PROMOTING LEADERSHIP IN THOUGHT
THAT LEADS TO ACTION

THE WEALTH OF NATIONS REVISITED

CADMUS

NEW PERSPECTIVES ON MAJOR GLOBAL ISSUES

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ARTICLES

The CADMUS Journal

The acronym of the South-East European Division of The World Academy of Art and Science—SEED—prompted us to initiate a journal devoted to seed ideas—to leadership in thought that leads to action. Cadmus (or Kadmos in Greek and Phoenician mythology) was a son of King Agenor and Queen Telephassa of Tyre, and brother of Cilix, Phoenix and Europa. Cadmus is credited with introducing the original alphabet—the Phoenician alphabet, with "the invention" of agriculture, and with founding the city of Thebes. His marriage to Harmonia represents the symbolic coupling of Eastern learning and Western love of beauty. The youngest son of Cadmus and Harmonia is Illyrius. The city of Zagreb, which is the formal seat of SEED, was once part of Illyria, a region in what is today referred to as the Western Balkans and even more. Cadmus will be a journal for fresh thinking and new perspectives that integrates knowledge from all fields of science, arts and humanities to address real-life issues, inform policy and decision-making, and enhance our collective response to the challenges and opportunities facing the world today.

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CADMUS VISION

The world is in need of guiding ideas, a vision, to more effectively direct our intellectual, moral and scientific capabilities for world peace, global security, human dignity and social justice. Today we face myriad challenges. Unprecedented material and technological achievements co-exist with unconscionable and in some cases increasing poverty, inequality and injustice. Advances in science have unleashed remarkable powers, yet these very powers as presently wielded threaten to undermine the very future of our planet. Rapidly rising expectations have increased frustrations and tensions that threaten the fabric of global society. Prosperity itself has become a source of instability and destruction when wantonly pursued without organizational safeguards for our collective well-being. No longer able to afford the luxury of competition and strife based primarily on national, ethnic or religious interests and prejudices, we need urgently to acquire the knowledge and fashion the institutions required for free, fair and effective global governance.

In recent centuries the world has been propelled by the battle cry of revolutionary ideas — freedom, equality, fraternity, universal education, workers of the world unite. Past revolutions have always brought vast upheaval and destruction in their wake, tumultuous and violent change that has torn societies asunder and precipitated devastating wars. Today the world needs evolutionary ideas that can spur our collective progress without the wake of destructive violence that threatens to undermine the huge but fragile political, social, financial and ecological infrastructures on which we depend and strive to build a better world.

Until recently, history has recorded the acts of creative individual thinkers and dynamic leaders who altered the path of human progress and left a lasting mark on society. Over the past half century, the role of pioneering individuals is increasingly being replaced by that of new and progressive organizations, including the international organizations of the UN system and NGOs such as the Club of Rome, Pugwash and the International Physicians for the Prevention of Nuclear War. These organizations stand out because they are inspired by high values and committed to the achievement of practical, but far-reaching goals. This was, no doubt, the intention of the founders of the World Academy of Art & Science when they established this institution in 1960 as a transnational association to explore the major concerns of humanity in a non-governmental context.

The founders of WAAS were motivated by a deep emotional commitment and sense of responsibility to work for the betterment of all humankind. Their overriding conviction was on the need for a united global effort to control the forces of science and technology and govern the peaceful evolution of human society. Inhibiting conditions limited their ability to translate these powerful motives into action, but they still retain their original power for realization. Today circumstances are more conducive, the international environment is more developed. No single organization can by itself harness the motive force needed to change the world, but a group of like-minded organizations founded with such powerful intentions can become a magnet and focal point to project creative ideas that possess the inherent dynamism for self-fulfillment.

Ivo Šlaus *Orio Giarini* *Garry Jacobs*

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The World Academy of Art & Science was founded in 1960 by eminent scientists confronting the profound policy implications and social consequences of science and technology. The threat of nuclear weapons to human security, which was uppermost at that time, still persists more than a half century later. But today fundamental questions regarding the role and social responsibility of science and scientists in promoting human security are relevant to every aspect of global society. Never before has science possessed such immense power for promoting human welfare. Yet never before has it posed such immense threats to human security and social welfare. These contradictory trends are the result of the growing gap between the speed and reach of technological innovation and the slower development of public policy, global governance and cultural evolution. Reviving the deep concerns of the Academy's founders, this issue examines issues discussed at an international conference hosted by WAAS, CERN and the United Nations Office in Geneva last November.

