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"

ISSUE 2, PART 1 FEBRUARY 2013 ISSN 2227-9679

Editorial

ARTICLES

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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World Academy of Art & Science, 4225 Solano Avenue, Suite 631, Napa, CA 94558, USA.

Editorial office:
University of Florida, Levin College of Law, P.O. Box 117625, 2500 SW 2nd Avenue, Gainesville, FL 32611, USA.

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Editorial

In this issue of ***Eruditio,*** we continue our emphasis on challenging ideas that can change the world. The first article by **Zbigniew Bochniarz,** "Comment: An Economist's Reflections on Individuality, Human & Social Capital & the Responsibility of Academia: The Case of Poland and Central-Eastern Europe," is an elegantly concise and sharp insight into the importance of human and social capital to the idea of individuality and additionally, provides an insight to the importance of human and social capital as a development priority and responsibility of academia. The author demonstrates that in the transformation of Poland, the country invested in the development of human and social capital in the context of higher education. This insight is important for the Fellows of the Academy. It means that investments in science and intellectual life are major forms of capital investment. The Polish success story seems to be a prototype that possibly should be replicated.

The second article is by **Simeon Anguelov,** titled, "Rationality in a Complex World: Pushing Back the Frontiers". It is a brilliant and insightful voyage into the inner workings of rationality. The author recognizes that rationality is important for problem solving. One could add it is critical for rationality to also recognize the problem that is to be solved. He notes that the conventional wisdom of rationality is that it is a faculty insulated from emotion or sentiment. In short, he expresses the idea that rationality is an isolated and purely a faculty of formal logical calculation. He reminds us that rationality is tied to consciousness which is a late evolutionary development and consciousness is not confined to the brain but to the entire living system. He also examines the problems that limit rationality, mainly matters which include the evolution of self entrapped complexity. He considers the prospect of a form of directed incrementalism to avoid this trap and to liberate the creative potentials of society.

Richard Hames' "A Civilized Society: Preparing the World-System for Redesign" raises the important question of the imperfections of the perspective of a shared world view that currently captures the attention of human social participants. He underscores the limitations of this point of view including the difficulties within it of eliminating war or adapting to climate change. The central idea is our paradigm does not generate a universal empathetic form of identification that can lead to global solidarity and a better human prospect. Hames suggests some ways in which that we may move forward in this regard.

Garry Jacobs' "The World as Web" provides us with a sophisticated, evolutionary understanding of human communications networks. He stresses the point that the interdependence and inter-determination of social process are the lines of communications networks shaping the forms of relationships between the participators and social interaction. What Jacobs sees in the wise and self-conscious development of global communications networks is that they have the power to generate an almost unlimited expansion of social productivity and human welfare. The piece underlines just how crucial are the global communications processes for the future evolution of humanity.

Pieter J.D. Drenth's "Bridging Political, Cultural and Religious Divides: The Role of Academies of Sciences and Humanities" is a timely and important paper. It is a paper that in a sense recognizes that the institutions of global academies of art and science have not established an appropriate reach and understanding with the equivalent type of institutions

in the Muslim world. At present the Western academic tradition does not recognize how central in history the Muslim academic tradition has been in maintaining and preserving the intellectual and scientific traditions of an earlier time and how much of these traditions have been transmitted to the West in time to contribute to the renaissance of learning. This article therefore can be read as an invitation to collaborate across the cultural and religious divide. Components of science and intellectual excellence might certainly be the common ground to deepen our understandings.

In "Study of Individuality & Social Evolution in Literature," **Janani Harish** has used the 19th century novel "Pride and Prejudice" as a vehicle to explore the changing dynamics of individualism and class barriers. She draws from Jane Austen important lessons about the evolutionary dynamics of class, accommodation and possible conflict. She sees in the Jane Austen novel the working through of class differences in which romantic love is the key to the breaking of social barriers. In this sense, class barriers are not impenetrable and inevitable barriers between people. But as the novel shows, the characters have to work through powerful cultural inhibitors, and work through complex emotions and feelings and find a form of connectedness in the end. In a sense, the work of writers such as Jane Austen provides us with a more gentle evolutionary approach to social change rather than one racked by the trauma of violent revolution.

Ashok Natarajan's "The Relationship between European Integration and the End of the Cold War: Lessons for Global Peace and Development." Natarajan alertly notes that the European Union received a Nobel Peace prize in 2012. The event requires some contemplation. In the longer view of European history the Union has been a remarkable instrument in generating continent wide peace. In short, it has been a powerful instrument of peace. It has also generated an important and enviable level of social well being. Natarajan suggests that the US after World War II served as a catalyst for European integration. The success of the European experiment clearly had an influence on the state run political economies of Eastern Europe and probably served as a perspective generating influence for change. Natarajan's piece provides some interesting insights and perspectives about the broader implications of political and economic integration in Europe.

Michael Marien's "Book Review – Bankrupting Nature: Denying Our Planetary Boundaries" is an insightful review of Whiteman and Rockström's Report to the Club of Rome. The Report is a concise and very useful update on the central problem which is the title of his review, bankrupting nature. The discourse is focused on the idea of planetary boundaries and the question that if you pretend they do not exist, you may be damaging major interests of the earth space community. The review integrates the ideas that human activity is a significant force in changing the capacity of the earth as a biosphere to sustain long term human survival. The review stresses the importance of nine biophysical processes as important markers for giving greater specificity to the challenges of climate change. This review is a brilliant and concise statement of the central challenges that we confront in terms of climate change today.

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ERUDITIO, Volume I, Issue 2, February 2013, 01-08

Comment: An Economist's Reflections on Individuality, Human & Social Capital & the Responsibility of Academia: The Case of Poland and Central-Eastern Europe

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Abstract

Human capital and social capital are gaining significance in economic development theory supported by mounting evidence from different parts of the world. The case of successful systemic transformation in Poland and Central and Eastern Europe (CEE) provides evidence as to how important investment is in human capital and social capital to overcome the systemic crisis, complete the transformation to democracy and move toward sustainable development. Twenty years of experience with the implementation of the CEE model of transformation also show the need for continuing investments in both forms of capital and the critical role of academia in building appropriate human capital and social capital to meet the challenges of the fast changing world of 21st Century.

1. Introduction

Individuality, human and social capital represent the core interests of the World Academy of Art and Science (WAAS) in research and educational activities (Giarini et al., 2012; Jacobs & Šlaus, 2011). For that reason it will be interesting to observe how these theoretical concepts evolved and shaped an original economic development model of systemic transformation from a totalitarian political and centrally planned system to a democracy and market economy in Central-Eastern Europe (CEE). Although some economists ignored the specificity of the CEE transformation (e.g. Stiglitz, 1999, 2001) focusing only on Russian (or post-Soviet) and Chinese models, some others appreciated the distinguished features of the CEE model which depended heavily on individuality, and human and social capital (Dabrowski et al., 2001; Archibald et al., 2006). Contrary to Chinese and post-Soviet models (implemented mainly in Russia and in former Soviet republics except the three Baltic states Estonia, Latvia and Lithuania), which are still evolving, the CEE model was completed by accession to the European Union (EU) in eight of the CEE countries (CEEC) in 2004 and two others (Bulgaria and Romania) in 2007. This is also a more comprehensive model because it includes not only economic transformation but also radical political and environmental transformation, contrary to the post-Soviet and Chinese models.

Among the ten states of CEEC which joined the EU, Poland has arguably undergone the most substantial social, economic and environmental transformation and integration with the global economy over the last twenty three years starting with parliamentary election on June 4, 1989, which marked the beginning of transition from communist to Solidarity-led

governance. This process comprised a set of challenges and opportunities for governance processes in the state, in particular mechanisms to enhance the legitimacy of decision-making by the government, toward informing public policies and improving public service delivery. Poland started with this process earlier than the other CEEC states marked by establishing an independent and self-governing Solidarity trade union in August 1980, which soon became a powerful social movement of over 10 million members. Although after 18 months of "co-habitation" with the communist-led government Solidarity was crushed by the introduction of Martial Law on December 13, 1981, the lessons were learned and a new human and social capital emerged. For instance, the two jointly developed by Solidarity and government laws *(On State Enterprise and On Self-government in the State Enterprise* in September 1981) representing the most radical change toward decentralized economy in the whole Soviet-bloc started to shape new entrepreneurship in the business sector. Although some governance provisions were suspended during the Martial Law in the *State Enterprise Law,* the process of learning of self-reliance in enterprises started and never died despite political barriers until the break in 1989. Simultaneously went the process of political learning led by the underground Solidarity with thousands of different illegal publications produced systematically by its activists. Despite governmental repressions and economic difficulties the process of building new human and social capital took place and Solidarity elites, as well as the majority of the population, were better prepared when the government offered "Roundtable Negotiations" in Spring 1989 leading to a peaceful transition of political power. Polish investment in human and social capital has been identified as a core component of Poland's design of the radical transformation process in Balcerowicz's Plan at its center leading to faster recovery in 1992 and engine-like growth and relative economic stability throughout the global economic crisis. The most critical was the social capital, particularly the unconditional trust and confidence in the first democratically elected government after WWII, which offered a very painful transformation package with radical liberalization and stabilization policies leading to the abolition of most of the subsidies to reach the world market prices and thus increasing initial prices several hundred points overnight (e.g. energy prices have increased about 600%).

These investments have also strengthened processes and enabled non-executive actors at multiple levels to hold the state to account for its actions and performance. This relationship – or social contract – between the government and the governed is a constitutive process for power, which shapes and is shaped by human and social capital, which in turn inform the communication and collaboration which establish and maintain the basic political and juridical institutions of effective and authoritative decision-making. In short, the Polish experience teaches us that investments in human and social capital can be self-reinforcing. Unfortunately, as economic categories both capitals require continuing investment to rebuild "wear and gear" and adjust to new conditions. This simple economic lesson was better studied and implemented by the Polish society than by the new Solidarity-based elites. The society invested very well in human capital producing a five fold increase in college enrollment but 17 fold in business and economic education, which was the most deficient at the beginning of transformation (Bochniarz, 2006). Former opposition-based politicians started to fight each other soon after they got rid of communists from government leading to faster deterioration of the Solidarity-linked social capital and thus opening the door to a post-communist government in the Fall of 1993. Fortunately, the leaders of the Left Democratic Alliance (SLD) learned

their lessons too and did not try to reverse the major design of the transformation process of 1989, which had already started producing first economic benefits thus cementing their political base.

My intention is to share the lessons – positive and negative – from CEE, and particularly from the Polish transformation showing which investments in human and social capital – with an emphasis on investments in education and increase in the supply and skills of the labor force – contributed to the country's explosive growth in the past two decades. Of key importance could be lessons parsed from the Polish experience by the academia, in particular for students of economics and public administration, which might inform the development of new curricula and research toward the achievement of better understanding about how institutional innovations can contribute to economic growth and even blunt the effect of a global financial crisis.

2. Some Context: The State of Poland Before and After 1989

Poland is rich in natural resources, for both agriculture and extractives (chiefly coal). Prior to World War II Poland was Europe's breadbasket, and boasted a strong industrial sector. Following World War II, the communist social and political reorganization brought an inefficient, centralized bureaucracy which controlled production (by now focused primarily on heavy industry), isolated the Polish economy through high dependence on the Soviet-dominated, non-competitive Council for Mutual Economic Assistance (CMEA) market, and effectively ignored market fundamentals.

The 1970s and 1980s brought some reforms which granted some additional revenue-generating power to the small number of non-state enterprises, but the overall economy was one of stagnation and continuing decline due to a chronic shortage of consumer and capital goods, high level external debt, social apathy, and poor public health due to high levels of industrial pollution. In short, by the late 1980s, Poland was a veritable disabling environment for growth and development.

The mid-1989 installation of a noncommunist government led by PM Mazowiecki brought the so-called 'shock therapy' reforms, including government decentralization, market liberalization, stabilization policy (e.g. In the 2nd half of 1989, inflation reached 600%) and broad institutional changes, including privatization. As expected, introducing new policy and institutions, and abolishing the old ones including interruption of traditional supply chains could not produce economic growth but painful price hikes, bankruptcies and unknown-for-decades high open unemployment. However, Poland experienced the shortest recession and relative economic stabilization and the first positive economic growth arrived in 1992. Despite all these economic and social hardships, the Polish Parliament addressed the needs of the deteriorating environment causing terrible human suffering and losses of high value ecosystems by introducing the very ambitious and original National Policy for Sustainable Development in May 1991, which was later implemented quite smoothly by four other governments from left to right parties.

The country now boasts of well-functioning democratic traditions, including a strong, decentralized government with peaceful power transitions, a profitable and well run banking sector (without fiscal crises, bankruptcies or "toxic assets"), and a diversified economy,

which has seen living standards rise to the level of Western Europe, thanks to the explosive economic growth throughout the last twenty years. Poland is now among the EU's fastest growing economies, with a steady annual growth that ranged between 3.5% and 4.3% through early 2012. While in 2009 growth was chiefly realized from increases in net exports, it was driven by growing domestic demand (which itself was driven by long term efforts to enhance the overall resilience of the labor market) in 2010, as well as strategic support to strengthen private consumption, encourage investment in the stock market, and to proliferate bank credit to a broader section of the public.

Starting in 2009, Poland was the only country in the EU to sidestep an economic decline. While growth has slowed, it has not halted as in other EU states and hovered between 2% and 2.5% in 2012 even as growth rates in the EU declined.

3. Considering the Contribution of Human and Social Capital Investments in the Rise of Poland

Poland's population has slightly declined from 39 million people to approximately 38 million people over the past two decades. Over the same time frame, Poland's Gross Domestic Product (GDP) per capita, adjusted by purchasing power parity (PPP) – despite being an imperfect measure of economic development – is nevertheless telling; between 1991 and 2011, GDP per capita PPP grew from approximately USD $5,700 to USD $20,200. Put the other way, Poland, according to the Organization for Economic Cooperation and Development (OECD), has become a high-income country.

Among the several lessons which academia may draw from the Polish experience are the relative contributions of human and social capital to national growth and stability. These are well accepted economic concepts boosted by Nobel Prize winners such as Becker, Lucas and Schultz, showing that investing in deficient human capital produces increasing returns. This emerged from the recognition that physical capital – man-made and natural – is far from the sum total of a state's total capital, which directly conditions a state's level of economic development.

"Academia plays an enormous role in building new human capital but its effectiveness depends on many other factors, including political system and culture, which could encourage or suppress critical thinking and creativity – the unlimited ability of this capital to create values."

From classical economists such as Adam Smith through neoclassical economists such as G. Becker and T. Schultz, capital is mainly defined as a stock of abilities to produce benefits – revenues, incomes or profits. Human Capital (HC) presents the unique form of capital that has the ability to put other forms of capital – tools, infrastructure (man-made capital) and land (natural capital) – in motion to produce goods & services and thus to create new values. The value of HC depends on the previous investments in developing new and useful knowledge, skills and attitudes.

Like any other capital, it requires continuing investment in developing new knowledge and skills. Academia plays an enormous role in building new human capital but its effectiveness depends on many other factors, including political system and culture, which could encourage or suppress critical thinking and creativity – the unlimited ability of this capital to create values.

Social Capital (SC) describes a stock of norms, rules and connections (networks) that allow building trust within communities and between those participating in economic or political activities – the fundamental factor of success. Academia plays an important role in shaping the right attitude, including openness, positive thinking, and collaborative behavior which are the foundation for building social capital. SC represents the economic value of intangible aspects of human relationships, customs, and social institutions, including norms and networks, which inform and condition community-level capacity to work together to meet collective needs and achieve common goals. While this necessitates investment in academic institutions to encourage critical thinking, other factors, such as the political environment, culture and taboo, the strength of public networks, social cohesion or solidarity, access to information and communication, also directly impact the economic value of social capital. These two forms of capital are themselves interconnected, as the quality of one can help or hinder the quality of the other.

The recent economic slowdown is an example, since the relative health of a state's labor market is a frontline indicator of overall economic health. Long term human and social capital investments, for example in Poland's education and health, positively impacted employment and ultimately reduced national economic vulnerability when the crisis erupted.

For example, over the last two decades, Poland's education system benefited from substantial investments in terms of financing and administration. This process was a targeted one, deliberately designed to strengthen the state's market economy. The process started in the early 1990s with administrative decentralization to enable focused, local (poviat and gmina-level) education management. By the late 1990s, reforms of secondary education and postponement of vocational training were implemented to enable students to broaden their horizons through expanded general education. This investment yielded a more skilled workforce, technological advancements, and the generation of new knowledge.

Poland's health sector inherited from the past a universal health care system with a centralized bureaucracy focused only on the number of available doctors and hospital beds rather than on health outcomes. Considerable reforms, including privatization and investment, particularly in human capital and technology in the same period led to a decentralized universal health insurance by the late 1990s by the center-right coalition. The new system focused on health outcomes and provided for outpatient care, a robust network of general practitioners, mostly private hospitals. Unfortunately, the election victory of the SLD in 2001 led again to centralization of the financing system with many negative consequences. For that reason, the health care reform in Poland is not yet a finished process but the private sector is getting stronger and effectively competes with the public system with reasonable price rates, quality services and accessibility. There have been some significant changes in the Poles' behavior, particularly in diet – about 50% of the men quit smoking and reduced significantly hard alcohol drinking – and recreation activities that led to further improvements in the national health. As a result of joint efforts, – individuals and families, government and business sec-

tors – the national health has greatly improved; indeed it is roughly equivalent to the rest of the euro zone and as a result the workforce is working harder, living an average of three years longer, and works more hours than the rest of the euro zone. A possibly relevant indication of the success of these reforms is that the country has recently implemented a phased process to raise the retirement age for men (from 65 to 67 by 2020) and women (from 60 to 67 by 2040).

While these and other investments in human and social capital have supported economic growth in Poland, it is important to note that there is substantial room for growth and improvement in these services. This is particularly true for the education and health sectors, where more efficient management of resources and the improvement of equitable access to services toward the further strengthening of the country's economic health are needed.

4. Challenges and Opportunities for Academia

Multilateral development banks and non-government organizations are heavily interested in analyses of the development impact and outcomes of particular investments, reform processes, and governance regimes. While several of these organizations and institutions produce high-value analyses, there is nevertheless a need for an even more comprehensive research agenda and the development of operational models for economic growth and sustainable development, in light of the pressing need for scalable models, for comprehensive implementation. The OECD tells us that by 2050, the global population will be 9.2 billion, primarily in the developed world, which will require 80% more energy (mostly extractives) than is being generated today. The global economic powers will fall substantially short of achieving the Millennium Development Goals. These realities collectively comprise a desperate call to action for scholars around the world to take up analyses of good practices in governance reforms and drivers of economic growth, to parse replicable lessons and hopefully enable humanity to achieve widespread sustainable development.

The Polish and CEE experiences in particular present pedagogues with the opportunity for deep exploration, toward the identification of possible development dividends associated with economic and governance reforms, including the impact of investments in human and social capital. In exploring the last two decades of Poland's growth and development, it might be possible to examine certain complementary forces that were behind those achievements. The academic community is perfectly placed to undertake the careful collection and interrogation of data emerging from this exploration, to extrapolate lessons concerning possible causal relationships between human and social capital and certain development and economic outcomes.

It seems to be no coincidence that the common feature of the most innovative and competitive economies – those rich in human and social capital – is the deliberate establishment of a strong enabling environment for academic institutions. Nordic economies, for example, successfully combined a high level of research and development with investments in education and information communication technology, while maintaining a high level of social capital and cluster-based development policies. Similar patterns have been followed by Switzerland, Singapore, the Netherlands and the United States. A more robust analysis of this phenomenon, with academia in a leading role, could better enable government actors and development practitioners to undertake supply-side reforms to strengthen the governance ecosystem, which take into account the effect of cultural patterns, harness the potential of

new technology, and encourage the development and operationalization of better policies to customize observed successes.

Through conferences and collective analyses, academia could also facilitate open dialogue and productive interchange on the demand side – scholars, civil society, and the private sector, among others – to surface and test new ideas and create solutions to enduring problems. Where success is defined – for example, where strategies might enable a sustainable balance between consumption of raw materials and the achievement of a decent standard of living – and might be observed, academia could glean lessons and good practices toward wholesaling this success through replication and scaled implementation. This could enable communities around the world to benefit from sustainable models.

In the classroom, academia could likewise design and develop balanced programs which integrate lessons from rigorous analysis into the role of social and human capital in sustainable economic development. This might include a more holistic approach to curriculum development, which prioritizes the right proportion of capacity development between technical knowledge, practical skills, and attitude-development. We have learned from the Polish experience that this approach could be particularly important for public and business administration officers. More diverse points of view could be surfaced through more faculty exchanges and joint programs through universities from the top competitive economies. At the institutional level, faculty should be motivated to conduct applied research on the role of social and human capital in the relative levels of innovation and competitiveness in their own communities, cities and regions. Normative integration of certain additional conditions into tenure-track promotion criteria could even require faculty to demonstrate achievements in developing or implementing innovative models in this space for advancement.

"Visionary leadership is called for in mobilizing factors to generate sound economic development strategies, innovations, entrepreneurship, for converting disadvantages into advantages, and weaknesses into strength. Academia and their alumni should be first to answer this call."

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5. Conclusion

The CEE transformation model, and its particular implementation in Poland teaches us that performance of strategic priorities, equipped in appropriate human and social capital and technology, can facilitate change for recovery and prosperity. Indeed, long-term strategic investments in social and human capital in particular have been said to have important and lasting constructive outcomes. Extrapolating from this experience, we also learn that sustainability of systemic transformation can mean the process has reached a "critical mass" and cannot be reversed in the foreseeable future; strategic investments in human and social capital can strengthen civic society to the point that a post-Soviet society (or other transitioning country) can avoid backsliding into an authoritarian regime, that a market economy can avoid being replaced by a centrally planned or heavily regulated economy, and that improved basic ecosystems cannot be endangered by a nation's policy; has initiated movement along

the path of sustainable development. This experience has much to teach actors on the supply-side and demand-side of governance and development. More knowledge and practitioner engagement is needed in this crucial space, especially in light of the recent global financial crisis and continuing recession across regions and lingering environmental and social crises. This calls for visionary leadership in mobilizing factors to generate sound economic development strategies, innovations, entrepreneurship, for converting disadvantages into advantages, and weaknesses into strength. Academia and their alumni should be first to answer this call.

