six groups according to previous day’s sign-up. Discussion of topic areas.
• Each group presents a summary of individual topic areas as other groups listen.
• Discussion to agree on three major dialogue areas of problems and opportunities based on proceedings thus far. Participants sign up for dialogue groups.
• First group dialogue; others listen, followed by large-group discussion.
• Second group dialogue; others listen, followed by large-group discussion.
• Photo Shoot, all participants.
• Social Hour.
• Lecture by Dr. Phillip Tobias, “What Can the Study of the Past Teach Us About the Future?”

April 13, 1999
The Inn at Semi-Ah-Moo

• Third group dialogue; others listen, followed by large-group discussion.
• Summary: Critical problems and opportunities.
• Each participant drafts his/her own personal statement about the thousand-year future, based on Humanity 3000 experience.

April 14, 1999
The Inn at Semi-Ah-Moo

• Plenary session: Summary of Day 3 and agenda for Day 4.
• Original three groups of participants reunite to draft answers to the three critical questions.
• Plenary session: Discuss, draft, and edit to arrive at a single consensus statement.
• Personal statements: Each participant makes brief remarks. Completion of evaluation forms.
• Closing remarks.
  Walter P. Kistler
  Robert Citron
On the evening of April 13, after a full day of discussion sessions, the Foundation took advantage of the opportunity to conduct an interview with two participants, Jerome C. Glenn and Francis Heylighen.

Glenn is an international consultant and lecturer on futures subjects, Executive Director of the American Council/United Nations University, and co-director of the AC/UNU Millennium Project on global futures research.

Heylighen, who was trained in mathematical physics, is a researcher at the Free University of Brussels, focused principally on the evolution of complexity, studied from a cybernetic viewpoint.

The interview was conducted by Sesh Velamoor, Deputy Director, Programs for the Foundation For the Future.

Velamoor: Good evening, Jerry and Francis. Let’s start off by each of you addressing the following: As you have gone through your life…to me it’s always been important as to the convictions that you develop over a lifetime, convictions that are non-negotiable, irrevocable, and that get solidified as you go, based on learning and so on. So, with reference to the long-term future, what would those convictions be? That’s Part A of the question, and for Part B, perhaps reflect on the profound influences that had a bearing on your arriving at those convictions. Francis?

Heylighen: As far as convictions are concerned, I would say that my first convictions were not about the faraway future; that’s kind of logical…the kind of thing you start to think about when you’re 14 years old. But those convictions, we could say, have shaped my philosophy, have shaped all my scientific work. Basically it’s the idea of evolution, the idea that there is something like a variation and natural selection, which together produce something that’s productive, that’s organized, that’s somehow better than what used to be before. That is a conviction that I have had from a very early age.

Velamoor: Continue.

Heylighen: …that there is some kind of a progressive mechanism that is based on the very simple idea of variation and natural selection. Starting from that, I have obviously been interested in biological evolution. Being trained as a physicist, I have been trained to apply that to physics, to physical evolution. At a certain moment I got in touch with cybernetics and systems theory, which kind of upset these ideas, a way to take them away from either the biological or the physical or the psychological elements, and look at systems or organizations in general. And then it still turns out that these same ideas of variation and selection can be applied to organization in general. What I finally came to with regard to the future is that there is something that’s afterwards—it’s not my term but something my collaborators called the

It is that in systems through evolution there is complexity that tends to develop. But this complexity does not just develop slowly and continuously…
metasystem transition. It is that in systems through evolution there is complexity that tends to develop. But this complexity does not just develop slowly and continuously, but tends to make discrete jumps to a higher level, to a higher level that we call the metasystem. Hence, the idea of a metasystem allows you to distinguish a number of important steps in evolution; for example, the origin of life, the origin of multicellular organisms, the origin of animals, the origin of people. For example, people have undergone a metasystem transition with respect to the animals. They are reasoning at a level where animals simply cannot imagine that there is something like that. Then the logical next step is to say that probably there is a system level beyond the human level, beyond the level of what I call rationality or symbolic thinking.

Velamoor: Obviously, then, I would think that Darwin was directly or indirectly a major influence for you. Anybody else in the thinking realms, in the literature, or people who taught you?

Heylighen: Not so much in teaching, but there is one person who has had quite a big influence. It’s Donald T. Campbell. He’s a very famous methodologist of social science. He’s the person who invented the concept of evolutionary epistemology. By coincidence I came in contact with his ideas. I read his paper. I recognized a lot of the things that had been preoccupying me, and he had developed a number of concepts that I could apply. Later I had the chance to work with him for a short while. Unfortunately, he died two years ago at the age of 79, but we still managed to write one paper together.

Velamoor: All right. And you, Jerry?

Glenn: People who influenced me?

Velamoor: Well, the convictions that have now become irrevocable, nonnegotiable. And the influences, the major influences in your thinking, in your life.

Glenn: Okay. One is that I really am hostile toward fatalism, the idea that there is one view; that it is all preset. Coupled with that is the idea that there’s nothing new under the Sun. Another conviction I have is that there is value in the mystic attitude toward life. And that this is not in contradiction with technocratic management of life. These two sides seem to be about as far apart as one could imagine, but as far as I’m concerned, I would like to have a world with technocrat management and attitude toward knowledge. But I would like to have it not only that; I would like to have the mystic attitude toward that management. So the attitude one would take in the management I think is a good balance, that I am pretty sure I don’t want to give up on my friendliness and shared consciousness with the mystic side of the house. Not mysticism or occultism, because that’s when they turn the mystic experience into ideology and they kill people over it. But, at the same time, the technocrats really do understand how to get things done and that shouldn’t be surrendered either. It seems to me that there is a way to have a flow of relationship between these two, and I think that the future minds around the world will be able to have this relationship. Some of the influences in this, I would say, are probably Timothy Leary maybe, on the more mystical side, and Herman Kahn more on the technocrat idea. Both of these people were considered to have extremely high IQs and also tremendous throughput of knowledge, yet both had very different orientations.

Timothy was looking at the opportunity side of the future, and Herman was looking at the security side. They were doing different jobs, and they both liked each other. Their fans didn’t necessarily know that. But they were just doing different jobs, and that understanding that there is a flow between these two houses (the mystic and the technocrat) should be understood by people. I don’t have a whole lot of tolerance when people say, “Well, you’re this; you’re therefore not that.”

Velamoor: Is that a conviction that you intuitively sense is the right one? Or do you see that in logical terms, as one extending into the other or evolving into the other? You mentioned Timothy Leary. One of his contemporaries also is a fellow who writes under an Indian name, Ram Dass, also a colleague at Harvard…

Glenn: Yes.
Velamoor: ...who writes brilliantly, even though from a very scientific bent of mind, but very, very Eastern in his outlook. So the question I’m getting at is this: this synthesis that you—I would call it a synthesis—you know, the Eastern mystic view, not so much at variance with the technocrat view. Is that like a satisfying of an inner need? Or….

