



E-Journal of the World Academy of Art & Science

ERUDITIO

*“A multidisciplinary forum focused
on the social consequences and policy
implications of all forms of knowledge on
a global basis”*

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Editorial

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Eruditio Vision

The vision of the Journal complements and enhances the World Academy's focus on global perspectives in the generation of knowledge from all fields of legitimate inquiry. The Journal also mirrors the World Academy's specific focus and mandate which is to consider the social consequences and policy implications of knowledge in the broadest sense. The vision of the Journal encompasses major challenges facing global society and seeks to examine these issues from an interdisciplinary, multi-method and value guided perspective.

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Editorial

This issue of *Eruditio* contains challenging and possibly controversial themes. Nonetheless, overall, these contributions challenge the frontiers of thinking in different spheres of global relevance.

The issue of global peace and security is one of the most important on the agenda of the World Academy. This is a complex subject in the sense that security is frequently prefixed by the term “national” and thus national security seems to detach itself from global security. In [“Security Reflections: A Holistic Approach Without Nuclear Weapons”](#), **Jonathan Granoff** has provided us with a short but incisive anecdote to the parochial edge of security discourse. His article brings in a concise and clear manner, the importance of global and collective initiatives in advancing the agenda of global peace and security. In doing this, he is giving great clarity to the emerging notion of collective security with traction.

Garry Jacobs’ contribution [“Ways of Knowing: Life Beyond Chaos”](#) was inspired by a WAAS seminar on scientific complexity. His understanding of the problem of uncertainty in cognition generated by scientific complexity underlines the important challenge to the evolution of human consciousness and the techniques of understanding not only the self, but the self in the universe. In doing so he confronts the problems of the limits of reliance exclusively on the mind which has a marked tendency to affirm one perspective to the exclusion of others, to reject what it previously embraced, and not arrive at an all-embracing perspective that can reconcile apparent opposites. In effect, the author calls for efforts to develop more synthetic and integrated ways of knowing which have the capacity to overcome the limitations of reductionism and systems thinking. Ultimately, he is suggesting a profoundly important challenge that requires a major shift of emphasis and perspective in how we think. His approach is sympathetic to intuitive insight and the techniques that we can develop to explore this important way of knowing how to discover solutions to pressing problems that we perceive as uncertainty.

David Krieger’s article [“Hubris Versus Wisdom”](#) revisits a central theme of the WAAS agenda namely, global security and the abolition of nuclear weapons. He draws out attention to the fact that activism has generated substantial reductions in nuclear warheads around the world. A reduction from 70,000 to just over 17,000 is itself a major accomplishment. The number is still too many, as he notes. He further draws our attention to the importance of understanding the mindset that finds strength and value in nuclear weapons in the concept of hubris and the mindset that seeks to eliminate them from the planet which reflects the wisdom tradition. The mindset vested in retaining nuclear weapons systems captures the hubris of arrogance, an arrogant belief in the supremacy of raw power, and the illusion that these weapons can be controlled by hubris and ensure the safety of humanity. Indeed, a central weakness of hubris is the fragility of its psychological and scientific foundations. It is hubris that may ultimately lead us to self-destruction and it is wisdom that may ultimately save us. The author draws attention to three global wisdom figures, Albert Camus, Mohandas Gandhi, and Albert Einstein. It was Camus who pointed out that our scientific advances here took us to “the greatest level of savagery.” It was Gandhi who noted, when informed of the bomb’s use that non-violence was not simply an ethical mandate but a fundamental moral standard

if humanity is to survive the nuclear age. Einstein, a spiritual father of the World Academy, suggested we need new modes of thinking to avert unparalleled catastrophe.

There is an urgent challenge to displace nuclear hubris with the wisdom of human solidarity. Humanity must be mobilized because the movement toward complete abolition is moving at a snail's pace. He concludes his piece with a poem he composed called "**A Few Simple Truths**". Truth is worthy of repetition and I hereby quote those truths:

Life is the universe's most precious creation.

There is only one place we know of where life exists.

Children, all children, deserve a full and fair chance.

The bomb threatens all life.

War is legitimized murder with collateral damage.

Construction requires more than a hammer.

The rising of the oceans cannot be contained by money.

Love is the only currency that truly matters.

One true human brings beauty to the earth.

In "[Being in Superposition: Modern Subjectivity, and the New Collectivity](#)", **Ljudmila Popovich** grapples with the classical philosophical person and personality over time problem. Here she adds another dimension, not simply the time artifact, but the space-time artifact. In this case she focuses on the importance of place on feminine identity and the ideal instrument to explore this is the woman in the position of a migrant, meaning that the migrant woman has an identity that is also shaped by special characteristics of exile. The superposition idea is an innovative but highly complex method of observation. It is a set "of the self as a set of positions and relations. Dynamic, relational, multi-positional and diversified individuality." From this vantage point the observer gets a profoundly more interesting and complex understanding of a multi-dimensional, evolving personality configuration. The author's essay is provocative and seeks to establish some important insights conditioned by time and space in the nature of human subjectivity.

Richard Hames is a profound social critic. In "[To Touch Eternity](#)", he has given us deep insights on some of the most vital and important questions on science, value and essentially the future of humanity. It is a short paper but insightful enough to be seriously contemplated by the reader.

Winston P. Nagan

Chair of the Board, World Academy of Art & Science

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Security Reflections: A Holistic Approach Without Nuclear Weapons

Jonathan Granoff

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Abstract

Today's global threats require a cooperative response. The ongoing cycle of fear – wherein armaments spread insecurity and insecurity generates more armaments – is incompatible with the requisite cooperative environment needed to address the 21st century crises of climate change, sustainable development (as identified by the Millennium Development Goals), and nuclear disarmament. Such cooperation, furthermore, will engender cooperation on other critically important issues such as terrorism, cyber security, pandemics, and financial stability and make efforts to address these challenges more likely to succeed. Today's unprecedented interdependence necessitates a new definition of security. No longer can we afford to practice the old model of real politik, based on a ruthless Hobbesian view of the human condition. National security can no longer be achieved through competition with other nation-states, and particularly not through increased amounts of military spending. Cooperation is no longer an admirable human trait: it is imperative for our very global survival.

There are present dangers to our biological and social environments which no one nation, or a small group of nations, no matter how powerful, can adequately address alone. These threats are global in nature and require cooperation rather than competition as the appropriate response. Maintenance of the implicit threat posed by the existence of the horrific destructive power of nuclear arsenals is incompatible with this cooperative environment which must be created for an increasingly interdependent world.

It is time to emerge from a dark cycle based on fear wherein armaments spread insecurity and insecurity generates more armaments. The nuclear arsenals are the most destructive example of this paradigm. By cooperatively addressing the crises identified by the world summits of the 1990s, and the more recently recognized challenges of climate change, we can create a new cycle of life wherein trust, confidence and cooperation can reinforce disarmament which will in turn strengthen trust, confidence and cooperation.

The United Nations Security Council marked the end of the Cold War by holding its first ever summit meeting which issued a declaration laying the ground work for the new global security agenda:

“The absence of war and military conflicts amongst states does not in itself ensure international peace and security. The non-military sources of instability in

the economic, social, humanitarian and ecological fields have become threats to peace and security.” (UN Document S/PV.3046, United National Security Council Declaration, January 31, 1992, P.143.)

An integrated post-Cold War human security agenda can be identified as emerging from the United Nations-administered world conferences of the 1990s.* These conferences set forth agendas, embodied in political commitments reached by consensus amongst member-states which effectively set forth programs to address our global crises. The security of all nations, including superpowers, has become collectively jeopardized. The United Nations system, which must be strengthened, provides us a global political identity and means for such coordinated action.† This agenda has been largely articulated in the Millennium Development Goals. The MDGs lack only a coherent incorporation of a new definition of security.

That new definition must be focused on obtaining global public goods of the highest value such as a stable climate, healthy oceans and rainforests, and the elimination of both poverty and nuclear weapons. Failure to work cooperatively to achieve these necessary objectives will ensure insecurity and enormous human suffering. Working together on these objectives will make cooperation on other critically important issues such as effectively containing terrorism, cyber security, controlling pandemics, and financial stability much more likely to succeed.

Never before have we required such new ways of thinking; never before have we faced such threats to our survival and found the means to address them.

Changing the cyclic patterns that lead to competition in military prowess as the predominant route to “security” is imperative if we are to overcome present tangible, scientifically verifiable threats to the planet’s life support systems.

The interlocking sets of problems are manageable and very realistic good advice can be found in the commitments made at the summits and world conferences during the 1990s. They were not so long ago. The 9/11 world has not changed their core insights and we can learn a great deal by looking at them carefully. (See Appendix A)

These world conferences addressed the increasing disparity of wealth between the developed and underdeveloped worlds, highlighted by the fact that tens of thousands of children die each day from malnutrition and preventable diseases, and over 1.3 billion people live with uncertainty as to whether they will have enough calories in the next few days to survive. These conferences addressed the global aspects of our environmental crisis highlighted by the fact that a hydro fluorocarbon molecule emanating from a refrigerant in Chile recognizes no national boundaries in its destruction of the fragile ozone layer that protects us all. The inter-relatedness between such issues as environmental protection and the well-being of children, unemployment and crime, population growth and the rights of women became apparent. We began there to recognize that so many threats to our security are global: organized crime,

* See the excellent descriptive material of the World Summits set forth in the year end briefing paper, “The World Conferences, Developing Priorities for the 21st Century”, ISBN: 92-1-100631-7, UN Publications, information current as of March 1997.

† Eighty per cent of the work of the UN system is devoted to helping developing countries build the capacity to help themselves. This includes promoting and protecting democracy and human rights; saving children from starvation and disease; providing relief assistance to refugees and disaster victims; countering global crime, drugs and disease; and assisting countries devastated by war and the long-term threat of land mines.

The budget for the UN’s core functions – the Secretariat operations in New York, Geneva, Nairobi, Vienna and five Regional Commissions – is \$1.3 billion a year. This is about 4 per cent of New York City’s annual budget – and nearly a billion dollars less than the yearly cost of Tokyo’s Fire Department.

trafficking of children and drugs, the AIDS epidemic, protecting biological diversity, ozone depletion, malnutrition, illiteracy, inadequate housing, unemployment, racism, ethnic and religious strife, violence against women, massive violations of human rights, the extraordinary expenditures in conventional weapons, the threats posed by weapons of mass destruction, deforestation, soil erosion, global warming, the widening gap between rich and poor and the threats posed by the provincialism of religious fanaticism. The world conferences provided a forum where civil society partnered with governments and governments cooperated with one another in addressing our collective threats.

“Cooperation is no longer merely admirable as a human trait; it is imperative for our very survival—our family values must be awakened.”

Each conference marked the culmination of months of consultations among member states, non-governmental representatives and UN experts who reviewed vast amounts of information and shared knowledge and experience. Each conference forged agreements on specific issues and commitments from member states. This process is unprecedented in world history. All of these world summits addressed problems which are beyond the capacity of any individual state to solve. Cooperation is no longer merely admirable as a human trait; it is imperative for our very survival – our family values must be awakened.*

The old model of real politique in which world politics is understood solely as struggles for superior power amongst nations reflects an outmoded Hobbesian view of the human

* Ambassador Douglas Roche, O.C., 8923 Strathearn Drive, Edmonton, Alberta T6C 4C8 Canada (tel. 403-466-8072) (fax: 403-469-4732) (Email: djroche@gpu.srv.ualberta.ca) (Internet Home Page: www.ualberta.ca/~djroche), former Canadian Ambassador for Disarmament co-authored with Robert Muller *Safe Passage for Humanity* and recently *The Ultimate Evil*. He said in “An Agenda for the ‘People’s Millennium Assembly’”: “It is interesting that the Report of the Commission on Global Governance, after its opening chapter describing the post-Cold War world, turned immediately to an elaboration of ‘Values for the Global Neighborhood.’”

“We believe that all humanity could uphold the core values of respect for life, liberty, justice and equity, mutual respect, caring, and integrity. These provide a foundation for transforming a global neighbourhood based on economic exchange and improved communications into a universal moral community in which people are bound together by more than proximity, interest, or identity. They all derive in one way or another from the principle, which is in accord with religious teachings around the world, that people should treat others as they would themselves wish to be treated.”

The Commission urged the international community to unite in support of a global ethic of common rights and shared responsibilities. This would “provide the moral foundation for constructing a more effective system of global governance” and close the present gap between governments and citizens. A global civic ethic also requires democratic and accountable institutions and the rule of law.

Discussions on ethics frequently tend to become esoteric, not to mention divisive. But a new global ethic can be expressed sharply, succinctly and irrefutably, as the 1993 Parliament of the World’s Religions did:

“Every human being must be treated humanely!”

This repeated the dramatic appeal contained in the 1955 Manifesto issued by a group of scientists led by Bertrand Russell and Albert Einstein who, having worked on the development of the atomic bomb, called for its abolition:

*“We appeal, as human being, to human beings:
Remember your humanity, and forget the rest.”*

Through the UN and its systems, we possess, for the first time in the history of the world, a catalogue of information about how our planet works, and treaties to protect the rights of individuals and the environment itself. Both people and governments are learning that they must cooperate for many purposes: to maintain peace and order, expand economic activity, tackle pollution, halt or minimize climate change, combat disease, curb the proliferation of weapons, prevent desertification, preserve genetic and species diversity, deter terrorists, ward off famines, etc.

All this has prepared us for the formulation of a new global ethic. By a global ethic, I do not mean a global ideology or a single unified religion and certainly not the domination of one religion over others. Rather, I mean a fundamental consensus on binding values, irrevocable standards and personal attitudes. This ethic is the expression of a vision of peoples living peacefully together, of national and ethnic groupings of people sharing responsibility for the well-being of the Earth.

The expression of a new global ethic of sharing and stewardship might seem, to some, overly ambitious in a world still torn by the effects of long histories of greed and dominance. Yet agreement on common values for common survival is the most pressing challenge facing the international community.

condition and is no longer realistic. The interrelationships of communication, transportation, international trade have released irreversible forces of transnational integration highlighting the transnational nature of the problems which must be solved co-operatively. The spread of democracy, the growing recognition of economic interdependence, the decreasing appeal of war, and the rise of supra national institutions in civil society, business and political life to regulate world affairs are clearly positive trends. Most significant is the growing recognition that the well-being of nations is not necessarily secured by increasing amounts of military spending; international cooperation is required to safeguard the interest of the planet as a whole. If humanity is to survive in this period of global interdependence and if global security is to be achieved, national policies should be enlivened by a vision of collective security and cooperation. This is the new realism – interdependence – which we all face now.

“The well-being of nations is not necessarily secured by increasing amounts of military spending.”

The conferences set forth a workable cooperative integrated human security agenda. The funds to fulfill the agenda have been given to wars and military deployments. This is not a new problem. The Advisory Board on Sustainable Development criticized countries that put weapons ahead of human needs:

The conferences set forth a workable cooperative integrated human security agenda. The funds to fulfill the agenda have been given to wars and military deployments. This is not a new problem. The Advisory Board on Sustainable Development criticized countries that put weapons ahead of human needs:

“The greatest financial waste is in military expenditure and this is dissipating resources needed for sustainable development. Agents from rich developed countries continue to promote arms sales to developing countries, and one such agent has even recently persuaded several African countries to reverse earlier decisions to switch expenditures to education.” (UN Document E/CN.17/1995/25, Report of the High Level Advisory Board on Sustainable Development, February 16, 1995, p. 25)

The world’s governments spend more than 1.3 trillion dollars a year to support military forces of more than 27 million soldiers. Analysis of the policies of a progressive country like the US can begin with the history of promotion of arms exports compared to the promotion of exports of environmental technologies.*

The developing countries spend approximately over 200 billion dollars on arms expenditures, while some 1.3 billion people are so poor they cannot meet their basic needs for food and shelter. Poverty grows as fast as populations.

Some of the poorest countries spend more on their military than on their citizens’ education and health: e.g., Angola, Ethiopia, Mozambique, Myanmar, Pakistan, Somalia, and Yemen. The Human Development Report suggests that 12% of the amount spent on military hardware would provide primary healthcare and safe drinking water for all; 4% would provide universal primary education and educate women to the same level as men; 8% would provide family planning services to all willing couples and stabilize world population by 2015. The ugliest part of this dynamic is that the sellers of these arms are the most developed countries which need the cash the least. The sales are dripping with blood.