Never before has the need for democratic governance been so great or its weaknesses and limitations so apparent. No other social system has been so effective in generating and releasing the vast social potential of ideas, knowledge, values, aspirations, energies, tools, technologies and organizational capacities. This issue also includes two papers reflecting conclusions of a high level international conference conducted at the Library of Alexandria on "Democracy in the 21st Century" last December focusing on both sides of the equation. Democracy succeeds only when the institutional structures of self-governance are supported by a culture of liberalism and respect for individual human rights. A true understanding of the problems and potentials of democracy requires that we view it as a complex social system that encompasses political, legal, economic, social and cultural dimensions.

Effective policy and institutions are essential conditions for addressing today's global social challenges, but they are not sufficient. Effective action is also severely constrained by prevailing social theories. We are prisoners of our thoughts. The radical changes required in economic policy and institutions to promote inclusive, sustainable welfare and well-being are obstructed by mechanistic Newtonian concepts in economic and social theory. This issue of *Cadmus* also includes several papers on the need for new theory presented at the XIII International Colloquium at University of Lisbon in May 2016. They examine prevailing myths regarding the market, money, financial systems, public investment, employment and social power, which obstruct concrete steps to promote equitable economic opportunity and security for all.

We are also prisoners of our minds and the prevailing system of education. The evolution of mind and the evolution of civilization are complementary, mutually reinforcing movements of history—one internal, the other external. Limitations in current theory reflect limitations in the way we are presently using and misusing the rich diversity

of mental faculties evolved by different cultures over millennia. This issue includes several papers presented at the WAAS-WUC course on Mind, Thinking and Creativity at Dubrovnik in April 2016, part of an on-going quest to evolve concepts and methods of education appropriate to the needs of the 21st century.

We hope you enjoy this issue.

The Editors

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Onwards!
Reinforcing Democracy for the 21st Century*

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Abstract

Universal suffrage has been the primary goal of democratic evolution. Despite elections and other measures taken to ensure democratic rights, some desired outcomes such as equality and transparency are not being met. The current mode of our democratic systems is archaic in addressing the world's multifaceted global crises. So, there's a dire need to incorporate new elements of democratic governance to address the issue. Humanity now lives in a transition period, so the path may not be easy. But the scientific and technological revolution underway is rapidly changing the mindsets of people and helping them exercise their rights. The article thus focuses on how democracy serves as the best system to ensure human rights and provide for a better society and also, how current models of democratic governance which matured in the last century can be improved in the 21st century, which is instrumental for meeting the challenges humanity confronts today. – Editor

1. Understanding what Democracy Means…

Humanity has ranged far and wide on a journey of exploration and discovery on the complex issue of what democracy is all about.

Many have looked at the evolution of systems of governance in the West and in the East.

Major milestones of that evolution have been identified thus far by historians.

The key stages of democracy in terms of content, as far as I can document, are the following:

- Limiting absolute rights of the monarch
- Guaranteeing some fundamental rights to subjects
- Creating a social contract between the government and the governed
- Limiting the power of government—separation of powers
- Legitimacy of the government comes from the consent of the governed
- The voice of the sovereign people is represented by an elected government
- The right to participate in electing that government was the privilege of the few
- Universal suffrage for all

* This article is based on the closing remarks delivered by the author at the international conference on Democracy for the 21st Century in Alexandria, Egypt on 11th December, 2015.

In general, democracy is seen as the best means to protect individual freedom and to prevent the emergence of dictatorship by holding the legitimacy of the government hostage to the consent of the governed. Elections are deemed the key tool for that, and thus the search for achieving universal suffrage has been the primary goal of democratic evolution.

"Whatever the shortcomings of democracy are, the treatment is to provide more democracy."