Glenn: Yes, for me it is. Yes, very much so.

Velamoor: Is that out of feeling a sense of alienation, living in and pursuing the technocrat side and suddenly discovering, hmm, you know, this longing, this need, this craving is instantly or suddenly satisfied and the lights go on?

Glenn: In my own life I believe they grew up together. I grew up in a mystic household in the sense that mystics were friends, meditation was normal, thinking “right thoughts” was how you keep healthy. I mean, it was nothing fancy; it’s just that those were our orientations. At the same time, we had four test pilots, two on one side of the family and two on the other side. It’s like engineering and….

Velamoor: The milieu was perfect.

Glenn: It was just a normal thing. When someone says, “Well, if you’re this, you can’t be that.” I say, “Why not?”

On the one hand, he was espousing this inner need, the need for compassion…And yet…he was saying that evolution is not all that compassionate.

Velamoor: It’s interesting that you state that as a conviction. One of the observations I had of this—coming back to work, what we’ve been doing for the last two and a half days concerning the three-thousand-year future—and I’ll phrase it as ambivalence. Let me explain this and then maybe you can react to it. The ambivalence. I take Terry Deacon, for example, a theorist on evolution. Again, I’m sure you don’t discount the notion that the evolutionary basis is the basis for most things that we’re familiar with. But yet, throughout the conference of Humanity 3000, Terry Deacon was struggling with precisely the same thing. On the one hand, he was espousing this inner need, the need for compassion, the need for listening to the inner voice—I’m paraphrasing the sentiments that he was trying to express. And yet, in the same breath, he was saying that evolution is not all that compassionate. There is a brutal side to evolution. There is a side to evolution that simply discards what is not appropriate.

Glenn: Right.

Velamoor: Is this the normal state for a mind that on either end has stretched and reached its limits, and perhaps it’s nothing more—and is it symbolic, is it representative of our civilization itself? Take it from that particular to the general, both of you, would you?

Glenn: I think one of the misunderstandings…to me, the mystic is one who’s had an experience or experiences of the world, universe, divinely or consciously, interconnected and so forth. And out of that experience one sort of loves their friends and is nice and so forth.

Velamoor: Play together.

Glenn: Yes, play nicely together. Perfectly fine. Now, the mistake is when you tell it to somebody else and they want to turn it into metaphysics. The mystic is the one who had the experience.

Velamoor: That’s right.

Glenn: Once you turn it into a metaphysical certainty, then it calcifies into a cult and rules and BS.

Velamoor: Right.

Glenn: Now, this is where I think Terry and others will have problems, because they know that there is this mystic who’s such and such, and his fans say, this is how the universe works. And Terry says, but that’s not how the universe works. So the thing is, from the mystic you take the attitude toward the universe but not the metaphysics of the universe.

Velamoor: Or the package that is put out.

Glenn: That’s right.

Velamoor: Because the critical point you’re making is that essentially that view is really not something you describe; it’s an experience.

Glenn: That’s right. And from that experience you have an attitude toward life, and that’s fine. After all, many of the mystics don’t get into—many of the great mystics never even wrote, for crying out loud.

Velamoor: That’s right.
Glenn: So the idea was, it was the being of the person and not a bunch of, like, here’s-how-the-universe-works sort of person. I think one of the great mistakes in religion is that they say ethics is based upon a particular metaphysics: Be good or else you go to hell. What about being good for being good, period? And don’t argue about whether there’s hell. That’s an irrelevant point to me. And the engineer over here says: Look, here’s how the universe works. We work on how the universe works. But, unfortunately, as we joked about it earlier, the engineer doesn’t always have the most joie de vivre. Imagine if you were going to have a party of a hundred engineers and another party of a hundred mystics. Which party would be more fun? So what you do is you take the attitude of the mystic and move it over to the engineering party and everybody has a good time.

Heylighen: For me, also, the idea on the one hand, the mysticism, and on the other hand, I wouldn’t call it engineering or technology, I would call it science. I think that those two attitudes are also very much related, because I was saying that I come to the conclusion that somehow there is a mechanism that will lead to a transcendence of the human mode of cognition, that’s basically symbolic language.

You have a number of symbols; they are primitive concepts. You cut up the universe in a number of discrete units. Those discrete units you can combine by a syntax into sentences to make new combinations of ideas. It’s a very creative process. You can make new combinations that have never been made before, but you are limited by the units you start with. The words of your language—they are given to you; you do not invent them. The distinctions you make in the world are kind of fixed. What I believe both the mystic and the scientists do is they start to question those distinctions. What the mystic does is very radical. The mystic tries to get rid of all distinctions. The mystic tries to experience the whole. He tries to have a kind of a perception where those hidden goals, those in greatest…. 

Velamoor: To become, as it were.

Heylighen: Yes…are kind of pushed away. The scientist is a little bit more careful. The scientist will question all distinctions. There’s a scientific method. The scientific method is: do not accept anything. Build a new theory. The new theory has new concepts. Try it out. If it works, okay. If it doesn’t work, throw it away. But even if it works, always try to refine, always try to find new ones. And what in the end it leads to in science is metascience—not only what is the ultimate theory, but what are the best methods to make better theories? And then you get things like artificial intelligence, or cognitive psychology, which are not so much about how the world is outside of us but how do we make models of the world and how do we make those models better and better? That is the issue with engineering: how to improve upon the things we have? That’s what both sides have been telling us, both the mystic and the scientist, is that you do not start with a fixed set of concepts and assume that that’s how the world is. You always try to question and go beyond the boundaries.

Velamoor: So the outcome, it appears, is where, in a sense, the two meet. There is a unity in that they’re not really contradictions.

Glenn: My feet don’t contradict my hands.

Velamoor: So let’s examine this a little bit. Why is it, then, that it’s almost always that these two sides are in either/or propositions?
Glenn: Okay. One of the conclusions out of 20 years’—now 30 years’—worth of futures research is that prejudice, prejudging the future, is the key problem. I tried to figure out if there was an idea to beat prejudice, like Martin Luther King’s idea of we shall overcome—and that we had to have an image of a nonracist future in order to make some progress. So I wondered: how do we have an image of nonprejudice in general, not necessarily race prejudice or age prejudice, but prejudice in general? Prejudice is really a false concept, when you think about it. You don’t know the future so you can’t prejudge it in that sense. I tried to look for the largest prejudice I could find, and the largest one I could find was the toolmaker and the consciousness sharer. The mystic tends to be the one who says that you’ve got to solve the problem by education, by shared consciousness, by love, and so forth. And the technocrat says, no, you’ve got to solve the problem by laws, legislation, tools, techniques, and widgets, and so forth. That prejudice does seem to hit all cultures. I don’t care where—you can go to India and you’re going to find toolmakers.

Velamoor: Sure.

Glenn: It’s not just an Eastern/Western thing. It cuts across all systems.

Velamoor: Right.