* A Tale of Two Markets: Trade in Arms and Environmental Technologies (call Commission at 202-234-9382 for copy).

The nuclear arsenals and their implicit threat of excessive violence to maintain global governance are no longer reasonable amongst parties which must work together.* “By global governance, we mean the way in which we manage global affairs, how we relate to each other, how we take decisions that bear on our common future.” (*Our Global Neighborhood: The Basic Vision* (Main Themes Booklet), p. 7.)

There are two icons of the modern age. One is the mushroom cloud, which emphasizes our collective threat of death and destruction through the abuse of the gift of scientific power. Like a mushroom it grows from decaying matter – in this instance the fear and the quest for world dominance. The other icon is the picture of the planet taken from outer space – one glorious living integrated organism. The image of this beautiful living biosphere highlights our interdependence and calls us to a new level of cooperation. Our choices could not be clearer.

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* Security is being redefined to encompass cooperation, disarmament, the environment, and social development. No one can doubt that there is presently excessive dependence on armaments and threat or use of force. The final declaration of the Social Summit in Copenhagen specifically adopted this analysis (“The Copenhagen Declaration and Programme of Action”, Section 70). Previously, 150 states adopted the following accurate description of security by consensus in the final document of the International Conference on the Relationship Between Disarmament and Development,” paragraph 14 (UN, A/ Conf.130/39, September 11, 1987):

“Security is an overriding priority of all nations. It is also fundamental for both disarmament and development. Security consists of not only military, but also political, economic, social, humanitarian and human rights and ecological aspects. Enhanced security can, on the one hand, create conditions conducive to disarmament and, on the other, provide the environment and confidence for the successful pursuit of development. The development process, by overcoming non-military threats to security and contributing to a more stable and sustainable international system, can enhance security and thereby promote arms reduction and disarmament. Disarmament would enhance security both directly and indirectly. A process of disarmament that provides for undiminished security at progressively lower levels of armaments could allow additional resources to be devoted to addressing non-military challenges to security, and thus result in enhanced overall security.”

Appendix A

1. The World Summit for Children in New York in 1990 issued a convention on the Rights of the Child and set goals for reducing deaths, malnutrition, disease and disability among the children of the developing world. (UN Document A/45/625, *World Summit for Children*, New York, September 1990). Already 89 countries have reached the end decade target of over 90% immunization coverage, and the achievement of the goal of the eradication of polio by the year 2000 is in sight. There has been a dramatic improvement in the management of diarrhea saving the lives of at least a million children annually. The program for iodine deficiency control has led to over 1.5 billion more people consuming iodized salt in 1995 than in 1990, and as a result, 12 million infants are protected from mental retardation each year. The population without access to safe drinking water has fallen by about one third helping in excess of over a billion people.
2. The World Conference on Environment and Development (Earth Summit) in Rio in 1992 produced a Biodiversity Convention, a Global Warming Convention, a Statement on Forest Principles, a Declaration on Environment and Development, and Agenda 21. The last is a blueprint for the sustainable development of the planet into the 21st century. (An interpretive guide to Agenda 21, *The Global Partnership for Environment and Development*, is available. UN Sales No.E.93.I.9.). The imperative of a rule of law governing sustainable development and a business environment will obviously need an enormous shift in the attitude of our leaders. The interdependence of the world's economic system bodes well that cooperative efforts could bear fruit rapidly when the political will is harnessed. In the same way as a village must cooperate to protect its commons, we will need far higher levels of international cooperation to address the problems of ozone depletion, global warming, and water pollution which continue to grow in seriousness. Nevertheless, Agenda 21 remains the only globally accepted comprehensive outline to respond to our planetary crisis.
3. The World Conference on Human Rights in Vienna in 1993 adopted a Declaration and Programme of Action, including the establishment of the office of UN High Commissioner for Human Rights, designed to strengthen human rights around the world. The Vienna Declaration set forth the universality, indivisibility, and interdependence of civil rights, cultural, economic, political and social rights as the birthright of all human beings and the first responsibility of governments. It clarified the essential relationship between development, democracy and the promotion of human rights. Despite sensitivity regarding respect for national sovereignty principles, it was agreed that within the framework of the purposes and principles of the UN charter, the promotion and protection of human rights are a legitimate international community concern. (UN Document A/CONF. 157/24, *The Vienna Declaration and Programme of Action*, Vienna, June 25, 1993). The emergence of an international criminal court can be indirectly attributed to the institutional momentum generated by this conference.
4. The International Conference on Population and Development in Cairo in 1994 shifted the previous emphasis on demography and population control to sustainable

development and the recognition of the need for comprehensive reproductive health-care and reproductive rights. Its declaration emphasized the empowerment of women, appreciation for pluralism values and religious beliefs, reaffirmation of the central role of the family, and the needs of adolescents. (“Declaration of International Conference on Population and Development,” UN Document A/CONF. 171/13, Cairo, September 13, 1995.)

5. The World Summit for Social Development in Copenhagen in 1994 brought together 117 heads of state to issue a political Declaration and Programme of Action to alleviate and reduce poverty (including the eradication of absolute poverty), expand productive employment, and enhance social integration. In many ways, the social summit is the centerpiece of the global conferences of the 1990s. The Summit Declaration set forth 10 commitments each followed by specific recommendations for action at national and international levels. They include, in part: the eradication of poverty in the world with policies addressing the root causes of poverty giving special attention to the needs of women and children and other vulnerable and disadvantaged; the promotion of full employment and social integration by fostering social stability and justice based on non-discrimination, tolerance and the protection of human rights; the achievement of equality and equity between women and men; the promotion of universal and equitable access to quality education and healthcare; the acceleration of the economic, social and human resource development of Africa and the least developed countries through the promotion of democratic institutions and addressing problems such as external debt, economic reform, food security and commodity diversification.
6. The Conference on Climate Change in Berlin in 1995 started a process to limit and reduce emission of greenhouse gases within specified time frames, such as 2005, 2010 and 2020. (UN Department of Public Information, Press Release HR/888, April 12, 1995.)
7. The Fourth World Conference on Women in Beijing in September 1995 produced a comprehensive plan, the “Beijing Declaration and Platform for Action,” for the international community to promote the status of women to the ultimate benefit of society as a whole. Twelve critical areas of concern are dealt with in depth: poverty, education, health, violence against women, armed conflict, economic structures, power sharing and decision-making, mechanisms to promote the advancement of women, human rights, the media, the environment, and the girl child. It redefined women’s rights as human rights, asserting women’s rights to “have control over and decide freely and responsibly on matters related to their sexuality, including sexual and reproductive health, free of coercion, discrimination, and violence.” The United States launched a six year, \$1.6 billion initiative to fight domestic violence and even established a White House Council on Women to plan for the effective implementation in the United States of the platform for action with full participation of NGOs. It was the largest conference ever convened by the UN, with 5,000 delegates from 189 States and the European Union. In addition, an independent NGO Forum attracted 30,000 participants.
8. The City Summit (Habitat II) produced a Declaration on Sustainable Human Settlements and brought together many of the themes of the previous world summits.

Recognizing that inadequate living conditions are a primary cause of social conflict, an agreement was reached on specific commitments such as adequate shelter for all, financing human settlements, international cooperation and review of progress in the future. Reports were received from over 500 mayors and key municipal leaders constituting the World Assembly of Cities and Local Authorities. It also convened NGO groups in forums which included the World Business Forum, the Foundations Forum, the Academies of Sciences and Engineering Forum, the Professionals and Researchers Forum, the Parliamentarians Forum, the Labor Unions Forum, the Forum on Human Solidarity and even the Wisdom Keepers Forum. By the year 2010, it was predicted that over half of the world's population will be living in cities and that there will be at least 20 mega cities. We are ill prepared to deal with the social repercussions of such a dramatic global transformation but the conference Secretary General, Wally N'dow, put it simply, "The resources exist to put a roof over the head and bring safe water and sanitation for less than \$100 per person to every man, woman and child on the planet." This is the new reality of security.

Ways of Knowing: Life Beyond Chaos

Garry Jacobs

Chief Executive Officer, World Academy of Art and Science;
Vice President, The Mother's Service Society

Abstract

The ways of knowing we employ determine the nature of knowledge we arrive at. Our capacity for knowledge depends on our conception of what knowledge is and the faculties we employ to seek it. The early advances of modern science resulted from efforts to overcome the limitations of the physical senses by a conception that sense data does not adequately reflect reality and from development of instruments capable of extending beyond the reach of our physical senses. The capacity of the physical mind to divide reality into its component parts, to concentrate on each of the parts and analyze its properties led to remarkable scientific advances during the 18th and 19th centuries. The capacity of mind to aggregate apparently independent objects and view them as constituent elements of a wider totality gave rise to systems thinking and important discoveries during the 20th century. Empiricism, reductionism and systems thinking are all based on a conception of reality that regards life and consciousness as artifacts or, at best, secondary emergent properties of material mechanisms. The problems of knowledge and life confronting humanity today result from exclusive reliance on the mind's capacity for division and aggregation. This article calls for efforts to develop more synthetic and integrated ways of knowing which possess the capacity to build on the strengths and overcome the weaknesses of reductionism and systems thinking. Doing so will enable us to discover solutions to pressing problems and vast unutilized opportunities concealed by what we presently perceive as threatening uncertainty.

One need not be a student of Chaos Theory to know how complicated and complex life can be. We are surrounded by evidence of it all the time. The sudden collapse of the international financial system in 2008 shook the world economy and undermined confidence in the entire edifice of economic science. Recent debate over theories and predictions of climate change has reinforced the age-old conception of the unpredictability of weather – a synonym for the fickleness of Nature – and the inherent uncertainty of life. The safety systems at Fukushima broke down in spite of sophisticated backup mechanisms thought invulnerable to any eventuality. Recent social unrest and political turbulence in Egypt, Turkey, Brazil and Ukraine point to serious deficiencies in our understanding of social systems and human behavior. Anticipating and managing human expectations seem to be far beyond the grasp of contemporary social science. These incidents are examples of complex social systems that have long defied analysis by conventional scientific concepts and tools.

Black swans, tipping points and butterfly effects are only the tip of the iceberg. The real complexity of life expresses everywhere, though often masked by aggregate statistics

that reduce variation to averages, normal curves and trend lines. During the 20th century, the divorce rate in the USA (per 1000 married women) rose five-fold. A simple trend becomes more complex when we begin to examine the multiple factors responsible for the increase. Partially it is the result of measurable physical factors, such as longevity, rising levels of household income, smaller family size, more working women, greater physical and social mobility, improved health and the discovery of Viagra. But it also reflects changes in social and psychological behavior – greater social equality, use of internet chat rooms, rising expectations, changing attitudes for and by women, ideas about love and romance. And when we zero in on specific cases, explanations may range anywhere from a husband's job loss or Alzheimer's disease to his wife's love affair or recent business trip to the Philippines. To describe the issue as complex may destroy simple stereotypes but it actually tells us very little.

*"As science evolves,
our ways of thinking
and knowing are
evolving as well."*

Given the overwhelming evidence about the complexity of life, it is remarkable that science has made such enormous progress in recent centuries based on simplistic assumptions regarding the nature of reality. The assumption that reality can be explained in terms of closed systems and linear models may be practically useful to the scientist, but grossly err when they are mistaken for an accurate description of reality. Advances in the Science of Complexity offer new concepts and tools that promise to unravel some of the mysteries associated with complex systems and the uncertainty associated with non-linear phenomena. Dynamic systems theory, self-organization, autopoiesis, emergence, networks, organismic theory and similar concepts are altering our understanding of both natural and social phenomena. But even more importantly, they are also altering our understanding of the impact of our mental processes and ways of knowing on our perception of reality. As science evolves, our ways of thinking and knowing are evolving as well. The emergence of new sciences is making us more conscious of the habitual forms of thinking that have defined and circumscribed the development of science over centuries – mental habits which have been reinforced by prevailing conceptions of reality, inculcated by belief systems, consciously buttressed by the education system and unconsciously transmitted by culture.

It is also becoming increasingly apparent that these habitual forms of thinking are not obligatory. Great scientific discoveries of the past few centuries have often resulted from mental processes which transcend the normal mental processes commonly associated with science today. The capacity for insight and intuition associated with great scientific discoveries and other works of genius may turn out to be the exercise of different ways of knowing based on less developed capacities of mind. The capacity to discover unity in apparently disparate and unconnected phenomena; to perceive the whole that is greater than the sum of its parts; to discover the truth in opposite viewpoints; to reconcile contradictions; and to perceive deeper levels of causality that escape conventional thinking has contributed to outstanding advances of knowledge.¹

Science seeks reliable knowledge. The word 'knowledge' is derived from the Latin *scire* "to know" and the Greek *skhizein* "to split, rend, cleave". Human beings have different ways of knowing reality – physically through sense perceptions, emotionally through feelings and empathy, and mentally through rational analysis of data and facts, through formulation of

thoughts, ideas, theories and imaginative experience. Modern science relies on the mind's capacity for analysis as its primary instrument for knowing. Earlier civilizations relied on other ways of knowing, such as the intuitive perceptions of Vedanta and Taoism. It is somewhat ironic that, as Karl Popper observed and many great scientists have testified, the greatest discoveries of modern science have occurred by a process that far more closely resembles intuitive ways of knowing than conventional rational analysis. Therefore, it is worthwhile inquiring into the gradual change in mental processes associated with the recent emergence of new knowledge and new sciences and to reflect on what conscious efforts can be made to transcend the limitation of existing patterns of thought in the quest for ways of knowing that more adequately reflect the complex realities of the world we live in.

1. Appearances can be Deceptive – Empiricism

Modern science arose in the West as a quest for knowledge free from the dogma of established church doctrine and the distorted appearances of reality presented by our senses. To the senses the Earth is flat and motionless. Copernicus' formulation of the heliocentric theory of the solar system challenged existing Church dogma regarding the central position of the Earth in the universe. It also challenged the direct evidence of the senses that the Sun rotates around Earth, a stationary planet. From time immemorial people have noted that a stick dipped in water appears bent or broken and a rapidly spinning windmill appears as a solid disk. The Milky Way was thought to be a cloud in the heavens until Galileo's telescope suggested it may consist of a multitude of stars packed closely together at a great distance from earth. Long before scientists discovered that what appears as solid matter is actually a mass of rapidly moving wave-particles, the scientific method developed as a means to eliminate the distortions arising from sensory appearances as well as the expectations, biases and prejudices of the observer. More significantly, the rise of modern science was based on the premise that sensory information may provide a distorted picture of reality. It affirmed a different mode of knowing in which the observer steps back and detaches himself from sense impressions and subjects them to systematic analysis before arriving at conclusions.

The illusion of the senses was also known to social thinkers long before the birth of social science. Sun Tzu's ancient treatise on *The Art of War* counsels military leaders that "All war is based on deception. Hence when we are able to attack, we must seem unable..."² The Allied command applied this advice with extraordinary success during the D-Day invasion of Normandy by creating diversionary attacks elsewhere along the coast of France. Mindful of Machiavelli's advice to employ deceit in the relations with other princes, Hitler impressed Neville Chamberlain on his visit to Berlin in 1938 so much so that the British Prime Minister came back convinced Germany did not want war. Stalin's gracious behavior made an equally benign impression on Roosevelt at Yalta in 1945. In economics, the distortion of sense data prompted former Federal Reserve Bank Chairman Alan Greenspan to assert that the economy was on a sound financial footing just shortly before the 2008 crash. In business, financial data on the performance of Enron deceived investors, bankers and employees into concluding that the company was soaring to new heights just months before it crashed into bankruptcy.

Although science has adopted a healthy skepticism regarding the reality presented by the senses, this has not prevented it from striving to ground its observations and conclusions on the realities presented by the senses. Instead it has taught scientists to discriminate between

sense impressions and the conclusions to be drawn by mental analysis. Modern science is still predicated on the sole reality of that which is represented by the senses and their instrumental extensions. This habit of mind of depending on the concrete reality of physical sense data imposes limits on the freedom of the thought mind to interpret sensory evidence or conceive of possible explanations. The notions that matter is energy in motion, that space and time are relative, and that light possesses properties of both a particle and a wave are inconceivable in conception to minds fully rooted in the senses. The sense mind observes facts, one at a time, as disparate existences with their own identity. Stepping back from the sense mind that perceives data to the thinking mind that analyzes them and conceives of pure ideas, we are compelled to agree with mathematicians and philosophers that knowledge based on abstract thought has its own reality independent of our senses and our perception of physical phenomenon.