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ERUDITIO, Volume I, Issue 2, February 2013, 09-16

Rationality in a Complex World:
Pushing Back the Frontiers

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Abstract

Rational decisions should not only be reasoned, but also be optimal for achieving a goal or solving a problem. Often, rationality is treated stricto sensu independent of emotions, personal feelings or any kind of instincts. A rational decision-making process should be objective and logical. However, observing patients with brain damage which perturbs the emotional sphere, neurologists have concluded that reason alone is insufficient for problem-solving in everyday life. Consciousness is a late evolutionary development. It is not the brain that we have to focus on, but the body as a whole being, the "container" of feelings and emotions. Rationality as a strategy for successive reasoned problem solving by human societies creates with the advancement of time a more complex world containing all technical artifacts of civilization and the corresponding social institutions necessary for their usage. In parallel with making existence more comfortable, rationality gets self-trapped in the complexity of the artificial world! At the individual level there are epistemological (metaphysical illusions) and existential (escape from freedom, nostalgia for the absolute, etc.) impediments which can aggregate by mimetism to huge constraints at the societal level. Objectively, by a three-way trade-off between time, energy (physical and social) and information one can get rationality out from a trap. The political approach to achieving the goal could be the so-called directed incrementalism. Identifying the creative elements in various strata of the society and giving them the opportunity to participate in constructive negotiations at various levels ("mega diplomacy"), one could fuel directed incrementalism.

Introduction

What follows is a concise overview of the various aspects of human rationality, and specifically of its limits. If rationality is an exercise of reason, a means to derive conclusions when considering things deliberately, a rational decision should not only be reasoned, but also optimal for achieving a goal or solving a problem.

Based on such a definition, our first point will be to consider the cognitive mechanisms of decision-making both at the individual and societal levels. As a next step, we shall attract attention to the fact that the rational activities of humans and humanity in general make the world progressively more complex, which by a kind of negative feedback impedes further progress of rationality. This phenomenon we shall call *self-trapping* of rationality.

Having stressed that, we shall review the objective factors limiting rationality in the complex world and how — at their "nano" level — individuals respond to the constraints. Specific impediments of epistemological and psychological (existential) character can act not only at the individual level but create by accretion huge constraints to rationality in the society. The final part of the analysis will try to outline the possible policies for getting rationality out from the traps.

Outline of the Article

The concise outline of the article is as follows:

1. Complex Structure of Human Rationality
2. Self-trapping of Rationality in a Complex World
3. Objective Factors Limiting (trapping) Rationality in a Complex World
    - 3.1 Material (Physical) Bounds
    - 3.2 Institutional Inertia including Vested Interests
    - 3.3 Democratic-voting Impossibility
    - 3.4 Subjective Responses at the Individual Level
4. Epistemological and Psychological Impediments
    - 4.1 Metaphysical Illusions, Nostalgia for the Absolute
    - 4.2 Apprehensions (Lack of Confidence, Escape from Freedom)
5. Pushing Back the Boundaries
6. Conclusions

1. Complex Structure of Human Rationality

Even today, rationality is considered to be *strictu sensu* independent of emotions, personal feelings or any kind of instincts. A genuine rational decision-making process is expected to be objective and logical *(Cogito ergo sum)*. If the cognitive agent is influenced by personal emotions, feelings, instincts or culturally specific moral codes and norms, the decision or more generally the reaction should be qualified as irrational.

Observing patients with brain damage that perturbs the emotional sphere, neurologists, among them Antonio Damasio, have concluded that reason alone is insufficient even for everyday-life problem-solving.[1] Damage to the *prefrontal cortex* can leave the patient apparently intellectually unimpaired, incapable of making even simple decisions. Paradoxically, cold, "robotic-like" decision-making is closer to the actions of brain-damaged individuals while the normal cognitive agents need their emotional biases in order to make the complicated human decision-making mechanism workable.

According to Damasio, Descartes' famous dictum *"Cogito ergo sum" ("I think, therefore I am")* is profoundly mistaken. Consciousness and thinking are late evolutionary developments. Long before their development there was feeling; so humans are still primarily feeling organisms! Damasio makes the important point that it is not only the brain that we need to focus on, but also the body as a whole being, the "container" of feelings and emotions. A

complete logical analysis needs time and supply of information, which usually are not available. The intuition and subconscious feeling of the situation compensate for this shortage. Humans take decisions not as robots but as feeling organisms with their capacity for subconscious assessment of the environment. As John Barrow puts it, *"The brain is a staging point in an ongoing evolutionary process. The mind was not evolved for the "purpose" of doing mathematics. Like most evolutionary products it does not need to be perfect, merely better, than previous editions, and sufficiently good to endow a selective advantage."*[2]

The philosophers felt this a long time ago, surely in different terms. Pierre Hassner, the French political scientist, recently wrote on the role of passions in social and political life.[3] Passions combine the intensity of emotions and the sustenance of sentiments. For that reason, they are driving forces influencing the decision-making process, hence the evolution of societies and the interactions among them. He recalls the classification of Thucydides, dealt with later on by Hobbes and many others, which distinguished three main passions: fear or the search for security, greed or the desire for material possession, and last but not the least, honor or vanity (Plato's *thymos)*. According to Plato, the latter is the choleric part of the soul, which is between reason and instinct. Today, one would call as passion the need to define our identity against other individuals and other social or cultural groups. All these passions or emotions are working together with reason when the societies as well as the individuals are forging their opinions and decisions.

2. Rationality Self-trapped in a Complex World

Rationality as a strategy for successive reasoned problem solving by active political units (nation-states, empires-civilizations or other politically-organized groupings of states) creates with the advancement of time a more complex world.* Let's call it WORLD 3, borrowing the metaphor of Popper.[4] In this context we consider World 3 as containing not only the products of science like theories, models and formulae (the objective knowledge in general), but also all technical artifacts of civilization and the corresponding social institutions created for their usage and management.[5] This World 3 created by human rationality as a product of the cultural evolution of *Homo sapiens* is getting more and more complex with the advancement of time. In parallel with making existence more comfortable, it generates problems that are more and more difficult to solve rationally. We propose to call this effect *self-trapping* of rationality in the complexity of WORLD 3.

Examples: (i) After the Fukushima 2011 disaster the energy dilemma *to* develop or not develop further nuclear power plants in Japan and also elsewhere (ii) "Merkel's" dilemma: decreasing the budget deficits and/or striving for further growth but risking the public's next debt increase.

Following Pierre Hassner, we shall recall the possibility to interpret human history as a succession of fears where every "medicine" healing a fear opens the door to a new one. As Lucretius already pointed out, the fear of death, of big natural catastrophes, of big wild beasts created the Gods. In their turn, they became threats: directly, as administrating punishments, and indirectly, as reasons for religious wars. The secular state was devised to avoid these fears, but ironically pronounced death sentences, involved the citizens in external wars,

* For a definition of political unit see Thierry de Montbrial, L'Action et le systeme du monde, PUF, Paris.

imposed despotic governments etc. In order to escape from fears related to such threats, the liberal state substituted the system. Softening of manners and customs contributed to the attenuation of fears from inter-individual violence and of severe punishments, while the progress of science attenuated the fear from epidemics and natural disasters. However, the fears never disappear, and those of technologies getting out of control have become overwhelming. It is easy to see the equivalence of the succession of fears and general problems getting more complex in the complex world. At a given degree of complexity, rational solutions appear critically hindered.

3. Objective Factors Limiting Rationality in a Complex World

3.1. Material (Physical) Bounds

As John Barrow pointed out, *"There is a three way trade-off between time, energy and information that is controlled by the limits on the amount of information that can be obtained with a given energy budget, the energy-time uncertainty principle and the Wigner clock limit."*[6]

This means that a short timeframe available for or imposed on a given decision-making process could be compensated at least partly by considerable energy and/or information inputs. Low energy resources (physical and also social) impose usage of longer timeframes, which need a lot of supplementary information to be shortened. Limits to the information available (uncertainties) or the limits to computational capacity will need more energy and longer time for achieving the goal. Eric Drexler said it another way: *"People who confuse science and technology tend to be confused about limits…they imagine that new knowledge always means new know-how; some even imagine that knowing everything would let us do anything."*[7]

"We need a lot of physical and social energy directed and managed rationally in order to change the structure of economy or any other social institution which has deep roots in the society."

3.2. Institutional Inertia and Vested Interests

A large part of the social reality around us is created by humans.[8] This is also true of the economy and the mechanisms of production and distribution of goods and services. We have all the reasons not to be happy with the economic situation, especially after the big financial catastrophe in 2008.[9] However, can we easily change the institutions created by us? Obviously not. And this is not only due to the vested interests and the corruption of the political class related to them. Simply speaking, there is quite an objective difficulty related to institutional inertia, which resembles the inertia of a big battleship or tanker trying to change its position in troubled waters. We need a lot of physical and social energy directed and managed rationally in order to change the structure of economy or any other social institution which has deep roots in the society.

3.3. Democratic Voting Impossibility

Very often, a collective impossibility results from the addition of a number of perfectly rational individual choices.[10] Democratic voting on issues like "pursue the nuclear electric-

ity production or close all nuclear power plants" creates contradictions! As we pass from individual choices to some form of collective choice, a paradox arises, as demonstrated by Kenneth Arrow (1972 Nobel Prize Laureate in Economics). It seems that more often, negotiations are a better means for solving dilemmas facing rationality than democratic voting procedures.

3.4. Subjective Responses at the Individual Level

The optimization of interplay between the components of rationality permits in certain limits adaptation to objective bounds: (i) the time frame imposed, (ii) the limited information and material resources available, (iii) the degree of preparedness to face the unforeseen, (iv) the overall confidence of social institutions including the state (their reliability) etc. This is especially clearly visible on the battle field. Clausewitz in *On the War* says the following to a capable commander: *"Intellect which, even in the midst of intense obscurity, is not without some traces of inner light, which lead to the truth, and then the resolution and courage to follow this faint light", "The mind must first awaken the feeling of courage, and then be guided and supported by it…in momentary emergencies the man is swayed more by his feelings than his thoughts."*[11]

The view of Clausewitz corresponds perfectly to Spinoza's understanding. The latter suggested that the intensities of the effects are usually so strong that the only hope to overcome a harmful effect — an irrational passion — is to struggle with a stronger positive effect generated by reason. In other words, Spinoza recommends struggling with a negative emotion with a stronger but positive emotion provided by reason.

One can argue that both at the individual and the societal levels, with the increasing complexity of the world and the shorter timeframes available, the emotional component of rationality could become the leading one in the binomial. Passing above a critical threshold, the behaviour of the agent(s) becomes overtly irrational, i.e. overwhelmed by emotions.

4. Epistemological and Psychological Impediments to Rationality Pushing to Irrationalism

4.1. Metaphysical Illusions

The desire to link all things together is a deep human inclination. The symptomatic dichotomy is, the greatest scientific achievements spring from the most insightful and elegant reductions of the superficial complexities of Nature revealing their underlying simplicities, while the greatest blunders (including harmful and misleading ideologies) usually arise from the oversimplification of aspects of reality that subsequently prove to be far more complex than initially supposed.[12]

"Those who do not have the courage to be responsible for their destiny escape from freedom, hence submitting to an authoritarian system."

4.2. Psychological (Existential) Impediments

Those who do not have the courage to be responsible for their destiny escape from freedom, hence submitting to an authoritarian system.[13] Very often, the latter replaces an old

order under a different external appearance but identical function for the faint-hearted: *to eliminate the apprehension and the lack of confidence by prescribing what to think and how to act.*[14] This escape from freedom serving as mass support to the totalitarian Governments was underlined by Hanna Arendt: *"There is no doubt that in spite of the evidence of its crimes the totalitarian Government has the support of the masses. This is very troublesome. For that reason, it is not astonishing that very often experts and politicians are denying the fact. The first ones believe in the magic effects of the propaganda and the brain washing, while the others as Adenauer simply refused to recognize it."*[15]

Nostalgia for the Absolute due to the decline of formal religious systems has left a moral and emotional emptiness in Western culture. As a consequence, alternative "mythologies" like Marxism, Freudian psychology, Levy-Straussian anthropology and/or fads of irrationalism introduced themselves.[16]

5. Pushing Back the Boundaries

5.1. Has the Irrational been explained Rationally?

Referring to the intuitions of Spinoza, Schopenhauer, and Clausewitz, stressing the contribution of Freud and the last scientific discoveries of neurobiology, the answer seems to be *yes, to a great extent.* This pushes back to *some extent* the boundaries surrounding rationality.

5.2. Directed Incrementalism

Against such a background, how can we push back further the limits to rationality? A possible issue is outlined in pointing at the so-called *directed incrementalism.*[17] It consists of purposeful decision-making guided by clear goals, articulated visions and guiding principles. At first glance, it generates only minor changes in the form of small-scale adaptations to policies, which may appear as merely incremental short-term policy changes, but in the long run emerge as policies clearly leading to stated goals relying mostly on negotiations than on voting.

5.3. Looking for Creative Minorities

The question is, who has the strong word in decision-making? Who participates in formulating the concrete realizations of directed incrementalism? National sovereign governments, groups of governments, bankers and other financial and business lobbies? Trade unions? Scientific societies and academies? Non-governmental organizations? Or a complex blend of them?

Arnold Toynbee considered history as an evolution of civilizations. Civilizations arose *in response* to some set of challenges, when "creative minorities" devised appropriate solutions. By *responding to challenges,* civilizations grow. They decline when they are not able to respond creatively further: *"Civilizations die from suicide, not by murder."*[18] An example is the empire of Angkor which lasted six centuries in the territory of contemporary Cambodia, thanks to the very efficient system of managing and distributing waters.[19] According to Georges Coedes, the weakening of Angkor's royal government by on-going war and the erosion of the cult of the *devaraja (God-king)* undermined the government's ability to engage

in important public works, such as the maintenance of the waterways essential for irrigation of the rice fields. As a result, Angkorian civilization decomposed due to shrinking economic base.

5.4. Role of Negotiations

Substituting *civilization* with any relatively stable *active political unit,* (civilizations are not such units, but empires or other political groupings corresponding to certain civilizations are) we may agree with Toynbee on the important role of *creative minorities.* Identifying such minorities in various strata of the society and giving them the opportunity to participate in constructive negotiations at various levels ("mega diplomacy"), we may reasonably fuel directed incrementalism.[20] This, probably, is the means we are looking for to liberate rationality from the self-created traps. What we may really need is less applied science increasing the density of technological "gadgets" in World 3, but what we need much more is applied humanities serving directed incrementalism aiming at the liberation of the society from the traps, actual consumerism being one among them.

Conclusions

A rational decision *"should not only be reasoned, but also optimal for achieving a goal or solving a problem."* Having outlined the emotional or passion component in the mechanism of human decision making, we should accept that optimal decisions, sometimes or even very often, are not apparently the most logical ones. This should not disqualify them as being irrational. The appropriate attitude is to look for rational explanation of the respective "irrationality."

"Human rationality solving problems inevitably creates more complex ones."

At the level of political units (nation-states, empires-civilizations, grouping of states etc.), rational application of the natural sciences (technologies and technical artifacts) complicated the world. Thus, human rationality solving problems inevitably creates more complex ones. In a way, the complex world resulting from the activities of rational humans is catching rationality in self-created traps: the phenomenon of self-trapped rationality.

The liberation of rationality from self-trapping may need negotiations with the participation of creative minorities in various strata of the society with the view to fueling policies of directed incrementalism.

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ERUDITIO, Volume I, Issue 2, February 2013, 17-25

A Civilized Society
Preparing the World-System for Redesign

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Abstract

Our shared worldview tolerates entangled factors that manifest in a pathological condition - a world-system. Certain factors constrain reflection that could lead to healthier alternatives. Depending on our perspective they cause us to perceive our reality as inevitable, or as a set of problems requiring solutions. But eliminating war, or adapting to climate change, for example, are complex issues. Linear problem-solving is ineffective. Yet most change efforts, even those at scale, avoid systemic reinvention because of a lack of radical empathy and difficulties involved in collaboration. If the human family is to endure in the face of imminent threats to our civilization, that must change. A conscious metamorphosis of the prevailing worldview is urgently needed. In spite of statistics proving that conflict, crime, poverty, starvation and disease are all in decline, the continued global application of certain factors (devised by emperors, monarchs, warriors and prelates to preserve power in an age long past) resonate adversely today. They are destined to generate even greater pain, delivering unimagineable consequences, if we cannot come together to create better futures. Yet this is a societal challenge we have wilfully ignored for the past few thousand years. This paper identifies those critical factors and proposes ways to break through the current impasse.

There is a widespread belief that the terms *worldview* and *mindset* are interchangeable. I cannot agree and contend there are profound differences and furthermore, that these differences matter.

The former manifests as an explicit philosophy, shared view, or conception of the world (a unified *society of mind*) while the latter aligns the values and attitudes we acquire as infants and subsequently apply to interpret, engage with, and contribute to society in a coherent manner.

Whereas our worldview is a shared, albeit largely subliminal phenomenon — obdurate and unchanging, a paradigm we tacitly accept without challenge, —cultural mindsets are diverse, numerous, and evolve over time. This evolution occurs by way of subtle (sometimes mysterious) modifications to customs, myths

"Arising from a unique combination of cultural and social conditioning as well as collective responses to shifting contextual and environmental circumstances, cultural mindsets are the idiosyncratic "lenses" through which we sense, make sense, and process meaning, expressions of which are then enacted locally"

and rituals that create myriad rich distinctions between groups and communities. Some of these are reified while others, often for no apparent reason, fade in significance or simply vanish altogether.

Since very recent breakthroughs in genomics have confirmed the idea that ethnicity (in its biological sense) does not exist, — that it is an illusion — differences in social context, together with the processes of inheriting and disseminating norms and customs, have provided crucial insights for appreciating alternate facets that connect and distinguish (rather than divide) human beings.

Arising from a unique combination of cultural and social conditioning as well as collective responses to shifting contextual and environmental circumstances, cultural mindsets are the idiosyncratic "lenses" through which we sense, make sense, and process meaning, expressions of which are then enacted locally. These expressions of meaning (or behaviours) are autonomically shaped to fit within the prevalent ethos of the worldview.

Deeper attitudinal expressions of this ethos (behaviours congruent with our most life-affirming beliefs) become ingrained moral tenets — for the most part, universally accepted. To step outside the bounds of these laws is to invite immediate hostility and separation, an existential position we learn to avoid, for such individuals are promptly labelled outliers, heretics, psychopaths, felons and delinquents. All are dealt with as misfits.

This presents us with a bittersweet paradox. Science and spirituality both hold that a viable living system can only be designed by an intelligence external to that system. Anything else is mere process. Logically, then, effecting radical change to the current worldview can only come about by recreating the system from the outside-in. I am not suggesting for one moment that we hand over responsibility for the future of humanity to criminals and delinquents. Far from it. But public branding of the types mentioned above could be construed as a clever device for helping safeguard the status quo – on the condition it had been deliberately contrived by an elite cadre with that sole purpose in mind. After all, it conveniently devalues any possibility of "what might be" by admonishing and quarantining those who would change "what is" (in this case the world-system) without which the worldview would lose its legitimacy. Such conspiratorial intentions might even be deemed acceptable by a majority of people if the worldview were benign, equitable and just. But it would be intolerable if the worldview happened to be toxic or malevolent in any way. I will return to this argument later.

So, while these terms *worldview* and *mindset* are both meaningfully distinct yet inextricably related, they are not identical. Nor is this just a pedantic view but a necessary discernment within the context of conscious evolution, for it helps signify a grand societal challenge humanity has conveniently ignored for the past few thousand years.

1. Value in Cultural Diversity

In spite of our nomadic existence and the trend towards mixed relationships, cultural mindsets can still be observed in their purest form within bounded territories such as a township, island or remote expanse of land. The indigenous Ubuntu of South Africa, the Inuit of the Arctic and the Koori peoples of Australia are examples of this. But because of progressive

urbanisation over the past century, heightened more recently by the surge in social media and mobile telephony, many unique traditions and more of these formerly discrete communities are blurring into an homogenous milieu.

Akin to the loss of biodiversity in the natural environment over the past century or more, the contraction of the world's disparate cultures and their corresponding cultural mindsets into a uniform monoculture is accelerating. The human family, once a richly variegated tapestry of cultures, languages and tribes, has been subjugated by a range of factors. Not least among these has been the emergence of an irresistible hybrid. Global in scale. Enabled by rapid leaps in artificial intelligence, information and communications technologies. Driven, from all points of the compass, by a psychosomatic desire for greater novelty that is fuelling a manufacturing frenzy from companies scrambling over one another to fulfil that need, this contemporary collective impulse, glibly labelled globalisation by some, which now engulfs us all.

This contemporary condition derives its uncompromising potency from the conjunction of the world's three most widespread cultural mindsets – namely Occidental, Indic and Sinic readings of the worldview. But now they are incited by a single myopic teleology: ownership and the acquisition of material wealth. At one level, this represents a convergence of the prevailing worldview and mindset hybrid, to the extent that it is almost impossible to distinguish between them and even more difficult to uncouple. Fused in a single overriding purpose they have become all but inseparable: a globalised presence representing an unprecedented accord between the two phenomena. At a lower logical level, a similar problem can be recognised in the growing tendency to equate *democracy* with *capitalism.*

In both cases, it is not in the least bit melodramatic to represent the contemporary condition as the triumph of materialism over belief. To some extent, I see this as a pathological state — one whose consequences should concern us all. The demise of cultural diversity has already had a profound impact on our habits, practices, relationships and future well-being. It has led to an unhealthy obsession with growth, monetary gain and affluence. It has positioned us as separate from (and superior to) other species and the environment upon which we rely for our health and survival. It stirs greed, envy and resentment, at the same time as it devalues compassion, generosity and appreciation.

It is also rapidly diminishing our legacy of inheritable knowledge — most evident in the loss of bio cultural diversity — such as local social structures, languages and dialects. Indeed, we appear to be on the brink of a mass extinction of languages. Global languages such as Mandarin Chinese, English and Spanish are now in the ascendancy. In situations where lesser languages are labelled primitive, overtly suppressed through government regulation or tacitly subdued, through an association with shame or suffering, and where there are obvious economic benefits from speaking a more international language, there is a strong possibility that the languages people use in their daily lives for expressing their unique identity will simply vanish without trace.

This loss of bio cultural diversity is significant from a variety of perspectives. But in the meta-context of disentangling our worldview from the various cultural mindsets we have traditionally used to interpret that worldview from which the *world-system* is constructed,

it is absolutely critical. Indeed, if we are unable to prevent a further assimilation of cultural mindsets into an homogenous, self-reinforcing, *world-mind* of unchallenged supremacy, it is highly probable that humanity will have sealed its fate. The pragmatic *nomos* of managing the economy will have totally appropriated the sacred logos of human purpose.