Glenn: And why is that the case? I could speculate, but others will be able to speculate better. What I am interested in more is how you get the toolmaker to make peace, so to speak, with the consciousness sharer and vice versa so that they all…the strategy to resolve that is the following. The toolmaker says: my tool will work. Don’t give me this consciousness jazz. You know my methods will work. My models work. I know how biology works. Don’t give me this metaphysical jazz. So the mystic can surrender on metaphysical certainty, and the engineer can accept that he’s boring, so to speak, or that there’s no meaning or value without the mystic experience. If they can both surrender on those two things and say, I need the mystic attitude toward life…. In fact, the great scientist Einstein and others all talked about thought experiments—what the hell is thought experiments but a mystical attitude? If the strategy is they both surrender a bit, both use each other’s things, then I think we can get the coherence and reduce prejudice in general. Why has it evolved like that? The anthropologist historians can give a better answer.

Velamoor: If we were to look back in time to perhaps the 1500s and before, you might think of that time frame as the time frame of those mystical traditions. It’s what I read the other day, it’s the Baconian paradigm of the last 400 years that creates the subject/object distinction, and then one becomes a matter of study. The whole idea of the linearity and the cumulative nature of progress, and that nature is there to be understood and manipulated, and so on and so forth, is where that partition, that separation, seems to have occurred, even as the Baconian paradigm is now reaching its limits. You mentioned Einstein a little bit ago; you talked about metaman and so on. It seems to me that Einstein’s theories didn’t disprove Newton’s theories. They simply built on them.

Glenn: That’s right.

Velamoor: Newton’s mechanics work within a limited frame of reference. Einstein’s theory works in an even larger frame of reference. Are we suggesting then—are you suggesting then—that metaman or the mystic conception of reality or mystic conception of whatever is of any consequence, is inclusive of, not necessarily in opposition to, that it is a stage, it’s another elevation of the comprehension of what this is all about?

Heylighen: I think that actually the theory of relativity is a good example, because in the theory of relativity you have a four-dimensional space/time continuum. Newton says you have the three dimensions of space, and you have the one absolute dimension of time. Newton reduces things. Newton makes an axis through space and time and says…. You must make a reduction, but you should at the same time be aware that this one reduction is just one among the many.

Heylighen: …that is space, this is time, and that’s all. If you have to make it, which you will have to do if
you want to do measurements, you should be aware that these are relative. You can take one axis and call it time, and then the other axis you call space, but you should know that somebody else might choose a different axis and say that’s time and then that is space. In a sense, that’s what happens if, on the one hand, you have this holistic perception. There is a whole that cannot be of use. On the other hand, practically you want to get solutions, so you work with reductions. You must make a reduction, but you should at the same time be aware that this one reduction is just one among the many. The genius of the theory of relativity is that it shows you that if you make one reduction—if you make one cut through space and time—it tells you how you can transform it into another cut. So it gives you at the same time the viewpoint of one observer and the viewpoint of another observer. This is an example just for space and time, but I think that the whole of science should go toward that kind of model. You should have a view of the whole, which can never give you anything concrete unless you make a particular cut to it. But then the moment you make that cut, you should know that it is just one among many and you should know how you can transform it into a different one if you want to look at it from a different point of view.

Velamoor: So, coming back to the long-term future, or the next thousand years, and coming back to the evolutionary reference, the frame—if indeed this progression or direction or whatever it is (I don’t want to load it with value by implying it’s good or bad)—but if that path has to take the evolutionary route, what are the things that are jettisoned? Who is jettisoned, if anybody?

Heylighen: I think that in this case the evolution we should look at is not the evolution of individuals, but the evolution of ideas. If you think in the biological world, some individuals are fit to survive; some are unfit; they are eliminated. What we are speaking about is ideas that are fit and ideas that are unfit. Ideas that are unfit are eliminated, meaning that they are forgotten; people who hold those ideas give them up at a certain level.

Velamoor: Correct.

Heylighen: The fit ideas are the ideas that if one person has them, he manages to convince others, and those others will convince others further, and so on. So a fit idea is an idea that will eventually spread over the whole of humanity. An unfit idea is an idea that will die out. So what I do expect is now, with much better communication—and that’s an aspect we haven’t even touched upon, the enormous capacity now of communication media. Ideas that have been created anywhere on the globe, which for some reason are better, are fitter, explain more…

Velamoor: …will be instantly available to anybody else.

Heylighen: …will relatively quickly be able to conquer the whole of humanity. These ideas are really obviously more useful.

Velamoor: True.
**Heylighen:** It will be very difficult for those people who disagree with them to hold on to their idea. For example, you might have some kind of a fundamentalist religion that says that people should not use modern medicine, should not drive in cars, should not use televisions. It may be possible for a short while in a small country to keep that kind of an idea...

**Velamoor:** Eventually they’re going to disappear.

**Heylighen:** …but eventually people who see what the result is of this ideology and who compare it to the ideology that says that medicine is useful, they will choose. They will say, no, I would rather go to a hospital when I’m ill than die and hope that God may possibly cure me.

**Velamoor:** Let’s explore this just a little bit more and then maybe we can move on to something else. Let’s simply take six billion people, and presumably in the next 50 years it’s probably going to be 12 billion or 18 or whatever it is.

**Glenn:** The estimate has just dropped down to 8.9.

**Velamoor:** I read that. So let’s take any number. At least it’s larger than today. For the sake of this discussion I think that’s more than adequate.

**Glenn:** Yes.

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**What’s going to change this hierarchic organization of human beings?**

**Velamoor:** Is it going to look like a case of these eight or nine billion that—to come right down to the mundane—that something that is described in the bell curve, for example, the aristocracy or the meritocracy of the smart with the smart; that the collective humanity has evolved into a grouping of people that are super smart who basically are calling the shots, a metaman on the fringes, whereas the rest of humanity is like it is today—in other words, what’s going to change that? What’s going to change this hierarchic organization of human beings?

**Glenn:** Well, it’s already changing, quickly. The big phenomenon in management worldwide is moving from hierarchical organizational structures to networks. That is empirically demonstrable in all kinds of societies. And the purpose of networking is to defeat the hierarchy.

**Velamoor:** Jerry, I’m not sure that I’m communicating real well. That’s not what I mean. By the flattening of the hierarchies, I don’t mean in terms of how decisions are made or how power is distributed and so on. That, I agree with you, is happening. That’s not what I meant. What I meant is, let’s take the case of the culture that I come from. Will the caste system disappear?

**Glenn:** Yes.

**Velamoor:** Will the caste system disappear on an economic basis, or will the caste system on who I was and what I was born into disappear?