These higher ways of knowing employ the mind's capacity for analysis, comparison and coordination. Mind applies this power to find relationships between pieces of data to evaluate facts and organize them as information. It applies the same power to coordinate two or more facts to one another based on their similar or contrasting characteristics to arrive at a thought and to coordinate two or more thoughts with one another to derive an idea that relates them. Copernicus shared the belief in a mathematically perfect universe. His calculations based on data regarding the relative position of the planets over time confirmed the idea that they revolved around the sun rather than the earth. This discovery, in direct contradiction to the data of the physical senses, revived the ancient distrust of sense perceptions and the search for intellectually coherent concepts or laws of nature. It resulted in a subtle shift in the concept of knowledge from observation of physical sense data to mental concepts about the objects of sense data.

Even when we go beyond the limitations and distortions of sense data, our view of reality is still powerfully influenced by the logic of the physical – mind's first training ground – in its effort to comprehend reality. That logic arises from the apparently discrete existence, solidity and distinctness of material objects, which appear to be separate and independent, are never in two places at once or two things at the same time, and cannot be given away and retained simultaneously. This mode of logic leads inevitably to our mind's propensity to know things by their differences, categorization, comparison and contrast. This faculty is of great practical utility, but as we have discovered, what our physical mind holds true of finite material objects is just an appearance. According to Quantum Theory, nothing is solid, nothing is separate and independent of its environment, even dense physical objects exist in constant relationship with things around them and even in outer space. And when it comes to non-material forms such as emotions and ideas, the logic of the physical mind breaks down completely. We can simultaneously think and feel many things relating to the here and now or somewhere else and some other moment in the past, present or future. We can share our thoughts and feelings without losing them; indeed, we grow by the process of giving. Each thought, feeling, idea and value forms an inextricable element of a complex, ever-changing web of associations, experiences, expectations and aspirations.

2. Divide and Conquer – Reductionism

In retrospect we find that the detachment of knowing from strict subordination to sense

impressions was merely the first step in the rise of modern science. Science progressed with increasing rapidity during the 18th and 19th centuries by the emergence of a triad of dominant conceptions regarding the nature of reality – physicalism, reductionism and mechanism. The atomistic conception of matter prevalent until the end of the 19th century was of separate, independent particles quite distinct from one another and from the various forms of energy with which they interact. This perspective was a natural consequence of the reductionist view of reality that dominated science at that time. Reductionism is based on the premise that the whole is nothing more than the sum of its parts, that it can be fully understood based on the properties of its smallest constituent parts, and that causality is from the part to the whole. The reductionist perspective led to an emphasis on chemical and electrical explanations for life and the germ theory of disease. It gave rise to conceptions of the body as combinations of genes, cells, organs and systems and of health as the proper functioning of each component cell, organ and system. It led to the decoding of the DNA molecule and efforts to explain the entire range of physical characteristics and abnormalities in terms of the molecular structure of the genome. Its ultimate goal was to reduce all biology to chemistry and physics.

In the social sciences, reductionism gave rise to the concept of society as a composite of innumerable independent members, organizations, systems and activities, each subject to minute analysis as a separate reality – political, economic, social, cultural or psychological. In political science, it was synchronous with the dramatic shift toward individualism and the rights of the individual citizen in the centuries following the Renaissance. In economics, it served as the basis for the emerging social philosophy of capitalism based on the central place of competitive individual behavior in the wealth of nations. In epistemology it led to a conception of knowledge as an amalgamation of data, facts, information, and ideas derived from many discrete, independent fields.

The shift in focus from the search for general, cosmic theories of change to the study of change at the micro level in every field led to a gradual specialization of disciplines, similar to the division of labor in industry. This process, which Stephen Toulmin calls *disciplinary abstraction*, required the scientist to conceive of knowledge in narrow, separative terms, rather than as an integrated whole and to abstract the special field from its wider context. The compartmentalization of disciplines has narrowed the range of questions and the methods of inquiry, making the entire body of science an aggregation rather than an integration of knowledge and, by their exclusivity, has ultimately eliminated from its purview fundamental issues of cosmic inter-relatedness.³

The capacity of mind to divide and analyze is prodigious and inexhaustible. Liberated from the constraints imposed by philosophy and religion, reductionism became the ruling principle of experimental science and reigned supreme for several centuries. And with good reason, for it led to remarkable advances in our understanding of the physical universe – the discovery of universal laws of Newtonian mechanics, the decomposition of all material substances into molecules and atoms, the categorization of the elements in terms of their atomic structure, the classification of living species by phylus and genus, the discovery of the cell and the analysis of its constituent parts, the decoding of the human genome by molecular sequencing of DNA, and countless other invaluable insights into the world we live in. It also gave rise to the gradual proliferation of specialized fields of knowledge from a handful of classical disciplines into the countless divisions and sub-disciplines prevalent today. Each

has contributed to the advance of knowledge, but becomes an obstacle to further knowledge when its partial perspective is mistaken for a complete representation of the reality it seeks to know.

“Reductionism arises from one of the most characteristic tendencies of the human mind – its powers of division and exclusive concentration.”

Reductionism is not merely a philosophical outlook. It arises from one of the most characteristic tendencies of the human mind – its powers of division and exclusive concentration. The ordinary thinking mind seeks to know by division. It strives to define unique and mutually exclusive concepts to distinguish and differentiate one thing from another so that they can be precisely defined, compared and contrasted. It has an inherent tendency to atomize reality by division into smaller and smaller parts, to concentrate on each of these parts and regard each part as if it exists as a thing in itself separate from everything else, and to regard each part as a separate whole in itself. Mind perceives form by identifying the boundaries that set it off from its environment. It conceives ideas by assigning exclusive, fixed meanings to words. It tries to clamp everything into rigidly fixed forms and apparently unchanging external factors, such as the ideal conditions of perfect competition on which the economic theory of supply and demand is based. It tries to ignore, dismiss or reject as anomalies all that contradict or are logically incompatible with its conclusions on the premise that the opposite of every apparent truth must be false. If only reality were so simple!

The tendency to divide gives rise to a conception of reality in terms of sets of mutually exclusive polar opposites – true-false, animate-inanimate, conscious-unconscious, progressive-regressive, good-evil, right-wrong. The capacity of the mind for exclusive concentration inevitably leads to the perception of extreme and mutually exclusive contradictions – liberal-conservative, Capitalism-Communism, Darwinian and Lamarckian, Keynesianism-neoliberalism. It gives rise to the logical conclusion that two things cannot occupy the same space at the same time or be in two different places at the same time, that markets should not be regulated because economy and politics are independent fields of activity. Within economics it led to the perception that financial markets should be regarded as separate and independent of the real economy and that markets should be left to function independently, regardless of their impact on society and human welfare.

3. The Great Divorce – Materialism

The problem of knowing is seriously complicated by the fact that we human beings are ourselves a part of the reality we seek to know. Can a part ever know the whole? Can a cell or an organ – even a brain – have the knowledge of the whole body or the whole of life of which the body is a part? Can a mind that consists of mechanical-electrical-chemical events ever know itself and the true nature of consciousness other than that which is founded on electro-chemistry?

Cartesian dualism presented an early solution to this dilemma by applying the divisive capacity of mind to divide reality itself into two neat, mutually-exclusive realms – Mind and Matter. By separating mind and matter, Descartes abolished the holistic view of man as a part

of Nature. He affirmed the view of an inanimate material world inhabited by machine-like forms of life, and fully explicable in terms of mathematical formulae, whereas he regarded the rational human mind as non-material, non-mechanical, and capable of perceiving the mathematical order of a mechanical universe. Newton and Galileo affirmed a dualistic reality consisting of two independent components – a physical reality that could be observed by the senses and a non-material, non-objective reality, responsible for the phenomenon of life, mind and consciousness. They accepted the premise of methodological naturalism that the physical reality was the legitimate field for scientific inquiry, leaving the non-material dimensions to religion and philosophy.

But the tendency of mind for exclusive concentration did not stop with division. It persisted on its course until it affirmed one aspect of reality as the sole reality and interpreted all other aspects in terms of this one. Thus, science soon eclipsed philosophy and religion, proclaiming itself as the sole means for knowledge of reality, as philosophy and religion had each affirmed their exclusive legitimacy during earlier periods. It went still further. Over time, the dramatic achievements of experimental science emboldened some of its proponents to insist that all phenomena could be explained strictly in terms of one side of the dividing line, reducing even mind and psychological experience to purely material terms, and thereby giving rise to the exclusive doctrine of materialism. The tendency toward exclusive concentration led inevitably to the collapse of all reality into a single dimension – the physical. While String Theory has postulated 10 or more dimensions of reality, of which only three are visible, it has no hesitation in eradicating the stark experiential differences between inorganic matter and animate life, subconscious life and conscious mentality.

Methodological naturalism, which focused inquiry on physical phenomenon as that which was most accessible to observation, measurement and rational analysis, gradually gave place to philosophical naturalism, which affirmed that only physical phenomena are real. As understanding of the nature of the physical universe grew, materialism extended the scope of physical reality to include physical energy, forces and the curvature of space as well. Human mental and emotional consciousness were reduced to chemical and electrical events, effectively denying reality to the most cherished of human endowments, conscious experience, rational thought, free will, idealism, love, joy, beauty, truth and spiritual experience. The dichotomy between mind and matter was eliminated by concluding that mind too is nothing but a mechanical device governed by mathematical principles. By logical extension, the nullification of consciousness by reduction to solely material principles leads inevitably to a nullification of the observer, the person, the knower and the knowledge observed. According to this view, the sensation of being a conscious individual reposes on the foundation of chemistry and electricity and is as suspect as any other impression born of the senses without any sure foundation for its existence. Ironically, this view comes to closely resemble the Buddhist conception of the void or the theory of illusionism proclaimed by the 8th century Indian philosopher Shankara.⁴ But whereas Shankara's philosophy affirmed the sole reality of consciousness and denied the reality of the material world, the conclusions of modern science undermine the reality of consciousness, mind, the scientist and of science itself. How can electrical impulses and chemical events know or affirm anything other than themselves? According to this scientific version of illusionism, the dividing mind somehow creates an illusion of a separate 'I' that has experiences 'as if' it were conscious and separate from that experience. This leads ultimately to the conclusion that the consciousness of the scientist, the

act of knowing and the body of scientific knowledge are mere artifacts with no firm ground in reality – for as far as we know, molecules and electrical currents are not conscious – and that science is nothing but a machine observing itself. Conscious decisions, free will and purposeful behavior are an illusion.

4. The Universe as Machine – Mechanism

The abolition of purposeful behavior in living beings naturally led to the third plank of the triad – mechanical necessity – the notion that all processes in nature share the characteristics of the machine, and all effects are the result of prior physical causes. Newton's laws of motion confirmed the view of a mechanistic universe. Kepler's laws of planetary motion, the laws of thermodynamics, the ideal law of gases and Harvey's discovery of the circulation of the blood were other steps in a series of discoveries that promised to fully explicate the mechanical workings of universal Nature. Mechanism is the natural counterpart of a world-view founded on reductionism and materialism. In combination they have led to remarkable advances in physics, chemistry, biology, pharmacology, genetics and industrial technology.

Darwin's theory of natural selection was later interpreted to prove that the proliferation of species could be explained wholly in mechanistic terms. Although Darwin did not postulate the precise mechanism responsible for evolution, in the 20th century Neo-Darwinians affirmed that a purely mechanical interaction of Necessity and Chance – inherited genes combined with random gene mutations mechanically sorted through biological competition – constituted a fully satisfactory mechanical explanation for evolution, without attributing any purposefulness to life or Nature or evolution itself. This mechanistic view conveniently omits dealing with the most important aspect of the theory, the universal drive of living beings for survival, a property unknown to inanimate objects. According to Rupert Sheldrake, Neo-Darwinians insisted that all creativity was in the final analysis a matter of random mutations and the blind forces of natural selection: an interplay of chance and necessity.⁵ In the 1990s, this triad fueled the massive international effort to decode the human genome based on the expectation that doing so would provide the key to unraveling the origin of all human physical and psychological characteristics and to developing cures for a wide spectrum of diseases. So far, these expectations have been largely disappointed.⁶

The mechanistic view of reality also guided development of the social sciences. In economics, a simplistic interpretation of Adam Smith's 'invisible hand' promised to impartially generate maximum benefit for all citizens. The mechanistic view reduced economic behavior to an equilibrium between supply and demand in the marketplace, marginal utility, law of cost, a balancing act between inflation and employment, investment and savings, and other 'natural laws' as the governing principle of all economic phenomenon.⁷ At the micro level, apparently conscious individual choices were subject to the same mechanical Necessity as those governing atoms and molecules. This view was clearly set forth by Carl Menger of the Austrian School in *Principles of Economics* (1871) when he wrote: "Economic theory is related to the practical activities of economizing men in much the same way that chemistry is related to the operations of the practical chemist. Although reference to freedom of the human will may well be legitimate as an objection to the complete predictability of economic activity, it can never have force as a denial of the conformity to definite laws of phenomena that condition the outcome of the economic activity of men and are entirely independent of the human will." If only modern economics had lived up to Menger's claims!

The triad's phenomenal achievements led some to conclude that science was on the verge of an all-encompassing Theory of Everything. The failure of the triad to explain the differences between plants, animals and mentally self-conscious human beings and to achieve advances in the social sciences commensurate with those in the physical sciences was for a period eclipsed by the enormous benefits and pride generated by its achievements.

Science has made strides in overcoming the limitation of the senses by fashioning ever more powerful instruments to extend the reach of human perception into the distant past, the far reaches of the macrocosm and the infinitesimal microcosm. In the final analysis, it is not the limitation of instruments that stands in the way of scientific progress, but rather the barrier posed by the rigid assumptions implicit in this worldview. These assumptions have never been proven and are rarely even debated, but they have served as a formidable barrier to rational consideration of ideas and evidence supporting alternative perspectives. For long, the dogma of the triad prevented us from seeing blatant truths that were right before our eyes all the time. For all our pride in the power of rationality, the normal functioning of mind circles within very narrow orbits of previously established convictions and is designed to reinforce that which we already believe to be true. Mind understands its own analysis.⁸

Mind is also a relentless seeker. It was perhaps inevitable that once the reductionist mindset gained supremacy, it would be compelled to follow the course set by its initial premises to their logical conclusion. Thus, mind's capacity to divide and fragment reality by a power of exclusive concentration has taken us to the borders where the infinitesimal shades off into an apparent nothingness. This pursuit has generated products and processes of unparalleled utility and, in some cases, unparalleled potential for destruction. The further the quest has gone, the more difficult it has become to speak with confidence about the true nature of reality – even of the most commonplace material things. And the pursuit of reductionism in the social and psychological realms has yielded even more nebulous results.

With each further step, our uncertainty increases, to the point where it has become a predominant philosophical underpinning of modern science. Has science really discovered that the ultimate knowledge is that which we cannot know? Or does this uncertainty arise from a limitation imposed by physical nature on the precision of our instruments? Or could it be the result of the limitation self-imposed by our insistence on outmoded conceptions, unproven premises and partial approaches to greater knowledge? The Julian calendar in vogue for fifteen centuries was remarkably accurate considering that it was based on an erroneous premise of a geocentric universe. The small latitude of error it admitted could be attributed to the limitations of our instruments or the inherent uncertainty of Nature. But after the establishment of the heliocentric view, it became clear that the underlying premise of the Julian calendar was fundamentally flawed. The source of the flaw turned out to be mind's excessive reliance on the direct evidence of the senses which mistook the apparent motion of the Sun for a fact. Copernicus exposed and countered this sense impression by the evidence of the analytical thinking mind through the non-material instrumentation of abstract mathematics. Similarly, significant scientific discoveries and new theoretical perspectives in the 20th century have arisen to challenge the triad of the enlightenment with a new conceptual framework predicated on a complementary power of the human mind – its power for inclusive comprehension.

5. Aggregation, Comprehension and Complexity

Mind's capacity for division leads to exclusive concentration. Its complementary capacity to combine smaller wholes into larger aggregates leads to another perspective on reality that is inclusive and comprehensive. Comprehension and concentration are complementary faculties. Concentration is to focus on a common center. It divides the whole into parts and narrows the field of vision to the smallest perceptible details of its component elements, blotting out perception of the interactions and relationships between the parts and the environmental context and interdependencies within which the parts and the wholes exist. Comprehension is to bring together, to unite. Mind's capacity for comprehension works in the opposite fashion. It widens the view from each part or whole to the larger wholes of which they are constituent parts and the environmental context in which they exist.