2. Worldview — Role and Ethos

Distinctions, even finely-grained, between worldview and cultural mindset are important if we are to comprehend which factors cause our world-system to be like the way it is and where in the final analysis we must look if we want to re-design or improve it. Why should world-system change be so vital? Why cannot we simply all speak the same language, stop worrying about the Earth's climate and warring states, and simply enjoy the material wealth we deserve and have so conscientiously created?

I believe there is a compelling answer to that question. But for any answer to make sense, we need to revisit the constitution and temperament of the prevailing worldview — its underlying *ethos*. We must get a sense of whether this ethos serves humanity's purpose, or whether only a very small minority of the population gain from its longevity. Are its values still relevant? Is its impact toxic or benign? Destructive or creative? Are our collective interests best served by its most profound assumptions, or have these beliefs outlived their relevance in an era of such extraordinary volatility and interconnectedness?

Over the course of human history, the past thousand years have been the most startling in terms of "change". During this relatively short period, we can trace our journey from nomadic tribes to settled villages, to the larger townships created by the industrial revolution to the vast urban conurbations of today. At the same time, we can point to an acceleration in the pace of instrumental change — from the agrarian revolution, through the industrial revolution to the present day where, from a technological perspective at least, the speed of innovation has become exponential. Actually, an identical trend, matching the pace of the times, is evident in music. For example, if one compares the calm, almost motionless nature of medieval polyphony with today's multi-layered sophistication, the increase in harmonic and rhythmic complexity is very apparent, coincidentally mirroring, at every stage, changes that are taking place elsewhere in society.

In spite of such accelerating change in so many factors of our lives, we tend to focus and remain absorbed primarily by five topics: politics, power, personalities, production and purchases. I include governance in the second category, and money and the acquisition of wealth in the latter two. These five themes and their interaction form the cinematic backdrop to our lives, which then inform the topics and ventures to which we attach most significance. Together, they have become the *leitmotif* promulgated in the narratives we weave for each other — appearing as headlines in popular media and as captions in our personal messaging. The world and consequently our world-system are awash with this *leitmotif* which appears in myriad different guises. It is incessant, undeviating and, one supposes, unintended. Or, at least, not deliberately designed by any single group to function as it does. Naturally, if there existed a global PR firm led by Edward Louis Bernays, working for an enterprise like the UN, I might be more suspicious...

Intentions are essential to ponder in this context, of course, especially as the collective behaviours of seven billion people now inadvertently reify the prevailing worldview which, overwhelmingly, is one of individualistic narcissism and rampant consumerism. Nothing wrong with that — might be your response. Possibly not. But if we take a long hard look at the nature of this "conception of reality" which drives the motif of industrial economism in order to examine our intentions in that light, we might well arrive at a somewhat different conclusion.

For this single, audacious idea has remained untouched by the commotion of humanity's advancement across the ages. It has persisted essentially intact, pure and immune from change — in every community, in every region, and in every era. We have even given this idea, this worldview, a name. We call it civilization. Civilization is something we all espouse. We all lay claim to being civilized. Everything that is not civilized we call uncultured, inferior or primitive. Those who (we assume) aspire to become civilized we judge to be illiterate, pre-literate, or we use some equally disparaging term signifying a lack of social or technological maturity. By that simple designation we ensure a majority of people regard its visible manifestation, the world-system, as the pinnacle of human progress. But what is this idea? What is this *worldview*? How can we actually "see" it in order to describe its essence with any degree of accuracy?

Naturally enough, the shift in perspective needed — the step into a new epistemology — cannot be achieved from within the chaotic hurly-burly and familiarity of everyday life in the valley. Climbing to base camp is not much help. The summit, too, can be shrouded with swirling mists. Even here in this relative silence, there is too much to confuse and confound. And so the next step takes us into the void. We learn to "see" differently from this higher altitude. From here we sense the most expansive cosmology of humankind — one encompassing the most impenetrable pathways into the human psyche and the unfathomable tracts inhabited by the soul. From there, but from there only, it is just possible we will be able to discern and appreciate the landscape of the *worldview* with greater clarity.

Far beyond political ideology and philosophy, transcending history, and reaching more deeply into the collective conscious than any branch of psychology can possibly map, some surprising distinguishing features become apparent in the expanded "now" of this epiphany.

2.1. Power and Authority

Conspicuously, we now comprehend that the inherent power to change whole systems is vested in guardians of the status quo. In reality, such power is wielded by very few people and their institutions at any one time. Most of the population remains an underclass of consenting serfs who work at the behest of these guardians, comprising eminent individuals elected to positions of authority, others who are self-appointed or who grab power for themselves, plus a few who acquire clout by virtue of their personal fortune or friendships. This group, let us call them the *leaders* in preference to more emotionally-charged terms like *elite* or *establishment*, protect their status and authority by various means (including the formal apparatus of the state, the military, and rules governing society) often in open opposition to one another.

Perhaps such opposition is a good thing. If those with power consciously decided to cooperate in order to maintain the status quo within the current world-system, the options and op-

portunities for radical change would diminish considerably. Outside of conspiracy theories, many verging on irrational hysteria, we can probably discount such schemas as mere fantasy.

2.2. Aggression and Hostility

One element that is impossible to discount is the way hostility and conflict are used by the *leaders* — both to cling onto and bolster their (personal or institutional) power, in addition to controlling all aspects of production and distribution. Indeed, from the warriors of the Zhou Dynasty in ancient China, through the medieval Crusades right up to the pre-emptive strike strategy so enthusiastically embraced by the US empire, the industrial war machine has been used as a key economic factor to boost public morale and manipulate patriotic feelings, as well as stimulate consumption.

2.3. Communications and Compliance

Words ignite change and can shape the course of destiny. So, it is no surprise that language is used by *leaders* to transform our emotions via carefully crafted messages. Most aspects of messaging in society are orchestrated — whether it be gossip, news, corporate marketing, public relations spin or government propaganda. Generally speaking, these messages are aimed at stimulating a specific commercial need or creating a sense of well-being that ultimately lead to civic compliance. Breaking or challenging the hereditary contract existing between *leaders* and society (particularly the presumed obligation of acting in the best interests of the community) can spark uproar. This is why public activism and campaigning organisations like Wikileaks and Avaaz, for example, have caused such vituperative reactions from the established patrons of the status quo. It is not that the law has been contravened that hurts them. It is the fact that social conventions implying trust have been shattered and found to be a sham. When cornered in this manner, a prey strikes back with all its cunning and venom.

2.4. Central Narratives

Again, the pivotal stories constructed or sustained by the *leaders* invariably choreograph public opinion and feelings in ways that are either aimed at stifling complaint or nurturing consent vis-à-vis the way things are. Paradoxically, these stories have also inspired some of the most beautiful works of art over the centuries. In this regard, it is fascinating to search through literature to find the three foremost categories of myth that have held sway across the ages.

Chief among these stories are the God-myths — explicit stories of a higher creative intelligence to which we must all eventually submit. Used by kings, witch doctors, shamans, law-makers and prelates alike, as well as by some of the world's most enduring institutions, these stories might just be a distraction. But they are a clever one — appealing to our innermost yearnings, the desire for renewal and hope, and the craving for hierarchy of some kind, mostly so that we can delegate responsibility, it must be said.

Likewise, rational and scientific narratives elevating human beings to one of pre-eminence over other species neatly fit lessons in the scriptures of all the world's great religions,

urging us to subdue nature and exploit it for our own use. We needed no second bidding on that count. I suspect we've even exceeded the Almighty's aspirations there!

The third category promotes notions of societal advancement and progress through economic means. These stories choose to ignore purpose and vision in order to endorse continued economic growth and development within the context of increasing competition for scarce resources. These stories invariably provide compelling arguments for constantly needing to boost production and grow GDP, as if this were the pinnacle of human achievement. The logic is clear. If more and more stuff is manufactured, the likely result will be complacency rather than complaints. As Noam Chomsky so eloquently put it, this is the manufacturing of consent.

3. Conclusions

It would be understandable, yet far too simplistic, to construe what I have claimed here about the differences between *worldview* and *cultural mindset* as coming from a deeply-ingrained, extreme, socialist point of view. As far as my self-awareness is able to stretch, it does not. I have tried to be as "objective" as any individual can possibly be.

"Progress will not come from sitting idly by watching our diverse cultural mindsets, with their vast repository of knowledge, customs and languages stretching back into antiquity, decline in importance and utility. Radical change is required. It is now an emergency we must tackle."

My observations of our current worldview derive their relevance and legitimacy from the fact that we find identical features cropping up everywhere. They were as common in medieval Europe as in Maoist China. They occurred in Mussolini's fascism as well as Lula da Silva's workers' party in Brazil. They are felt in the turmoil of revolutions and in extended periods of peace. They occur in the most prosperous nations like the US and Japan and in the most poverty-stricken like Somalia and Afghanistan. They are as universal as anything can be.

Likewise, the connotations I put on my analysis are above the politics of the past and an attempt to envisage a future where all people share in the joy of what it means to be alive and human. So, if anything, my position is not ideological but humanitarian — deeply engaged with the potential for humanity to evolve differently and prosperously by accessing an entirely different set of moral intentions and design criteria.

My conclusion is as inevitable as this latter premise. Progress will not come from sitting idly by watching our diverse cultural mindsets, with their vast repository of knowledge, customs and languages stretching back into antiquity,

"The capacity we have for creativity and innovation is already unparalleled. Our capability to learn and adapt is remarkable. Human ingenuity and willpower, especially when under pressure, are astonishing."

decline in importance and utility. It will not come from tweaking the current paradigm in a futile effort to placate public critique, protect current positions, and delay changes that are probably inevitable. And it will certainly not come from pretending that everything is fine — that we will soon end the melodrama and return to some semblance of normality. No. Radical change is required. It is now an emergency we must tackle. But how difficult could the conscious redesign of our civilizational worldview really be?

Whether it is climate change, water conservation, increasing the capacity of the planet to produce nutritious food, ending war or eliminating poverty, the technologies and financial capital we have at our disposal today are sufficient for our needs. The means of production are already shifting in a new industrial revolution where distributed systems, additive manufactures, online intelligence and open source enterprise will be able to cater to the common good.

The capacity we have for creativity and innovation is already unparalleled. Our capability to learn and adapt is remarkable. Human ingenuity and willpower, especially when under pressure are astonishing. But we are dragging our feet when it comes to harnessing any of these capabilities to improve the world-system for greater good. Instead, we resort to myopic stupidity in projects that are constantly constrained by the gravitational pull of a worldview that is dangerously obsolete. If we wait too much longer for evidence, this worldview is unworkable; we will probably be responsible for consigning future generations to a life of unwarranted misery. I do not want that. My children certainly do not want that. I am sure everyone reading this piece does not want that. So what must we do?

Fundamentally, it is a matter of design. Especially the design of revised intentions and a vision for what the human project on this planet could become if we were to restore the dynamic idea of a single human family. That will require us to be uncompromising in addressing the four features I previously identified:

i. Power and authority will need to migrate from the current group of individuals — the *leaders* (with their particularized institutions and highly protective strategies for success) to the community — a global commons enabled by new technologies where knowledge is exchanged and shared openly in new and enlightened forms of governance and human enterprise. This immense task will need to be undertaken sensitively and in ways that "include and transcend" the very best our species has created and loved. It will need to discard those things (tangible and intangible) that no longer make sense. It will need to navigate the bewildered and hostile reactions we can expect from those with vested interests in preserving the status quo. And it will need to avoid the potential for creating different forms of corrupt practice we witness ingrained within the present world-system.

ii. War is unnecessary. I do not mean to demean the sacrifice made by men and women who go to war in the genuine belief they are fighting for freedom, or democracy, or human rights, or whatever argument their leaders have made to convince them of the need for conflict. But if we all aspire for a common goal, collaborate to distribute the wealth from production more equitably, and global issues confronting us are adequately resolved, the reasons for fighting fade. Indeed, putting an end to all conflict would be the most appropriate memorial for such human sacrifice. Historically, conflict has been a subterfuge,

a device deliberately manufactured and deployed by *the leaders* because of an impulse to protect the status quo, maintain artificial distinctions, or seize hold of resources. In almost every other instance it is promoted as the final straw in situations where all other options have been tried yet found wanting. In reality, this final reason is purely a failure of imagination coupled with an unwillingness to engage for mutual benefit.

iii. Communications need to become open and globally transparent. Attempts by current *leaders* to limit public freedoms, such as controlling the Internet, for example, must be met with a courageous and firm resolve to ensure they do not triumph. Messages traversing the public domain will need to convey the truth rather than hide in various shades of grey. For example, I find it absolutely abhorrent that the tobacco industry is able to fund research proving smoking cigarettes is not a health hazard when so many millions die each year from inhaling tobacco smoke. The same indictment can be alleged at the fossil fuel industry. The game is up. We will no longer be duped.

iv. Finally, the key narratives in society will need to be redrafted. These, after all, are the myths that persuade and influence. Outmoded themes of apathy, competition and scarcity must quickly be replaced by themes emphasising empathy, cooperation and abundance. The new constitution for Iceland is an objective lesson in how this might be accomplished. It was drafted from thousands of contributions invited from citizens online. Although Iceland is a bounded jurisdiction, there is absolutely no reason we cannot apply the same principles to creating and expressing a global vision for the human family — a new ethos for a worldview starved of fear, superstition and individual heroes.

Our collective future is bound up with being able to make substantial, long-lasting changes to the constraints we have already identified in the prevailing world-system — including manifestations of inequity and injustice in addition to toxic and wasteful practices. If we can change the assumptions and intentions underlying the prevailing worldview, bringing a wealth of diverse knowledge, wisdom and cultural diversity to bear on dealing with the issues facing us, we will not simply survive but set the scene for a new golden age.

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ERUDITIO, Volume I, Issue 2, February 2013, 26-35

The World as Web

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Editorial Note: Networks play a central role in the biology of organisms and their physiological functioning, social organizations and relationships, domestic and international political processes, business, finance, development of new ideas and discoveries in science and technology. The World Academy's project on 'The Science of Networks' focuses on the various dimensions of networks and the principles governing their operation. This is the first in a series of articles applying concepts of Network Science to explore untapped potentials for accelerating the development of global society.

Abstract

Society is a highly complex, interconnected, living network of relationships. The entire process of social development and civilization from early times can best be understood as the progressive growth of the number, type and complexity of interactions and relationships between people, places, activities, and ideas. Moore's law for the micro-processor is a subset and technological expression of a principle that has been operative in society since before the invention of agriculture. Networks govern the operation of society at multiple levels and scales in Space and Time. They determine the movement and exchange of material things, interactions between individuals and groups, interrelationships between activities, systematic linkages between organizations, collection and dissemination of information, accumulation and organization of knowledge, and exchange and development of ideas. The exponential growth in the power and productivity of modern society is an expression of the laws of network science. This article examines the development of the physical dimension of social networks that begins with the linking together of small isolated communities into clusters and their organization around larger urban commercial and political centers. It explores the role of language as a networking tool, the transformative power of roads and railroads, the rise of cities as multi-functional centers, and the role of printing, media and the Internet as catalysts for human interaction and social development. The concept of integration, which is so critical to the power of networks, is also the key to unlimited expansion of social productivity and human welfare.

The development of Knowledge and Language are interdependent. It is sometimes difficult to comprehend a phenomenon until after we have formulated a special word or concept to express it. This may be the case with the word *complexity.* It is only after the word has come into common usage as a scientific term that researchers have uncovered patterns of non-linear relationship among a wide range of phenomena, such as weather, the edges of leaves, fluid dynamics and oscillating chemical reactions, which were previously believed to be random variations.

The formulation of a new metaphor can have a similar result. Over the past two decades, the World Wide Web has become a powerful metaphor for understanding society as a whole. The idea of society as a complex interconnected network of relationships is not new. Since the 1930s, a number of early theorists in social complexity have studied the exponential growth arising from increasing social encounters and exchanges. But until recently this perspective has been largely overshadowed by a predilection to view society in static terms of structure and function, rather than as a living system in terms of the flow and exchange between innumerable interdependent nodes. The very sudden and rapid development of the World Wide Web as an entirely new global system of electronic inter-relationships has made far more tangible and evident the relevance of the web metaphor to society as a whole. Insights into the nature and functioning of society as a web reveal immense potential for enhancing its capacity to promote the welfare and well-being of all its members. This article focuses on the physical aspects of the social network. Subsequent articles will examine the growth of its economic, political, intellectual and cultural dimensions.

1. Interconnectivity

What does the web metaphor tell us about society? The most fundamental characteristic of a web is its connectivity. Web connectivity is a function of the number and distribution of nodes, the distance between nodes, the patterns and degree of their interconnectedness. The greater the number of nodes and the greater the intensity of their interconnections, the greater the power of the system. A larger market is obviously more lucrative than a smaller one, a larger research network more productive than a smaller one. But the capacity of a web is not merely a function of the number of nodes. It depends far more on the degree of functional interrelationship between them. Webs are not merely masses of haphazard interconnections. They may and do have structure – hierarchical levels of authority, multiple pathways, clusters, hubs, centralized or distributed centers of concentrated activity, etc. The primary function of that structure is to ensure optimal connectivity between all nodes and specialized centers of activity. Thus, American prosperity after World War II made evident to the countries of Europe that sheer numbers of people were not sufficient. They recognized the need to remove the barriers to improve interconnectivity and fashion their vast, fragmented economies into a single, integrated market. Since the end of the Cold War, the same process has been repeating at the global level.

Webs are not just complex networks of interconnection. They are living systems. The structures of a living system are intended for maximum interaction and exchange between myriad nodes and centers; for rapid feedback and dynamic regulation; for growth, development and evolution of the structure itself. Families and tribal communities constitute the first human networks. Cooperation within families and communities makes possible the first steps toward the division and specialization of function that have so powerfully contributed to the development of civilization. The family is a simple network in which the roles of each member are physically and culturally defined and the knowledge and skills needed by each unit are passed on from person to person, generation to generation, forming the basis for the conscious accumulation and dissemination of knowledge unique to the human species.

By an imperceptibly slow process of repetitive contact, small clusters of individuals and families evolved into tightly knit local communities. Initially, these communities may have

little connection or interaction with other groups in the outside world, which are often perceived as threats. The process of connectivity gradually extends beyond local boundaries as previously isolated communities discover a commonality of interest for collective defense, commercial exchange or acquisition of knowledge. The development of networks of roads linking local clusters in spoke-like fashion to regional hubs led to the rise of trading centers as an efficient way to coordinate exchanges among many small outlying communities. Roads constitute the primary physical network needed for the development of society. Historian Eugene Weber described the transformative effect of roads on the evolution of France into a modern nation in the decades around 1900. He referred to roads as "the first fertilizer" for their catalytic impact on production, trade, technology adoption, flow of information, literacy, education, health, democracy, law and human rights.[1] One isolated French village where surplus grapes were fed to the pigs for want of a market began exporting wine within a year after a road was laid connecting it to the national economy. The hub and spoke, one of the simplest of all web structures, evolved as an ingenious method for connecting many outlying rural centers of agricultural production through a centralized marketplace where all could converge to exchange their produce. These centers also became a means of pooling resources for collective self-defense and governance. The lure of conquest and trade provided strong incentives for clusters of such communities to reach out to other clusters as components of a wider network, thus giving rise to market towns and trading centers and eventually to great commercial empires. All roads lead to Rome.

2. Univer-cities

The development of road networks provided the essential infrastructure for the development of another network that transformed the social existence of the human species – the rise of towns and cities. The urban center is a highly complex and sophisticated social organization designed to centralize a wide range of activities within a small geographic area with linkages to the surrounding world to provide all that is needed for the existence of its inhabitants that is not generated locally. Cities became the first universities – places where all forms of knowledge, expertise and experience were available in a single concentrated area. Urban centers may have begun as centers for trade and security from invaders. But they quickly diversified to become centers for the development of manufacturing, distribution, transport, communication, education, health care, governance, sanitation and other public utilities, entertainment, the arts, culture and religious worship.

Urban centers consist of densely concentrated and highly integrated networks of systems covering all of these and many other social functions. The 'structure' of these complex social webs is so thickly woven, overlapping and intricate in design that it is almost impossible to disentangle, but the functional power of their connectivity is self-evident. Historically, cities have been the birthplace of great revolutions – Athens (508 BC), Boston (1773), Paris (1789, etc.), St. Petersburg (1917), Budapest (1956), Berlin, Prague and Beijing (1989), Cairo (2011). Today, cities are epicenters for the birth, growth and development of civilization and culture.

Silicon Valley became the birthplace of another kind of revolution in the 1970s when it developed into a global hub for the micro-electronics industry due to an extraordinary nexus of innovative research and educational facilities, entrepreneurial corporations and dynamic

venture capitalists immersed in the revolutionary, anti-establishment culture born in the late 1960s and surrounded by one of the most prosperous, fast growing markets of its day. All the ingredients necessary for a catalytic reaction were present in one place and interconnected. Today our systems for interconnectivity extend globally and proximity is far less dependent on physical location. The Internet supports the spontaneous creation of virtual groups in a manner unthinkable in the past, as witnessed by the Occupy Wall Street and the Arab Spring movements. Direct connectivity appears to exist between all nodes on the network; in fact, the nodes are grouped into clusters and the clusters linked to more centralized centers, as rural towns are linked to cities and cities to metropolitan centers. Even when direct connectivity is possible, in practice it proves far more efficient to utilize major pathways for linkage, as the bulk of internet traffic is directed in and through major hubs such as Facebook, Twitter, Google, YouTube, Wordpress, LinkedIn, Amazon, Apple, Wikipedia and so forth.

"Human relationships are the real source of our wealth, knowledge and psychological fulfillment. Human resourcefulness is the ultimate resource."

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3. Movement Creates Relationship

Human beings are social creatures. We depend on one another for our physical survival and security, acquisition of skills and knowledge, social companionship and affection, ideas and values. Human relationships are the catalyst for our remarkable inventiveness, innovation, curiosity, creativity, and soaring aspirations. The growth, development and evolution of the human community is founded on relationships between people. Human relationships are the real source of our wealth, knowledge and psychological fulfillment. Human resourcefulness is the ultimate resource.

Relationships are fostered by movement – movement of people, materials, information, knowledge, technology, skills, ideas and values. This movement is characterized by an energy or momentum which determines its velocity. The capacity for transportation and communication is the most essential infrastructure for the development of a dynamic social network. Speed and throughput are crucial measures of a network's capacity and power for accomplishment. The greater the bandwidth, the greater the power. Anything that facilitates and enhances movement magnifies the effective power of a network.