But democracy as a system of government—so eloquently and succinctly described by Lincoln as "Government of the people, for the people, by the people"—is intended to achieve certain desired outcomes, including:

- Freedom
- Justice
- Equality
- Social choice
- Participation
- Due process
- Rule of Law
- Protection of minorities
- Transparency
- Accountability

And it has become apparent that in many countries, despite regular elections and other trappings of the modern democratic state, these desiderata are not being fulfilled, or at least not sufficiently, to meet the expectations of the public.

Some argue that we have in the last century focused on expanding the base of those who have the right to vote, automatically accepting the elected governments that became the representative of the people. But experience towards the end of the century shows that despite broadening the base of participation to universal suffrage, corruption, special interest groups and lobbies, perpetuation in office due to the advantages of incumbency, and other problems have emerged. The presence of a vigorous free press and an active civil society are a few of the bulwarks beyond elections that seem to be required for a healthy democratic system which has better chances of responding to the needs and wishes of the people.

Since we are conscious of the fact that many of the ideas that govern our democratic systems are almost 200 years old, could we not improve and add to them in the light of the changing world in which we live? Given the amazing transformations taking place in the world, driven by globalization and an unprecedented revolution in science and technology, especially in ICT and the enormous penetration of connectivity through the internet, mobile telephony and such media as Facebook, our world is different from that of Montesquieu, Jefferson and Madison.

Three important questions need to be answered:

- Are the current modes of operation of democratic systems delivering the desired outcomes? No, or at least not enough!
- Are we confusing means (elections) with results (desired outcomes)? Too frequently observers make this mistake…
- Are there new instruments that we could incorporate into our democratic models that would bring us closer to these desired outcomes?

First I would like to record that I am not in any way a pessimist, that I remain profoundly optimistic about democracy and its promise for the 21st century, and that whatever the shortcomings of democracy are, the treatment is to provide more democracy…

Let us just look back at the last century: the 20th century. We could rightly call it "the century of democratic expansion". Indeed, despite the turbulences and wars, democracy surged forward during the last century, both in terms of reaching more countries, and in terms of expanding suffrage in the countries where it was already accepted as a form of government.

The world was transformed in the 20th century. At the start of the 20th century the Western World was dominant and its values were far from benign. Colonization, racism, gender discrimination were the order of the day. European empires ruled or dominated the earth, with the US emerging as a major power. Women, youth and many European men did not get to vote. Then came World War I, the Great Depression, and the rise of totalitarian systems: communism, fascism, Nazism, with all the horrors that they would commit… Finally came the bloodbath of WWII and the civil war that accompanied the Chinese Communist Revolution.

Then the second half of the century saw the foundation of the UN, the Universal Declaration of Human Rights and the world saw the emergence of the Cold War and the conflicts in Vietnam, Cambodia and other places, but murders and mayhems were permanently left behind after WWII. Nazism and Fascism were largely defeated, and Communism's turn was to come. Decolonization was spreading everywhere by the 1960s, the democratic transformation of most of Latin America took place in the 1980s, and upon the collapse of the Soviet Union, and of Eastern Europe in the 1990s, the march of democracy seemed unstoppable. In Europe the EU emerged as the greatest democratic transformation of all, and with it came peace. In one generation the youth of Germany and France could no longer envisage that their countries would ever go to war, an unimaginable dream for their parents and grandparents. Internationally, we built on the legacy of the Universal Declaration of Human Rights, and we had CEDAW (Convention to Eliminate Discrimination Against Women), and by the end of the century we even had the Convention on the Rights of the Child.

And so, on the journey of exploration that has seen the surge of democracy, and with the emergence of so many examples and models, with criticism and response, with scandals, crises and revivals, we need to acquire a much more realistic appreciation of the complexities of democratic governance in this increasingly complex world.

In the words of T.S. Eliot,

"*We shall not cease from exploration,*
And the end of all our exploring,
Will be to arrive where we started,
And know the place for the first time."

But if we see the destination with renewed clarity, we recognize that transitions from dictatorship to democracy are particularly arduous and challenging.