As a reaction to the inadequacies of the classical triad based on exclusive concentration, during the 20th century an alternative perspective emerged based on the mind's power for inclusive comprehension. While the reductionist approach was to divide and subdivide reality *ad infinitum*, the new approach sought to examine phenomenon in their context and relationship to everything else, to view each thing as an element of a larger whole that exists by virtue of its relationships with other things or with the wholes within which they exist. The holistic perspective can be traced back to Aristotle's dictum that the whole is greater than the sum of its parts. It was the basis for the unifying thought of the German naturalist Alexander von Humboldt in the 18th and 19th centuries. But the change in perspective from the part to the whole, from discrete objects to contextual relationships, from analysis of the parts to synthesis, gained widespread credence in scientific circles only after Heisenberg and Bohr in their Quantum Field Theory described matter in terms of energy fields forming an inseparable web of relationships, rather than small discrete particles.⁹ The new perspective focused attention on patterns, feedback loops, interconnected systems, self-organization and networks of relationships. It eventually gave rise to whole new disciplines based on a contextual mode of thinking – Systems Theory, Cybernetics, Organismic Biology, Ecology, Gestalt Psychology, Complexity Theory, the science of Networks and Chaos Theory – all of them based on the holistic premise that reality is an indivisible whole.



In retrospect, this shift in focus appears obvious, indeed, self-evident. It is reminiscent of the reversible perception test depicting an image that can be viewed either as an old or a young woman, but not both simultaneously. Each living thing exists only in a wider environmental context and its relationship with everything around it governs its functioning. A seed either sprouts, remains dormant or decays depending on the moisture levels and nutrient content of the soil in which it is planted, the ambient temperature, the CO₂ level, the availability of sunlight in the atmosphere and the presence of myriad other organisms that either foster or feed on it.

The development of systems thinking presented a serious challenge to reductionism. It also displaced the simplistic, mechanistic metaphor of the machine with a more complex, sophisticated conception of organization. Physical phenomena came to be viewed in terms of flows of energy, fields of force and self-regulating feedback loops, rather than merely

mechanical actions of one object on another. Biological phenomena came to be viewed as complex self-regulating, self-balancing systems utilizing feedback as an essential mechanism to maintain homeostasis. The discovery of complex patterns concealed in apparently random phenomena such as weather and turbulent flows led to the realization that the appearance of chaos may result from non-linear patterns that actually represent highly complex forms of organization. In genetics, reductionism led to the postulate that everything in biology – and even psychology – may be reduced to genes, because the genome is the only repository of transmissible information.

6. Emerging Challenges to the Triad

After a triumphant beginning in the 1950s, the attempt of molecular biology to reduce the entire functioning of organisms to the molecular level has proven increasingly problematic. Recent findings in biology challenge both the reductionist and mechanistic notions of life.¹⁰ The reduction of Mendelian genes to DNA has been subject to serious challenges. It is now known that the human genome accounts for only about 5% of the DNA.¹¹ A growing body of experimental evidence confirms that genetic activity is powerfully influenced by environmental factors both within and external to the body, giving new meaning to the premise of Lamarck which had been discarded by neo-Darwinists long ago. A new discipline of Systems Biology has emerged, an inter-disciplinary field of study that focuses on complex interactions within biological systems, using a more holistic approach (holism instead of the more traditional reductionism) to biological and biomedical research. During the past decade, this approach has been widely applied in the biosciences in a variety of contexts. One of the objectives is to model and discover emergent properties, properties of cells, tissues and organisms functioning as a system whose theoretical description is only possible using techniques which fall under the remit of Systems Biology. These typically involve metabolic networks or cell signaling networks. One recent expression of it is the formulation of a tissue organization field theory of cancer in place of the notion that cancer is the result of multiple mutations of a single cell.¹²

Systems ecology has emerged as another interdisciplinary field with a holistic approach to the study of ecological systems, especially ecosystems. It is based on the premise that ecosystems are complex systems exhibiting emergent properties. Systems ecology focuses on interactions and transactions within and between biological and ecological systems, and is especially concerned with the way the functioning of ecosystems can be influenced by human interventions.

The phenomenal successes applying the triad perspective in the physical sciences have exerted a powerful influence on the development of the social sciences as well. A systems approach to the social sciences is now addressing some of the inadequacies of reductionism in study of human beings and their interactions. Human beings are social animals. They do not survive, develop, thrive or evolve socially, culturally and psychologically in the absence of community. Society itself is clearly more than the sum of its parts. It is a highly complex multi-level, multi-dimensional web of interconnections encompassing individuals, families, organizations, communities, states and humanity as a whole knit together by myriad physical connections, social institutions, cultural traditions, shared information, values, ideas and ways of thinking. A more holistic perspective has recently arisen in reaction to the fragmentation

of the fields of human life to challenge the notion that economy, politics, society, culture and psychology can be conceived and studied as watertight compartments. It has led to the rise of interdisciplinary and multi-disciplinary forms of research and instruction.

The systems approach also seems to offer some promise of addressing the absence of unifying concepts, principles and theories in the social sciences. While all the physical sciences are based on a consistent framework of laws of Physics and Chemistry, no common basis has emerged linking or unifying the disparate concepts and principles of different fields of social science. Indeed, even within social science disciplines, a severe disconnect exists between different fields, such as the link between micro and macroeconomics or between behavioral, motivational and physiological perspectives in psychology. Systems theory provides a way to view different fields of social activity from a common perspective – to view individuals, activities, pathways, formal and informal connections and organizations as component elements of a highly complex, multi-tiered social network of relationships. Common systems principles such as nodes, connections, feedback loops, homeostatic mechanisms, environmental factors seem equally applicable to the functioning of social, political and economic activities. Experience with development and globalization over the past six decades has been aided by comparative analysis of institutions and social systems within different countries and between the national and international sphere.

7. Breaking the Third Leg

Systems theory has replaced the simple metaphor of the machine as a closed system operating independently of the world around with the more sophisticated concept of physical organization as an open system in relation with its environment. The quest for simple social laws such as the equilibrium between supply and demand has given way to complex mathematical models. In Economics, it has led to the study of markets as complex systems and the search for hidden, non-linear patterns in their apparently chaotic fluctuations, which could be used to anticipate future results. Computer algorithms have come to dominate transactions on financial markets so much that they pose a severe threat to the real economy which they are intended to serve. A mechanistic approach to society – no matter how sophisticated – has proven inadequate to either explain or anticipate human behavior, as illustrated by the sudden collapse of the Berlin Wall, the 2008 financial crisis, Occupy Wall Street, the Arab Spring and countless other events in recent memory. The systems perspective represents a considerable advance over earlier conceptions in social science. But like reductionism, it too has thus far failed to adequately account for the characteristics that distinguish physical, biological and social systems.

The problem of emergent properties had vexed reductionist science from its inception. For though reductionism has proven useful for explaining the underlying physical and chemical principles and structures on which living organisms are based, it can only speculate on the causal factors responsible for the emergence of higher order properties and characteristics. Organic chemistry has deciphered the chemical code of all living tissues, but it is unable to adequately explain the capacity of life for sensation, reproduction or adaptive behavior. Systems theory introduced the concept of emergent properties to describe the capacity of higher order systems to exhibit new properties. But naming a phenomenon and explaining it are two different things. Emergence is a name rather than an explanation.

How does systems theory account for the differences between organizations and organism? It tends to regard organism as a very complex form of organization consisting of many interrelated subsystems aligned with one another. Ironically, the very power of the systems approach has also given a fresh lease of life to the third leg of the triad mechanism. Rather, the greater subtlety and sophistication with which systems theory deals with differences between inorganic and organic forms of organization have given new impetus to efforts to fully account for the properties of living organisms as essentially identical in constitution, though differing in complexity from purely physical systems. As in the past, many scientists who balked at a purely reductionistic and mechanistic approach have been too fascinated by the power of a new perspective to see what it omits. By this means, reductionism has itself been reduced to an error of perception, while complex mechanism is exalted with characteristics which at least superficially resemble intelligence, conscious choice and goal-oriented behavior. Rather than unpacking the factors that distinguish physical, biological and social systems, systems theory has tended to collapse and recompress animate and conscious behavior into physical mechanisms. Thus, materialism has acquired a fresh lease of life and a new incarnation in disguise.

8. Reconciling Contradictions

After centuries of dormancy, the Cartesian problem of consciousness has reappeared in an unexpected and more formidable incarnation and revived long dormant ideas and disputes which materialism had laid to rest or brushed under the carpet centuries earlier. Just when neo-Darwinian theory was thought to have solved the problem of biological creation without the need to postulate an intelligent creator, the problem of consciousness resurfaced in theoretical Physics. By far the most disconcerting and potentially threatening contribution of Quantum Theory relates to the impact of the observer on the behavior of subatomic particles. As the reconceptualization of matter in terms of quantum energy fields deposed reductionism, the impact of consciousness on matter revives age-old questions regarding the nature of mind, which Descartes had divorced from Nature and materialism had reduced to a chemical-electrical process of the brain.

The capacity of mind to formulate resourceful explanations to reconcile the contradictions between theory and experience is not in question. As Sri Aurobindo explains it, "All human thought, all mental man's experience moves between a constant affirmation and negation; there is for his mind no truth of idea, no result of experience that cannot be affirmed, none that cannot be negated.... thinking mind is in its very nature an ignorant dealer in possibilities.... sounding and testing each in turn.... Our nature starts from facts and actualities which it takes for real; it is pushed beyond them into a pursuit of uncertain possibilities and led eventually to question all that it took as real."¹³ In recent times this capacity has been applied to negate the existence of the conscious individual and free will as illusion. The impact of chemistry on human psychology is an established fact. But equally well established is the impact of psychology on biology. Our thoughts powerfully affect the chemistry and physiology of our bodies, as amply demonstrated by mounting evidence of the Placebo Effect. We reduce all thought to a particular coincidence of chemical reactions and dismiss the notion of conscious choice and will entirely. The impact of consciousness on matter and life demands that we seek beyond mere material systems for more adequate explanations.

Mind has a marked tendency to affirm one perspective or truth to the exclusion of others and cling to it as long as possible against assault from all contradictory viewpoints. When finally it relinquishes hold on the old and embraces the new, it has an equally marked tendency to reject what it earlier embraced and exclude all that is inconsistent with the new viewpoint or to maintain old and new in separate watertight compartments that never meet and interact. Thus it arrives at alternative and incompatible perspectives and is unable to reconcile them, as testified by the century old struggle to reconcile Relativity and Quantum theory. Today we see the same tendency permeating the debate throughout all fields of science between simplification by reductionism and complexity. Both have made and continue to make contributions to the growth of knowledge. Neither has any likelihood of achieving completeness. For the conflict itself is an indication that we have not yet arrived at a final, all-embracing perspective in which the apparent opposites can be reconciled.

"All progress in thought seeks a reconciliation between apparently unconnected phenomena."

All progress in thought seeks a reconciliation between apparently unconnected phenomena. Thus, Newton reconciled the contradictions between motion and rest by demonstrating that the same laws govern celestial motions and phenomena on Earth. Maxwell unified the apparently disparate phenomena of electricity and magnetism as electromagnetism. Einstein unified acceleration and gravity, space and time. Continuing Einstein's work on unified theory, WAAS Fellow Abdus Salam unified electromagnetic and weak forces. Today, there is an urgent need to reconnect disparate fields of thought in the social sciences – economics, politics, society and psychology. But beyond these, there is a need to reconcile the truths of reductionism and the truths of holism within a wider theory of knowledge.

"Systems theory attempts to embrace the totality of phenomena and study the mutual interactions between its parts, but totality is not reconciliation."

The inability to resolve the apparently irreconcilable discord between the reductionist and systems perspective suggests we are using two faculties of mind at the same level which are themselves irreconcilable at that level. Mind as we commonly use it seems incapable of concentrating on the details of the part, while simultaneously embracing the wider wholes to which it belongs. Exclusive concentration and all-inclusive concentration appear to be incompatible modes of thought, at least in practice. It is equally unlikely that either the mind's capacity to divide or its capacity to aggregate will be sufficient to bring about that reconciliation. Reductionism seeks reconciliation by searching for a common denominator, ultimately reducing everything to its infinitesimal component parts, but analysis of the atom and the molecule will never be sufficient to explain the properties of matter, life or mind any more than analysis of the letters on a page can explain the meaning of its text. Systems theory attempts to embrace the totality of phenomena and study the mutual interactions between its parts, but totality is not reconciliation. It embraces all but does not reveal the true nature of their interrelationships or underlying unity. Even at the merest physical level, the phenomenon of non-locality defies both reductionism and holism. The sense of identity, belonging

and bonding we feel as members of a family, community, nation or common humanity cannot be fully known by dissecting our individual behavior or by charting the maze of interactions between us. That which unites us is deeper than the actions which express our interrelationships.

Intuitively many thinkers perceive that something essential is missing from both the reductionist and systems perspectives – something more real and essential than fundamental particles or even the sum of all the parts – something living, vibrant, aspiring, conscious. Perhaps it is beyond the capacity of division and aggregation to know or express it, but it is not beyond our consciousness to experience and know for certain that it is true. When our conceptions fail to fully account for our experience, it is wise to question the sufficiency of our conceptions rather than deny the validity of experience which is a more direct and complete way of knowing. Intuitively we know we are not merely bundle of parts, an assembled mechanism or a complex system, regardless of how particulate, mechanical or systematic some aspects of our functioning may appear. We intuitively perceive that our emotions are far more than mere chemical reactions, our experience more than just complex electrical circuitry, and our thoughts more than mere synaptic events. Our abstract mental rendering of mental, emotional and physical experiences according to limited conceptions falsifies their reality, reducing love to a chemical hormone, joy to an electrical impulse and consciousness to the action of a glorified bio-computer chip.

A holistic, inclusive approach to knowledge has proven so fruitful to new discovery that there is a natural tendency to repeat the error of reductionism in the opposite direction by embracing wholesale a holistic philosophy to the exclusion of other ways of knowing. Both perspectives have been generative of new insights and knowledge. They present a constant tension between the part and the whole, between a mechanistic, reductionist, atomistic perspective and a holistic, organismic, ecological, systemic viewpoint. But when we try to reconcile the truths of both we find they present contradictory and irreconcilable views of reality. Can two diametrically opposite philosophies of knowledge both be valid? If not, are we compelled to choose one over the other? Or is it possible that their truths can be harmonized by a third perspective which not merely accommodates and draws upon both but reconciles their differences? This is precisely the point to which Physics has been brought in its efforts to reconcile Quantum Theory and Relativity Theory from different perspectives, each seeking to affirm the validity of its own premises.

9. Contradictions are Complements

The solution is not to dispense with rationality, but to broaden it; not to reject the insights arising from reductionism and holism, but to go beyond them to something that harmonizes and reconciles. We need a fuller conception. In doing so, what must be avoided is the inevitable tendency to deny reality to what does not match our conceptions, to deny validity to experimental data and personal experience that contradict our limited mental powers of conception, as past generations have denied with sincere conviction so many truths that to us now appear to be commonplace and self-evident. Instead of compressing and collapsing reality to fit within the four walls of narrow, rigid mental definitions and conceptions, we must challenge those conceptions to relinquish their dogmatic assertions and broaden to embrace the greater breadth and complexity of our experience.

But what if no solution exists at that level? What if the problem is not with our theories, but rather with the mental faculty we insist on using to perceive reality? What if the answer lies in discovering and systematically developing higher ways of knowing which have been the source of the greatest discoveries in both science and spirituality? The achievements of both the genius and the seer throughout the ages affirm that there are. If that is the case, then the greatest pursuit of science would not be for a final Theory of Everything, but rather a quest to more fully understand both the powers of mind and the limitations of our mental faculties as we now employ them. Then the ultimate quest of science would be for a truer conception and capacity for knowing.

Is there a mode of consciousness capable of reconciling these contradictory mental powers? Is there another faculty of knowing by which we can better understand our own experiences without giving way to wild speculations or making the error of mistaking sense experience for reality? We need to draw upon another power of mind – its capacity for integration.