As the development of rural road networks led to the growth of market towns, technological advances in transportation created the physical pathways for connectivity over long distances. The mercantile age of commercial empires was launched in Europe after the invention of the mariner's compass and the chronometer enabled ships to safely navigate the open seas to establish links with distant trading centers. The invention of the steam engine made possible connectivity and rapid movement by railway over the vast expanse of the North American frontier, more effectively linking and uniting the American states and spurring the westward expansion to the Pacific. But it would be a gross over-simplification to reduce the major advances of civilization to technological changes. Advances in each field depend on corresponding advances in allied, connected and even distantly related fields of activity. The

development of technology is one among many strands of the social network that develop in tandem. The railway may have made possible the closer integration of states within a federated union, but it took an extremely violent and prolonged Civil War to create the required political will and legal structure, the lure of economic gain to integrate their markets, and many decades of intense and often bitter interaction to forge a common social and cultural identity between them.

4. Reaching Out

Movement creates physical contact but that is not sufficient for forging effective relationships. Means of transport must be complemented by effective means for communication. Language was the first great networking tool. It radically multiplied the variety, frequency, speed and effectiveness of communications between people, dramatically enhancing the capacity of individuals and groups to collaborate for their collective survival and defense, to gather and produce food, exchange the fruits of their labor for mutual benefit, work together to build communities, discover and transmit knowledge to present and future generations, fashion lasting social relationships and social structures, exchange affections, define rules and laws, develop shared values and beliefs, and extend all forms of communication in Space and Time.

Throughout the ages, humanity has devised innumerable mechanisms for extending the reach of language and the speed with which communications spread socially. Rome developed sophisticated methods for disseminating handwritten news on political happenings, trials, scandals, military campaigns and executions well before the birth of Christ. By that time China already utilized printed news sheets. Newspapers played an important role in the commercial and political success of Venice during the 16th century. Gutenberg's invention of the letterpress and movable type dramatically accelerated the spread of what was already an essential system for social networking. This led to the rapid spread of newspapers in England, Amsterdam, Germany and the English colonies, where they helped foment the American Revolution. Newspapers and printing made rapid mass communications from one to many possible for the first time. The first edition of *Origin of Species* published in 1859 sold out immediately and the book went through five editions in England and four in America within two years.

The most dramatic improvement in the speed, breadth and reliability of news coverage came in the 19th century with the invention of the telegraph and Morse code, which combined to create what has been aptly described as the "Victorian Internet".[2] Newspapers became the major customers of the telegraph companies. Newspapers combined to form wire services such as Associated Press to share the cost of telegraph transmissions. The telegraph enabled newspapers to report on current events occurring thousands of miles away. With the completion of the first cable in 1866, news of the latest political events, economic trends, and social developments travelled instantly across the Atlantic.[3] More rapid communications acted as a powerful catalyst for revolutionary political changes, such as the rise of nationalism and the spread of communism, the dissemination of new scientific ideas and technological innovations. Most of all, they spurred the growth of trade and manufacturing.

The mindboggling speed and volume of global communications today are accelerating the evolution of every sector and aspect of global society in ways difficult to conceive let

alone measure. The launching of i-Tunes by Apple a decade ago has transformed the global music industry. Today e-books and newspapers are transforming publishing in a similar manner. In the past one year, the landscape for global education so firmly entrenched in brick and mortar has suddenly given rise to a new global delivery system that is likely to soon multiply access and transform the content of education worldwide.

5. Organizing Chaos

Social networks are not merely intricate patterns of connectivity. These patterns are organized in ways that are not easily perceived. The functioning of society, like the functioning of the WWW, sometimes gives the impression that nobody is in charge. But in fact contacts and relationships both in society and on the Web are governed by the 'authority' of conventions, standards, laws, rules and feedback mechanisms designed to reinforce their effectiveness. Given the complexity and rapid development of society, there is immense scope for enhancing the authority and functioning of social systems both nationally and globally – a process dramatically illustrated by the efforts of the European Union to arrive at common standards for hundreds of types of interaction between countries. ISO quality standards are designed to facilitate commercial relationships between companies.

The rise of the World Wide Web provides a striking example of both the power of language as a networking device and the power of standards for organizing human interactions and relationships. The WWW was born when Tim Berners-Lee developed HyperText Markup Language and succeeded in having it adopted as a standard protocol for communication between computers on the Internet. Until then, the Internet was limited to a postal system for sending packets of information from one location to another where they could be opened and read locally, as we still receive email messages today. The adoption of HTML made it possible for computers of different design, make and technical specifications to display text, visual and audio content on web pages viewable by any other computer utilizing a web browser. Berners-Lee clearly understood that the power of HTML depended chiefly on its adoption as a networking standard. Therefore, in 1994 he founded the World Wide Web Consortium as a global organization to develop standards for the WWW.

> *"Moore's law for the micro-processor is a subset of a principle that has been operative in society since before the invention of agriculture."*

Standards are the common networking language the society employs to facilitate interconnectivity between its myriad activities. The importance of standards in the modern network society also dramatically illustrates their role in the international financial crisis. The absence of an effective international regulatory framework of banking norms and requirements left the rapidly expanding global financial community vulnerable to the greatest economic calamity in eight decades. Recent progress in strengthening the standards for international banking is specifically intended to create a more stable and effective basis for global financial activity. The governance of the World Wide Web and international banking does not occupy the attention of the global community like the meetings of heads of states, important national elections and proceedings in the UN, but it may be even more powerful in determining the overall effectiveness of the global social network.

6. Power of Integration

The entire process of social development and civilization from early times can best be understood as the progressive evolution of society from small isolated packets into a single integrated web of interactions and relationships. The physical movements of people and materials from place to place, social movements of energy and attitudes, mental movements of information, techniques, knowledge and cultural values weave an increasingly dense, multi-layered fabric of interrelationships. Moore's law for the micro-processor is a subset of a principle that has been operative in society since before the invention of agriculture. Each positive human interaction has the potential to enhance social accomplishment and multiply the welfare of the collective through mutual discovery, production, protection, nurturing, sympathy, loyalty, understanding and affection.

Every new social organization has a tendency to extend itself until it reaches the boundaries of society geographically and integrates itself with every other social institution. This is most evident today in the development of the internet from an organization for the exchange of research information between universities into a global social system for commerce, banking and finance, all forms of media communication, electoral politics, education, entertainment, religion, social and personal relationships.

The concept of integration is critical to understanding the power of networks. The degree of integration of any social system is an important measure of its development and its potential for further growth. Networks have a tendency to integrate isolated nodes and separate lines of activity into a single system. This is a natural property of all social systems. The most perfect example of a highly integrated network is provided by the physiology of the human body, which integrates all biological functions with our physical needs, vital urges and emotional needs, mental awareness and aspirations. Therefore, an intangible thought or emotion can activate the physical system and place it on high alert. Medical science speaks about circulatory, endocrine, gastrointestinal, immune, musculoskeletal, nervous, respiratory, reproductive and urinary systems, as if they were separate divisible components of the human body; in fact, they form inseparable and interrelated subsystems of an indivisible living organism. Each depends on the others for its functioning and in turn supports them to maintain the equilibrium of the whole. Rising levels of carbon dioxide in the blood stimulate respiration to compensate. Healthy growth of the body depends on the balanced and proportionate development of all the body's subsystems. The same is true of the sub-systems that constitute the main channels of interactivity in the social web – transport, communications, governance, production, commerce, education, research, entertainment, recreation, culture and religion. So too, the development of language, roads, cities, markets, money, law, governance, art and culture develop hand in hand in a mutually supportive manner.

The known physiological processes of the human body offer useful insights into the functioning of sophisticated, multi-dimensional, multilayered social organisms. The body combines and integrates multiple biological systems, just as society combines and integrates multiple systems for its survival, growth and development. The body also integrates these physical systems in a manner yet to be understood with subconscious needs, urges and impulses for maintenance of the body; semi-conscious desires, feelings and emotions for accomplishment, enjoyment, interaction, relationship and emotional bonding with other peo-

ple; and mentally self-conscious perception, discrimination, judgment, ideation, aspiration, imagination, creativity and value-formation for acquisition of knowledge, development of personality, self-affirmation and individuality. The social organism integrates physical, social and psychological factors in a similar manner, making it difficult to separate democratic forms of government from the culture of liberalism in which they were fashioned or to distinguish the health of an economy from the confidence level and psychological expectations of its members. Both the body and society consist of myriad interconnected subsystems which combine and integrate at multiple levels to contribute to the overall functioning of an integrated living organism – one individual, the other collective.

A significant difference between the human body and the social network is their degree of integration. Under normal conditions, the subsystems of the human body develop in coordination with one another from the embryonic stage to physical adulthood. Skeleton, musculature, nervous and circulatory systems extend and differentiate in perfect symmetry and synchronicity and in tandem with the development of the bodily organs. Even a tiny gap in their development can lead to major deformities or life threatening diseases, as seen in the cancerous growth of bodily tissues. An excess or deficiency of a single substance, such as insulin, is sufficient to endanger the survival of the entire organism. The body is subject to more than 6000 endocrine disorders resulting from hormonal imbalances, but most of them are relatively rare.

In contrast, the social organism begins as a series of isolated nodes and clusters, developing at first independently of one another, and as a series of discrete and loosely connected fields of activity which become more closely linked and integrated over time. Therefore, the social organization can best be conceived as a work in progress, a haphazardly developing, incomplete organization striving to become an integrated living organism – very much alive with energy, awareness and capacity for initiative and response, but lacking the smooth and harmonious integration of the physical body. This is one reason for the prevalence of pressure, tension, competition, confrontation, crisis and open conflict characteristic of social systems.

Both the body and society undergo continuous change. The body grows, undergoes hormonal changes and then slowly begins to degenerate, undergoing hormonal changes during all phases of its life. Society expands horizontally, continuously develops new and higher levels of organization and functioning, and progressively evolves from physical to social to mental levels of activity. Thus, balance and equilibrium are relative and progressive terms, ever-changing with changes in the physical and social organism.

Problems arise in society at precisely the points where nodes, clusters, subsystems and sectors are inadequately coordinated and integrated. In recognition of this fact, Malthus warned two centuries ago that unchecked population growth would outpace the growth of food production, perpetually consigning the masses of humanity to a subsistence level existence. He could not have anticipated the revolution in agriculture brought about in the 19th and 20th centuries by farm mechanization and improved production techniques. The population explosion in the developing world in the 1950s resulted from rapid dissemination of modern medical technology. Raising levels of education and altering reproductive behavior took much longer, resulting in a sudden and drastic imbalance between fertility rates and death rates. The rapid

development of labor saving technology spurred the Industrial Revolution in America during the 18th century when labor was perennially in short supply, while today the spread of automation is eliminating jobs and displacing workers faster than new jobs are created to absorb the expanding labor force. So sensitive is the social organism to imbalances that a sudden surge in demand on a regional power grid can disable the entire system, pulling the plug that drives the entire society, like the outage that paralyzed the Northeastern and Midwestern USA in August 2003 and the one that affected 600 million people in North India in July 2012 during soaring summer temperatures. The tremendous growth of the global air transport industry over the past 50 years would not have been possible without the corresponding development of sophisticated systems for weather tracking and on-line reservations. *The laws of ecology apply to society as well as to the environment.*

"The laws of ecology apply to society as well as to the environment."

7. Unlimited Accomplishment

Although it may appear to the untrained eye as random or chaotic, movement in living systems is always purposeful, even when that purpose is purely recreational. Social networks develop to meet human needs. They are organized for accomplishment. Society can best be conceived of as a multi-purpose web designed to serve all of the primary and secondary functions of the human collective related to survival and reproduction, defense and governance, production and exchange, acquisition and dissemination of knowledge, recreation and entertainment, culture, religion and spirituality. The society represents the organization of the collective for the purposes of accomplishing myriad objectives. Therefore, anything that enhances the effectiveness of the social web, magnifies the power of the entire society to fulfill its intentions.

At a time when the concept of limits raises serious concerns regarding humanity's future development, the perspective of society as a web acquires special significance. Society reveals itself as an infinite ocean of power for accomplishment. At any point in time, humanity exploits only a tiny portion of the potential interconnectivity and interactivity between an infinity of points and possibilities. *The potential for enhancing the connectivity and performance of the social web is unlimited and can never be exhausted.* As the number of nodes increases, the possibilities for interaction and its resultant effective power grow exponentially, magnified by the interaction between groups or clusters of nodes and by the capacity for simultaneous interaction for multiple purposes – production, governance, education, enjoyment – and at multiple levels – for movement and interactions between people and things, products and services, activities and attitudes, information and ideas, aspirations and values.

Historically, this potential has been most vividly revealed in times of war and other national emergencies when society mobilizes all its available resources to meet a crisis. America nearly doubled its GDP during World War II in order to supply materials for the armed forces and civilian populations at home and in Allied countries overseas. During the war, the US produced more than 324,000 airplanes, more than 1000 military vessels, including 22 aircraft carriers and 203 submarines. At the onset of the war, the US possessed virtually no merchant shipbuilding capacity. With the Axis nations torpedoing merchant vessels at an alarming rate, Great Britain was in desperate need of both armaments and civilian provisions.

Under America's Liberty Ships program, the time required to build a merchant ship was brought down from a month to less than five days. America produced eleven million tons of shipping in 1942, but enemy submarines sank twelve million tons. The next year it produced twenty million tons of shipping. The Liberty Ship proved to be a crucial factor in the final outcome of the war. Social mobilization during times of war and national calamity illustrates the latent capacity of society which normally remains unutilized because its interdependent social systems are not fully developed for optimal performance.

This latent power of society – most especially the unutilized productive power of its human capital – is dramatically illustrated by the sudden emergence of Wikipedia as one of the wonders of the world, an unprecedented product of global social collaboration. In a little more than a decade, millions of individuals around the world have collaborated to create a free encyclopedia containing more than 24 million articles in 285 languages with only nominal expenditure. The 4.2 million English language articles alone are equivalent in size to 1700 printed volumes of the Encyclopedia Britannica. This untapped social potential is ever-present, but has never been fully harnessed for productive purposes. Global society is still in the early stages of discovering how to best organize this potential for the betterment of all human beings.

Author's note to the Editor on the themes for subsequent articles in the series: Article 2 will focus on the political and economic dimensions of society as a web – the role of trade, markets and money, the initiation of political movements, development of political institutions and law. Article 3 will focus on the intellectual and cultural dimensions of the social web – acquisition and dissemination of knowledge, development of science and technology, spread of education, development of human values, the evolution of consciousness and the rise of individuality.

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ERUDITIO, Volume I, Issue 2, February 2013, 36-47

Bridging Political, Cultural and Religious Divides:
The Role of Academies of Sciences and Humanities*

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Abstract

This paper addresses the question why science in the Muslim world, after its influential position at the end of the first and the beginning of the second millennium,has declined to a marginal position at present, and what Academies of Sciences can contribute to building, or rather rebuilding, bridges between science and higher education in the Muslim and the Western world. There is no doubt that the causes of such decline are manifold and in several ways dialogue and cooperation between Academies from the two worlds can be helpful here. In this paper it is also suggested that to quite some extent the intolerant,anti-science attitude of some leading Islamic clergy bears responsibility for the backward state of science in many Muslim countries. The rejection of the universality of science, the resistance against freedom of thought and speech,and the claim of 'otherness' of the Muslim experience leading up to the efforts to develop an Islamized science seriously hamper the development of science and technology, and bear resemblance to the harmful curtailment imposed on science by church authorities in the pre-renaissance Western world. It is defended that 'truths' in holy scriptures and 'truths' in science are of a totally different order and cannot be at variance any more than a poem can be at variance with mathematical physics.

1. Introduction

The fourth objective of the 18th Conference of the Islamic World Academy of Sciences (IAS) held in Qatar on 22-24 October 2011, as formulated in the 1st conference circular, was *'to air the views of scientists and academicians on ways to bridge the divide between the Islamic World and West….'*. Although I have tried to acquire some insight into the Islamic scientific and scholarly sphere of thought by reading some relevant literature, my views as presented in this paper may be defective since I cannot claim great expertise on Islamic academic thought.

This objective continues with *'.....and the particular role that academies of sciences can play in such an endeavour'*. Here I feel a bit more at home. During my term as President of the Royal Netherlands' Academy of Arts and Sciences (1990-1996), and especially as President of ALLEA (All European Academies), the European Federation of 53 national Academies of Sciences and Humanities from 40 countries (2000-2006), I regularly engaged

* Elaboration of an invited address presented at the 18th Conference of the Islamic World Academy of Sciences (IAS) on *The Islamic World and the West: Rebuilding bridges through Science and Technology* held in Doha, Qatar on 22-24 October 2011.

† I thank Ruediger Klein, executive director of ALLEA, for his valuable comments on an earlier version of this paper.

to reflect on the core functions of (associations of) Academies, and their role in building a platform for understanding (see, for instance, various chapters in Drenth, 2006; some of these articles were translated and edited in Arabic language by the Royal Scientific Society of Jordan (2005)). I will come back to the role of Academies below.

I want to bring a third element in the text of the Conference circular to the fore: the subtitle speaks of *rebuilding* bridges through science and technology, suggesting that these bridges have existed in the past and merely have to be revitalized. For anyone who takes cognizance of the history of science, this is indeed a correct observation! Abulafia (1997) has made clear it is a fundamental error to classify medieval Europe and medieval Islam as two separate worlds. One only has to look at the powerful presence of Islam in medieval Spain and in the late medieval Balkans. And during the 600 years of the Ottoman Empire, Muslims, Jews and Christians lived together for most of the time without basic conflicts about their existence (see Majer, 1997). There was also an extensive recognition of scientists and scholars and interaction between them. The Renaissance in Europe owes much to Muslim and Arab science (see, for instance, Saliba, 2007).‡ In the flourishing times of Arab science (Abbasid times between circa 750 and 900 AD) quite a number of classical texts of the Greek scientists and philosophers (Plato, Aristotle, Ptolemy, Euclid) had been translated into Arabic, and were thus saved for later generations only through these Arabic translations, while many of these original texts got lost. Saliba (2007) argues further that a strong scientific culture (astronomy, medicine) must have existed already in Arab countries to enable them to appreciate the greatness of the Greek giants. Later on in the 11th century, Muslim scientists in al-Andalus elaborated and translated Arabic texts into Latin, thereby transmitting to Christian Europe a wealth of scientific knowledge (Cohen 2008). They also enriched science with their advanced achievements in arithmetic and mathematics. But most important was their contribution by their early calling to rely on experimental and empirical evidence, and rejecting the uncritical acceptance of 'authorities'; see, for instance, the writings of the Arab scientist Al-Haytham (Alhazen). A striking example of this attitude is depicted by Baffioni (2011), who shows how independent from Aristotle the scholars Avicenna and Fakhr al-Din al-Razi were in their explanation of the causes of earthquakes.

I must point out that the strong influence of medieval Arab and Persian scholars and thinkers on the West is not restricted to science and mathematics. The old Sanskrit and Persian literature and poetry have always attracted much attention and appreciation of western writers and artists. In a recent symposium of the Netherlands' Academy (31-05-2011), the extensive influence of the Muslim World and its creations in art and literature on my own country was illustrated. For instance, Boutens and Leopold, two of the most well-known Dutch poets at the beginning of the last century were fascinated by the classical quatrains of Omar Khayyam and translated many of them.

In the course of time, however, the influential position of Muslim science has dramatically declined (Slomp, 2004, Cohen, 2008). For a number of reasons which will be discussed below, scientific values have lost their power in the Muslim World, and today only few universities in that world are any longer centres of excellence in research; scientific achievements as measured by international quality criteria (publications in peer reviewed

‡ I know that this proposition has been challenged (e.g. by Sylvain Gougenheim, 2008) and discussed (le Monde, Oct. 2008, New York Times, 28-4-2008), but even if some reserve is assumed a substantial influence of Islamic scholars on the development of Western philosophy is beyond doubt.

international journals, citation indices and other performance indicators) are scant, despite occasional and isolated highlights. In many Muslim countries, the number of scientists and engineers who are active in research is precariously low. Still, for the Muslim world science and technology are keys for development and prosperity, as the Director General of IAS Moneef Zou'bi made convincingly clear at the conference of IAS and RSS in Amman, Jordan in December '04 (Zou'bi, 2005). Ismail Serageldin, the Director of the Alexandrian Library, appealed explicitly to the scientific community in the developing world: "We are at a cross roads. Either we reassert the importance of science and the scientific outlook, or we are going to witness our societies increasingly marginalised in the world of the information age" (Serageldin, 2002).

Fortunately, there are also positive signs. The 2010 UNDP Human Development Index, focusing on three dimensions Health, Education and Living Standards, shows five Arab countries (Oman, Saudi Arabia, Tunisia, Algeria and Morocco) as the top movers relative to the starting point in 1970. Moreover, as the UNDP report observes, the Arab region is experiencing a defining moment in its modern history, with millions of (particularly younger) women and men issuing a resounding call for change, demanding a greater say in decisions that affect their lives and a more transparent and accountable governance. This is an advantageous circumstance, since there is a clear positive correlation between the Human Development Index and the quality of democracy in a country. UNDP's strategy to support these changes includes fostering the emergence of responsive and accountable institutions and promoting inclusive growth, job creation and human development. The programme 'Global Innovation through Science and Technology' (GIST) initiated a number of interesting US-backed projects in an effort to promote science-based innovation in the Middle East, North Africa and South Asia (www.scidev.net). The Royal Society started a project 'Atlas of the Islamic World; Science and Innovation', registering the progress and needs in various Muslim countries, starting with Malaysia (http://royalsociety.org/aiwsi/). Optimism and hope were also eloquently expressed by Barack Obama, the President of the USA, in his speech at the University of Cairo, promising support and cooperation in medical, scientific and technological development in Muslim-majority countries (2009).

We conclude that there is a need for *rebuilding* bridges between Islamic and Western science. Let us focus on the question on what Academies of Sciences and Humanities can do to contribute to this process.

2. Academies of Sciences and Humanities

What do Academies of Sciences and Humanities stand for? It is clear that the world of Academies is rather heterogeneous. Some Academies confine their interests to natural and life sciences. Others include social sciences and humanities. Some Academies limit themselves to the promotion of science through scientific meetings, the exchange of information and opinions, and (international) scientific contacts. Others have, in addition, an influential evaluative and advisory function, engaging in advice on science and science policy, on the quality of research, and on ethical standards and societal consequences of developments in science and technology. Again, others actively promote research by funding and carrying the responsibility for high quality research programmes or research institutes.