2. Transition from Dictatorship to Democracy

At the end of the 20th century and the beginning of the 21st century, the world of the 20th century is no more, thanks to the advent of the internet, globalization, local identities…

A new scientific revolution has been underway, from ICT to biology. Profound economic transformations appeared with the rise of China and the emerging markets, and the widespread penetration of new technologies, especially the internet and mobile telephony with more lines than the planet's human population. Social connectivity touches almost everyone on the planet, and all that is new is instantly shared across the world.

"Are there new instruments that we can incorporate into our democratic models that would bring us closer to these desired outcomes?"

Such transitions are difficult. Our region is awash with broken dreams and human blood. In many of our countries, corruption runs from the lowest bureaucrats to some of the custodians of the highest offices. Oligarchs are emerging between the cracks of the breaking old system, as the new system is still not fully formed… There is anxiety among those who know that the old system is vanishing, while the youth drift between uncertainty and aimlessness… With violence in the streets, and rampant profiteering and black markets, with a virtual despair among the many who seek a life of dignity amidst the ruins of bygone systems and the incompleteness of the successor systems, the general outlook for a system rooted in revolutionary change can indeed be bleak…

The economic underpinning for transition democracies is essential—people expect improving living conditions—but transitions provide a very poor climate for economic development.

In addition, periods of transition witness an explosion of many local identities asserting themselves and many hitherto suppressed tensions and conflicts coming to the fore. Indeed, authoritarian regimes do not resolve society's profound problems, they keep them suppressed, "under the lid" so to speak, and therefore when democracy arrives all these old issues come out again and provide fodder for demagogues and allow the emergence of oligarchies….

So the role of leaders in transitional times is important. Who can underestimate the contributions of leaders such as Mandela and Tutu in South Africa? And as we saw in the

case studies of Latin America and Eastern Europe, how to prevent the emergence of oligarchies is very important in crucial times when new institutions of governance are taking root in the fragile periods of transition from dictatorship to democracy.

"The years may wrinkle the skin, but to give up our ideals wrinkles the soul."

3. Today: New Instruments, Innovations

But beyond the issues in transitions towards democracy, even in mature democracies, as in Europe and the US, there are a number of danger signals of trends that could undermine the good functioning of these democracies, such as declining party membership, declining participation and generally low opinion of elected representatives and lack of trust in the institutions of government, that sometimes go as far as making people consider the government incompetent at best, an enemy at worst. But instead of just criticizing, we will move to look at possible improvements that we can make, new instruments that we can use… Thus we will explore possible answers to the third question I posed at the outset:

Are there new instruments that we can incorporate into our democratic models that would bring us closer to the desired outcomes?

Institutional developments must also encourage the emergence of the civil society which has a crucial role to play in any democratic society. It is only by practicing democracy that people will learn to establish trust in the government system.

4. So, Where Are We Now in the Arab World?

We are in a transition period, and we cannot expect smooth sailing…

But as Shakespeare said,

"*There is tide in the affairs of men*
Which taken at the flood leads on to fortune
Omitted, all the voyage of their lives is bound in shallows and in miseries
On such a full sea are we now afloat
And we must take the current when it serves
Or lose our ventures…"

We shall not lose our ventures!

Our young people will create the future which past generations have not been able to achieve…

But what about those of us who are not so young anymore?

I believe that we are young at heart…

For indeed, the years may wrinkle the skin, but to give up our ideals wrinkles the soul. The years may mark our face, diminish our physical vigor, whiten our hair and limit our eyesight, but we can remain young at heart… for You are:

"*As young as your faith, as old as your doubt;*
As young as your dreams, as old as your cynicism;
As young as your self-confidence, as old as your fear;
As young as your hope, as old as your despair. "*

"If not now, when? If not us, who?"

You will remain young as long as you believe in the beauty of your dreams, as long as you believe in hope, cheerfulness and courage…

Only if you give in to pessimism, and lose your heart to cynicism, then, and then only, are you growing old.

And then, indeed it is as Douglas MacArthur said: "you just fade away".

But the dreams will not fade away… The dreams are there for they inspire us all to aspire for new levels of effort…

To look at democracy as Amartya Sen was quoted saying:

"Democracy is equal authorship of collective life".