Some insight into what might be necessary may derive from a fresh consideration of the human organism that affirms the truths but transcends the constraints imposed by reductionism, materialism, mechanism and even holism. For in human experience we find a perfect integration of multiple viewpoints of reality. We see the contribution of each of the constituent parts – DNA, cellular organelles, organs, glands, chemical compounds and structural components. At the same time we are aware of the essential contribution of systems which consist of varied component parts functioning in harmonious relationship with one another – respiratory, circulatory, digestive, nervous, muscular, lymphatic. The parts and the systems functioning interdependently and neither can be fully understood independent of the other. But neither the sum of the parts by themselves nor the totality of the parts and systems is sufficient to fully represent the complex integration between them. The smallest change in one part or system can have repercussions throughout the whole organism.

This mutual interdependence or integration is a characteristic of living organisms that distinguishes them from mechanical material systems. All depend on the functioning of each. Each depends on the functioning of all the others. Together they exhibit the properties of an All which is more and other than the properties of any and all of them – sensation, metabolism, reproduction, adaptation, growth, development and evolution. These properties are the characteristic attributes of all living organisms. Living organisms are seamlessly integrated wholes that are more than the sum of their parts and their systems and cannot be assembled from their components.

Moreover, in addition to the physical dimension defined by its material component parts and the living dimension represented by its integrated systems, the human organism possesses a third dimension, conscious mentality. Conscious mentality is a characteristic of a living being with the capacity for sensation, perception, emotion, thought, will, decision, discrimination, judgment, ideation, imagination, aspiration and joy – capacities unlike anything exhibited by things and systems. Reductionism relies on the mind's capacity for division to explain consciousness strictly in terms of chemical and electrical events. Systems theory relies on the mind's capacity to view totalities to explain life and consciousness in terms of feedback loops and emergent properties. Neither is adequate to describe or explain more than their rudimentary attributes. But by what capacity of mentality shall we seek to explain

consciousness, which is neither a thing nor a mechanism and which is the basis for human mentality itself? As the properties of physical things are not wholly intelligible by a process of mental division and the properties of living systems are not wholly intelligible by a process of mental aggregation, conscious mentality is not fully explicable by either or both.

The solution must lie in some powers of conscious mentality that transcend the limits of division and aggregation. All ages and all traditions, both scientific and spiritual, refer to the power of insight and intuition, without actually explaining what they are. Great scientists have affirmed these powers as the source of their greatest discoveries without being able to explain what they are or by what process they act. A study of genius suggests that at least some of their characteristics can be reproduced by consciously striving to transcend the limitations of mind's capacity for exclusive concentration on the parts and inclusive embracing of the totality. For want of clearer terms, this higher mental faculty may be denoted as the capacity to reconcile contradictions, synthesize apparently disparate or unconnected phenomena and integrate different parts, levels, dimensions and aspects of reality to perceive it as a complex living whole. As Niels Bohr expressed it, "It is the hallmark of any deep truth that its negation is also a deep truth."¹⁴ Or as Sri Aurobindo explained it, what appear to a limited perspective as contradictions reveal to a wider vision as complementary aspects of reality.¹⁵

10. Toward a Science of Society

The need for developing higher ways of knowing is clearly illustrated in the field of social science where the failure of reductionism and the limitations of systems theory are most apparent. It is highly significant that after nearly two centuries of development, human endeavor has arrived at a multitude of autonomous social science disciplines but nothing that may be termed a true science of society. It is as if political science, economics, anthropology, sociology, psychology and, one might add, business management were each studying a separate aspect of reality independent of one another. In fact there is no such thing as the political or economic individual or the political or economic part of society. Society is an integral reality. All aspects of human activity exist or function in relation to every other. There are individual human beings and the societies which they constitute. As every perceptive historian knows, it is impossible to study political institutions independent from economic institutions and productive systems, social values and customs, cultural norms and patterns of behavior, psychological aspirations and attitudes of the people who participate in those political institutions. The same is equally true of the other social sciences. Economy is inseparable from policy, custom, values and aspirations. Law, governance, business, communication, transportation, education and other activities are inseparable from one another.

Yet in spite of this obvious fact, the social sciences continue to function as if they were largely independent from one another compensated only by a modicum of inter-disciplinarity. This separation is justified as a practical necessity by the extreme difficulty of studying society as a living, conscious whole. If expediency were the sole or real justification, one would expect that each of the social sciences bases itself on the same common principles of a science of society and then applies those principles to one field of human activity or the other. In fact there is little evidence of anything resembling a science of society or a consensus regarding the basic principles governing all human activity. Although growth, development

and evolution are processes or attributes of all fields of social activity, there is no consensus regarding the principles that govern these processes.

Systems theory comes closest to attempting a unification of the social sciences by examining the common properties of social systems in different fields of social activity. But its attempt to explain complex social systems in purely mechanical terms is far from adequate. Social systems are alive and they are conscious. They not only function repetitively through self-regulation; they continuously innovate, develop and evolve. Moreover, systems theory ignores the most salient and striking feature of human social systems, the role of the conscious individual. For society is not merely an assembly of parts linked together by systems. It is a grouping of unique individuals with some common characteristics but also with the capacity for unique individual choice. History confirms that the conscious choices of a single person can alter the whole society or change the whole world, as Alexander, Napoleon, Lincoln, Gandhi, Churchill, Gorbachev, Copernicus, Newton, Darwin, Einstein, Edison, Tesla, Ford, Jobs, da Vinci, Shakespeare and countless others have changed it in the past by the power of an idea, an aspiration or an action. The conscious individual remains an inexplicable mystery to both physical and social science. The individual is not merely a complex impersonal system, and therefore unpredictable. The emergence of conscious personality out of impersonal mechanism defies the premises of both reductionism and holism. There may be lower level phenomena that imitate it in one respect or another, but none even approximately accounts for it. To state that conscious life is an emergent property of inanimate matter or an example of the self-organizing properties of complex systems is merely a description that explains nothing.

The relationship between the individual and society defies explanation solely in terms of division and aggregation, reductionism and holism. The individual and the society form inseparable, interrelated aspects of a single whole. The individual draws upon the society as the source of knowledge, ideas, values, attitudes, feelings, skills, habits, customs and beliefs and combines them in unique ways to constitute and develop its own attributes. So too, the society draws upon its individual members to make new discoveries, formulate original perceptions, affirm new and higher values, aspire for higher goals, evolve new skills, invent new technologies and innovate new and more effective forms of social organization. Neither can be understood separately from the other. Neither exists without the other. Both form aspects of an integrated whole and can only be effectively understood by approaching them with a faculty capable of insight into their individual uniqueness, common attributes, and more essential unity with one another. *Knowledge of the parts is true within limits, as is knowledge of the whole, but neither is complete without knowledge of the essence which integrates them. Consciousness is that essence.*

The introduction of conscious intention poses monumental consequences. While the determinates of results in the physical sciences always move from the past to the future, the presence of consciousness introduces a radically new factor. It makes possible the introduction of determinates driven by anticipation of future possibilities. According to Newton's First Law of Motion, inanimate objects remain at constant velocity unless acted upon by an external force directed at it some time in the past; whereas conscious beings can be set in motion by internal forces in pursuit of a future goal. More than a half century ago former World Academy President Harlan Cleveland recognized the profound significance of this

truth when he formulated the phrase ‘revolution of rising expectations’ to describe the influence of the future on the rapid development of countries in the Far East. Consciousness broadens the time frame to encompass the force of the future on the present and the past. As a moment’s reflection will make self-evident, our ever-changing perceptions regarding the future account for much of the uncertainty associated with human behavior. In recognition of this fact, Roberto Poli argues convincingly that “the future can be used to reshape the human and social sciences.”¹⁶ A true science of society must necessarily take into account the powerful influence of aspiration and anticipation on human affairs.

“The first necessity is to recognize that the limitations of present knowledge are the result of the limitations of the mental faculties we employ and that the solution lies not in endless, repetitive exercise of those faculties, but rather in efforts to transcend them by developing more powerful ways of knowing.”

The founding of a real science of society would have to be based on knowledge of this integral relationship between the individual and the collective, between past consequences and future aspirations, between material substance, living organism and conscious individuality. It would also have to be founded on the common processes that govern survival, growth, development and evolution in all spheres of social existence. While its expressions vary, all social activity is based on the release of human energy which is directed to become purposeful force, organized into productive power and expressed through skilled action to achieve results. The processes governing the release, direction, organization and skilled expression of those energies are common to all fields of activity.¹⁷

The founding of a unified science of society depends on the development of higher ways of knowing, which great minds of the past have achieved in moments of inspiration. But there is no reason to think that this capacity must remain an attribute of rare genius. A careful study of the mental processes of the exceptional may reveal capacities latent and capable of development in all of us.¹⁸ There was a time not many centuries ago when even the capacity to read and write was taken as a sign of superior intelligence. Those with the capacity to recite classical texts have been lauded for their genius. Many scientists of the past are revered for having exercised a capacity for careful classification and analysis which is commonplace today. Complex systems-thinking is far more prevalent than it was a few decades ago. Therefore, there is no reason to conclude that capacities for synthesis and integration are beyond our common reach.

The first necessity is to recognize that the limitations of present knowledge are the result of the limitations of the mental faculties we employ and that the solution lies not in endless, repetitive exercise of those faculties, but rather in efforts to transcend them by developing more powerful ways of knowing. Division deals with complexity by searching for irreducible, independent, individual elements and classifying them according to their similarities and differences, while disregarding their relationships and interactions. Aggregation combines and coordinates myriad parts in search of the greater whole to which all parts belong and traces

the observable common pathways and material processes by which they relate with one another, while ignoring the living and conscious dimensions that are unique, unifying characteristic of the whole, or mistaking them for mechanical processes in the material dimension. Integration seeks the unifying principles and essence by which the individual differences and aggregate relationships of the totality are organically united as expressions of an indivisible living organism. Integration embraces all three dimensions – individuality, commonality and essential unity.¹⁹ Unification of the social sciences involves recognizing that both the aggregate society and the unique individuals of which it is composed are constituents of a single, organic, living, conscious, integral reality that grows, develops and evolves in all its aspects, fields, activities, and dimensions based on common principles and processes.

11. Necessity, Uncertainty & Infinity

Humanity has made remarkable progress in its quest for knowledge and the application of that knowledge for its own advancement. By knowledge we mean knowledge of existence. Such knowledge, in the measure it is comprehensive and complete, must necessarily bring with it the capacity for application to fulfill the aspirations of humanity, including its quest for peace, security, prosperity, welfare and well-being. The progress we have made and the problems we currently face reflect the extent and limits to current knowledge.

The evolution of science and mentality has resulted in a progressive revelation of phenomena once regarded as inexplicable mysteries of Nature. Reductionism by mind's power of division has delved into the nature of the infinitesimal particles, atoms, elements, molecules, cells and myriad living beings that constitute the components of life in the universe. The holistic vision made possible by mind's power for aggregation and inclusiveness has revealed the complex interactions and relationships between these components that characterize the nature of physical, biological and social systems.

Yet each new discovery in knowledge has cast a new shadow of doubt. More than a century after the formulation of the standard model in Physics, our understanding of the true nature of material energy and substance seems less certain than ever before. More than 150 years after Darwin's *Origin of Species* the precise role and interaction between Nature and Nurture, heredity and environment are less clear than it was a century ago. The very process of our knowing seems to lead to a greater awareness of our ignorance. The successful quest of reductionism to discover immutable laws of Nature has brought us to the boundaries where necessity and certainty shade off into uncertainty and chaos. Indeed, Chaos theory urges us to accept with a sense of resignation that uncertainty is an essential property of reality and an ineluctable characteristic of all knowledge. Mind's quest for ultimate knowledge leads to the conclusion that perpetual ignorance is the only certainty. Uncertainty is the ultimate truth.

But what, after all, is uncertainty if not the flip side of infinity. The doctrine of uncertainty which compels us to accept that nothing can be known for sure simultaneously invites us to accept that anything is possible. On the other side of uncertainty lies "the unstructured potential from which all social creativity continuously throws up new opportunities."²⁰ Looking back on the advances of human civilization over the past few millennia, we are struck not so much by the uncertainty of our historic advance as by the inconceivable creativity, inventiveness and unfolding of previously unimagined possibilities. Life in the Middle Ages was a comparatively uncreative period in which all essential truths were thought to be known but

nothing much changed, except by infinitesimal incremental steps. Life today is a period of unparalleled creativity and inventiveness where the only thing we can be sure of is that things will be different tomorrow and that the pace of change will continue to accelerate. Although we may disparage the tendency toward sameness associated with globalization, looking back on the multiplication of people, languages, cultures, religions, nations, institutions, organizations, technologies, ideas, concepts, fields of study and ways of life that constitute our present humanity, one of the most striking facts is the seemingly unlimited diversity that has emerged from our common origin as a species.

Where does that diversity come from? Where is it headed? We are entering a period of greater diversity than ever before in human history. The movement of diversification is now shifting from the level of collective to the level of the individual. No longer are we merely inventing distinct and distinguishing social forms. We are now fostering as never before the emergence and development of individuals with their own unique, individualized characteristics, as if the unseen goal were for humanity to manifest infinite variability in the midst of unifying commonality. The spread of democratic freedom, education, access to information, human rights and tolerance for differences is unprecedented and rapidly increasing.

It seems natural that a world of ever increasing diversity would become less and less intelligible according to an approach to knowledge predicated on the fixity, certainty and predictability of nature. It is equally understandable that a world of ever increasing complexity should appear less and less certain to an approach to knowledge derived from a charting of the relationships and interactions between an ever expanding network of nodes. From one perspective, the Internet has become the symbol of the increasing uncertainty bordering on chaos. From another perspective, the Internet has become a symbol of the unlimited aspiration for creativity, inventiveness and initiative that society has made possible by unleashing the emergent power of individuality.

Uncertainty and Infinity are complementary aspects of reality. The problems humanity suffers from today are problems of surfeit, not insufficiency. We possess the knowledge, capacity and resources to meet the needs and fulfill the aspirations of everyone. But we are imprisoned by outmoded concepts based on limited ways of knowing. We still believe in the economics of scarcity and competition, politics based on balance of power, the sociology of conformity, the value of money and technology. We still ignore the inalienable rights, ultimate value and unlimited creative potential of being human. A new way of knowing is urgently needed to convert the challenges that confine and threaten us into opportunities for unlimited development. The solution for every problem lies in new ways of knowing.

The old school of scientific thought regarded infinity as a philosophical or theoretical concept which could never actually exist. Humanity's future affirms *infinity* as a practical concept striving ever more intensely and eagerly to express itself. To comprehend the future toward which we are moving, we need to complement mind's powers for division and aggregation with other powers capable of reconciling contradictions, integrating the physical, social, psychological and spiritual dimensions of reality, comprehending and perceiving the practical evolution of the Infinite.

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Hubris Versus Wisdom

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Abstract

The world has shed over 50,000 nuclear weapons since the mid-1980s, but some 17,000 nuclear weapons still remain, primarily in the arsenals of the United States and Russia. This is far more than a sufficient number of these weapons of mass annihilation to end civilization and cause the extinction of most forms of complex life on the planet. This article explores the tension between hubris and wisdom in relation to nuclear weapons and the human future. Hubris says that these terrible weapons are subject to human control, while wisdom says that humans are fallible creatures, subject to error, miscalculation and irrationality. Examples of wisdom are provided in the form of perspectives of three leading 20th century thinkers: Albert Camus, Mohandas Gandhi and Albert Einstein. The article concludes that the Nuclear Age demands that humanity conquer hubris with wisdom and achieve Nuclear Zero, the only acceptable number of nuclear weapons to assure the future of humanity and other forms of complex life.

The steadfast commitment of the people of Nagasaki and Hiroshima to nuclear weapons abolition for nearly seven decades is both admirable and honorable. Along with many millions of other thinking and caring people throughout the world, I share with you the hope and goal that Nagasaki will remain the last place on Earth where nuclear weapons are ever used in warfare.

It is evident that there is only one way to assure this goal, and that is to abolish nuclear weapons. To do so will require leadership and a massive demand from people throughout the world. As one who has worked toward this goal for more than four decades, I know that this is an extremely difficult challenge, but I also know that we are making progress.

In 1986, there were over 70,000 nuclear weapons in the world. Today there are just over 17,000. It is progress that the world has shed some 53,000 nuclear weapons in roughly the past quarter century, but we still have far too many. To assure that there are no more Hiroshimas or Nagasakis will require achieving a world with Zero nuclear weapons.

1. Hubris Versus Wisdom

In the Nuclear Age, humankind must not be passive in the face of the threat posed by nuclear weapons. The future of humanity and all life depends upon the outcome of the ongoing struggle between hubris and wisdom.