In spite of their differences, two important objectives have always characterised Academies throughout history: the advancement of critical scientific thinking both in the scientific community and in society at large, and the promotion of excellence in scientific and scholarly research. And Academies have always recognised and emphasised that freedom and independence of science are *sine qua non* for the pursuit of these objectives. The importance of this freedom and independence, so adequately symbolised by the creation of the first *Akademeia* by Plato in a gymnasium outside the mainstream political bickering of ancient Athens, and so tragically misjudged by Emperor Justinian about a millennium later when he closed this academy because its views were not in line with his own, came to light again in the 16th and 17th centuries, when universities in Europe were increasingly brought under the yoke of the church and the state. Academies were founded as places where results of scientific research and philosophical issues could be discussed freely; they became safe havens for oppressed and persecuted scientists to express and debate their sometimes strongly deflecting views and ideas.

The power of a modern Academy is rooted in its membership and the combined scientific and scholarly expertise of its members. Members are chosen purely on the basis of the quality of their scientific capacities and achievements. No other criteria such as gender, ethnic background, political preference or religious affiliation may play a role. Members are chosen for life and should have no vested interests other than the promotion of science and scholarship in their country and abroad. Thanks to an active and committed membership that an Academy can accomplish its mission.

3. The Role of Academies and their Contribution to Bridging the Divide

In at least three of the roles and remits of an Academy we should expect an important potential contribution to bridging the divide between Islam and the West.

"The laws of natural and life sciences, and also those of social sciences and humanities, are applicable everywhere, and scientists and scholars from all over the world can, in fact should, participate in the common scientific discourse."

In the first place, there is the ***forum and meeting function*** of Academies: gatherings, conferences and colloquia, international contacts and reciprocal visits, lectures, exchange of information and periodicals, and membership of international organizations such as IAP (Inter Academy Panel), ICSU (International Council for Science), UAI (Union Académique Internationale), and many other bodies express the international collaborative and meeting functions of an Academy. In these scientific contacts, different scientific views and clashes of opinions occur. However, firstly, these differences seldom coincide with divisions between continents, nations or political alliances, and, secondly, scientists that have different views are basically agreeable to reason: their weaponry consists of arguments and not instruments of force or power. The common search for the truth, the open ear for each other's arguments, and the joint effort to analyse and comprehend the complexities of the issues at hand function as important piers for the bridge between what may be initially disagreeing parties.

Of course, there are two *preconditions* for this uniting function of science and scientific organizations. In the first place, there should be an acceptance of the *universality of science.* As I argued earlier (Drenth, 2004), the laws of natural and life sciences, and also those of social sciences and humanities, are applicable everywhere, and scientists and scholars from all over the world can, in fact should, participate in the common scientific discourse. Here I do agree with Hoodbhoy (1991), Abdus Salam (1991) and Serageldin (2006) in their vigorous rejection of the claim of 'otherness' of the Muslim experience, of the alienating presumption that science is 'Western' and consequently, the efforts to develop an Islamized science. Buruma and Margalit (2004) exemplify that the anti-Western attitude – for which they use the term 'Occidentalism' – in the more fundamental Muslim range of ideas refers to more than political or scientific rivalry; it rather defies idolatry and moral decadence. But I postulate that science is not Western, and that modernization by applying the fruits of science and technology is not westernization. Nor did the early Muslims plead separateness of their scientific enterprise. They did not call for banning or burning Plato's and Aristotle's books, but they had them translated into Arabic and wrote excellent annotations about them, entirely in the tradition of the search for knowledge and truth as prescribed in the original sources of Islamic doctrine, the Quran and the Sunnah of the Prophet (Serageldin, 2006, Zewail, 2010).

A second precondition for a successful forum and meeting function of Academies is the acceptance of *scientific values:* honesty, freedom of thought, freedom of speech, critical approach, use of reason, the acceptance of fallibility and renouncing absolute truths, and tolerance with diverging views. Forms of fundamentalism are undermining these values in parts of the West. But among others, Abdolkarim Soroush (2004) and Sadik Al-Azm (2004) have shown that acceptance of scientific values also leaves unfortunately much to be desired in many parts of the present day Muslim world. Too much influence is exercised by militant Muslim fundamentalists, preventing these values to be accepted, which is, according to Serageldin (2006, p.107), in contradistinction to the real and true Muslim tradition. He argues that the values promoted by the scientific outlook are profoundly Islamic values. "Let us reclaim, as intellectuals, our right to reason, let us liberate our Muslim mind" he summons. Likewise, Zewail (2010) states: "It is these values that the Muslim world has to cultivate if it is to recover its heritage and take its place among the modern family of nations." This plea leads us to the second role of Academies.

The second role of Academies is ***informative and educational*** with respect to students and fellow scientists, as well as the public at large. Since their origin, Academies have taken on the educational charge: the transmission of scientific knowledge and the enrichment of the next generation with knowledge and insight. This educational imperative of Academies might even be more prominent in Muslim countries today, since universities in many of those countries suffer from the absence of freedom of inquiry and lack properly enforced quality standards (Zewail, 2010). Among the top 200 universities of the world according to the Times Higher Education Supplement ranking (2011), only three are located in a country with a majority Muslim population (two in Turkey: Bilkent University (112) and Middle East Technical University (183), and one in Egypt: Alexandria University (147)).

The teaching of biology may be a case in point. Among professional biologists, there is no doubt whatsoever that the evolutionary principles of Darwin are irrefutable. It is, according to the American National Academy of Science, the central unifying concept of biology or as

Dobshansky, the well-known expert in genetics, observes: "nothing in biology makes sense, except in the light of evolution". Of course, like in any scientific theory, there is incompleteness in the theory of evolution and there are controversies about technical details that are being debated and tested, but evolution as such is a fact. The positive evidence for this fact is truly massive; it consists of hundreds of thousands of mutually corroborating observations in palaeontology, geobiology and DNA research. Denying this fact as is done in creationistic or neo-creationistic (intelligent design) criticisms based on revelations in holy scriptures (Bible, Quran), undermines the fundamentals of science, since it seeks to recognise super-naturalistic beliefs as authentic scientific arguments (I shall come back to this point below). It is not by coincidence that a group of 67 Academies of Sciences, together with ICSU, signed a statement a few years ago (21 June, 2006), that rejected all attempts to deny or obscure the overwhelming scientific evidence about the evolution of the earth and life on this planet, and the attempts to create confusion by the introduction of theories that cannot be tested scientifically. This protest was directed against a powerful conservative-orthodox movement, notably in the USA, that is supported by authors like William Dembski and Michael Behe, but also against the high popularity of creationistic teaching in the Muslim world. The Quran is less specific than the Bible on the creation of the earth, and leaves more room for the conception of Allah as the *originator* of evolution. Yet, there is a strong popular current that rejects evolution as 'Western' and as incompatible with Muslim belief (Thompson, 2008). These attitudes are further encouraged by fundamentalist writings and inflammatory media messages (e.g. Internet-sites such as Yahya and Islamonline) that mix anti-evolutionist appeals with anti-scientific and anti-western propaganda. Quite a few Muslim students, also in Western universities, are attracted to this indoctrination. In my own university (VU University, Amsterdam) we had a case a few years ago, when a number of Muslim medical students refused to give serious answers to exam questions on evolution in the mandatory biology course, and copied all kinds of anti-scientific nonsense from the Internet. Failing the test was venomously denounced by the students, and the professor was accused of religious discrimination. Fortunately, the latter stood pat against the accusations, and the students had to resit the examination. The situation in other western countries with respect to this resistance of Muslim students is not different. Thompson reports that less than 10 percent of Muslim students in the UK accept the theory of evolution. The figures in Muslim countries themselves are even more disturbing. Thomson concludes: "In rejecting 'Darwinism' the developing world thinks it is demonstrating superiority over degenerate Western values. In fact, it is doing nothing of the sort. It is rejecting the scientific method itself and thereby condemning the future generations to material and intellectual poverty" (Thompson, 2008, p.59). It is good to know that among the 67 Academies that signed the statement on the teaching of evolution, about one quarter are based in Muslim countries in Europe, the Middle East, Africa and Asia. It is interesting that working contacts with Western scientists may have a significant influence. At the recent 7th World Conference of Science Journalists in Qatar (27-29 June, 2011), Salman Hameed reports on the basis of a survey that 80 percent of Pakistani doctors working in the USA accept the theory of evolution, including microbiological, animal and human evolution, whereas most Malaysian doctors (in Malaysia) reject this theory, especially with regard to humans (Hameed, 2011).

A final remark on the educational role of Academies: as stated above, this function also pertains to the broader community. The scientific enlightenment of the general public can be

seen as an important instrument with which to develop and strengthen the defensibility and democratic foundation of a society. Indeed, intolerance, enmity, discrimination and xenophobia are all too often products of ignorance and misinformation. The stimulation and dissemination of accurate information and proper guidance by respected institutes like Academies may have beneficial effects. Moreover, this not only applies to the natural and life sciences. The teaching of history is another example. Nationalistic, prejudicial and selective history education has always fomented further enmity, intolerance and bigotry. Mertus (1999) shows, for instance, how myths overgrew historical facts in the Balkans, and how this contributed to the wars. Sadik Al-Azm (2004) illustrates that the Muslim countries are no exception in this respect. National Academies, therefore, also have a responsibility for offering guidance and wisdom to the nation and its leaders (as was rightly submitted by Moneef R. Zhou'bi at the conference mentioned earlier (Zhou'bi, 2005)).

The third role of an Academy that may help in bridging divides between countries and cultures concerns its ***advisory*** function. Although this advisory function is not always made explicit in the Academy's statutes or bylaws, many Academies consider it as their responsibility, on the basis of their scientific insights and mission, to convey judgements on science-related matters to governments, scientific and cultural authorities, educational and research institutes or the public at large. This advice may be delivered, formally or informally, solicited or unsolicited; sometimes, it is also explicitly prescribed by law or regulations.

As far as the content of this scientific advice is concerned, one can distinguish five categories:

- Advice based upon quality assessments;
- Advice regarding scientific policy, including foresight on trends in science;
- Science-for-policy advice: advice regarding pending policy decisions that are based on scientific research and expertise;
- Advice on ethical and social questions related to or generated by scientific research;
- Advice on research integrity.

Most of this advice-work relates to national science policy and practice. However, we see an increasing internationalisation of research and scientific collaboration, and a growing tendency to lift the discussion and decision making on scientific policy and research funding to a supra-national level. Consequently also, the consultatory and advisory role of Academies assumed more and more an international dimension. In fact, this is an important reason why ALLEA (All European Academies) was founded in the beginning of the 1990s, so as to become an active player in the European science policy arena.

Academies of Sciences and their Associations can make a significant contribution to bridging the divide between countries and cultures. Concord, mutual understanding, rapport will be achieved by developing and cherishing common values. And in their often prestigious, formal and informal advisory capacity vis-à-vis educational, political and religious leaders, Academies of Sciences and their Associations can stress these basic values of science and research integrity and thus create further dialogue and understanding.

What are the scientific values that form the pillars of these bridges? (In the previous sections we have already touched upon these values a couple of times). Here they are summarized:

- A basic commitment to solving problems through rational reasoning, a critical approach to 'established' theories, and persistence in looking for evidence through experimental or empirical facts or observations. No supernatural, untestable explanations or interpretations are allowed as scientific arguments.
- A prerequisite for this commitment is the independence and absolute freedom of mind. No political, economic, ideological or religious interest or preference can be allowed to enter or influence the scientific analytical process.
- Freedom of thought, speech and interaction are essential for critical analyses of one's theories and those of others.
- The realization that no one possesses the truth, that no one has absolute vision, and that all theories may prove fallible in the light of new discoveries or new evidence requires tolerance with respect to different views or explanations. Abdolkarim Soroush in his *Treatise on Tolerance* (2004) quotes a saying of the famous Iranian poet Hafez: "In these two expressions lies the peace in this world and the next: with friends, magnanimity, with enemies, tolerance", but he also adds: "but no tolerance with the enemies of tolerance!"
- The principles of research integrity (as for instance formulated in the European Code of Conduct for Research Integrity, developed by ESF and ALLEA (2011)) require *honesty* in presenting goals and intentions, in reporting methods and procedures, and in conveying interpretations. Research must be *reliable* and its communication fair and full. *Objectivity* requires facts capable of proof, and transparency in the handling of data. Researchers should be *independent and impartial* and communication with other researchers and with the public should be *open* and honest. All researchers have a *duty of care* for the humans, animals, the environment or any of the objects that they study. They must show *fairness* in providing references and giving credit for the work of others; and must show *responsibility for future generations* in their supervision of young scientists and scholars.

Promoting these scientific values shared by scientists all over the world forms the basis for the challenging task of Academies to exert their influence in building bridges. As indicated before, some Muslim scholars or scientists may remonstrate by insisting that these values are the product of the European enlightenment, as postulated by philosophers like Spinoza, Locke and Kant, and are therefore 'western' values. I propound to refute this objection. Spinoza, Locke and Kant were not just addressing the West, but the entire intellectual world. The enlightenment — while in many ways a reflection of its time — also bore fruit for universal science, not just for Western science. And again, as shown by authoritative Muslim authors, these central thoughts of enlightenment and core values of science are not at all at variance with classical Muslim values and traditions. Also Chaney (2008) concludes after careful analysis of conditions of Islamic science throughout history, that the use of medieval scientific achievements as justification for a return to Islamic orthodoxy is unjustified. The opposite is true. Evidence suggests the importance of tolerance and personal freedom.

4. Science and Religion

In this last section, a few words on a controversy that seems to determine extensively our subject of discussion, namely the relationship between science and religion. Throughout history, the relationship between autonomous reason and divine revelations has been a recurrent source of conflict. In many faiths, and particularly in their more orthodox streams, science and religion have been at daggers drawn. An interesting question is: can these sources of knowledge and understanding somehow be reconciled or is their relation necessarily strained?

History of science shows that in many cases actions of religious leaders in the conflicts between science and religion were fierce and merciless. Discussion on 'heretical' science findings were forbidden, books and manuscripts were burned, scientists themselves silenced, isolated, imprisoned, or put to death. Obviously, scientific truths, based on facts and proof of observation, can come in basic conflict with 'truths' as revealed in holy scriptures and as interpreted by religious leaders. The latter often accept miracles, propagate myths and legends, and advocate magic and scholastic reason. The former only accept logic and empirical or experimental observation. How could these two different worlds ever be reconciled?

Before we offer an attempt to do that let us realise two important solicitudes:

1. The altercation between religion and science certainly does not run parallel to the divide between Islam and Christendom. Both religious worlds have had their share of this contention. In the West, churches have been fighting the ideas of Galileo, Spinoza, Voltaire and Thomas More. The Vatican always resisted scientism, rationalism and naturalism (see, for instance, the 1864 syllabus of Pope Pius IX). Even today, orthodox movements in the West use religious arguments to stand up against evolutionism and the biological basis of moral judgements (see Dawkins 2006). In Muslim history, we have seen the early attacks of the influential Al-Ghazali (see Al-Azm, 2007) and Abu Ala al-Maari (see Chaney, 2008) on the rational and tolerant views of the philosophers Al-Kindi and Ibn-Sina (Avicenna), calling some thoughts of the latter heretical, and others even apostatical (kufr). Later in the flowering period of the Islamic science in Spain we see again resistance of for instance Ibn Rushd (Averroes) against the orthodox repression of science. Orthodox Muslim theology has always tried to dominate, rather than to inspire science, as Bürgel concludes in his extended study (1991). And as far as the present time is concerned, we have already seen the charges of concerned Muslim scientists like Serageldin, Pervez Amirali Hoodbhoy and Abdus Salam against the attempts to base (an Islamised) science on the Quran, Sunna and ancient Muslim authorities.
2. There is little doubt that the intolerant, anti-science attitude of some Islamic clergy bears some responsibility for the backward state of science in many Muslim countries. But this is not the sole determining factor. As has been demonstrated already some time ago, other factors holding back scientific development include demographics, insufficient mastery of English as the main language of scientific communication, poor learning objectives and practice (rote learning as a legacy in many Qur'anic madrasas), lack of research capabilities and experience, state-owned corporations that have grossly neglected research and development, lack of funding and resources, powerless

professional societies, and authoritarian regimes that deny freedom of inquiry or dissent (see, for example, Segal 1996). In the same strain, Adnan Badran points out the damaging indifference of Arab countries towards science and technology activities as not being a priority condition for economic development (2005).

Back to our basic question: Are scientific rationality and religion-based convictions implacable or is there a way to reconcile these two?

Let us, in an attempt to address this issue constructively, introduce the distinction that I made earlier (Drenth,1999), namely that between science *stricto sensu* as the methodical-analytical study of natural or social phenomena employing experimental or empirical methods, and science as the *process of knowledge accumulation,* which is embedded in pre-scientific choices and a socio-political context.

"What we call 'God' is to be conceived as the symbol for ultimate justice, honesty, care and love, based on the realization that there is more to life than the mere gratification of biological needs and that life transcends the simple physical existence."

The former, which the Swiss philosopher Bochenski at the 1990 Engelberg Forum on Science and Technology referred to as *Wissenschaftals Inhalt (science as content),* has no room for norms other than the logical-analytical norm. Objectivity has to be maintained against any pressure from external sources, including religion. Science should be allowed to analyse and interpret the facts and findings without any religious or ideological interference, and should be, in this sense, value-free. This is the science that has an independent and universal character, and that is the backbone of innovations that drive economic and intellectual progress. This is also the science that Muslim scientists like Serageldin, Hoodbhoy and Abdus Salam so vigorously stand up for and this they see as the only way for Muslim countries to climb out of the trough.

What if the scientific truths are at odds with the 'truths' as revealed in the holy scriptures? The answer is: they cannot be. The Bible, the Torah and the Quran are not historical, geological or biological textbooks. They do not intend to give a scientific explanation of physical or social phenomena. They are imaginative texts that attempt to help people to understand the meaning of life, to guide and inspire them, to provide hope and consolation. True, religion has been and is appallingly misused by men. But what we call 'God' is to be conceived as the symbol for ultimate justice, honesty, care and love, based on the realization that there is more to life than the mere gratification of biological needs and that life transcends the simple physical existence. And the holy scriptures can support and inspire people with this realization. Science, on the other hand, is the world of falsifiable knowledge, of logical consistency and of verification and validation. These two worlds cannot be at variance any more than a poem can be at variance with experimental physics. Gould (1999) suggested something similar when he described the worlds of religion and science as two Non-Overlapping Magisteria (NOMA).

This independence also means that both worlds should not hamper each other. Religious authorities should not interfere with the scientific analysis and interpretation, and should not try to impose supernatural causes or explanations upon the scientist. On the other hand, the 'scientific' endeavours to try to prove that religion is nonsense and that God does not ex-

ist (Dawkins, 2006, Hitchens, 2007, Stenger, 2007) are meaningless. Aspirations, hope and trust, which are essential in religion, are excluded from such argumentations, because they are not based upon a demonstrable or falsifiable existence of something or someone. The question whether God or Allah exists cannot be a scientific question, and can therefore not be answered scientifically.

However, we come upon a quite different picture if we consider science as a process of *knowledge accumulation,* called by Bochenski as *Wissenschaft als Tätigkeit (science as practice).* Here we see science as a societal process, enfolded in a non-scientific context of often religion-based convictions and ethical choices. These pre- or meta-scientific conditions relate to:

- the philosophical assumptions that underlie the deployed theories and paradigmata;
- the choice of subjects and hypotheses to be researched, with no-go or slow-go decisions in the pursuit of scientific questions (for example: is stem cell research allowed, can the scientist engage in anthrax or napalm research? and many others);
- the manner in which experiments are conducted (appropriate care for animals, patients, the environment) and data is gathered (respecting informed consent, privacy issues), and
- the always pressing question of what is being done with the research results and by whom. Can the scientist be held responsible for misinterpretation, selective use or abuse? And how is one to repair or to prevent this?

In this sense science, as a human and social activity, as practice, is anything but value-free, and the scientist is faced with a variety of moral and normative dilemmas and questions, for the answering of which non-scientific considerations of ethical and normative nature are required. Here religion and normative traditions do have an important and legitimate role to play. The discussion of ethical and social dimensions of research is therefore a crucial terrain for discussions among Academies of Sciences and Humanities from countries with different cultural and religious traditions.

"Through the promotion of free and clear communication and open debate between different schools of thought and between science and society, Academies can really contribute to understanding, in concordance with and in agreement within and between societies and cultures."

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5. Conclusion

It has become clear that through the promotion of free and clear communication and open debate between different schools of thought and between science and society, Academies can really contribute to understanding, in concordance with and in agreement within and between societies and cultures. It is a question of communication with the national intellectual

and student population, and also with the international science community. Conferences are extremely useful in this regard. I hope that in the future a more frequent and more intensive dialogue between Muslim and Western scientists and scholars, and especially between Muslim and Western (Associations of) Academies of Sciences and Humanities will take place. I certainly will recommend our own organisation (ALLEA) to take up this challenge.

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ERUDITIO, Volume I, Issue 2, February 2013, 48-56

Social Evolution

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Abstract

Literature, which marks the major landmarks in history, focuses on events at the micro and individual level, and can thereby uncover significant social processes either overlooked or difficult to document from the historical record. This article illustrates, using Anthony Trollope's novel Doctor Thorne, the social evolution of England in the 19th century. Trollope depicts social evolution at the level of decisions, events and acts involving individuals, which aggregate to acquire wider social significance. These movements provide insight into the evolution of society. Society has evolved over the centuries, but the evolution has been mostly unconscious. Knowledge of the process of social development revealed by the study of literature may be applied consciously to facilitate and accelerate social progress. Conscious development abridges time. Trollope's works, like all great works of literature, can be an invaluable aid in our effort to comprehend the evolution of society and devise ways to accelerate it.

Revolutions come in many forms. There are the traditional ones, with mass uprisings, violence and dethroning. In what was perhaps one of the earliest revolutions nearly three thousand years ago, the Babylonians overthrew the Assyrian empire in a long, bitter war and declared their independence. There are others, well planned and executed, that silently repaint the landscape. The Russian October Revolution was launched by Lenin, signaled by a blank shot. Hardly another shot needed to be fired as the Bolsheviks took over all critical power centers in Petrograd. They entered and almost got lost in the vast Winter Palace, stumbling upon members of the government who still remained inside. Illiterate revolutionaries compelled the arrested men to write their own arrest warrants. Thus was born the Soviet Union.