**Glenn:** Yes, but new phenomena may reappear. I mean, if it’s correct.

**Velamoor:** That’s what I’m getting at. Will there be a new caste structure? And if so, what will it look like?
Glenn: All right. Well, one, if it’s correct that the current theories of complexity—as complexity increases, the attractors create self-organization and new emergence—if that’s the case, then at least it’s more complex, and new organizations will come out of it. The idea of the old castes will not seem to be there. Will they create new castes? I don’t know, but you can certainly make a little bit of a parallel. You have less of a caste system culturally, institutionally, say, in places that are sort of like the United States. You still have some layers, obviously, and you’ve got prejudice—there’s no question—but they didn’t push for titles and they didn’t push for those sorts of things. So there are different kinds of self-organizations, but it was very primitive at that point. If that analogy works, then you should have new kinds of social organization functions. My own feeling, though, is that the self-organizational stuff in itself will be so complex, there won’t be simple organizational structures coming up. I expect an extremely complex future that will seem so easy and simple because the individuals become their own phenomena much more. So that if you look at the totality, it’s extremely complex and hard to understand, but the individual is quite graceful and smooth because they’re creating their own reality, almost solipsistically.

Heylighen: I think I understand the question in a different way. I think, if I understand it, that you would get a larger differentiation between the people who know and the people who are ignorant, between the haves and the have-nots on the intellectual level.

Velamoor: Correct.

...multimedia computer technologies will make it possible, in principle, for people to learn to read and write without any teacher supervising them.

Heylighen: The danger is certainly there. I think on the one hand positively it will become easier and easier and cheaper and cheaper to educate people. For example, multimedia computer technologies will make it possible, in principle, for people to learn to read and write without any teacher supervising them. That is a positive thing. On the other hand, there will also need to be some kind of a political system where people will want to put in the money to at least help the more difficult-to-educate people. I think there is still some room left for the ideologies, because I see what is happening in my own country. In Belgium, universal education from the earliest age for free and of good quality is something that is generally accepted, and nobody would dare in any way to question that. And it works. There are very few people in Belgium who really are unemployable because they have no education—and their numbers are diminishing. While in countries like the United States, where there’s much more a question of individual responsibility and the government is supposed not to intervene too much, I see that there is a problem. There is a large group of people who simply get such a poor education that they are virtually unusable for anything except the simplest tasks. So there is a difference. Some countries will tackle it differently from others. I think that we should be aware that it is worth investing in education. I heard some voices that were very critical about that, saying that it has been tried out, that we have put lots of money in education, and it didn’t work. Maybe there was not enough money put into it, or maybe it was not done very efficiently.

It almost seems like a contradiction in that if the future holds that promise, then we wouldn’t need an ethical system.

Velamoor: A thought crossed my mind. When we’re talking about metaman or this thousand-year future, which eventually leads to this coincidence of the mystic, the experiencing of being or becoming, not in contradiction to the technocratic way of how things are done—about the need for an ethical system, a system of ethics and so on. It almost seems like a contradiction in that if the future holds that promise, then we wouldn’t need an ethical system. An ethical system would be necessary in the short term.

Glenn: Because there will be ethical consciousness, you mean?
Velamoor: Yes. Because of the fact that in the short term, that gap is pretty wide between those that are able to function in both realms quite satisfactorily or efficiently or efficaciously, and a large majority of us that are not able to do that. So, in order to protect the interests of the future generations, as someone might put it, describing it in terms of the environment being destroyed, the need for a system of ethics actually becomes more of a short-term issue. If we’re simply saying that there is an inevitability to this, even taking into account that it’s an evolutionary process and we don’t even have to be instrumental in making it happen, if there is an inevitability to it, it’s the short term that we need to be concerned about. In a lot of ways it is the transitions that are far more critical than actually making the eventuality occur, because the eventuality seems inevitable.

Heylighen: I think it’s also a problem in…when you speak about the future, people tend to automatically subdivide into the optimists and the pessimists. The pessimists say that we can’t do anything about it; everything is going down the drain. The optimists say that everything will go for the better. But there is also a more pragmatic view, which is, if we do our best we can make it very well, we can create a very good future, but we still have to make an effort and we have to work hard. In working hard, as you said, the first part is developing an ethical system. I don’t know whether it will be called an ethical system. It may get different names. It may be called values, it may be called a worldview. It might even be called a new religion—whatever. But I think that one of the first urgencies—and that’s what I put in my statement about what are the essential factors—is that we develop something like a coherent worldview through some kind of a system of values that everybody can more or less agree with, and that allows us to coordinate our actions so that they’re not working against each other but with each other.

Velamoor: Let me stop you right there for a minute. Isn’t there the likelihood that that, too, will evolve?

Heylighen: Of course.

Velamoor: I come back to this: if we subscribe to the notion that the evolutionary process is what’s going to get us there, because that’s what has got us to where we are, not only in a biological sense but, as I would concede in terms of what you have said, whether it’s the survival of ideas or the carrying forward of memes, or in whatever dimension you look at, the evolutionary process is what’s going to take us to wherever we end up....

Glenn: Let me jump in. The image of the evolutionary process “taking us,” for me, is less instructive as an image. I think, if ever there was much in the past, I think increasingly it’s like we are with the evolutionary process. We are creating the evolutionary process.

Velamoor: Oh, I would agree, yes.

Glenn: So that was a little caveat there.

Velamoor: I agree. I’m granting that we intervene; we actually are conscious of the fact that that is the process. We are also aware of the fact that we have a role to play in how all this unfolds. But what I’m getting at is, this notion of a conception of the totality of the human population, the conception of the totality of the Earth and so on, in the short term, in the medium term, seems to me to be not such a realizable goal.

Glenn: Yes, but you can show we’re doing that.

Velamoor: Of course we are. Technology....

Glenn: The astronaut looking at the Earth. The ecology movement. That’s very clear.

Velamoor: True.

Glenn: I mean, that’s very clear.

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One of the things that I understand about evolution is that it doesn’t have foresight, one, and two, it is an incremental process.

Velamoor: It’s already tending to that. But most of the inputs to the evolutionary process, even given the constraints of ideology or political forms or the economic systems, differences around the world, they’re taking place in a localized sense. Not that there is any harm in being instrumental or defining what is right or what is appropriate. If those things get into the main stream, the river of evolution still flows. There are two things that it results in. What I’m saying is that the need for an overall grand design, is it necessary? What I’m saying is that as long as each of us, in terms of our ability to intervene, even given what we conceive to be right or wrong at any given point, making the moral choices or the ethical choices, con-
strained by the ideologies and the governments and the systems that we live in, it contributes to the evolutionary process. One of the things that I understand about evolution is that it doesn’t have foresight, one, and two, it is an incremental process. At best all it does, is able to do, is to look at a set of circumstances, and say, ah, this is the path of least resistance; this is the best compromise. If I could assign mind to the evolutionary process, that’s how it seems to work.

Glenn: Let me see if I understand where you’re going: Do we create a whole ethical system, a whole world system, and go for it?

Velamoor: Exactly.

Glenn: Now, my own view is, give it a try. You probably can’t do it, but the process of doing it makes you smarter.

Velamoor: And that, too, is an input to the evolution process.

Glenn: Right.