Hubris is an ancient Greek word meaning extreme arrogance. Wisdom is cautionary good sense.

Hubris is at the heart of Greek tragedy – the arrogant belief that one's power is unassailable. Wisdom counsels that no human power is impregnable.

Hubris says some countries can hold onto nuclear weapons and rely upon them for deterrence. Wisdom says these weapons must be eliminated before they eliminate us.

Hubris says these terrible weapons are subject to human control. Wisdom says that humans are fallible creatures, subject to error.

Hubris repeats that we can control our most dangerous technologies. Wisdom says look at what happened at Chernobyl and Fukushima.

Hubris says the spread of nuclear weapons can be contained. Wisdom says that the only sure way to prevent the spread or use of nuclear weapons is to abolish those that exist.

Hubris says that political leaders will always be rational and avoid the use of nuclear weapons. Wisdom observes that all humans, including political leaders, behave irrationally at times under some circumstances.

Hubris says we can play Russian roulette with the human future. Wisdom says we have a responsibility to assure there is a human future.

Hubris says that we can control nuclear fire. Wisdom says nuclear weapons will spark wildfires of human suffering and must be eradicated forever from the planet.

2. The Necessity of Wisdom

In the Nuclear Age, wisdom is the best antidote to hubris. I want to go back in time to the horrific opening of the Nuclear Age and explore the wisdom of three men who understood clearly that the creation and use of atomic bombs changed the world. These men were Albert Camus, Mohandas Gandhi and Albert Einstein. Their responses to the use of atomic weapons were very different from that of then-President of the United States, Harry Truman, who, when he heard of the bombing of Hiroshima, is reported to have said, "This is the greatest thing in history." He also thanked God that the bomb had come to the United States and not to its enemies.

Albert Camus was a great French novelist and existentialist who, during World War II, edited the underground French Resistance newspaper, *Combat*. Twelve years after the war, in 1957, he would receive the Nobel Prize for Literature. After learning of the bombing of Hiroshima, even before the second bomb had been dropped on Nagasaki, he wrote:

"Our technical civilization has just reached its greatest level of savagery. We will have to choose, in the more or less near future, between collective suicide and the intelligent use of our scientific conquests. Before the terrifying prospects now available to humanity, we see even more clearly that peace is the only battle worth waging. This is no longer a prayer but a demand to be made by all peoples to their governments – a demand to choose definitively between hell and reason."

Camus recognized instantly that, after the atomic bomb was created and used, peace needed to be elevated to the top of our hierarchy of values and goals. It needed to be pursued actively, that is *waged*, with the same strategic thinking, discipline, commitment and courage

as for waging war. For Camus, the new circumstance of nuclear weapons in the world required *the people to wage peace and to lead their leaders*.

Gandhi was the great proponent of *satyagraha* (truth-force) and non-violence. He was leading India to independence from the British when the atomic bombs fell on Hiroshima and Nagasaki. Gandhi recalled his reaction to the bombs: "I did not move a muscle when I first heard that the atom bomb had wiped out Hiroshima. On the contrary, I said to myself, 'Unless now the world adopts nonviolence, it will spell certain suicide for humanity.' Non-violence is the only thing the atom bomb cannot destroy." For Gandhi, *the violence of the atomic bomb could only be overcome by the nonviolence of humanity*.

Albert Einstein, the great scientist and humanitarian, wrote, "The unleashed power of the atom has changed everything save our modes of thinking and thus we drift toward unparalleled catastrophe."

Einstein saw that the old ways of thinking were a trap and that people must learn to think in new ways. I believe the most important new ways of thinking that are needed are species identification and solidarity, that is, we must think like members of one race, the human race. In doing so, we will learn to settle our differences peacefully and not through violence, and we will build institutions, such as the United Nations, that will support these ways of thinking. For Einstein, the critical factor brought about by atomic weaponry was *the need for new modes of thinking if humankind is to avert "unparalleled catastrophe."*

Three great men: three powerful expressions of wisdom.

3. Ending the Nuclear Threat

The only number of nuclear weapons that makes sense is Zero and that must be our goal: a world with Zero nuclear weapons. This world is only as far away as our imaginations, our determination and our perseverance. To achieve Nuclear Zero, we must wage peace, take nonviolent actions, and change our modes of thinking to identify as members of the human species. The Nuclear Age demands that we conquer hubris with wisdom.

We must never give up on seeking the goal of a world free of nuclear weapons. We can follow wisdom and live together as humans, seeking solutions to our common problems; or we can follow the path of hubris and perish together stuck in our apathy, our ignorance and our national allegiances.

The most important next step on the journey to a peaceful and non-killing world is ending the nuclear weapons era. This can be accomplished by the negotiation of a Nuclear Weapons Convention for the phased, verifiable, irreversible and transparent elimination of nuclear weapons. Progress is being made toward this goal, but it seems unbearably slow.

Civil society and non-nuclear weapon states must bring more pressure to bear upon the existing nuclear weapon states to negotiate the elimination of their nuclear arsenals. I would also encourage countries to begin negotiations, with or without the nuclear weapons states, for a legal ban on the manufacture, possession, use or threat of use of nuclear weapons. The process must begin and it must be approached with a sense of urgency.

Having identified the problem – that nuclear weapons endanger the human species and much of complex life – we should move rapidly toward eliminating the threat. In doing so, we will free up scientific and financial resources to deal with other pressing global threats, including climate change, development of renewable energy resources, pollution of the oceans and atmosphere, scarcity of potable water, food insecurity and loss of forests, biodiversity and arable land. For the future of humanity, we must also move forward to eliminate war as a human institution.

“For the future of humanity, we must also move forward to eliminate war as a human institution.”

4. A Few Simple Truths

I will end with a short poem that I wrote earlier this year. It is titled “A Few Simple Truths.”

A FEW SIMPLE TRUTHS

*Life is the universe's most precious creation.
There is only one place we know of where life exists.
Children, all children, deserve a full and fair chance.
The bomb threatens all life.
War is legitimized murder with collateral damage.
Construction requires more than a hammer.
The rising of the oceans cannot be contained by money.
Love is the only currency that truly matters.
One true human brings beauty to the earth.*

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Being in Superposition: Migrant Women, Modern Subjectivity, and the New Collectivity

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As soon as there is the One, there is murder, wounding, traumatism. (. . .) Self-determination as violence. – Derrida¹

In fact, it might be that what is happening to us is just another sort of “Copernican revolution” (. . .) of “social Being” (. . .). – Jean-Luc Nancy²

Abstract

Granted that one of the key features of our times is global migratory movement, this paper examines how these contemporary trends and developments affect, inform, and reconfigure modern subjectivity, which, in turn, constitutes one's individuality and identity as socio-culturally and econo-politically recognizable. More specifically, I trace and articulate the shift in and evolution of modern subjectivity through the emergence of migrant women on the global scene, whose existence among different geo-social locales and value systems I name here as being in superposition – synchronously multiple placedness in the world. Subjectivity here refers to subjective experiences and subjective consciousness as resources for individuality formation and formulation – the conception of an individual as she (re)presents herself and appears in the world. Furthermore, subjectivity refers to a subject as a being called to act(ion) as well as to a way of relating to others. Through its emphasis on migrant women's manifold realities, superposition also becomes a different way of both historicizing and envisioning the self and community. Searching not only for an alternative figuration but also for a new (con)figuration of such envisioning, superposition as a more comprehensive model is recognized, first, as the emerging property of individuality grounded in the felt history of women migrants; second, as a more comprehensive conceptual plane for understanding poetico-politics of modern subjectivity; and, third, as a set of strategies for and means of engaging being in superposition for more inclusive aesthetico-political representation and wider social equity in an empathic community.

1. Mythical Foreigners: Female Exile and the Foundational Disobedience

In her book *Strangers to Ourselves*, a poignant study of foreignness, Julia Kristeva traces the literary history of migrants and points out incisively: “It is noteworthy that the first foreigners to emerge at the dawn of our civilization are foreign women – the Danaïdes.”³ In this foundational myth of Argos, the fifty daughters of Danaus were ordered to marry the fifty sons of his brother Aegyptus. In the exilic story of these itinerant women, it is crucial to point

out that not only were the Danaïdes fleeing their native land but, particularly, the laws of that land and the enforced marriages. Their defiance of such a violent enforcement prompts their flight. Beyond Greek antiquity, we can further trace our civilization in the originary expulsion and lapse of the Judeo-Christian tradition, within which too *the mythical exile as well as the notion of otherness are found in and founded on the female disobedience*. The notion of disobedience is invoked here resonantly with Henry David Thoreau's understanding that it is, in fact, one's higher duty to be disobedient to an unjust cause and unjust government.⁴ Human condition and human history, as we know them, begin with the expulsion from Eden, for which Lilith and Eve were not given the credit as foundational mothers but were expelled as monstrous begetters of human suffering. Manifold women's exile starts from their initial, fundamental position which puts them outside the border of symbolic language which organizes social institutions and laws, governs the production of socio-cultural meaning, and renders women muted historical subjects.

While neglected and under-represented both as a mythical and a historical subject, migrant women have become the decisive markers of our contemporary times. In these times of dramatically increased international mobility and migrations, we are witnessing an unprecedented number of women on the move. The mythical reference to women as figures of socio-cultural otherness and to migrant women as unruly foreigners who unsettle multiple socio-cultural borders thus sets the historical stage for the discussion of women's migrations which tend to be enforced, violent, and driven by socio-economic necessities even today.

2. Women in Modern Migrations

Women are experiencing drastically greater possibilities for voluntary movement as well as a dire likelihood of enforced displacements. Their migrations are happening within the context of global market economy whose means for the movement of the people and capital may be highly advanced but its labor division and profit sharing run along well-entrenched lines of racial/ethnic/class/gender hierarchies. In their introduction to the collection *The Gender of Globalization*, Nandini Gunewardena and Ann Kingsolver expound on the inequities generated by neoliberal globalization and "feminization of poverty." Highlighting the observation that "current globalization builds on patterns created by centuries of colonialism and imperialism interacting with local systems of domination," they examine "how local and global constructions of gender are employed in the operations of transnational capital to exacerbate women's economic and social vulnerabilities."* Furthermore, the multi-media digital technologies are bringing greater number of people together while increasingly keeping people confined to virtuality. Many of these technological means, however, are enabling migrants to keep closer ties to their originary geo-cultural locales than ever before.

* Gunewardena, Nadine and Ann Kingsolver. Eds. *The Gender of Globalization: Women Navigating Cultural and Economic Marginalities* (Santa Fe: School for Advanced Research Press, 2007), 19, Foreword xi, 3 respectively. In light of what Gunewardena and Kingsolver recognize as "the multiple and overlapping systems of subordination and exploitation that have emerged or been reified in globalized contexts, especially in the global South" (8-9), see United Nations' 2006 publication *World Survey on the Role of Women in Development 2004: Women and International Migration*. Increased women's vulnerabilities on the global scale are also discussed most recently at the 2013 United Nations Women 68th General Assembly and its General Debate on the state of women globally and in particular in relation to the UN Millennium Development Goals. See "High-Level Dialogue on International Migration and Development: 'Making Migration Work'" of the United Nations General Assembly at <http://www.un.org/esa/population/meetings/HLD2013/main-hld2013.html?main> and "Toward Safer Work and Migration for Women" of UN Women – United Nations Entity for Gender Equality and the Empowerment of Women at <http://www.unwomen.org/en/news/stories/2013/10/report-on-women-migrants>. For an analytical study of the intersecting issues of gender, international migration and economic development in the contemporary world, see also the 2007 World Bank Research Program on International Migration and Development and its publication *The International Migration of Women* edited by Maurice Schiff and others.

I use the term “migrant” not only to cover a broader spectrum of migrant conditions such as exile, dislocation, and immigration, but also to indicate a change in the contemporary demographic movements which is marked by an overall greater mobility and greater socio-cultural and economic capacity of people to move repeatedly; to be more mobile and less settled. The term “immigrant” seems to connote a singular act of moving to a new settlement and, consequently, focusing on the processes and problematics of adjustment and assimilation; while “migrant” carries with it a sense of restlessness. Additionally, I want to distinguish a migrant’s conditions as those of somebody who experiences more dramatic socio-cultural changes such as new locations and new languages, and in that sense I want to mark a greater difference between migrants and established diasporas.

3. Being in Superposition: Multiple Placedness in the World

Granted that one of the key features of our times is global migratory movement, this paper examines how these contemporary trends and developments affect, inform, and reconfigure modern subjectivity, which, in turn, constitutes one’s individuality and identity as socio-culturally and econo-politically recognizable. More specifically, I trace and articulate the shift in and evolution of modern subjectivity through the emergence of migrant women on the global scene, whose existence among different geo-social locales and value systems I name here as being in superposition – synchronously multiple placedness in the world. Subjectivity here refers to subjective experiences and subjective consciousness as resources for individuality formation and formulation – the conception of an individual as she (re)presents herself and appears in the world. Furthermore, subjectivity refers to a subject as a being called to act(ion) as well as to a way of relating to others.

As I explore the properties of the smallest scale social entity and a mobile physical system of a migrant, I turn to the language of quantum mechanics and theoretical physics for the term superposition for its greater conceptual capacity to elucidate the possibilities of multiple positionality.* What I find conceptually productive in the term superposition is the notion that a physical system such as an electron exists partly in all its particular, theoretically possible states or configuration of its properties simultaneously; but, when measured, it gives a result corresponding to only one of the possible configurations, thus the notion of the observer not only as participant but also as a reductive force. Similarly, a migrant’s simultaneous existence among multiple social systems and multiple loci of her consciousness is reduced by traditional categories of national, political, and other forms of assumed identifications and

* For a detailed record of the influence of physics concepts on literature, see H. T. Hamann et al. Eds., *Categories – On the Beauty of Physics: Essential Physics Concepts and Their Companions in Art and Literature* (New York: Vernacular Press, 2005). Connections between our historical and imaginative representations of the self and the world and our scientific discoveries are evoked from the premise that the study of physics, whose range of inquiry spans from the invisible quantum domain to the questions of multiple universes, has to be intrinsically connected, relatable, and relevant to the study of human imaginative ranges, fictional worlds and intellectual realms. Rutherford’s splitting of the atom correlated with the splitting of the notion of the unified self, which found, in turn, its representation in the fragmented narrative forms and Virginia Woolf’s preoccupation with the atom. No realization about our place in the world and universe, both in terms of being subjects of observations as well as observers, can exist in isolation without affecting and interfering with other inquiries. Furthermore, that which is known cannot be unknown; that which is discovered, reached, and proposed as information and knowledge cannot be taken back – it enters the collective circulation of ideas and beliefs and can only be incorporated further, modified, debunked, expanded but not erased. Interdisciplinary influences are also not unidirectional – fiction and science have been mutually informative and complementary. When Brian Greene discusses theories of multiverses, he reaches out to the language of the arts and humanities for explanations of the realms which can only be relegated to the imaginative conceptions – physics as a discipline itself experienced the displacement in terms of those conceptions into the language of mathematics. John Archibald Wheeler’s lectures are known for his extensive quoting of poets and writers. In his *The Quark and the Jaguar* (New York: St. Martin’s Griffin, 1995), Murray Gell-Mann, Nobel laureate for physics and an avid linguist and connoisseur of literature who proposed the quark model and coined the term, discusses the connections he made across physics and literature and the etymology of “quark,” the elemental particle, derived from James Joyce’s novel *Finnegan’s Wake*. Moreover, two of the several types or “flavors” of quarks now known as “bottom and top” were originally called “beauty and truth” of the sub-nuclear world, which is characterized by graceful symmetries that would be to John Keats’s delight.

allegiances. This discussion situates the modern subject along the intersecting lines of race/ethnicity/class/gender and in relationship to, rather away from, the universalized, disembodied, rationalized, and lionized individuality of traditional conceptions.

Working and developing away from such traditional conceptions, sciences and arts of our times and the burgeoning of interdisciplinary studies have been informing and registering a dramatic shift in our general worldview. I align here my understanding of the migrant subject and the migrant modes of existence with Alfred North Whitehead's conceptions of process philosophy, embodied mind, and occasions of experience. Process philosophy identifies metaphysical reality with change and dynamism. It has its counterpart envisioning in the sphere of physics through Ilya Prigogine's distinction between physics of being and physics of becoming and the understanding of reality as experiential, as a process of continual (re) invention, rather than given material.* Taking off from such philosophico-scientific perspectives, the emerging modern worldview is characterized by the notions of interconnectedness, participatory universe, transformational processes and being as becoming.