Some revolutions seem doomed to failure. The Irish Rebellion failed to overthrow British rule in Ireland. The Tiananmen Square protests may be discussed the world over, but not in the land where it took place. There are yet other attempts, apparent failures, that in retrospect can be seen to mark the beginning of truly radical change. Spartacus and his 70,000 slaves who attempted to escape during the Roman slave rebellion were annihilated by the powerful Roman army, but their unconquerable spirit left an impact on the Romans, who reduced the number of their slaves, looked elsewhere for laborers, and began to treat the remaining slaves less harshly.

Some are led by one man, others by countless men and women all over the land. Tunisia's Jasmine Revolution that led to the Arab Spring of 2010 began with a poor vegetable seller who did not live to see the global impact of his suicidal act. Some are carried out in ways so unconventional. Mahatma Gandhi ousted the British colonialists from India by defying

the British prohibition on salt production, encouraging Indians along the country's over 4,000 mile coastline to make their own salt. The Estonian Singing Revolution began with spontaneous all night chorus at a music festival, and culminated in Estonia, Latvia and Lithuania declaring independence from the USSR.

"Every revolution has been an expression of people's aspiration - for food, for freedom, for security, for happiness."

The weapons wielded in the struggles vary widely. The guillotine was a symbol of the French Revolution in the 1790s, with which the people wiped out their aristocracy in an attempt to level society. Such a contrast was the Carnation Revolution that overthrew dictatorship in Portugal in the 1970s, when people joined the military revolutionaries by sticking carnations in their uniforms and rifle muzzles. Perhaps the most unexpected, that took even the techno savvy of the world by surprise, was the smart phone, which along with Facebook facilitated a mass uprising in Egypt.

Whatever may be the form a revolution takes, and whatever the mode and weapon employed, the cause is invariably the same. Since the first revolution in recorded history some five thousand years ago, when the Sumerian king Lugalanda was overthrown because of his corruption and injustice, every revolution has been an expression of people's aspiration - for food, for freedom, for security, for happiness.

A revolution is defined as a complete, radical change. But not all changes go by the name of revolution. There are also the silent, slow changes, often unnoticed till afterwards. They too, are an answer to humanity's primal longings, the result of unvoiced, collective aspirations. Revolutions can be traced as far back as five millennium ago. But evolution is older than humanity itself. The aspiration for food, family, happiness and power spurred early human beings to evolve socially mentally, culturally and spiritually.

"Every invention, every discovery, every change in the history of mankind has been the consequence of an expanding human awareness and rising human aspiration resulting in new and higher forms of social organization."

When man discovered that he could imitate Nature and produce food where he lived rather than go searching for it, agriculture and animal husbandry were born and permanent settlements developed. When he discovered the power of symbolic communication, language evolved. As interactions became more and more complex, trade, markets, urban centers, governance and law came into existence. The thirst for knowledge led to inventions. The printing press facilitated the dissemination of knowledge. The spirit of adventure led to the age of exploration. Unknown expanses of land and sea were drawn on the world map, and brought closer and closer together in a world shrinking due to technology that has conquered time and space. Every invention, every discovery, every change in the history of mankind has been the consequence of an expanding human awareness and rising human aspiration resulting in

new and higher forms of social organization. Life "evolves through growth of consciousness, even as consciousness evolves through greater organization…"[1] Every period – the Renaissance, the Industrial Revolution, the Information Age – is a reflection of this evolutionary process.

WAAS Project on Ideas can Change the World

This is the first in a series of articles reproduced from the January '13 Op-Ed as a a call to Fellows for ideas that can change the world. All Fellows are invited to send in contributions (500-1000 words) for publication in WAAS Op-Ed.

The Symbol Dawn

Garry Jacobs
Chairman of the Board of Trustees, World Academy of Art & Science;
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Ideas define our view of the world. Ideas determine the world. Ideas have the power to change the world – beyond recognition. Our senses observe and take in data from the environment to generate sense impressions. Our minds combine, associate and coordinate sense data to formulate thoughts, as Pavlov perceived the relationship between stimulus and response in a dog. Our thinking minds combine, associate and extract the common essence of several thoughts to conceive complex ideas, as Copernicus extracted the essence of numerous observed facts and concepts about the revolution of the planets to reverse the prevailing conception of a geocentric universe. We know the world indirectly through thought. All our knowledge is based on this indirect process of receiving, interpreting and converting sensory data into simple thoughts and recombining those thoughts to form complex ideas.

Ideas are symbols for reality, not reality itself. Therefore the idea of a symbol may be considered the first of all ideas. The dawn, fire, a rose flower and a ring are symbols as well as facts. A symbol is something – a sound, numeral, word, image, object, name, title – that is employed by the mind to represent something intangible. Signs convey information. Symbols convey power and inspiration. More than the discovery of fire, the wheel or agriculture, symbols are the basis for our emergence from the forest and our evolution beyond the animal to conscious mental living. Human civilization and culture are founded on intangible abstract symbols. Symbols are the basis for our communication, exchange, relationship, social organization, governance, knowledge, education, science and arts.

Today humanity enjoys an unprecedented abundance unimaginable to past generations. Yet at the same time we are increasingly constrained by a sense of limits. The earth is crowded with teeming millions, non-renewable resources are being consumed at an alarming pace, poverty persists in spite of exponential increases in production, insecurity still haunts us in the midst of our invulnerable defenses, uncertainty prevails in spite of an ever-increasing glut of information.

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Language as an Idea

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Language is an idea that has had infinite power to stimulate the growth of civilization. As the potential growth of language is unlimited, so too is society's power for development.

The power of ideas was born with the birth of Language. Language itself is one of the most fundamental of all ideas, like the idea of organization. It is the idea that sounds, signs and notations can be employed as symbols to represent people, places, objects, events, actions, thoughts, feelings, intentions, other ideas, the unseen, unknown and even – as in the case of a mantra – the unknowable. It is a conscious organization of signs, sounds, words, categories of words according to standards, conventions, customs, rules and creative inspiration to represent material facts, emotional attitudes, thoughts, complex ideas and to give symbolic expression to that which is immaterial and ineffable.

The development of symbolic language marks a radical step in the evolution of human beings from the animal kingdom. While animals may instinctively communicate through sounds and gestures, none that we know of possesses the capacity for the conscious creation of new forms of complex symbolic language.

Language is the first bridge linking one human being to another in an effective and affective relationship. As money is the language of commerce, language is the essential medium of exchange for the 'commerce' of human relationship, for without language our physical, economic, social, emotional and intellectual interactions and exchanges with other human beings would be limited to the most primitive, rudimentary forms of physical association and exchange. It is the first human social organization upon which all others are based. It is social for its value arises from the fact that it is recognizable and accepted by other human beings. As money is valueless to a man stranded alone on a deserted island, the full value and power of language emerge only in a social context.

Initially, language developed to represent objects and facts, making possible the communication and organization of information. Later it evolved to make possible the coordination of facts as thoughts and the coordination of thoughts as complex, abstract ideas. The development of language reflects, supports and directs the development of consciousness. They are mutually interdependent.

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History and biography provides insights into this process, but much of it falls beneath the radar screen of historical fact. It can only very partially recreate or infer the thought processes, attitudes, perceptions and beliefs of which historical facts are an expression. Great literature offers more, for it captures the ideas, motivations, aspirations, superstitions, ambitions and fears as well as the mental, social, cultural and psychological atmosphere in which individuals and groups live and act. The creative imagination of great writers reveal through their stories far more than merely character and action. The views of the protagonists depict the prevailing ideas and beliefs of the day. Their struggles and hopes reflect the aspirations of

the times. Their failures and successes reveal the social, economic and political climate and conditions in which they lived. On the surface the plot describes a course of action, but it also depicts the course of social evolution. In other words, the writer paints a miniature of a living and evolving world in his pages. One such world created is Anthony Trollope's Barsetshire.

Anthony Trollope was one of the most successful English writers in 19th century England. He was a respected and prolific novelist, and he set a number of his stories in the imaginary county of Barsetshire in England. Trollope was a political novelist with 'steady interest in the effects of history and of power relationships on everyday life', who had the ability to 'represent broad historical changes by a few carefully drawn characters rooted in a particular environment'.[2] One of the Barset chronicles, Doctor Thorne, revolves around a country doctor and his niece. Doctor Thorne, a respectable and successful physician brings up his niece, Mary, the illegitimate child of his brother, to be a good natured, high principled girl. The son of the county squire, Frank Gresham, is in love with Mary. The Greshams are an old, reputed family, but have lately fallen on hard times. Their estate is heavily mortgaged to a worker turned railway contractor who has seen a meteoric rise in his fortunes. This noveau riche man, Sir Roger Scatcherd, also happens to be Mary's uncle on her mother's side. Frank is under pressure from his mother and titled relatives to court money and property. They try to match him with the wealthy Miss Dunstable, the heiress to a fortune made in trade by her father. Lady Gresham overlooks the lack of title, and hopes for a rich match for her son. Frank is unable to stand up to his august family at first, and makes a poor attempt at striking gold through marriage, but is quickly brought back to his senses, and to Mary. Sir Roger Scatcherd passes away, leaving all his wealth to his closest relative, Mary. Now it turns out that most of the Gresham property is in Mary's hands, and a marriage between Frank and Mary not only unites the happy couple but also retrieves the Gresham property. Lady Gresham receives her daughter in law she has till the day before opposed, with the words 'Dear Mary', and Trollope concludes the story with a happy ending for the lovers as well as their property. A simple straightforward story, almost moral in its implication, reveals the deep undercurrents shaping society.

"Trollope depicts social evolution at the micro level of decisions and events involving individuals which aggregate to acquire wider social significance, in a manner similar to the way legal theorists have documented the role of micro level events in the evolution of law."

Trollope depicts social evolution at the micro level of decisions and events involving individuals which aggregate to acquire wider social significance, in a manner similar to the way legal theorists have documented the role of micro level events in the evolution of law.[3] Historical studies focusing on political change, war and major social events tend to overlook this very gradual and subtle process of social change. For this reason, the study of literature can provide original insights into a scientific study of the process of social development.[4]

It was a period of revolutionary change in Europe. A half century before the story was written, the guillotine had decimated the entire upper class of France. Trollope's early works in the 1840s hint of the fear that the revolution might spread across the channel to England.[5]

English society sought to avoid revolution by a more gradual and less violent process of evolutionary change. With subtle insight and attention to detail, Trollope depicts the direction, nature and future course of those changes in his Barsetshire series, written in the 1850s. Dr. Thorne traces elements of the process by which England evolved into a more liberal, egalitarian society.

The conservative, class conscious society in rural England that frowned upon even a slight act of impropriety was boldly introduced to Mary. The much respected and liked Dr. Thorne, whose livelihood depended on his acceptance and patronage by those around, took her into his home. Mary's background was murky. Her mother, a poor girl, was seduced and later abandoned by Dr. Thorne's brother. The girl's brother, later to become Sir Roger Scatcherd, was outraged. He murdered the culprit and served time in jail. After giving birth to the fatherless child, the young mother left the infant in the care of Dr. Thorne and migrated to a new life in America. This child, who had lost her father before birth and mother soon afterwards, received education, a good upbringing, parental care and love, and most to the point, the acceptance of society. When life outside, and even within the house was ruled by a strict code of conduct, when dress and manners were according to protocol, and society venerated tradition, custom, propriety and values handed down over generations, a girl with a rogue for a father, murderer for an uncle, and a mother who abandoned her at birth, a girl with no title, property or accomplishment, was warmly embraced by all her acquaintances. Instead of becoming an outcaste, Mary was accepted into the highest society in the neighborhood and became a companion to Squire Gresham's daughters. The impenetrable barriers between classes were beginning to be relaxed, and intermixture between the classes became increasingly common.

One of the dramatic changes in the national psyche was the reduced importance accorded to birth.[6] Earlier, if a man's lineage could be traced back over a dozen generations, if an ancestor had been knighted by a former monarch, if his family estate was a few centuries old, and of course if its value an impressive sum, then the man was respected. He gained entry into the highest circles in the country, his acquaintance was sought eagerly. He wielded considerable influence, his word carried more weight than his fellow countrymen not born into such privilege. High society, politics, church – all were open to him if he cared. Such men and women were prize catches in the marriage market. Often, beauty, youth, even values and reputation were overlooked in an effort to marry an heir or heiress. Birth was everything.

Such a society slowly started rearranging itself along different lines.[7] Roger Scatcherd began humbly as a stone mason. When fury overtook him at the thought of the wrong done his sister, he landed in jail for murder. His situation could not have been much worse as he stepped out of jail after many years. His willingness to work hard was all he had, but that stood him well. He became a contractor, first for odd jobs, and gradually worked his way up to become a railway contractor. There had been a task of the railways urgently required, that involved extraordinary physical and mental resources. Scatcherd had been the man for it. He had done the job, and as recognition for the work, been knighted by the queen. In earlier times when society was predominantly agricultural, when the tenant farmers worked on the land and paid rent to the nobleman, the gentleman could generously lend his fine manners and breeding to pleasurable past times such as hunting or entertaining friends. But with industrialization came different needs, needs that could not be met by finery or stateliness.

Needs that could only be met by the assets that the likes of Roger Scatcherd possessed – diligence, physical strength, fortitude, willingness to soil one's hands and clothes with sweat and grime. The successful completion of the railway work brought Scatcherd what birth had denied him – title, fame, wealth and a new kind of respect. Previously respect had been reserved for title and rank that came with birth. Hard work was looked down upon, the need to work hard was treated with commiseration. A life of idleness or one spent in the pursuit of pleasure was respected. Gradually merit, accomplishment and earned wealth acquired greater respectability and became a means of entry into high society. Scatcherd, now Sir Roger Scatcherd, contested in the elections, and came close to becoming a member of parliament.

In spite of the wealth, accomplishment and title, Sir Roger's crude manners still grated on people's sensitivities, but if one polished one's outside, one could even outshine the natural-born aristocrats. Because of her enormous wealth, Miss Dunstable was made very much of by everyone, even though the source of that wealth was commerce rather than landed property. She was sociable and witty and spent generously. Her invitations were gratefully accepted, she was perseveringly courted by men of noble families. Her stay in a friend's country estate added charm to her hosts and their estate. Everyone tried to please her, bachelors tried to woo her, ladies treasured her friendship, and Frank Gresham was sent off to win her heart, or at least hand, in marriage, in order to secure her wealth to save the Gresham property. Lady Gresham who set great store by birth and rank was willing to forego the pristine prestige that nobility gave, to the more tangible advantage that her wealth would provide to save the family property. In earlier times, class barriers were strong and high. They were guarded jealously from any contamination from below. New money could not hope to buy its way into the higher society. For it still carried with it a faint odor of trade that was looked down upon. A few still did so, secretly, for Miss Dunstable's fortune had been made in selling medicinal oil. But the very size of wealth had washed away the odor of oil, and just as success gave Sir Roger a new kind of respectability, enormous money hewed a shortcut into the nobleman's world for the Miss Dunstables of the time. Money became the new currency.

As every old value was giving way to the new, so it was with parental authority. The arranged marriage was prevalent at the time.[8] The parents, and very often even the uncles, aunts and grandparents settled marriages in much the same way business transactions are arranged. The match was weighed according to a number of values. One was the value of the property and settlements made on the person. A title of marquis or earl tipped the balance most decidedly, compared to which virtues such as character and accomplishment were but minor issues to be considered or ignored as per convenience. Affection and love were often absent. A marriage was a good one if it was good in the material sense. Lady Gresham had married Squire Gresham for his wealth and the good name of his family, but she couldn't compare herself with the superior match her sister had made by marrying a duke. In her ambitions for her son, she insisted on his marrying a lady of fortune, even if the lady was older than he was and owed her fortune to oil trade. Miss Dunstable too was nudged by many in the 'right' direction, towards Frank. But in what was a breakaway from tradition, Frank and Miss Dunstable looked upon the match as silly scheming. They laughed over the family's interference and indulged their older relatives for a while. But all along, Frank was true to his love for Mary Thorne, and even confessed it to Miss Dunstable. Attachment rather than advantage determining marriage was becoming more common among the upper classes. Rules were

rewritten, practices that bound people stronger than fetters gave way, traditional authority was cast aside , when Frank refused to sacrifice his ideals to the choice of the collective. The individual in every man and woman stirred to life.

The herd mentality had been an overpowering force. Food, fashion, recreation, learning were all decided by the collective. If broad brimmed hats were the fashion in Paris, they were adopted in London, and later, made their way to Barsetshire. If fox hunting was taken up by an aristocrat, others followed him. Every girl aspired to marry young and marry well because every other girl wanted to.[9] In this way, one's role had been scripted by society. Young men chose to enter the church or army, become sailors or study law because others respected these professions. The individual was lost in the collective, as even his values were directed by what others valued.

Men and women slowly began to see that they had a choice.[10] If they chose, they could be free, free to be happy, to choose the life they desired — just as Frank chose. When his thoughts and feelings were unsettled, he did as he was bid, swayed one way now, another way next. But when he decided he would follow his heart, he would not choose the mercenary path his mother showed, give up all material comforts if it came to that and marry Mary, Frank asserted his individuality. He expressed an emerging trend that was shocking at first, admired later, and eventually emulated universally.

This birth of individuality we see in Frank Gresham's simple decision to marry Mary Thorne is an indication of the upheaval that was taking place in society. Something in the inscrutable darkness stirred. Society was awakening to the value of individuality. The Industrial Revolution changed the face of England. New lands were found, new settlements founded. Monarchy gave way to democracy, science dispelled ignorance, medicine conquered disease, inventions made life easier. The world developed more rapidly than it had in the previous millennia. And it began with a change, in man's mind, when Doctor Thorne boldly introduced Mary to the world as his niece, when Roger Scatcherd worked hard and earned success and knighthood, when Miss Dunstable boldly pushed open the gates to the world of aristocracy world undeterred by low birth and background, when Frank Gresham and Mary broke free of the invisible yet strong fetters of society and chose to be true to each other, and to themselves.

"Society has evolved over the centuries, but the evolution has been mostly unconscious. Just as we learn to replicate discoveries initially made by accident, we can discover the process of social development and apply that knowledge consciously to facilitate and accelerate it. Conscious development abridges time. What would otherwise take centuries to achieve by trial and error may be accomplished instead within a few decades."

Careful study of a movement, be it from a story or a page in history, places characters and events in social perspective.[11] Frank loved Mary one minute, bowed to his mother's wishes the next, confided in Miss Dunstable later, and came back to Mary finally. He did not know that he was liberating the individual in man when he refused to bow to parental pressure. But we, with the advantage of our perspective, can see the complete picture. Nathaniel Haw-

thorne called Trollope's work, 'just as real as if some giant had hewn a great lump out of the earth and put it under a glass case, with all its inhabitants going about their daily business.[12]

When a young aristocrat in a story chooses to give up his leisurely life in the country estate and pursue trade, it is representative of the collective choice of the aristocracy, to give up its old sedentary ways and embrace modernization. When the peasants rose up in revolt against their feudal master in the past, and dictators are overthrown and freedom movements spread as if by contagion today, it is because of the collective aspiration for freedom and equality. Mass movements start with one individual and an inspiration.[13] These movements and changes, studied, give us an insight into the evolution of humanity.

Society has evolved over the centuries, but the evolution has been mostly unconscious.[14] Just as we learn to replicate discoveries initially made by accident, we can discover the process of social development and apply that knowledge consciously to facilitate and accelerate it. Conscious development abridges time. What would otherwise take centuries to achieve by trial and error may be accomplished instead within a few decades. Anthony Trollope's works are 'valuable in our efforts to explain ourselves to ourselves'.[15, 16] Study of Trollope's works, like all great works of literature, can be invaluable aids in our effort to comprehend the evolution of society and devise ways to accelerate it.

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The Relationship between European Integration and the End of the Cold War:
Lessons for Global Peace and Development

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Abstract

The award of the Nobel Peace Prize to the European Union in 2012 is an appropriate moment to reflect on the significant role of the European experiment in the evolution from war to peace. Europe, which was the epicenter for global conflict for nearly a thousand years, has now become a place where war is unthinkable. The end of the Cold War has been widely attributed to the economic failure of the Soviet State and the communist system it imposed on Eastern Europe. This article explores aspects of the World Academy's program on Revolution in Human Affairs, examining the social dimension of some major political movements of the 20th century. It argues that the changing social perceptions as much as political and economic realities were responsible for both the move toward European Union and the end of the Cold War. The rise of America to world pre-eminence following World War II served as a catalyst for European integration and the electrifying impact and magnetic attraction of economic and political integration in Western Europe constituted a major stimulus for liberalization and reform behind the Iron Curtain leading to the abrupt end of the Cold War. It concludes that economic cooperation among erstwhile enemies can be an effective strategy for building permanent peace in other parts of the world. The article examines measures that can be taken to accelerate similar evolutionary advances elsewhere.

Society is an integrated and live organism and incidents such as wars and social unrest are not confined to any one part of the society. When such incidents break out in any society, they affect the whole of that society. Discrimination in employment against Tamils in Sri Lanka, rigged elections in Kashmir in the 1980s, sudden rise in rice price in Bangladesh and the sudden demise of a tribal leader in an African country are sufficient to destabilize a nation, when the social fabric is not strong enough to absorb such a disturbance. So too, any move that will strengthen such a fabric or provide a safe and constructive outlet for the suppressed energies of the people can defuse social tensions and remove the underlying source of discontent from which it rises. Viewed from a social, rather than merely a political or military perspective, the end of the Cold War offers insights that can be applied to defuse lesser conflicts today, both within and between states.

The Cold War came to an abrupt and unexpected end in the autumn of 1989 bringing with it profound social, economic and political changes across Europe and the world beyond. This was followed by the largest, most complex arms control treaty in history, START I, the founding of the European Union under Maastricht Treaty in 1993, and establishment of WTO

in 1995. Revolutionary ***changes followed with the exponential growth of the World Wide Web in the mid-90s, the founding of the European Central Bank in 1998 and the launch of the Euro in 1999.***

In retrospect, it is possible to identify a chain of events and construct a plausible explanation for any historical event. But at the time these events were unfolding, the infallible logic of hindsight was missing and nobody saw what was coming. Arriving in Moscow in August 1989, no one would have imagined that in little more than a month the impassable borders that constituted the Iron Curtain would become porous, letting through the first flood of immigrants from East to West, in three months the Berlin Wall would be a mere pile of stones, in 15 months Germany would be reunified, in 23 months the Warsaw Pact would be dissolved, and in 30 months the invulnerable superpower USSR would cease to exist. We are tempted to regard these events as extraordinary and unique. But, examined more closely, we find that they are expressions of an underlying social process which is universally prevalent and relevant to the peaceful resolution of smaller, more localized conflicts around the world.