Velamoor: That I got.

Glenn: So it’s like it’s a direction but not a neurosis: don’t assume you’re going to get it, but go in that direction because you’ll do better. But don’t make it a neurosis.

Velamoor: It could be a tragic outcome if we have that magnitude and that importance assigned to where we are, to the grand design, and getting frustrated by the fact that it doesn’t happen.

Glenn: Right.

Velamoor: It could be a bigger tragedy.

Heylighen: Yes. That’s always the danger of foundationalism or, in other words, fundamentalism, the idea that you have the fundamental truth and we all have to stick to it.

Velamoor: Correct.

...an ethical system should interiorize evolution.

Heylighen: What I would like to inject again is an idea I mentioned in the very beginning. It is that evolution tends to go through metasystem transitions, to higher stages. Donald Campbell, whom I mentioned as somebody who influenced me, has introduced as a concept that in evolution the system tends to internalize part of the evolution. It develops what we called a vicarious selector. Instead of just being subjected to the natural selection by the environment, such a system interiorizes selection and creates its own internal selector by which it makes decisions. Because of that, the system becomes much more efficient in adapting and much faster and much smarter. What I suggest as an ethical system should interiorize evolution. That’s to say that as much as we understand about evolution, about both its complexities and its irregularities, both predictable and unpredictable aspects, if we manage to have a theory that incorporates all those things, that theory will be like a metatheory; it will not be a theory that says this is the final proof, this is the ultimate picture of the universe. It will be a theory that says evolution is capable of doing all this and this and these things. It’s a theory of what evolution is capable of, rather than a theory of what the situation is here and now. It is this interiorizing of evolution that I see as the way to build an ethical system. Our ethical system should tell us what evolution is likely or less likely to produce.

Velamoor: Let’s come back to Humanity 3000.

Glenn: We’re going back to 3000?

Velamoor: Yes. Back to the future. We’ve been here for the last three days with another half day to go. What is your sense of the idea of a thousand-year future and the people gathered here; what’s your view or analysis or impression of how we attacked that proposition? Attacked may not be the right word, but how we approached that proposition? Given the fact that this was intended to be a process, the beginning of it, not the—again, going back to what we just discussed, that is to say: don’t define the grand goal and get frustrated because you didn’t
achieve it—we started by creating a set of expecta-
tions that stated fairly clearly that this was a first step
in a process that we are unleashing or unfolding, that
we will continue to carry on. Given that context, any
thoughts? Any impressions? Any recommendations?

Glenn: You did great. My guess is if you were to go to
a World Federation of Futures Studies or a World
Future Society or an International Institute of Fore-
casting symposium, and you had two stop watches,
one to comment about the past, one about the
future, I am willing to bet that way over 90 percent of
all these meetings would be about the past. This one
may have been around 30 or 40 percent about the
future. For me it’s sort of a collective kick in the bot-
tom of a lot of people who think they think future,
but really don’t. So, here you gave license, you gave
permission, you invited people to think a thousand
years, so at least they got a little bit off the dime, and
that’s great. You can talk about a changing process to
make them feel more futuristic. Throw in a little bit
of participant selection, too. Some people really
don’t want us to do the long-range thinking. I’m
pleased that it has begun. I personally enjoyed the
meeting. I’ve been involved in futures research for at
least 30 years, and, as hinted, I’ve been in different
dimensions within the game, more than most, and I
enjoyed it a lot. I thought it was great. You can talk about a changing process to
make them feel more futuristic. Throw in a little bit
of participant selection, too. Some people really
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least 30 years, and, as hinted, I’ve been in different
dimensions within the game, more than most, and I
enjoyed it a lot. I thought it was great. The only other
thing I might say is when you sent out that ques-
tionnaire, which I thought was brilliant, it would have
been nice to feed it back in a couple of rounds. So you
take all that stuff, feed it back to people, and the com-
ments come back—do it in a couple of rounds, so
that by the time you get here, you can get down to
work a little faster. You also may want to have certain
sessions where you say: look, do you really want to
worry about present-tense problems? Fine. You go
over there. You really want to do 3000? You go over
here. And if you start talking about present tense, you
move over to that room.

Velamoor: Right. These are some things that we’re
looking for in the feedback tomorrow.

Heylighen: My impressions are generally the same. I
mean, you have to start at some point, but you
should start in a conceptual way—not just put lots of
people in a room who don’t know really what they’re
talking about and hope that in those two or three
hours something will come up. It might happen, but
most likely it will just remain a lot of interesting leads
to develop. Rather, collect all the different points like
you did with the statements and try to refine them.

Let people see the whole that has been collected, try
to group, try to categorize, to cluster, to see different
things, to see similarities, and develop and build a
system of possible ideas for the future, build it up step-by-step, and actually refine it.

Glenn: Yes. In one of the early sessions in our group,
talking about some direction, that sort of question
kept coming up, and one of the things I said was:
Look, maybe the objective is to make us all smarter. If
you take a cross-section of future-oriented folks and
improve their capacity, that’s good, too—and that for
sure you did.

Velamoor: I don’t know that we stated it quite that
way, but like Terry Deacon keeps saying, if that was
one of the unintended consequences, we’ll accept
that because it was a positive unintended conse-
quence.

Glenn: That’s right. One of the purposes of futures
research isn’t to know the future, it’s to make you
smarter. So if you do that in a group, that’s a good
idea.

Velamoor: Clearly one of the intentions here was to
get people to think with people that think the same
way, then mix them up, and then to bring them back
together to see if there are transformations, if there is
actually a change in the perception. Perhaps, if noth-
ing else, to go back later to say, Hmm, you know, I
listened to some of the stuff that I didn’t know much
about and this is something I’d better look into a lit-
tle bit more, because what it does is enhance my own
perception of what I have been thinking about all
along. If we accomplish that, then I think we will be
quite happy with that. I’ve always said in my past career that progress is a process, it’s not an event.

**Heylighen:** I think certainly on the individual level it’s very successful. For me as an individual, and I suppose for all the others who were there, what you come to such a meeting for is to get new ideas, to hear people with different views, and to hear about things that you have never thought about but that when you hear them, you think: Yes, that’s true, I hadn’t thought about that. In that sense, yes, there are lots of things that I have heard that I have thought: if I really want for myself personally to develop a better picture of the future, I should take that into account. In that sense, it certainly will make all of us smarter. The question is whether also collectively we will be smarter; whether we will be just, again, a bunch of individuals with some new ideas coming out of it, or whether something will remain about which we see the consensus, because that’s always the difficult part, to choose some kind of a consensus.

**Velamoor:** We’ve taken a lot of your time, so perhaps just a quick thought about humanity in the year 3000.

**Heylighen:** You mean my prediction for the year 3000?

**Velamoor:** Whatever. I don’t want to circumscribe it or emphasize any aspect of that. Say whatever comes to your mind.