4. Individualism and the Diversified Self

Expansion of our consciousness thus changes the conditions for individuation. Consequently, individualism as the key feature of our times needs to be rethought and reconfigured. In her meditation on the possibility of modern human bonding entitled *Flesh of My Flesh*, Kaja Silverman points out that insistence on uniqueness in narrowly defined individualism leads to the point at which we as unique individuals are bound to be rivals if not enemies.⁵ I ask then: How can we conceive of individualism within and along the lines of interconnectedness? How can we protect women's emerging and precarious autonomy and, thus, individual autonomy at large as we focus on creating the new global community?

Regarding the figure of a foreigner, Julia Kristeva asserts: "Whether a constraint or a choice, a psychological evolution or a political fate, this position as different being might appear to be the goal of human autonomy (. . .) and thus a major illustration of the most intrinsic, most essential part of civilization."⁶ In that sense, women migrants are the socio-cultural figures of utter difference, whose existence can be viewed as being in superposition. *Superposition is applied here for a conceptualization of the self as an evolving set of positions in relations. Dynamic, relational, multipositional and diversified individuality* thusly conceived keeps a sense of unique positional configuration, always escaping one-dimensional categorizations, while simultaneously allowing for multitude of affinities, intersecting, and solidarity.

As I explore the properties of an individual as the smallest social system, the microcosm of an individual migrant, I want to emphasize that superposition accounts not only for the complexity of the subject matter but also for the precarious roles of the observer. To measure the given subject's many discrete aspects requires the subtle skill of discretion. On the one hand, we need to recognize that we cannot simultaneously measure the subject's position (identity) and velocity (transformation) and that any definition we offer would have to have the capacity to account for the subject's continuous change and transformation. On the other

* In his seminal *Process and Reality* (Gifford Lectures Delivered in the University of Edinburgh during the Session 1927-28, 2nd Ed. Free Press, 1979), Whitehead counters reductive materialism and Cartesian dualism by showing reality to be a relational process. See Prigogine's *From Being to Becoming: Time and Complexity in the Physical Sciences* (New York: W H Freeman & Co., 1981).

hand, we need to acknowledge that we can observe the subject only by interacting and interfering with it. *As gendered and mobile self-conscious spaces, migrant women's existences, termed here as metalives, highlight multiple loci of consciousness and modes of identifications and emphasize the zones of their negotiations as existential, epistemological, and aesthetic distances of self-reflection.*

5. Gendered Psychogeography and the Ethics of Home

Migration alters and reconfigures one's psycho-geographic orientations. Once the borders are crossed, the bigger the world gets, the more concentrated the one is on the self, which is now experienced as an expansion within which we recognize home differently and integrate aspects of the new space as somehow recognizable. It is erroneous to identify home with stasis, clear-cut boundaries and identity, and fixity. It is delusive to associate home with familiarity, safety, and comfort – that which is, in fact, projected as the feeling of “being-at-home.” I invoke here the life and work of Theodor Adorno, quoting his grave irony: “it is part of morality not to be at home in one's home.”⁷ What does this imperative statement mean for women who have been exiled to private spaces and systematically confined to home, systematically contained and trained to contain themselves in the domestic domain that is to stay and stay put? How can women act upon Adorno's instructive proclamation with conviction and effectiveness? If we recall Kristeva's unruly Danaïdes, we realize that for a woman to follow Adorno's recommendation it would require an act of radical disobedience. As such, their act would not only be a matter of individual emancipation but a form of civil service that alters all-encompassing social regulations.

To get to the multiple planes of diversification and dynamization of personal space and subjectivity, it is necessary to unhinge critically the conventional bind between women and body (identification with the natural, irrational, and emotional) as well as women and space (identification with the static and the land – motherland, Mother Nature etc.). Womanhood as gendered self-space is magnified with hypersensitivity in the migrant situations. By tracing the meridians of migrant female psychogeographies,^{*} I want to point out that the most immediate impact of migration is, however, examined through the body. Experiences of different orientations and surroundings, climate, food, spatial/linguistic/legal regulations throw the body as the moving and transforming habitat into focus. The necessity to situate the subject makes the subject necessarily spatially constructed through, what Avtar Brah called, the “lived experience of locality.”⁸ The questions of the history, locale, and national allegiance come to the forefront at which all the former demarcations and orientations are destabilized, questioned, and problematized. The gendered position further complicates such orientations, and to prominence come questions and problems of how/what it means to be out of one's proper place in terms of locale, home, tradition, beliefs, and gender proper to name just a few. The meaning of one's (im)proper place is negotiated primarily on the bodily site. As an embodied system, the female self holds multiple systematically delimited spaces which need to be re-examined for potential nostalgic trappings of fallacious unification, reconstitution, and homing.

^{*} Psychogeographies is Guy Debord's term and concept for the influence spaces and spatial organizations have on the psycho-emotional and behavioral constitution of an individual.

6. The Ectopic Subject and the Exquisite Individuality

Out of the connection between spatialization of subjectivity and superposition, *I examine women migrants as the ectopic subject – the always already out of place identity* pulsing vitally somewhere not expected, not naturalized, not sought, not allowed, or not recognized. The ectopic subject is a challenge to the understanding of identity because it is there where you are looking but it is somewhere else – *as being-in-superposition it is always (not) here and (not) there*. That which we look for to identify in the ectopic subject is always in part going to avail and yield affirmation, but always also leave many other aspects unaccounted for. As being-in-superposition it is being-in-relations among multiple loci of consciousness as points among which we intuit and estimate our living, transforming ranges – our micro-ecologies.* Consciousness itself is a set of relationships between the mind and the world as the spheres of sensing, sensibility, and sensuality from which we derive and compile a sense of identity. The subjective ectopy as the complex individual out-of-placedness problematizes, furthermore, what, how, and why it means for one in relation to what, how, and why it means for another – thus subjective ectopy is an ethical question. The marginalized and mobile female positions are self-examining perspectives on collective consciousness, which should understand that the capacity to accommodate the marginal, the different, and the shifting is the measure of the flexibility, thus the survival and success of a society.

It appears that subjectivity here emerges still via a structuring effect by being viewed as an arrangement of mobile positions. However, it is not by Hegelian structuring – by negation and splitting as well as overcoming and overpowering; but, rather, by multiplication and inclusiveness (at the risk of reproducing negation here). It appears as a mobile arrangement of multiplicity without totality; totalizing via synthesis would, in fact, be reductive – reducing a person to a story, a role, a character, a case, a profile, a belonging, a political affiliation and so on. It opens up further politics of multiple positionality and posing as and associating with others along the lines of multiple appearances in the world. A displaced, disoriented individual endowed with ingenuity by necessity acknowledges that all positions could be viable directions; all positions are potential directions to a way, a way out, a way toward, a way out of no way. *This kind of exquisite individuality is a delicate, difficult subject in continual seeking marked by fine discrimination*. This phrase is intended to denote a refined capacity for critical discernment gained on migrant routes as well as to indicate an array of continually refined discrimination practices against migrants.

The subjective ectopy as the complex individual out-of-placedness opens up referential spaces for otherness and opens up socio-political spaces for another. Over-identification with a position leads to repeated performance of a persona – displacement, conversely, has the potential of expansion. Migrant subject unsettles such negotiations, and migrant female subject further complicates any simplistic settlement, emplacement, and any assimilationist and/or repatriationist project.

* The contiguous term here is Umwelt (environment) as introduced by Jakob von Uexküll. This not popularly known but tremendously influential theoretical biologist from Estonia used the term to denote subjective spatio-temporal worlds created by the unique way living beings perceive and experience their environment. I draw, additionally, on von Uexküll's understanding that recognition of an organism and meaning for an organism are generated by movement (generally it is in its movement rather than in its restive state that an animal is detected, engaged, and also attacked). Studying the way organisms perceive and react to sensory data as signs, von Uexküll argued that all the organisms should be considered living subjects. Thus laying the foundations of biosemiotics, von Uexküll sensitizes us to all the life forms as readers of signs connected in the greater web of interpreters in which we co-create our worlds and the world at large. See Jakob von Uexküll, *Theoretical Biology*. (Trans. D. L. Mackinnon. New York: Harcourt, Brace & Company, 1926) and *A Foray Into the Worlds of Animals and Humans*. (Trans. Joseph D. O'Neil. Minneapolis, London: University of Minnesota Press, 2010).

7. Settling of Subject Positions in a Social Field and the New Collectivity from Within

Among the multiple loci of consciousness in superposition arises the question of how they relate to each other and how they are connected into and within a personhood. Beliefs and values organize them and hierarchize them. Beliefs and values are reinforced and confirmed by a shared social field within which we reside; to which we contribute and with which we interact; and which recognizes us as and interpellates us as subjects. By such calling upon us, the social field is reductive and summons us to a subject position, which is, in turn, recognized as a calling in terms of legality and legitimacy, private and public, and personal and professional expectation/function. The self, however, is and remains always in excess of its roles, functions, and classifications.

“Superposition is not only a realization of the multiplicity within the self but also a gathering of one’s positions into a collectivity from within.”

As a migrant traverses and a migrant woman most often trespasses multiple social fields, they have the capacity to open up internal multiplicity and expand the spaces among the loci of consciousness so as to open up a greater inquiry into the values of assumed cultural certainties. That is why migration as an expansion is experienced as deeply unsettling in numerous ways. Adherence to the over-determined social field results in settling with comforts of and rationales for narrowly-defined belonging, but it also precludes other modes of connecting to otherness along plural lines of relating.

That is why even when we may not believe in everything a social field offers and/or enforces, as certain religions for example, we still want to hold on to the notion of culture with respect for the tradition, continuity, certainty and repetition of ritual that settle us, so that we get in return a confirmation of values that help organize us. When in migration we experience disorientation, the shifting of that which orients us locally and logically in geo-social locales (regulated by social codes) opens up the self and space activating differences within ourselves. The experience is unavoidably marked by anxiety even within benevolent circumstances. All this, of course, is possible to contemplate if our physical existence is not under direct threat. The migrant self could be experiencing trauma, suffering, terrifying uncertainty and anxiety, aimless roaming and loss, but the self thus experienced, seen, and felt is not fractured, fragmented, and evacuated but rather multiplied. It is a plenum capable of replenishing and ennobling not only the migrant but also all the geo-social locales which she occupies.*

As an opening unto oneself, *superposition is not only a realization of the multiplicity within the self but also a gathering of one’s positions into a collectivity from within*. However, opening of those multiplicities leads not only to an opening of the ways in which we experience the self as it appears in the world but also in the ways it is called to act in the world. Superposition is thus here developed into the idea of collectivizing from within as a means

* Laden with intentionality, the term “occupy” has multiple referential implications besides residing: to engage the attention or energies of; to take up (a place or extent in space); to take or fill (an extent in time); to take or hold possession or control of; to fill or perform the functions of (an office or position). The term is infused with political significance with which I want to evoke and highlight the Occupy Movement as it exemplifies in collective political practice the distinction between dwelling somewhere and taking a conscious decision to make a claim to a geo-social space under different terms and with an intention to alter one’s habitus.

to multiple politico-poetic postures (relating to another's positions with empathy and in reciprocity) that lead to opening possibilities of multivalent relating to the self and to others.

8. Female Individualism and the Neoliberal Politics

With particular claims to diversified subjectivity of women migrants, we need to take into consideration, however, Gayatri Spivak's astute critique of female individualism and the dangers of locating and pinning it down. Addressing certain entrapping tendencies of the feminist criticism, she speaks of the "mesmerizing focus on the subject – constitution of the female individualist."⁹ This paper aims to decentralize and unpin that subjectivity; it aims to interrupt such over-determined focus on the condensed subjectivity. In relation to the contemporary socio-political developments, Rosalind Gill and Christina Scharff inquire: "Could it be that neoliberalism is always already gendered, and that women are constructed as its ideal subjects?"¹⁰ The female subject is showcased today as the favorite and ideal subject of neoliberalism and its ideology of empowerment, freedom, autonomy, and choice – of the particular feminist *Bildung* (as emancipatory narrative and representation; development trajectory and image). However, the questions of freedom and choice need to be rethought as presentment of potentially fallacious alternatives as in, for example, abortion and migration.*

If the female subject is the ideal subject of neoliberalism, then the ethnic female subject appears to be one of its ideal projects – one that confirms the need for monitoring and civilizing other cultures and countries, where women's issues are used as a means and measure of judgment. Such political stance runs tremendous risks of championing women as it uses women's issues to evacuate others' politics while also hijacking and controlling women's actual political projects. Recognition of one's multiplicity, of one's internal differences turns superposition into an ethical question and leads to the recognition of the multiplicity of another allowing no fixity of position or identity. It pitches one into uncertainties and reconsideration of how we can more inclusively relate to ourselves as well as to each other from our multiple spaces. While it may be preoccupying, it is also revitalizing. Moreover, recognition of one's reductive, interfering, but also participating role as an observer in turn augments transformative preoccupation with superposition.

9. Multiplicity and the New Community

Superposition as collectivizing from within becomes a necessity for the possibility of modern community. Recognition of the multiplicity of the self saves us from a reduced, thus diminished self but also from the reductive self who cannot anymore diminish others to a calling, an appearance, a position. Activating and engaging internal differences so as to relate to others along multiple lines of identification, alignment, and association, such subjective configuration re-creates and co-creates multiple ways of calling upon each other in mutual recognition.

* Migration is only sometimes a matter of privileged choice; more often and especially for women it is a matter of various forms of enforced displacements. The choices here need to be reconsidered as potential fallacious options because they are always already posited as predetermined. The question of women's choice of abortion has been polarizing the U.S. socio-political life in its very narrow presentment of pro-life or pro-choice inducing subscription one way or the other. Choices here are, indeed, very constricting especially when one considers that the women are put in a place to "choose" to endure physical, psychological, emotional, financial, and social pain almost always alone. The whole framing of the question, the supposed choice, and presentment of the issues at stake need to be re-thought and re-formulated in order for us to reach an understanding of the issues along multiple lines of damage control and shared responsibility on the individual as well as collective level. This can be a fair choice only in so far as the social organization, institutional system, and cultural climate provide the proper conditions to support either choice.

Toward such recognition, a great impetus, energetic charge, and motivation have been coming from women who are roaming the globe. For the new, coming community, being in superposition as identification of the collectivity from within is a necessity and a precondition emerging from an intimate and immanent transformation. Registering the already present social conditions as well as the possibilities for the next stage of our personal and collective development, this paper conceives of a notion of subjectivity emerging from our increasingly multiple placedness in the world. As such, it is both a more faithful reflection of our internal and social realities and a more hopeful projection of the future of those realities in the making.

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Notes

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3. Julia Kristeva, *Strangers to Ourselves* (New York: Columbia University Press, 1991), 42.
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5. Kaja Silverman, *Flesh of my Flesh* (Stanford: Stanford University Press, 2009).
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7. Edward Said, *Reflections on Exile and Other Essays* (Cambridge, London: Harvard University Press, 2002), 184.
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To Touch Eternity...

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Abstract

Has humanity's progress been hijacked by a pervasive scientific rationalism that trades spirituality and communality for cold efficiency? If so, does this cultural meme promise anything more than sterile technological miracles that, while solving past problems, ambush our ability to imagine how we might avoid civilized society descending into the barbaric once again? Have we permitted economic growth, wealth creation and the financialisation of almost everything we cherish to become an all consuming obsession, superseding any higher moral purpose? This essay puts a case for curbing our sanctification of industrial economism by reinstating more compelling and empathic narratives as a keystone strategy for the future advancement and survival of the human family.

As old age beckons, many things become clear. Memories occasionally rearrange themselves in curious ways. But in most respects the fog of uncertainty lifts. Subjects considered *urgent* and *important* become profoundly entangled. Cultures, customs and events, distinct in times past, fuse into patterns so dynamic they resist further compartmentalisation.

Solitude comes too – mostly unpredictably, yet always welcome. And, above all else, empathy for others. Incredibly I find myself comforted by the thought of reincarnation in its most literal sense: the fact that while I breathe the dust of previous generations, the atoms comprising my own body, loaned by the ecosphere for a few brief moments in a span of millennia, will decay and endlessly recycle in the provision of nutrients for other creatures in generations to come. This seems to me to be the most perfect way to touch eternity.