As soon as the Soviet Union collapsed, superficial explanations were offered to account for what had happened. Conservative American politicians took credit for running the USSR into the ground economically by driving Soviet military expense to ruinous levels. This however is only partly true. World military spending did reach an all-time-peak of $1.1 trillion in 1989 before dramatically declining by a quarter just after the end of the Cold War. However, the USSR, with 40,000 nuclear weapons and enormous conventional armed forces, remained very well equipped of defending itself against any military onslaught.* Although the economic deficiencies of the Soviet command economy were increasingly evident by early 80s, there was no serious breakdown of the social order compelling the Soviet Union to transform or dissolve itself. But changes in the global social context did provide compelling reasons for the Soviet Union and other East European countries to radically alter course and a new-generation leader rose in the Soviet Union with the vision and courage to take the initiative.

1. The World's Evolving Center of Gravity

Understanding the real forces behind the momentous events that occurred in Europe in 1980s requires that we really understand what happened during the previous century. Although the central focus of this study is on Europe, the most significant of those forces arose on the other side of the Atlantic. After the American Civil War, the U.S became the largest economy in the world, a fact that was ignored or overlooked in Europe. Till the outbreak of World War II, most Europeans did not think much of Americans and regarded them mostly as uneducated and uncivilized and unfit to move with the sophisticated people of Europe. Europe had been the center of the world from the Roman times and only the impoverished and landless Europeans left for the New World hoping to start a new life there. Their departure was not regretted and indeed people were glad to see them off. Europe did not expect much from the United States which was looked upon as a place where even the man on the streets could run for political office and where even Presidents could grow up as log-cabin boys.

The change in the attitude of the Europeans came in a slow and imperceptible manner as the Americans began to demonstrate the energy, dynamism and creativity of the New World.

* See http://www.nrdc.org/nuclear/nudb/datab19.asp

Even as late as 1940s American Universities did not command as much respect in Europe as they do now. Early American scientists were regarded as mere technicians and inventors, unfit to explore the theoretical realms of pure sciences. They began to be noticed only when the majority of Nobel Prizes were awarded to Americans after the 1950s. America's entry into World War I nearly three full years after its onset reflected the sense both in America and Europe that the New World was peripheral to Old World events. Ironically, it was the Great Depression that changed the world's perception of America's role in the world scene. When the Crash affected investors in London, coffee plantations in South America and indigo farmers in South India, the World realized how integral the American economy had become to the health and well-being of the world.

The central role played by America economically, then militarily and politically, made evident what had long been denied or ignored. The U.S emerged as the only major world power from the devastations of the War. American per capita income had risen 40% by the end of the War and the American economy had become more dominant than ever before. By 1948, America controlled 70% of the world's public gold reserves. By 1950 its GDP was 40% higher than the combined GDPs of the original six members of the European Community and its per capita GDP was almost double that of these six European countries. Loans given under Marshall Plan along with private American corporate investment greatly helped European economies to recover. By then it was amply evident that the U.S had indeed become a world leader in economic, political and military terms.

2. Triple Axis of Power: Society, the Individual and the State

"The rise of America marked a significant shift in the social center of gravity, from the collective to the individual."

Though American achievements were outstanding, Europeans were reluctant to concede its superior achievements and genuinely baffled in their attempt to comprehend the true source and motive power behind its success. Appreciation came only grudgingly. America seemed to lack the tradition, culture, cohesiveness and well-oiled social organization that were prized features of European society when not engaged in destructive wars. For all its defects, the highly stratified and hierarchical European social structure had preserved continuity and stability for many centuries, while gradually evolving into a more egalitarian and participative society. By contrast, America was still an immature democracy, motley heterogeneous nation of immigrants. Her power came not from a stable and stratified social organization, but from unleashing the aspiration and productive energy of the Individual. The rise of America marked a significant shift in the social center of gravity, from the collective to the individual.

America's stupendous energy and dynamism arose from the fact that it had emerged as the evolutionary pioneer of a new phase in human development. This truth was captured by the perceptive French writer Alexis de Tocqueville in his famous treatise *Democracy in America* (1835). A century and a half later, the British historian Paul Johnson reaffirmed with equal enthusiasm in his *History of the American People* that somehow America and Americans were different. They struck outsiders as remarkably self-confident, fond of bold and new initiatives, with a talent for practical organization. In Europe change had always been spurred

by collective initiative that was given shape by Individual leaders. But here in America the Individual himself was the agent of change who acted on, for and by the power of the society, but no longer confined or strictly governed by its conventions, convictions, beliefs, honored limits or cherished values. In the extreme, that value lapsed into an entirely egocentric pursuit of self-interest, just as the collective social ideals of the French Revolution so often lapsed into new forms of social convention and conformity.

Even before the world discovered the value and power of American individuality, the Old World was still in the process of developing to its acme a third axis of power, the power of the State. While Western liberalism cherished the values of law and order and social stability, its history had given it a healthy distrust for the power of the State. The English landed aristocracy had always opposed the centralizing efforts of the monarchy. The French King Louis XIV tried centralizing all power in the State, thus emerging as the most powerful monarch in European history. Napoleon went even further, by trying to form a Pan-European empire with France as the center. In the 19th century, Europe redirected its energies from centralization of political power and conquest of its neighbors to industrialization and economic colonialism on other continents. Germany belatedly began its process of confederation after the Battle of Waterloo and eventually emerged as a nation-state. Further to the East, Czarist Russia was transformed into the preeminent model of the modern autocratic state, the USSR.

These three powers — the power of the liberal, democratic social collective; the power of the all-powerful, centralized state; and the power of evolutionary individualism combined and clashed in unprecedented intensity during the two world wars. These wars could not settle the question of supremacy between these powers for the simple reason that each is an integral aspect of the whole, an essential element in an equation with three variables. Therefore, it was not surprising to find the same three powers emerging again after the Second World War in new combinations and alliances seeking once again to discover the optimal formula for equilibrium and balanced development. What resulted became known as the Cold War.

3. Impact of Communism on the East and West

The origins of the Cold War have their roots in the Communist takeover of Russia which began toward the end of World War I. Ever since the publication of *The Communist Manifesto* in 1848, European leaders had been apprehensive about the rising popularity of the Communist doctrine among the working class. By the beginning of the 20th century, the Industrial Revolution had drawn countless millions away from their rural agrarian livelihoods into sweatshops and proliferating urban slums, while the rise of a new class of wealthy capitalists accentuated the inordinate differences between haves and have-nots. Britain was shocked by two social surveys that revealed that up to 30% of the urban population lived in poverty. Conventional wisdom predicted that Communism would take root in Britain first, as it was the most industrialized country in Europe with the largest and best organized labor movement. Sensing the danger, politicians such as Lloyd George and Winston Churchill enacted socialist measures to alleviate the sufferings of the working class.

But while such palliative measures were being taken, the Russian Revolution sounded an ominous warning which even the complacent European upper class could not ignore. The West felt as threatened by the Russian Revolution as much as the aristocracy of Europe had

been by the popular uprising that had wiped out the French aristocracy. Thus, as soon as the war ended, a half-hearted, failed attempt was made mainly by the British army units on the side of the anti-Bolshevik forces.[1] That failure was forgotten in the West, but became a pretext 30 years later for the Soviets to erect an Iron Curtain to protect the gains of the revolution from further outside interference.

Unable to stem the spreading tide of Communism, the nations of Europe refashioned themselves according to a more benign, enlightened, libertarian and humane image of society. During a period of high unemployment in the 1930s, the British Labor Party came under increasing pressure from its working class members to affiliate itself with the Communist Party. The victory of the Populist front in France and Spain added to the growing alarm. There was a growing fear among British politicians about the spread of Communism in Europe. Chamberlain openly feared that if not for the Nazi Party, Germany too would have succumbed to Communism. The threat was less keenly felt in America, which relied more on economic opportunity than social legislation to combat it. Still the grim impact of the Great Depression forced FDR to come out with the New Deal social legislation that transformed primitive American capitalism from the 1930s onward. When FDR was asked which single book he would put in the hands of a Russian Communist, he unhesitatingly replied, "The Sears Roebuck mail order catalog". It cannot be said that Capitalism had a direct head-on confrontation with Communism and emerged victorious. It would be more apt to say that Capitalism transformed itself into socialism in self-defense, filling the gaping hole in its lower flanks that had left it so vulnerable to popular discontent and violent revolt.

4. From Politics to Economics

After World War II, indigenous Communist parties became increasingly active in Western European Countries where the postwar poverty helped them gain significant electoral success. The Communists became the single largest party in France. An unspoken aim of the Marshall Plan was to contain the growing popularity of Communism in France, Italy and Czechoslovakia. By reducing popular discontent the Marshall Plan helped contain the spread of Communism and enhance political stability in Western Europe. It also created a conducive climate for European integration.

Western Europe embarked on a period of rapid economic growth and standards of living. From 1948 to 1952 these nations recorded the highest growth rates in European history. Agricultural production surpassed pre-war levels and industrial production rose by 35%. The 1950s and 1960s were an exhilarating period for the people of Western Europe, many of whom had survived at least one great world war, if not two, as well as a Great Depression, the destruction of their cities, occupation by foreign invading forces or incarceration in concentration camps, and lived for years during and after the war on short rations or on the brink of starvation. The economic transformation of Europe from scarcity to abundance was a standing miracle, erasing war-time hardships and replacing them with renewed confidence, hope and increasing material abundance. Per capita income in Western European countries more than tripled during the 25 years that followed World War II.

The absence of participation of Eastern European countries in the Marshall Plan was an early sign of the Cold War division that was soon to encompass Europe. Rather than accept

Marshall Plan funds, the Soviets organized the Council for Mutual Economic Assistance (CMEA). Central planning and command economics enabled a backward, agrarian Soviet Union to industrialize itself in record time. Economically, progress on the other side of the Iron Curtain was also remarkable during the following two decades. Starting from average per capita income less than half of that prevailing in Western Europe, growth rates in these countries during the 1950s and 60s actually outpaced those in Western Europe in percentage terms. During this period, competition between the two types of economies was played out on nearly every continent and marked by confrontation and proxy battles and what not. In military terms the Cold War signified a capacity for both the warring camps to inflict devastating injuries on one another. Nevertheless, refraining from doing so meant a dangerous peace that brought no sure security to either contending party.

By the mid-1960s Europeans found themselves living in the midst of two heavily armed camps, caught between two superpowers with irreconcilable philosophies. America was engaged in war with Vietnam. The Soviets had invaded Czechoslovakia to arrest the budding aspiration for freedom there. The all-powerful American dollar began to decline. The surge in Western European prosperity worked to mitigate the lopsided American economic dominance. As a sign of those changing times, the U.S. abandoned the Gold Standard and the Bretton Woods financial agreement collapsed. A new era began.

5. Looking beyond the Nation-State

At times of change, humanity commonly looks to the past for better times or old ideas that can be revived in new forms. Thus, Europe began to look beyond the very brief period of American dominance and leadership, to which they had been awakened so abruptly during and after the war, while never being able to fully embrace the irony of dependence on an erstwhile colonial nation founded by their ancestors. Britain and France may have lost their empires in 1945, but not their sense of pride, political importance or cultural significance. They began to reassert in the form of renewed faith in an old dream, the dream of a United States of Europe.

The reason for reviving that dream is easy to understand. America stood as a living embodiment of what a united Europe could become. Here was a nation nearly three times larger in total area than the combined area of Western Europe, where one could travel 3000 miles from East to West in North America without crossing a border, using a passport, exchanging currency or changing language. It became increasingly apparent to thinking Europeans that the historic division of the European continent into a multitude of sovereign states had been the root cause of the perpetual strife between nations in the past and remained a serious barrier to realizing their economic potential in modern times. The tangible benefits of economic cooperation had amply proven themselves since the establishment of the European Coal and Steel Authority in 1951 and the Treaty of Rome in 1958, by which Belgium, France, Germany, Italy, Luxembourg and the Netherlands established the European Economic Community. In the late 60s plans were also prepared to found a European Monetary Union as a prelude to introduction of a common currency, but the abrupt collapse of the Gold Standard forced a postponement of that initiative. Two years later, Denmark, Ireland and the UK joined the EEC, raising total membership to nine countries.

From 1970 to 1990, growth rates in the West were three times higher than in Eastern Europe. By the end of the Cold War the average per capita income in Western Europe was double the average in the East and still widening, while the difference between Western Europe and USA remained significant.† Greece joined the EEC in 1981, followed by Spain and Portugal five years later. Mikhail Gorbachev's initiatives to open up the USSR and defuse the tensions of the Cold War provided the opportunity for the nations of Western Europe to hasten their efforts to economic and political union. In 1986 they signed the Single European Act, the first attempt to amend the treaty of Rome and set a deadline for creation of a single market by 1992 with complete freedom of movement for goods, services, people and money. The European Union came into being in 1993. Two years later, Austria, Sweden and Finland joined the EU, raising total membership to fifteen.

6. The East Leans Westward

Behind the Iron Curtain, younger leaders grew increasingly conscious and their people increasingly intolerant of the inherent weaknesses in a centrally-controlled, planned and coercive approach to rapid national development. So long as Western Europe was in shambles or only a few steps ahead, the poorer relative performance of the East, where employment was guaranteed and minimum social security was assured, left much to be proud and grateful for. But by the 1980s the contrast between the achievements of free-market and centrally planned economies was too visible to ignore. Increasing international travel and tourism, television coverage and telecommunications coupled with Gorbachev's conscious policy, *glasnost,* brought these differences into stark relief. As Western Europe pressed ahead with efforts to unify itself in quest for parity with America, the nations of the Eastern bloc saw a new opportunity they had not previously glimpsed and did not want to miss—an opportunity to jump ship from CMEA and link their fortunes to the rise of a single, unified European market. A major expansion of trade between the Soviet Union, its East European allies, and the Western industrial countries in the 1970s was an early indication of what was to come.

Earlier Soviet leaders had refused to take the movement toward European integration seriously. But with ratification of the Single Europe Act in 1986, Gorbachev called for closer relations with the European Community (EC) and began to openly speak of making the USSR a "legitimate component and partner in building the common European house".[2] In June 1988, the EC and CMEA signed a declaration formalizing their mutual recognition and opened the possibility for concluding bilateral agreements between the EC and individual states within the Soviet bloc. Declining living standards led to an increasingly popular clamor for democratization and economic reform in Poland. By September 1989, Hungary, Czechoslovakia and Poland had signed bilateral agreements with the EC. During the same period the EC began negotiations on economic assistance to these countries, including $295 million in emergency food aid to Poland, which was suffering a severe financial crisis involving a 40% per month rate of inflation. These events culminated in the establishment of the European Bank for Reconstruction and Development (EBRD) in 1991.[3, 4] The special support extended to these three countries became an example and a powerful stimulus for other Soviet bloc nations to lean westward. The movement toward democratization that spread through

† See Penn World Tables.

these countries like wildfire was the overt occasion and instrument for ending the Cold War stalemate, but a principal driving force behind the clamor for political freedom was the economic aspiration of the people for democracy in the marketplace. The fall of the Berlin Wall and the reunification of Germany closed the door on a violent and tumultuous past filled with memories that many were eager to forget. The signing of the Maastricht Treaty opened the door on an unbounded future that most people in Europe, both East and West, were anxious to explore or eager to embrace, and which the whole world watched with a various mixture of skepticism, cynicism and unbridled hope. For the first time in history, a significant group of mature nation-states stepped up to the sacred line of national sovereignty and crossed over into the unknown territory of supra-national governance. The whole world has a vital stake in the outcome. Despite temporary disappointments and numerous obstacles, fifteen years later it is evident that the European Union is not merely an experiment. It is a viable model and forerunner of what must eventually become, in the near or distant future, a system of global governance that unifies and integrates the three sources of social power within the framework of liberal democracy.

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7. Implications and Conclusions

This concise social history of 20th century Western civilization contains valid lessons applicable for addressing the practical problems of peace and development in other parts of the world. For while the histories of every nation and continent are necessarily different and while the values and attributes which each country is in the process of developing as its contribution to the total gene pool of human development are unique, certain underlying principles apply commonly to people and nations everywhere and at all times. As part of a wider effort to codify and explicate these principles as components of a comprehensive theory of social evolution, we conclude by examining their relevance to some of the most intransigent problems of peace and development currently confronting humanity.

7.1. Military Problems can be Solved Politically; Political Problems can be Solved Economically

Society is not merely a combination of military, political, economic, social, cultural and psychological dimensions. These dimensions exist in a graded hierarchy, similar in nature to the hierarchy of human needs identified by psychologist Abraham Maslow. Indeed, the history of human civilization describes a movement along an ascending curve that begins with physical security achieved by military prowess and the capacity for self-defense. Political union partially solves the problem of warfare between heterogeneous groups by incorporating them within a common framework in which differences of opinion can be settled by negotiation rather than physical force. The modern concept of the nation-state eventually

emerged as an ultimate consequence of this shift from military to political means of self-governance.

The great European colonial empires of the 17th to 19th centuries marked a new phase in which countries recognized that economic advantage was more valuable and durable than political or military domination. Indeed, the British Empire arose almost inadvertently as English commercial interests spread around the world searching for economic opportunity. Had Britain possessed the foresight and generosity to share the economic benefits of its empire more equitably with its overseas subjects, the British Commonwealth might have emerged as a viable intermediate step toward global governance a century before the founding of the EU.

The power of economy to resolve political and military disputes has been dramatically illustrated by the permanent cessation of violence in North Ireland, where underlying political, religious and social differences remain still unresolved. Five years ago it was as difficult to foresee the end of violence in North Ireland as it is today to see beyond the decades of reciprocal terrorism in Palestine. In spite of repeated efforts for a peaceful settlement by Britain and the Irish Republic, the IRA's announcement of a permanent ceasefire in 2005 was not the result of political negotiations. The primary reason for this unexpected development was the remarkable economic progress of the Irish Republic, which altered social attitudes among Irish Catholics and opened up unprecedented economic opportunities south of the border. Economy, not polity, defused a conflict that has festered for centuries.

7.2. Liberal Democracy is not merely a System of Governance; it is a Way of Life

More than 200 years ago, Immanuel Kant postulated that a world of democracies would create perpetual peace. A study by Dean Babst of 116 major wars that occurred between 1789 and 1941 revealed that not a single one had been fought between independent states with elected governments.[5] Since then the relationship between peace and democracy has been frequently cited both as a strategy for eliminating inter-state and intra-state conflict, as well as a justification for imposing democratic regimes. The basis for this observed relationship is not difficult to comprehend. Democracies have no inherent dynamism for war. Democracy is based on mental ideals that cannot release energy for physical conflict or war. Production is the basis for social peace. Democracy organizes production to support abundance. War is the antithesis of democratic production.

But the validity of this relationship does not justify attempts to impose democratic systems by force or coercion. Imposition of any kind is inimical to the spirit of democracy. Experience has shown that such attempts are most often disappointing or counter-productive. The reason can be traced back to the fact that Kant's original thesis and subsequent research failed to make a vital distinction between liberalism and democracy, as Fareed Zakaria has pointed out in *The Future of Freedom.* Liberalism is a set of idealistic human values and social attitudes that evolved in Western Europe over the past five hundred years, affirming the importance of individual freedom and social equality. Liberty is democracy of the individual. Democracy is liberty for the collective.

In formulating his conclusions, Kant assumed that liberalism and democracy were either synonymous or inevitably went hand-in-hand. Today we know that this is not necessarily the case. Democracy is a system of social institutions. Liberalism is a mindset and a cultural

endowment. The past century is replete with examples of countries that introduced or were compelled to adopt democratic systems in the absence of liberal values. In many instances a freely elected populous government utilized the powers legally vested in them by a democratic constitution to exercise what Sri Aurobindo termed a 'tyranny of the majority', depriving substantial minorities of the essential rights associated with liberalism, namely freedom of speech, worship, property, equal treatment under the law, etc. Hitler was democratically elected as Chancellor of Germany. In developing countries with low level standards of living, low levels of education and heterogeneous populations, the dangers of illiberal democracy are very real. The on-going struggle in Iraq to establish democratic institutions in a country divided by strong religious animosities, wracked by internal strife and pulled by centrifugal forces, is only the most recent reminder of the stark difference between building political institutions and developing a liberal social culture.

On the other hand, the fact that democracy arose in Europe as a natural expression of Western civilization and culture has been cited as evidence that democracy is merely a form of cultural imperialism foisted on the world by European civilization. But the concept of social and individual rights and the underlying human values associated with liberal democracy predate the rise of Western civilization and are the common heritage of all humanity. A democratic tradition based on the rights of citizens and participative governance existed in ancient India centuries before it first appeared in ancient Athens and democracy is fully in accord with the spiritual values of Indian culture. Indeed, this may be one of the reasons why democracy has been relatively successful in India, despite its poverty and low levels of general education. As Zakaria points out, the world's most populous religion, Islam, is also founded on values of egalitarianism. The values of freedom and equality are universal human values, not the property of any one civilization. The high failure rate and abuses associated with nascent democracies should not discourage us from promoting forms of government that protect human rights and encourage public participation. But it should remind us that such efforts are likely to fail and can even lead to social unrest, communal conflicts and civil war, unless or until the necessary social climate and attitudes have been engendered among the population. In instances where a population is clearly not prepared for effective self-governance, it will be more humane for the international community to assume responsibility and protective control, until the appropriate social conditions can be brought about. The US imposed its own control over autocratic Germany and Japan following the Second World War, resulting in the emergence of two of the most stable and successful democracies in the world today. They succeeded because democratic freedoms were founded on a secure economic base.

7.3. Foreign Aid as an Instrument of Peace

The Marshall Plan has been widely credited for contributing to the stunning recovery of Western Europe after World War II. In the late 1950s this led to the facile assumption that foreign aid could be utilized as a primary mechanism for eradicating poverty and spurring development of countries around the world. Global experience over the following three decades did not support this conclusion. The reason is not difficult to understand. During the war, European governments had exhausted their gold reserves to procure food and war material from abroad, leaving national treasuries empty, precisely at a time when foreign currency

was needed to support peacetime transition. The primary objective of the Marshall Plan was to provide urgently needed financial assistance to war-ravaged countries for importation of food and industrial equipment in order to minimize human suffering during an initial five year period required to restore normal economic functioning and rebuild an industrial base. And by the time the program ended, food shortages had been eliminated, industrial production had returned to prewar levels, and living standards were on the rise.