**Heylighen:** Well, humanity in the year 3000, I think, will be so incredibly different from what it is now that we simply cannot imagine it. We just know that it will, I think, function at a much higher level of complexity and intelligence than anything we have now. The only thing we can say more or less for sure—except, of course, if there is a catastrophe and humanity is wiped out, but barring that—I think that humanity will be unrecognizably more intelligent, more complex, more sophisticated than what it is now.

**Velamoor:** So, barring the catastrophe that you just mentioned, the prognosis is optimistic: we will be around; we’ll be better off in whatever form; but the I or the we or the experience of being human would still be the same.

**Heylighen:** I’m not sure.

**Velamoor:** You’re not sure of that. Jerry?

**Glenn:** Well, if current trends continue—I mean, you can have discontinuities—but, yes, if current trends continue, I expect that the integration of technology will be pretty well complete before a thousand years. By complete, I mean all the way genetically, cytoplasmic genes as well as synthetic genes integration, all the way through to the interconnectivity of humans and technology in every possible way we can imagine, so that you’re really talking about, in a sense, the old mystic dream of experiencing humanity as one. Well, we could actually engineer humanity as one.

**Velamoor:** That’s right. Technologically we have arrived there.

Glenn: That’s right. You know, we could actually talk about the operationalization of the noosphere into a conscious-technology entity that would still maintain individual individuality.
tation. It’s sort of a temporary deal, to me. I think that we’ll merge with that system and in space adapt.

**Velamoor:** To come back to who appears to be sort of an intellectual icon for both of you, Pierre Teilhard de Chardin. Would you subscribe to the idea, then, that what we have seen so far, what we know so far, is not a descent from God, but that what is in the future is an ascent to God—for which he got a lot of trouble in saying?

**Glenn:** I think we both liked Teilhard. The only thing I would add there is I also like Socrates. If truth is staring me in the face, I’m still going to doubt it a little bit.

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**Heylighen:** I like very much Teilhard’s philosophy of humanity climbing up to a God-like state, but I would not agree with his idea of the omega point or of a predestined future. I don’t think anything is predestined, and I don’t think there is any endpoint. It will go on and on.

**Velamoor:** Right.

**Heylighen:** We may achieve something which at present we would call a God-like status, but for the entity that then will be in our eyes God-like, it will be just business as usual and it will aspire to even higher status.

**Velamoor:** I think that’s a good point, and a good place to stop. Thank you both so much.
Walter Truett Anderson attended the University of California at Berkeley and California State University, graduating with a B.A. and an M.A. in political science, respectively. He pursued further graduate studies in political science and social psychology at the University of Southern California. In between his academic pursuits, Anderson also served two years in the U.S. Army, working in a general staff office in Heidelberg, Germany. He has worked in freelance journalism and writing college texts, television, teaching (Northridge, Pepperdine, and University of California at Berkeley), and a ten-year avocation in group psychotherapy. Since the mid-1970s, Anderson has focused primarily on his writing, and has written on many different subjects—biotechnology, postmodern thought, global governance, personal identity—exploring in various ways the big picture of human evolution, the central theme of his thinking and writing. His most recent books are *Reality Isn’t What It Used to Be*, *The Truth About the Truth*, *Evolution Isn’t What It Used to Be*, and *The Future of the Self*. Anderson is also involved with the Meridian Institute and the World Academy of Art and Science. He is currently writing a book about the emerging global civilization.

William H. Calvin is a theoretical neurophysiologist at the University of Washington in Seattle. He is the author of nine books, including *The Cerebral Code; How Brains Think; The River that Flows Uphill*; and, with neurosurgeon George A. Ojemann, *Conversations with Neil’s Brain*. Calvin’s research interests include the recurrent excitatory circuitry of the cerebral cortex used for split-second versions of the Darwinian bootstrapping of quality, the four-fold enlargement of the hominid brain during the ice ages, and brain reorganization for language and planning. He has long been following the paleoclimate and oceanographic research on the abrupt climate changes of the ice ages, hoping to find a connection to the big-brain problem. Calvin has an amateur interest in prehistoric astronomy and the associated archaeology. He recently returned from a stay at the Rockefeller Foundation’s study center in Bellagio, Italy, where he collaborated with linguist Derek Bickerton on their forthcoming book about the evolution of syntax, *Lingua ex Machina: Reconciling Darwin and Chomsky with the Human Brain*. 
George Cowan

George Cowan is currently involved in studies of early mental development in babies and toddlers at the Santa Fe Institute in Santa Fe, New Mexico, where he is a Distinguished Fellow. He served as the founding President of the Institute from 1984 to 1991. Cowan is a Senior Fellow Emeritus at the Los Alamos National Laboratory, from which he retired ten years ago after serving as Research Director. He is also retired Chairman of the Board and continues on the Board of a banking firm. Cowan served on the White House Science Council in President Reagan’s administration. He has received various honors including the Enrico Fermi Award from the President and the E.O. Lawrence Award. He continues to serve on the boards of various research centers, including the Santa Fe Institute, the North American Institute, the National Center for Functional Brain Imaging, and the Center for the Neural Basis of Cognition.

James Dator

James Dator has degrees in ancient and medieval history, philosophy, and political science. Professor Dator’s major area of study is political futures studies, with an emphasis on the design of new political institutions and the futures of law, education, and technology. Dator is Professor and Head of the Alternative Futures Option, Department of Political Science, at the University of Hawaii. In addition, he is Director of the Hawaii Research Center for Futures Studies and past President of the World Futures Studies Federation. He is a Fellow of the World Academy of Art and Science, and a member of Phi Beta Kappa. He was a Danforth Fellow and a Woodrow Wilson Fellow. He is a member of the College of Teachers and Co-Director of the Space and Society Department of the International Space University, headquartered in Strasbourg, France.
Terrence Deacon

Terrence Deacon is an Associate Professor who received his Ph.D. from Harvard University in biological anthropology and is currently directing the expanding biological anthropology component of the Boston University anthropology curriculum. He relocated to Boston in 1992 after teaching at Harvard for eight years. Professor Deacon’s research focuses on the evolution of the brain, and he is best known for his work on the evolution of human language abilities. His new book, *The Symbolic Species*, summarizes this research. He is currently involved in neurobiology using cross-species transplantation of embryonic brain tissue both to study evolutionary and developmental brain differences and to develop new cell replacement therapies for brain damage. He teaches the general introduction to biological anthropology as well as courses related to his particular interests.