But serene empathy can also bring dissonance. Seeing in new ways and stepping lightly into unfamiliar epistemologies have led me to one discomforting conclusion. The future story of our species is held captive by a form of scientific rationalism in which visions for a better world are most often portrayed as a grand technopolis we are privileged to inherit. While contemporary life has deterred many from venerating archaic deities and other convenient fictions, this new technocratic utopia seduces whole societies into shifting their allegiance away from prelates, monarchs and politicians to a distributed artificial intelligence. This digital presence is held to be a redeemer of past ills and liberator of an incipient promise: nothing less than the genesis of an omnipotent Homo sapiens.

The alternative story, a gentler yet compelling narrative of compassion, inspiration and amity in which diversity and difference are virtues to be nurtured, is lost to all but a few enlightened souls – individuals who refuse to consign the joy of what it means to be human to computer programs or sterile numbers. These individuals are the true guardians of humanity.

For the most part these poets, philosophers and indigenous elders, are scorned or ignored; treated as misguided fools by those who do not possess such clarity of insight or who are alarmed at what seems like spirituality on steroids. But when fear shrouds the truth we remain deaf to these voices who warn of impending catastrophe. All but invisible, their cries are becoming fading echoes in the sanctuary of human conceit.

The West chose a technically dominated course in the immediate aftermath of World War II – tethering society's fate to a mix of industrial mechanisms and arcane financial devices that individual corporate greed and self-interest would later unravel, usurp, and use to plunder in the name of progress, freedom and democracy. Almost by default, the rest of the world is following suit – so irresistible is the Occidental promise of a consumer paradise.

Liberating for some, yet tyrannical to so many, the ideology of *industrial economism* is the epitome of scientific rationalism. Thriving on competition and adversity this ideology is bent on the wilful destruction of our most fundamental needs – affiliation, kindness, friendship, gratitude and love.

We are disinclined to admit this fracture in the human story for fear of appearing weak or foolish. Consequently this system, recently branded *disaster capitalism* by activist Naomi Klein, is entrenched within our daily routines to such an extent that we are totally blind to alternatives. Our capacity to pursue a different direction is thus drastically curtailed. It is like inviting a fish to swim without water or a bird to fly without air. So our penchant is to linger as long as we can, addicted to a desire to consume more and more stuff, and seldom concerned that the future we have set in motion and which we embrace with so much zeal will probably destroy more than it can ever hope to create.

The fact is we have spawned a civilisational apocalypse – one that continues to deliver the illusion of increasing health and well-being even as it gnaws away at our collective soul and the resources we need to prosper. Safeguarded by a relatively small number of influential individuals, corporations and financiers, all of whom extract enormous personal wealth from their activities and are therefore disinclined to change their minds, *industrial economism* is the most terrifying of legacies we are bequeathing to our youth. Why? Because nobody can grasp the full impact of its end-game. We can only guess.

What we do know is that while many human beings suffer from starvation, oppression and various forms of deprivation, from which escape seems barely possible, the rest of us live in relative luxury – enjoying a vicarious existence by embracing an assortment of diversions in the hope they will distract us from a reality we cannot bear to confront.

Let us speak the truth as if it mattered and cannot be tainted by self-interest or ignorance. The human race is on a destructive path. We are forcing changes to Earth's biophysical systems with unparalleled power and at an unprecedented rate. In spite of this it is highly unlikely there will be a single devastating tragedy that brings us to our senses. Our ruin is advancing by stealth.

"We have nobody to blame but ourselves. We chose the path and what we created is entirely of our own making."

This was not the plan. There were no predetermined intentions – no divine power perched in the heavens declaring an inevitable outcome for our species. There is no elitist-led conspiracy, not even an alien life-form manipulating events for its own evil ends. On the contrary we have nobody to blame but ourselves. We chose the path and what we created is entirely of our own making. We are our own worst enemy. The sad irony is that much of what we have created has been astonishingly enriching and beneficial.

The power of language and scientific invention, for example, opened up possibilities that are unavailable to other species. But an inherent flaw in human nature meant we were oblivious to unintended consequences. Behaving as if omnipotent, we willingly engineered a path to self-destruction and are now stumbling towards an end-game that we could still avoid.

But we are doing nothing to alter our course. In some ways we seem to be embracing our demise with the kind of insane euphoria observed during the collapse of empires.

“We have stopped caring for each other to the extent that our lives have become one prolonged saga of narcissistic preening and of proving ourselves better than our neighbours.”

Where did we go wrong? What critical decisions were so impetuously taken and why did we abide by those decisions when we saw them to be corrupt? What forces did we knowingly unleash that, with hindsight, should have been contained? Could it be that our technical knowledge has far surpassed our ability to apply it wisely, the nature of the tools we have invented, or simply a lack of foresight in how to use them to benefit humanity? Has it anything at all, do you suppose, to do with a population of seven billion people competing for limited resources in ways that assume those same resources to be infinite? If so, what should we do about that? Are the more convoluted problems the result of leadership deficiencies, religious fundamentalism, political incompetence and corruption or deep-seated tribal inequities? Or is it possibly the sheer complexity of modern life that seems to extend far beyond the bounds of our capacity to comprehend, let alone manage, with any degree of harmony or flexibility?

I suspect it is none and all of these. Human beings now dominate this planet – of that there can be no question. But we are changing our home in ways that threaten Earth’s ability to sustain us and other life forms. Furthermore we have stopped caring for each other to the extent that our lives have become one prolonged saga of narcissistic preening and of proving ourselves better than our neighbours.

Within this context there are at least three civilizational acupuncture points – together with their related activities – the impact of which we should be analysing far more seriously and with greater granularity – ultimately with a view to reinventing their essential qualities and propositions. These acupuncture points are best envisaged as universal belief systems and can be summarised quite simply as:

1. Our readiness to compete, to the death if necessary, against nature and each other
2. Our proclivity for placing economies and the pursuit of individual wealth above that of assuring ecological resilience

3. Our fascination with money and the politics of self-interest.

None of these constraints are particularly novel. Indeed they have been enshrined within our moral architectures from time immemorial. But they only began to forge a step-change spin on the civilisational worldview following the Industrial Revolution. The main causes for this extreme expansion of our world-system orthodoxies were a series of factors we can group under the collective banner of *globalisation*. In particular:

1. A sudden exponential growth in the size of the human population. This provoked a surge in the demand for goods of all kinds which then intensified and advanced the importance of *competition*. Today *competitive behaviour* is regarded as both virtuous and necessary – a key pillar of any capitalist society and an inherent part of human nature. Although the latter view does not stack up from a purely scientific perspective it is used as the militaristic rationale for why armies should be kept on a constant war footing and to justify why some of us are “better” than others.
2. Access to low cost yet easily accessible manufacturing and distribution technologies meant that more goods could be produced faster than ever before and shipped to countries half way around the world with relative ease. The new demand for goods put unprecedented pressure on small-scale local industries and regional economies, sending many of them to the wall, while dramatically increasing the amounts of energy used and waste generated. This substantially altered humanity’s ecological footprint.
3. The rise of *individualism* as a moral stance created conditions in which the desire for personal affluence, together with its achievement – whatever that takes, now warrants more consideration than ensuring public prosperity. This has had multiple unplanned consequences. Among the more detrimental impacts, two are especially relevant:
 - A shift away from customary social obligations governments accepted in caring for their citizens to a primary role of facilitating commerce and trade has effectively delegated public well-being to impromptu charitable gestures boosted sporadically by cynical populist schemes mostly aimed at keeping political parties in power. Politicians have outsourced compassion.
 - Permitting private corporations to own and control assets that are vital for human survival – including water, seeds, lakes and forests – is a laissez-faire recipe for discrimination on a massive scale. Given that the responsibility of corporations as they are currently constituted is to make money for their shareholders, it is absurd to believe these enterprises can also act altruistically on behalf of the community. Meanwhile we must deal with the strategic ambitions of multinational enterprises attempting to control every aspect of our most life-critical systems, such as the food chain.
4. The speeding up and international integration of cultural and economic activities create unparalleled levels of interdependence at every scale – from the individual, to the state, to the human family as a whole. But because the universal driving force is still primarily economic this interdependence has also hastened growing disparities between the wealthiest in our society and a poorer underclass. If these continue to morph into discriminatory practices it is possible a new form of transnational class warfare might result.

5. The ability to communicate instantly with almost anyone, anywhere, for any reason whatsoever has generated massive opportunities to collaborate and innovate. At the same time an all-pervading digital reality seems to be alienating large numbers of people who yearn for greater human contact and intimacy. We do not know what the outcome of this trend could be. In the meantime suicide rates are escalating while children as young as five have their own smartphones and Facebook pages but experience difficulties participating in normal healthy relationships.
6. The dominance and motives of the finance sector in the sum total of economic global activity have allowed financial markets to dominate industrial and agricultural markets. Because profits arise increasingly through financial channels, rather than through traditional trade and commodity production, a new financial elite comprising private equity firms and investment bankers effectively governs operations of the economy at national and international levels.

Recently, all these factors have converged and interacted in ways we could not possibly have anticipated. Or so our leaders continue to insist, thereby excusing their disgraceful lack of moral courage.

"We still cling stubbornly to the past, refusing to admit the damage we are doing to each other and to the environment, continuing to endorse the same beliefs, and taking no urgent remedial action or even to make minor adjustments to our course."

Regardless of where we sit on the continuum between technocratic optimism, like inventor Ray Kurzweill, and humanitarian pessimism, like scientist James Lovelock, it is impossible to deny that these factors, and possibly many more than these, have conspired to generate the circumstances in which we now find ourselves.

Regardless of perspective there is a far more distressing issue with which we must come to terms. It is one combining consciousness and conscience. Fallout from the toxic mix of motivations and activities listed above is rapidly poisoning life on our planet. Yet we still cling stubbornly to the past, refusing to admit the damage we are doing to each other and to the environment, continuing to endorse the same beliefs, and taking no urgent remedial action or even to make minor adjustments to our course. Furthermore, rather than trying to slow things down we are doing exactly the opposite. We are now hurtling to our annihilation.

In the year I was born there were under two billion inhabitants on this planet. By the end of this century I fully expect human numbers to have collapsed to that level once again. Unless we can learn to live with each other more productively than in the past, setting aside partisan views for the common good, conflict and starvation will overwhelm those without access to sufficient food, water, compassion and justice.

Trapped on a tiny planet catapulted way beyond the *Goldilocks principle* that generated conditions not too cold, not too hot, but "just right" for human habitation, we will be forced

to adapt to a situation never encountered by human beings. Should present trends continue it is probable that one half of all species of life on earth will be extinct in less than 100 years as a direct result of habitat destruction, pollution, invasive species, and climate change. We have no idea if we can survive such a transition, much less thrive in it.

So how should we be thinking to forestall that possibility? What can we propose, even now, to avoid crossing critical thresholds that would precipitate a planetary-scale state shift in the global ecosystem – thus extinguishing the civilizational paradigm and sending humanity back to a dark age? In order to present any kind of sensible suggestion in such matters we must examine our three initial acupuncture points to determine how we might nudge these into a more viable state.

1. Fighting Nature and Each Other

Setting aside the idea we are separate from, and superior to nature, and exchanging it for a more realistic credo, require a total transformation in how we think, plan, and act. Similarly, replacing the notion that some of us are inferior in some way and that certain cultures are therefore more advanced than others, with a more empathic view demands a paradigm shift in how we relate to each other in the first place.

Exceptionalism of this kind is irrational hubris. Such beliefs are naive – untenable in an age where science has substantiated the genetic equality of all humans as well as our dependence, along with all living creatures, on nature for our continuing existence.

Unfortunately, we have been living as if biophysical resources are infinite, and that we can do pretty much as we please with other “less advanced” cultures, for so long that we have only the faintest clue what it might look or feel like to act otherwise. Judaic, Islamic and Christian scriptures all teach us that it is our God-given right to conquer the Earth – in return for which we gang up on each other in God’s name.

But while challenging entrenched societal beliefs such as these has always been problematic, we now have one huge advantage over previous generations. Digital social media give us the ability to transcend boundaries and to connect with each other across all stratas of society in campaigning for an awakening to new values.

2. Putting Economies Before Ecologies

In the beginning was The Word. The Word meant *purpose*. Purposeful intentions directed human activity. Originally just a matter of the tribe’s physical survival, human purpose later grew to encompass more mature goals such as security, affiliation, love, self-esteem and personal accomplishments. At the same time social development traced a path ranging from communitarian obligations to the fulfilment of individual needs and self-determination. And there it seems to have stuck...

In Greek philosophy purpose is *logos*. The wisdom of knowing one’s purpose – our *ecology* – meant comprehending how everything that is important fits together in a form that benefits everyone. When the *logos* is clear, comprehensible, and shared by the community as a whole, *nomos* – the laws and rules that enable society to sustain and manage efficiently – can take its rightful place in service of the *logos*.

This sequence is important. Logos is purpose. Only when purpose has been established can nomos act in ways that optimise the purpose. At some stage in our history we forgot this and inverted the natural order. Nomos, the economics of managing the house, became an end in its own right. We lost our way. We lost our purpose. In doing so we neglected what it means to be human and empathic. Now we stand to lose far more than that. Natural resources critical for our survival are under threat.

The only solution I can envisage is one where we all take responsibility for restoring the status quo. We must lobby those in positions of authority to reinstate the natural order in which economics plays a necessary but subservient role to ecologies. We must then also determine a revitalised purpose.

3. The Politics of Self Interest

Most contemporary governments are deficient – in the sense they are no longer able to keep the promise made to their citizens concerning basic public services – including security, full employment, an adequate education and welfare for those in need of assistance, for example. The reason is pretty straightforward. Governments have forgotten their prime purpose – preferring to pander to the media and meddle in affairs in which they have no competence or legitimate role. Yet we put up with it.

Most Western-style governments have been corporatised. While key advisers drift to and fro between government departments and industry, bureaucracies have been forced to abandon their traditional impartiality, morphing instead into agencies acting on behalf of big business. This shift has allowed the wealthiest corporations to buy and exercise control over humanity's most life-critical systems. It allows companies like Monsanto and Syngenta, to monopolise and privatise the supply of seeds. And it permits a mutually beneficial relationship to be preserved between governments and defence-minded enterprises like Lockheed Martin and Northrop Grumman.

In the former case we need to understand that biodiversity and economic diversity are linked. They are key to providing a large, diverse, genetic pool that enables organisms to withstand and adapt to new conditions. To restore both we must combat the disgraceful economic and political power of agri-business. The need for governments to legislate to prevent large-scale industrial agriculture and agri-food corporations accelerating the loss of genetic diversity, eroding biodiversity and undermining global ecosystems, is paramount.

In the latter case the military industrial complex has constructed an unholy alliance in which war-planners receive the tools necessary for waging an effective war and furthering their political interests abroad, while defence contractors are the recipients of lucrative deals. This relationship must be dismantled as the first step in declaring a halt to conflict.

As I write this article tobacco giant Philip Morris is suing the Australian government to overturn public health laws aimed at reducing teenage smoking. Chevron has hired 2,000 lawyers to avoid paying Ecuador \$19 billion in damages due to the horrific oil spills they inflicted on the country. Bayer is suing Europe to overturn their ban on bee-killing pesticides at the same time as investing millions with Monsanto to defeat an effort to label GM foods in the US.

The monstrous power of large corporations has gone feral. It seems the world's largest and most profitable corporations are determined to defeat any efforts to hold them to account. By investing billions of dollars in dirty legal battles, corrupt backhand payments and lobbying campaigns, big business is taking over our democracies.

"Inaction is no longer an option."

As powerful as these companies may appear, their arrogance will be their downfall. They are ultimately at the mercy of consumers and the general public. Community action can hit these companies where it hurts their profitability. By withdrawing our patronage we also put them out of business.

4. Conclusion

I find no consolation in speaking these truths. I am especially culpable in that I have given life to so many children and grandchildren who must now cope with a situation worsening by the hour. My guilt is multiplied many times because I have foresight of this future. Mine is a terrible burden. And yet I bear it in the hope that I can play a small part in diverting the human family from its current suicidal course.

Addressing these three acupuncture points that allow current toxic belief systems to persist is crucial. Finding solutions that are socially and economically feasible will require all the ingenuity and courage we can muster. So massive are the issues facing us it may seem impossible to know where to start. In truth anywhere will do. Any thoughts, plans or actions aimed at shifting the civilizational framework of beliefs away from their current trajectory will be more acceptable than the alternative. Inaction is no longer an option.

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