This remarkable achievement was possible because the nations of Western Europe had already achieved a high level of industrialization before the war. They possessed educated and highly skilled workers and technicians, knowledge of industrial processes and organization, modern work cultures and administrative systems. They needed only to reconstruct the physical infrastructure required for industrial economies to function efficiently, and they accomplished that in record time. Foreign aid did not develop them. Indeed, Japan virtually duplicated the European accomplishment without the support of Marshall Plan funds for reconstruction. After struggling in the early post-war years, Japan's real GNP grew at a phenomenal average annual rate of 9.6% between 1952 and 1971.[6]

"Human development is an evolutionary social process, not a condition that can be constructed, imposed or gifted to a society from outside. No government or aid program can develop a nation."

Misunderstanding the nature of European recovery, nations and international organizations have unsuccessfully attempted to replicate that experience in countries with no prior basis of industrial development, and the results have been largely disappointing. No doubt, many of these nations, especially those in East Asia, have made astonishing progress over the past few decades, but it is doubtful that much of this progress can be directly attributed to foreign aid. Foreign aid is a valuable and, indeed, essential instrument for humanitarian relief and temporary alleviation of the ravages of war and natural catastrophes. But, in most instances, money itself is not an effective instrument for promoting social development. Experience confirms that large portions of foreign aid are often expended wastefully or stolen by corrupt officials. Foreign aid is counter-productive as an instrument of development, because it undermines the self-respect of the recipients and fosters an attitude of dependence, which is the very antithesis of human development. This is true even when the source of those funds is domestic rather than international. The extension of free electricity to farmers in India was originally conceived as a means to spur agricultural development. In practice it has encouraged an unconscionable squandering of India's precious water resources, 95% of which are consumed in agriculture. The benefit having once been bestowed, popularly elected governments dependent on rural voters have found it impossible to withdraw.

The underlying thesis of this article is that human development is an evolutionary social process, not a condition that can be constructed, imposed or gifted to a society from outside. It derives its energy from the awakening of human aspirations and the release of human initiative for self-improvement and self-advancement. No government or aid program can develop a nation. On the other hand, where the essential conditions for social development are in place, where the aspirations of the population have been awakened and the people are

actively taking initiative for their own upliftment, financial support in the form of aid, but more preferably in the form of loans and investment, can play a constructive and beneficial role in supporting and accelerating the development process, especially when those funds are employed for acquisition of appropriate technologies, education, training and institution-building.

7.4. Society is an Integral Whole

From the outset this narrative attempted to view the political, military and economic events surrounding the end of the Cold War from a wider integrated social perspective in which all three are perceived as inseparable aspects of a single indivisible whole, which we term 'society'. The causes of war and sources of peace are never strictly or entirely political, no matter how ambitious a nation's ruler or aggressive its foreign policy may be. Napoleon's thrust to build a pan-European empire would neither have been possible, nor as successful as it was, had it not been for the stupendous social energy released by the French Revolution. That energy had not been harnessed effectively, until he gave the budding nation a glorious vision and erected an administrative structure capable of channeling it. Hitler's rapid ascent and remarkable capacity to win the allegiance of the German people was founded upon the economic chaos wrought by the war, severely aggravated by reparations, and converted into desperation and despair by the ripple effects of the Great Depression. So too, the problem of civil war in Sri Lanka can be traced back to the inferior social status originally accorded to Tamil migrant workers brought from South India to work on the island's tea estates under colonial rule and the attempt of the Sinhalese majority in post-independent Sri Lanka to retain a socially and economically privileged position. Without addressing the underlying problem at its social and economic roots, any attempt at a purely political or military settlement is bound to fail or remain inadequate.

"Without addressing the underlying problem at its social and economic roots, any attempt at a purely political or military settlement is bound to fail or remain inadequate."

7.5. Peace is a Stage of Development, not merely a Social Condition

"War among the nations of Europe has become unthinkable," said Dutch NATO defense expert Rob de Wijk, who startled the participants at an international conference in New Delhi with this statement in 2004. On reflection, the truth of this observation is self-evident. The continent that was the battlefield for countless wars over the past millennium, the flash point and center of two world wars and the principal ground of the Cold War during the 20th century has suddenly emerged as the safest, most peaceful place on the entire earth. How did Europe arrive at this remarkable condition? No single event or chain of events, strategy or strategic paradigm is adequate to explain this accomplishment. It is the cumulative product of a long evolutionary advance. The answer can be found in the social changes that occurred on the continent, some of which have been briefly highlighted in this article.

This does not mean that every society must undergo the long process of trial and error development which Europe has undergone before it can achieve a status of permanent peace. The world possesses a knowledge today that was lacking even in the recent past and

the more positive international climate created by the European accomplishment provides a conducive atmosphere from which other nations can draw immense benefit. But it does not mean that partial, facile, make-shift arrangements are unlikely to achieve and sustain comprehensive and permanent peace. Understanding the process of social evolution and the laws of development which govern its course and speed, society today has the opportunity to vastly accelerate that process, avoiding countless pitfalls and blind cul de sacs along the way. Peter Drucker once observed that there is nothing so practical as a good theory. Social science has generated several theories to explain war, but it has yet to produce a comprehensive theory of peace.

"Social science has generated several theories to explain war, but it has yet to produce a comprehensive theory of peace."

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ERUDITIO, Volume I, Issue 2, February 2013, 70-76

Book Review — Bankrupting Nature:
Denying Our Planetary Boundaries

A Report to the Club of Rome

*By **Anders Wijkman** (Co-President, Club of Rome; Senior Advisor, Stockholm Environment Institute) and **Johan Rockström** (Executive Director, Stockholm Resilience Centre).*
NY: Earthscan/Routledge, Nov 2012, 206p, $44.95.

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It is sometimes said that you can't tell a book by its cover. Or by its title, or sub-title. This 33rd Report to the Club of Rome is a case in point. The sub-title indicates that "planetary boundaries" is the major theme, but only 13 pages are devoted to exploring this essential concept in Chapter 5, while many other related and not-so-related ideas are also discussed.

The broad integrative theme herein is to "critically examine the relationship between human beings and nature, and the threats we pose to the complex natural systems on Earth that are the preconditions for all life." The basic premise is that *"the living biosphere and natural resources (are) the prerequisites for prosperity and development in the future"*— a perspective that "is obvious to most natural scientists" (but not to the general public). Moreover, "humanity is facing a critical reality: an abundance of scientific reports clearly points out that we are very close to a saturation point, where the biosphere cannot handle additional stress…all signs reveal that our lifestyles and consumption patterns are on a violent collision course with nature." (pp1-2) We thus need a "proper balance sheet" for the planet to replace the aggregate GDP measure of production.

Before getting into the details, a few words about the two distinguished authors, in addition to the affiliations mentioned above. Anders Wijkman is also a Fellow of the World Academy of Art and Science and a member of the Swedish Royal Academy of Sciences. He has been a member of the Swedish Parliament and the European Parliament (1999-2009). Wijkman served as Assistant Secretary-General of the UN, Policy Director of the UN Development Programme, and Secretary General of the Swedish Red Cross. Johan Rockström is Professor of Natural Resource Management at Stockholm University, and co-chair of Future Earth, an international research initiative on global sustainability. He was the lead author of a major September 2009 article in the prestigious UK journal *Nature,* which introduced the concept of planetary boundaries. (J. Rockström et al., "A Safe Operating Space for Humanity," *Nature,* 461, 472-475. Also see J. Rockström and 28 others, "Planetary Boundaries: Exploring the Safe Operating Space for Humanity," *Ecology and Society,* 14:2, 2009, article 32; download at www.ecologyandsociety.org).

1. PLANETARY BOUNDARIES, IN BRIEF

"The influence of human activity may have so altered the world that we may have entered a new geological age, the Anthropocene." Life on Earth depends on the intimate interaction between the troposphere, the stratosphere, the biosphere, the geosphere, and the cryosphere. *"It is not only greenhouse gases, with their impact on climate, that have shown an accelerating and negative trend over the past fifty years. The same curve of development, which is often likened to the blade of a hockey stick, also characterizes most natural systems."* (p37) The evidence is now clear: since WWII, *"the pressures on key ecosystems have increased exponentially."* Major indicators are higher levels of CO_2 in the atmosphere, large dead zones in coastal areas, melting sea ice and permafrost, ocean acidification, rising sea levels, biodiversity loss, land use changes, soil degradation, and growing consumption of fresh water and energy by a growing global population.

Awareness of climate change risks is "reasonably large" today. But an understanding of interactions between the atmosphere and the biosphere is "much more limited." The Earth is a complex and self-regulating system with an inherent resilience to meet different types of disturbance. But as the atmosphere, oceans, and terrestrial ecosystems are subject to negative influences caused by humans, the resilience changes. *"We need to acknowledge the risk of surprises, tipping points, or threshold effects."* (p38)

"The concept of planetary boundaries provides an opportunity to develop a game plan for human development on a planet that has limits." The concept involves ***nine biophysical processes:*** 1) climate stability; 2) ozone depletion; 3) ocean acidification due to rising temperatures (thus reducing ocean ability to absorb CO_2); 4) biogeochemical loading (nitrogen and phosphorus cycles); 5) biodiversity loss; 6) degradation of land resources; 7) over-exploitation of freshwater resources; 8) pollution from toxic chemicals; and 9) atmospheric aerosol loading (soot particles, nitrates, sulphates). Humanity has already exceeded three of the boundary limits on the safe side of unwanted consequences, as concerns climate change, loss of biodiversity, and the global nitrogen cycle (adverse effects of all excess nitrogen are extremely serious, e.g. air and water pollution and depleted oxygen in water or eutrophication).

The critical conclusion is that *"climate change must be viewed in a broader context than hitherto.* The close interaction between the climate system and many ecosystems makes it impossible to focus on greenhouse gas emissions alone." No one knows exactly where the various threshold effects are, and how other biophysical processes will respond. But "if the oceans, forests, and soils gradually lose their capacity to absorb greenhouse gases—going from carbon sinks to being carbon sources—the consequences will be extremely serious." (p.48)

2. THE BROADER ARGUMENT

As indicated at the outset, the Chapter 5 discussion of planetary boundaries is relatively brief. The other 18 chapters are highly varied. The more important ones are briefly summarized:

Agriculture. To adequately feed a growing world population, food production must increase

70% by 2050, a task that is made difficult by climate change (e.g., crop yields in tropical regions could shrink by 25-50% over the next 50 years due to warming). Agriculture is "the world's single largest contributor to climate change and loss of biodiversity… (and) the world's single largest consumer of both water and land. It is also the key driver behind the use of nitrogen and phosphorus." (p52) Industrial agriculture must be reformed by increasing productivity on existing farmland, technological and biological breakthroughs (we must be open to GM crops—and their risks), developing plow-free cultivation and perennial grains that generate carbon sinks and retain water in soils, exploiting rainfall more efficiently, better nutrient management through organic farming, and promoting biological diversity that provides resilience.

Energy. A successful energy transition must involve 1) massive development of renewable energies; 2) advanced energy systems with carbon capture and storage for both fossil fuels and biomass (although there are doubts about CCS; very few pilot projects have been established so far) 3) removal of fossil fuel subsidies (37 governments spent $409 billion on such subsidies in 2010, according to the IEA); 4) most importantly, radical improvements in energy efficiency, especially in end use; the technology is already on the market to reduce energy consumption to one-fifth of today's level, as shown by Ernst Ulrich von Weizsacker (Co-president, Club of Rome) *et al.* in **Factor Five** (Earthscan, 2010). [NOTE: See the IEA's **World Energy Outlook 2012,** the GFB Book of the Month for November 2012, which also stresses the benefits of energy efficiency.]

Population. Overpopulation and overconsumption are "the forgotten issue," and both are central to resolving planetary environmental problems. Despite progress made in many countries, hundreds of millions of couples still lack access to contraception. Population should be part of climate policy, and could make a significant difference in world population by 2050, which could range between 8.1 and 10.6 billion according to UN projections.

Arctic Alarm. Developments in the Arctic region are a serious cause of concern at many levels. The feedback mechanisms that cause the Arctic to self-accelerate change are well-known. When ice melts, the albedo (degree of reflection) changes dramatically: from bouncing back about 85% of incoming radiation to surfaces that absorb 85%, which amplifies warming. *"This is probably the most important climate feedback on Earth."* Due to the albedo feedback, it is possible that the entire Arctic will cross a tipping point, changing from a cold and ice-free state to an ice-free warm state. Indeed, there are signs that the Arctic may have entered a "death spiral." Acidification is hitting the Arctic Ocean particularly hard, and permafrost is thawing faster than predicted, emitting large volumes of methane. "The canary in the coal mine is choking." (p.118) [NOTE: See *GFB Update* newsletter for October 2012 on Greenland ice melt and sea level rise.]

> *"The conventional economic model, based on population/resource assumptions that go back to the early industrial era, is out of date."*

The Economy: Getting it Right. The world is in a triple crisis: the global financial crisis, the economic crisis of nations, and the crisis of the economy of nature. The conventional economic model, based on population/resource assumptions that go back to the early indus-

trial era, is out of date. Most economists still think that environmental impact in a country is reduced as the economy grows, and the influence of ecological and biophysical economists has been limited. Key changes that should be implemented: 1) stop using GDP growth as a development target and measure of well-being; 2) give a value to natural capital and ecosystem services; 3) rethink the discounting of future values (the discount rate should be low, near zero, or zero, in the context of climate policy strategies); 4) rethink the organization of the economy by moving toward circular material flows (radically increasing re-use and recycling). [NOTE: See *GFB Update* for September 2012 on the many new books on "New and Appropriate Economics."]

Financial Sector Reform. Central banks generate only a small part of the money flow; most newly-created money results from debts issued by commercial banks. But conditions have changed, and a number of new credit instruments have been created that lead to increased risk-taking. Thus the collateral value held by many banks is far from stable. Values are inflated, and risks are building up as credit volume rapidly increases, along with higher prices and growing scarcity of some commodities. Financial markets have high exposure to investing in companies with a major stake in oil, gas, and coal, but the valuation of most of these fossil fuel companies rests on very shaky grounds. The financial sector can become a positive force for sustainability by: 1) a shadow price minimum for CO_2 applied to all loans or investments in fossil fuel businesses; 2) mandatory reporting by all major companies on how their activities affect important environment/resource issues; 3) ending the system of quarterly reporting that heightens short-term focus at the expense of long-term responsibility; 4) compensation systems that reward long-term value rather than short-term capital appreciation; 5) sustainability education for those working in banks and finance companies.

A Circular Economy. Resource efficiency alone won't be enough to get us where we need to be. When economies continue to grow, a large part of the gains will eventually be lost. A first step toward more efficient use of resources is to significantly increase recycling rates, which are "ridiculously low." Citing *Towards a Circular Economy* (Ellen MacArthur Foundation, 2012) and *Cradle to Cradle* (Braungart and McDonough, 2002), the authors advocate that we seek "to extend wealth, minimize waste, and go for maximum reuse and recycling of materials." These new business models to improve resource efficiency would lower CO_2 emissions. Policies to promote a circular economy include binding targets for resource efficiency, research priority to sustainable design, and raising taxes on use of virgin materials.

3. SIDEBAR CHAPTERS

Sidebar boxes in a book or article can enhance variety and bring in related topics. This book offers entire chapters that are related to the main argument, but, arguably, draw attention away from it:

— ***Anders Wijkman on Politics.*** As a former politician in Sweden and the European Parliament, Wijkman critiques the current political system as "poorly equipped" to deal with many of today's complex problems, and "the media's obsession with people rather than ideas."

— ***Johan Rockström on Science's Role and Responsibility.*** Notes over 500 international environmental agreements that "have so far failed in all but possibly one case" (the

Montreal Protocol on ozone), and that scientists are not exaggerating environmental risks but tending to tone them down. Calls for research "organized on a much broader understanding of systems."

— ***Climate Change Negotiations.*** Describes the failed Copenhagen climate summit in 2009, the Cancun conference in 2010 (which, at least, rescued the negotiation process), and "a glimmer of hope" after the Durban conference in 2011—a step forward from "the point of view of the realist whose expectations were low."

— ***Attacks on Climate Science.*** On the media's "fatal misconception" that "both sides" in the climate debate involve two equal actors, the problems of climate change deniers (conspiracy theories, citing dubious experts, cherry picking isolated details, unreasonable demands for certitude), and types of deniers (constructive critics, underestimators, outright deniers).

"The current growth model is not sustainable because: 1) it assumes that material wealth is an adequate measure of prosperity; 2) growth is unevenly distributed; 3) we have already gone into ecological overshoot."

— ***Responses to Climate Deniers.*** Deflates the most frequent arguments: that global warming doesn't exist, the sun or natural variations have caused temperature increases, CO_2 emissions have no effect on climate or lower temperature, the reduction of Arctic summer sea ice has not occurred, and glaciers are not melting.

— ***The Greenhouse Effect.*** Describes the natural greenhouse effect that controls climate conditions, and the contribution of CO_2 at about 14%. "One thing is established beyond any doubt: CO_2 contributes substantially to the natural greenhouse effect."

— ***Sweden's Climate Impact.*** Is Sweden a world champion in climate policy? The official accounting based on domestic emissions captures only part of the picture, and fails to acknowledge embedded emissions in imported products such as autos, electronics, meat, and clothing. Thus Swedish carbon emissions as measured through consumption increased by 9% in the 2000-2008 period.

— ***Growth's Dilemma.*** If GDP and purchasing power increase, so do demand and pressure on the environment. Moreover, efficiencies in energy and resource use increase growth (the rebound effect). The current growth model is not sustainable because: 1) it assumes that material wealth is an adequate measure of prosperity; 2) growth is unevenly distributed; 3) we have already gone into ecological overshoot. Some possible ways forward: mandatory targets for improving resource efficiency, lower taxes on labor while raising taxes on fossil fuels and crucial raw materials, smart market solutions for water shortages, incentives for companies to create long-lasting products that are easily upgraded and repaired, and climate and environment risks incorporated in banking operations.

4. COMMENT

The "bankrupting" of nature, or its mere degradation or transformation (so far, at least), is a very serious concern. The singular contribution here is that the authors rightly tie this to

climate change, as well as outmoded thinking about economics and finance. Whether people are consciously "denying" planetary boundaries (as stated in the book's sub-title), or simply haven't given it much thought until recently, is a moot point. The authors go to great lengths to refute climate change deniers, but don't consider those who would dismiss the larger planetary boundaries concern, notably the generally implicit argument that new technologies can solve much or all of the problem, or that adequate restoration efforts and pollution control policies are well underway.

The critical argument that there are boundaries, even if not well-established in many cases, is important to make. Unfortunately, it is not pursued here in the detail that it deserves (e.g., nothing is said about desertification or aquifer depletion, two themes frequently pursued by Lester R. Brown, who is also ignored). Moreover, the presentation is confusing in parts, e.g. most of the nine biophysical processes (p45) that deserve consideration are not clearly explained (or discussion is scattered in the text), and the two charts on pp46-47 designate ten planetary boundaries.

This report breaks fresh ground while synthesizing many well-established ideas. But it is also unwieldy. The core message needs to be refined, and widely-distributed in various forms (articles, op-ed essays, documentary films, TV talk show appearances). Although the growth of global population and the pressure on resources and the biosphere are the central theme, the explosive parallel growth of the human "infosphere" in recent years is ignored, yet, arguably, this new buzzing world of hyper-abundant information and information technologies makes it far more difficult to convey the planetary boundaries message—which makes it all the more important to get the message right and pursue a multi-media outreach strategy to be heard above the din. A quick indicator that the Wijkman/Rockström report is unlikely to travel beyond a handful of already sympathetic scientists is the hefty $45 asking price. Similarly, the new **Global Environment Outlook 5** report from the UN Environment Programme (Jan 2013, 548p) is priced at $80. **"GEO-5"** reinforces the CoR report, warning that several critical thresholds have been exceeded or are close to tipping, and that, once passed, "abrupt and possibly irreversible changes to the life support functions of the planet are likely to occur." But where are the idea champions, conveying this message of grave environmental alarm to the world? Pricey books, alone, won't do the job.

Illustrative of the infosphere blindspot is the idealized advice by former politician Wijkman for political parties to revise their policies, in that "today's political platforms lack sufficient relevance to the globalized world," (p18) which is patently true. But politicians have a full plate of many other problems, most requiring immediate action, and also must first get elected. And thus it's a matter of educating the electorate and educators to long-term systemic concerns—no small matter, indeed, in a world of megabucks political and corporate campaigns (witness the lack of success of Green parties outside of Germany—and even in Germany, where they are still a minority).

Facing up to the huge difficulties of selling—yes, *selling*—the planetary boundaries concept should lead to the strategy of broadening the coalition that is concerned with a sustainable world. By inviting more partners into serious collaboration (and acknowledging the best ideas, as well as similarities and unresolved differences), the voice for planetary boundaries can be amplified. (Consider the recent Egyptian election, where the forces for democracy and

a secular state were fragmented, resulting in victory for the Muslim Brotherhood—which was not at all intended by the Arab Spring uprising).

An example of a seemingly unlikely coalition partner is the *Re/Source 2050* report from the Smith School of Enterprise and the Environment at the University of Oxford (Jan 2013, 83p; www.smithschool.ox.ac.uk), which is nicely presented for the financial and investor communities in terms of two scenarios: "Growth" and "Health." It discusses many of the concerns of the Club of Rome report (water, energy, climate change, land, infrastructure, business models, subsidies, economy), and also ends up advocating a "circular economy." And, as much as the unwieldy and expensive CoR report—perhaps even more so—it could arguably be the leading edge in the global struggle for sustainability.

In addition to broadening the sustainability coalition to include the business and finance sector, efforts should be made to engage religious leaders who should be concerned about the ethics of desecrating God's creation (as they occasionally are), and, especially, the security sector. For example, **Climate Change and National Security: A Country-Level Analysis** edited by Daniel Moran of the Naval Postgraduate School in Monterey CA (Georgetown University Press, 2011, 310p) provides a very detailed analysis of 19 countries and regions, where the outlook for food, water, environmental degradation, ruinous sea-level rise, and related conflicts is generally worrisome. Allies are needed in selling the notions of climate change and the expanded notion of planetary boundaries, and the well-funded security community could prove to be a major supporter of the many actions that will be needed for any semblance of a sustainable society.

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