Steven J. Dick

Steven J. Dick is the Historian of Science at the United States Naval Observatory (USNO). He studied astrophysics at Indiana University and received a Ph.D. in the history and philosophy of science there in 1977. In 1979 Dr. Dick joined the scientific staff of the Naval Observatory as an astronomer, a position he held until being named Historian of Science in 1989. In the early 1990s, Dick acted as historian of the National Aeronautics and Space Administration’s High Resolution Microwave Survey—Search for Extraterrestrial Intelligence program. He is a member of the SETI Committee of the International Academy of Astronautics and its Subcommittee on Issues of Policy Concerning Communication with Extraterrestrial Intelligence. Dick has written several books, including *Plurality of Worlds: The Origins of the Extraterrestrial Life Debate from Democritus to Kant*; *The Biological Universe: The Twentieth Century Extraterrestrial Life Debate and the Limits of Science*; and *Life on Other Worlds*. Currently Dick is President of the International Astronomical Union’s Commission 41 (History of Astronomy).
Howard F. Didsbury

Professor Howard F. Didsbury holds degrees from Yale, Harvard, and The American University (B.A., M.A., and Ph.D., respectively). Today he is the Special Projects Director of the World Future Society. Didsbury is also Professor Emeritus of History and founder/director of the Program for the Study of the Future at Kean University. An international lecturer, Didsbury is the author of numerous papers on future-oriented topics and the editor of nine pre-conference volumes for the World Future Society including: *Communications and the Future; The Global Economy: Today, Tomorrow, and the Transition; The Future: Opportunity Not Destiny; The Years Ahead: Perils, Problems, and Promises*; and *Future Vision: Ideas, Insights, and Strategies*. Didsbury is also a member of the National Press Club, the U.S. Association for the Club of Rome, and the editorial board of *Futures Research Quarterly*. He is a World Futures Studies Federation Fellow.

Clive Gamble

Professor Clive Gamble received his Ph.D. in palaeoanthropology from Cambridge with his research on the long-term land-use and hunting economies in Palaeolithic Southern Germany, following extensive field research in Italy and Greece. Gamble joined the Southampton Department and participated in a number of joint projects with Colin Renfrew. Gamble was involved in the long-term project of the Klithi excavations in northwest Greece. He is also the author of a number of books including *Prehistoric Europe; The Palaeolithic Settlement of Europe; Timewalkers: The Prehistory of Global Colonization; In Search of the Neanderthals* (with Chris Stringer); and the forthcoming *Palaeolithic Societies of Europe*. 
Ashok Gangadean

Ashok Gangadean is Professor of Philosophy at Haverford College, Haverford, PA, where he has taught for the past 31 years. He was the first Director of the Margaret Gest Center for Cross-Cultural Study of Religion at Haverford, and has participated in numerous professional conferences on interreligious dialogue and East-West comparative philosophy. His primary concern throughout his career has been to clarify the universal logos or common ground at the heart of human reason and rational life. He is Founder-Director of the Global Dialogue Institute, which seeks to embody the dialogical powers of global reason in all aspects of cultural life.

Jerome C. Glenn

Jerome C. Glenn is currently the Executive Director of the American Council/United Nations University and co-director for its Millennium Project on global futures research. Glenn consults and lectures internationally on future prospects for civilization, futures research methodology, conscious-technology, and other future-oriented subjects. He has worked for think-tanks such as the Committee for the Future, Hudson Institute, and his own firm, the Futures Options Room, and is the author of Future Mind and co-author of Space Trek and the 1997, '98, and '99 State of the Future. Glenn was the Deputy Director of Partnership for Productivity International, which was involved globally in national strategic planning, institutional design, training, and evaluation in economic development.
Francis Heylighen

Dr. Francis Heylighen received his university degree in mathematical physics and his Ph.D. from the Free University of Brussels (VUB). He is presently a Research Associate for the Fund for Scientific Research—Flanders and an Associate Director of the transdisciplinary research center “Leo Apostel” at the VUB. The main focus of his research is the evolution of complexity, which he studies from a cybernetic viewpoint. He has worked in particular on the evolutionary development of knowledge. More recently, he has extended the underlying principles to understand the evolution of society and its implications for the future of humanity. He is editor of the Principia Cybernetica Project, chairman of the Global Brain Group, and co-founder of the Journal of Memetics. He has authored some 80 scientific publications and lectured around the world.

Barbara Marx Hubbard

Barbara Marx Hubbard is a visionary futurist, author, speaker, and social architect, currently serving as President of The Foundation for Conscious Evolution. Hubbard graduated from Bryn Mawr College with a B.A. in political science, and studied at the Sorbonne and the Ecole des Sciences Politiques. She was a founding member of the World Future Society in the late 1960s and co-founded The Committee for the Future in Washington D.C. in 1970. Hubbard initiated Project Harvest Moon with the support of Dr. Thomas Paine and Werner von Braun to inaugurate a citizen-sponsored mission to the moon. She is also the producer of 25 SYNCON conferences. Her books include: The Hunger of Eve; The Evolutionary Journey; and Conscious Evolution: Awakening the Power of Our Social Potential.
Seymour Itzkoff

Seymour Itzkoff attended the University of Hartford as an undergraduate major in music and graduate school at Columbia with a major in philosophy. He has taught education, child study, and sociology at Smith College for the past 33 years. Itzkoff has published 15 books on such subjects as philosophy, educational theory, reading and psycholinguistics, social theory, the evolution of human intelligence, and music.

William W. Kellogg

Dr. William W. Kellogg attended UCLA for his graduate studies, concurrently working for Project RAND (later the Rand Corporation). While at RAND, Kellogg received awards from both the American Meteorological Society and the Department of Commerce for his idea of using Earth satellites as weather reconnaissance platforms. Kellogg was a member of the President’s Science Advisory Committee (PSAC), the NASA Space Council, the Environmental Protection Agency, the National Science Foundation, and the World Meteorological Organization. Kellogg also worked on the World Climate Programme in Geneva, which resulted in the first World Climate Conference. Kellogg is a one-time member of numerous National Academy of Sciences committees, including the Space Science Board (for which he collaborated with Carl Sagan to review their knowledge of the atmospheres of Mars and Venus), the Atmospheric Science Committee, the Polar Research Board, and the Air Force Scientific Advisory Committee.
Yersu Kim is the Director of the Division of Philosophy and Ethics at UNESCO. Kim has a long history of activity in the Korean and international academic communities. He was a Professor of Philosophy at Sung Kyun University in Seoul, Seoul National University, and Director of the Social and Human Sciences Sector of UNESCO in Paris. He is the past President of the Korean Society for Analytic Philosophy and of the Korean Philosophical Association. He has also been Secretary-General of the Afro-Asian Philosophy Association (AAPA) and serves now as Vice-President of the International Federation of Philosophical Sciences. The major focus of his present work at UNESCO lies in the elaboration of the Universal Ethics Project, which is an attempt to forge a set of ethical values and principles that would help humanity deal with the problems it faces in its tasks of survival and prosperity.

Dietrich Koelle has a 32-year background in the aerospace industry (Bölkow-Entwicklungen, MBB and Deutsche Aerospace). He started his career in 1961 as Project Manager for the ELDO Launch Vehicle EUROPA I Third Stage (“Astris”) and later became Director of Advanced Space Transportation Systems at MBB/DASA Ottobrunn. Since 1993, Dr. Koelle has been an independent aerospace consultant (Executive Director, TCS-TransCostSystems), specializing in the area of advanced space systems and economics. Koelle also does other system analysis work pertaining to global climatic history and the impact of climatic changes on life and civilization. He has been elected as a member of the International Academy of Astronautics and is Chairman of the IAA/IAF-Subcommittee on Launch System Economics. He is also an honorary member of the DGLR (German Aerospace Association) and member of the BIS (British Interplanetary Society).
Meng-Kin Lim

Meng-Kin Lim is currently Associate Professor in the Department of Community, Occupational and Family Medicine, National University of Singapore. A physician by training, he has had a distinguished career both in the Singapore Armed Forces, where he was Brigadier-General and Chief of the SAF Medical Corps, and in the medical world of Singapore, as Chief Executive Officer of the Health Corporation of Singapore. He is an alumnus of Harvard University (MPH ’90), an elected Fellow of the Royal College of Physicians of Edinburgh, and a Selector of the International Academy of Aviation and Space Medicine. He is currently a Board Director of Tan Tock Seng Hospital, Senior Consultant in Aviation Medicine to the Republic of Singapore Air Force, and Advisor in Aviation Medicine to the Civil Aviation Authority of Singapore. Among his awards are the Bailey Memorial Medal, the SAF Overseas Mission Medal, the Public Administration (Silver) Medal, and the Public Service Star.

Rosaleen Love

Rosaleen Love comes to writing about the future from a deep and abiding interest in the history of wrong ideas. Formerly a university lecturer in the history and philosophy of science, and in professional writing, she is currently a research associate at Monash University, Melbourne, Australia. Both science writer and writer of science fiction, both feminist and satirist of feminism, she has published two books with the Women’s Press (UK): The Total Devotion Machine (1989) and Evolution Annie (1993). She has written regular science columns for Australian Society and Age Monthly Review dealing with current issues in science and society. She has a forthcoming book on Reefscape, dealing with the idea of the Great Barrier Reef of Australia. Her work in futures lies in exploring the links between futures and fantasy.
Frederik Pohl

Frederik Pohl is a science fiction writer, editor, private lecturer, and consultant, who has delivered over a thousand addresses on futures-oriented topics around the world. In addition to numerous science fiction writing awards, Pohl has received the American Book Award, the annual award of the Popular Culture Association, and the United Nations Society of Writers Award. Pohl was elected as a Fellow to both the British Interplanetary Society and the American Association for the Advancement of Science. He is a past President of the World Studies Federation and the Science Fiction Writers of America. Following successive years as a Council Member of the Authors Guild, he is currently the Midwest Representative. Pohl is a long-time active member of the World Future Society, the American Association of the Advancement of Science, and the Astronomical Society of the Pacific.

Phillip Tobias

Dr. Phillip Vallentine Tobias (Professor Emeritus) received his degrees from the University of Witwatersrand, followed by postdoctoral study at the University of Michigan, the University of Chicago, and Cambridge University. Tobias has been a visiting Professor of Paleanthropology at the University of Pennsylvania, Cornell University, and Cambridge. He is an elected Fellow and past President of the Royal Society of South Africa. Among his marks of distinction, Tobias has received the Certificate of Honour from UC Berkeley, the Balzan International Prize, the (First) L.S.B. Leakey Prize for Multidisciplinary Research in Ape and Human Evolution, Fellowship of the Royal College of Physicians, Carmel Award of Merit, Order of the Southern Cross and Order of Meritorious Service (Gold Class) of South Africa, Huxley Memorial Medal, Wood Jones Medal, Charles R. Darwin Lifetime Achievement Award, Commander of National Order of Merit of France, Honorary Fellow of the College of Medicine in South Africa, and Foreign Member of the National Academy of Sciences, American Academy of Arts and Sciences, and the American Philosophical Society. In addition to these prestigious honors, Dr. Tobias has been awarded 16 Honorary Degrees.
Allen Tough was born in Canada and has lived in Toronto for most of his life. He earned his doctorate at the University of Chicago in the 1960s and became a Professor at the University of Toronto. Tough’s early research focused upon the adult’s successful efforts to learn and change, particularly the 70% that are self-guided without relying much on professionals or institutions. In the 1980s, Tough’s primary line of research shifted to extraterrestrial intelligence, the long-term future of human civilization, and humanity’s search for meaning and purpose on the individual, societal, and cosmic levels. Dr. Tough has made over 180 presentations and authored nine books and 88 papers. He is now Professor Emeritus at the University of Toronto and devotes his research efforts full time towards his scientific interest in extraterrestrial intelligence and humanity’s long-term future.

R. Spencer Wells received his B.S. in biology from the University of Texas at Austin and his doctorate in biology from Harvard. From 1994 to 1998, Wells was a postdoctoral fellow in the Department of Genetics, Stanford University. Since 1999, he has been an ICRF Research Fellow at the Wellcome Trust Centre for Human Genetics, University of Oxford, where he teaches genetics. Wells was a National Merit Scholar and has received fellowships from the NSF, the Howard Hughes Medical Institution, and the Alfred P. Sloan Foundation. He has lectured around the world on the topics of molecular evolution, divergent HLA alleles, the Y chromosome, and the human genome. He is currently studying the genetic basis of complex human traits.
Paul J. Werbos holds four degrees from Harvard and the London School of Economics in economics, international political systems (emphasizing European economics), applied mathematics with a major in quantum physics and a minor in decision and control, and applied mathematics towards an interdisciplinary Ph.D. thesis. Werbos taught courses at Maryland in quantitative methods and global futures, and performed research in intelligent systems for policy application. He worked at the Department of Energy evaluating and developing a wide range of energy forecasting models. In 1989 he joined NSF as a Program Director in the ECS Division with emphasis on neuroengineering. He also initiated the SBIR topic 26, which emphasizes fuel-cell automobiles. He is Program Director for learning and adaptive systems within the Control, Networks and Computational Intelligence program. He has served as President of the International Neural Network Society, where he is still on the Governing Board. He also serves on the Neural Networks Council of the IEEE.
Appendix IV

Background Papers

Bibliography


Bell, Wendell. “Futures Studies Comes of Age: Where Are We Now and Where Are We Going?” Revised June 10, 1997. Accepted for publication in Future’s Research Quarterly. Reprint permission granted to Foundation For the Future by the author.


Appendix V

Suggestions for Further Reading


1. Audiotapes.
Approximately 30 hours of audiotapes covering all plenary sessions and the small-group discussion sessions.

2. Digital Videotapes
Approximately 30 hours of digital videotape covering all plenary sessions and parts of the small-group discussion sessions.

3. Videotapes of Scholar Interviews
Three- to five-minute digital video interviews of each of the twenty-three Seminar No. 1 participants answering the same question: "What is your vision for the thousand-year future of humanity?"

4. Proceedings Document
A complete, almost verbatim record of the discussions and dialogues of the four-day seminar.

5. Color Photography Archive
Five hundred color prints and transparencies.
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