To look at our legislative tasks and think of them as:

Fashioning the wise constraints that make people free.

To look at the dawn of a new era and live by the immortal words:

There are those who look at things as they are and ask why.
But we are among those who look at the world as it could be and ask why not…

To confront these turbulent times in our world and take up the challenge of the future… for…

If not now, when?
If not us, who?

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* From a poem by Samuel Ullman (1840-1924) which was a favorite of General Douglas MacArthur (1880-1964) who quoted it frequently and kept a copy of it on his desk.

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Debugging Democracy

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Abstract

Democracy was the most successful political idea of the 20th century. However since the beginning of the new century democracy has been clearly suffering from serious structural problems, rather than a few isolated ailments. Why has it run into trouble, can it be revived? In the consumption driven world people have started to be driven by the belief in economic prosperity as the guarantee of human freedom. As a result, human development and personal status have become hostages of economic performance, deforming basic civilisation's ethical matrix. However in 10-15 years, the world may be completely different. We are looking at communications and technology revolutions occurring in very abbreviated time frames. Soon, billions of people will interact via a fast data-transferring Metaweb, and it will change social standards as well as human behaviour patterns. Integrated global economies functioning as holistic entities will spur a deep reframing of global governance, shaping a new configuration of political, economic and military power. One can hardly expect that these changes will leave democratic mechanisms intact. It's a pivotal moment for all of us because we are facing paradigm changes in our way of life. We clearly need a new political vision that is deliverable quickly. Democracy can be reset if it can provide a platform for collective judgement and individual development—in a value-driven process, when values manifest themselves in concrete and socially meaningful issues, and are not reduced to the economic optimization and politics of the wallet. In other words, the only remedy to resolve the crisis of democracy is more democracy.

Democracy was the most successful political idea of the 20th century. Just a few years ago it looked as though democracy would dominate the world. Upbeat articles and euphoria flourished. By 2000 *Freedom House* classified 120 countries, or 63% of the world total, as democracies.

Between 1980 and 2000 democracy experienced a few setbacks, but since 2000 there have been too many to be listed as exceptions. Even in its heartland, democracy is clearly suffering from serious structural problems, rather than a few isolated ailments. Political systems have been undergoing dramatic changes in the past decades driven by globalization and neoliberalism. Vital democratic institutions have been tarnished and manipulated.

Why has democracy run into trouble, can it be revived?

According to the usual explanations of the Western writers, democracy as a model has been attractive, because democracies are on average richer than non-democracies, are less

likely to go to war and have a better record of fighting corruption. More fundamentally, democracy lets people speak their minds and shape their own future and their children's.

Why then the crisis? All is still there—democratic countries are richer, more stable, less corrupt and more liveable. Why the crisis?

The answer is that democracy is not only about how people live. It's also about what they live for—it's about human dignity, self-esteem, meaningfulness, sense of fulfilment. It's about values!

"In the absence of basic human rights, economic life as we know it today is inconceivable."

The first time I thought about this was in August 1968 after the Prague Spring was crushed by the Soviet Union and its allies, feeling the shame, total helplessness and hopelessness.

Today I feel the same just looking around.

Terror in Paris. Crimea annexation, Russian plane shot down by Turkey, refugee tragedy, wave of nationalism sweeping over Europe... One thing is clear.

World governance has gone impotent. G7, G20, UN, World Bank, EEC, BRICS, UNESCO, World Economic Forum and the likes are ineffective.

Dozens of important organizations, dozens of important presidents, thousands of important ministers, millions of spies, analysts, the CIA, the Russian Federal Security Service, MI-6 and so on. An incredible financial, industrial, intellectual capacity is getting wasted.

They run the world. But they run it really badly.

What went wrong?

There are existential, political and operational reasons.

First is the degeneration of liberal values.

The modern market economy was a natural outgrowth of the rise of liberalism and political democracy in the West. The extension of freedom and democratic rights to every citizen has gradually led to the emergence of economic democracy as well, in which each individual casts monetary votes according to his individual needs and capacity. In the absence of basic human rights, economic life as we know it today is inconceivable.

But the further evolution of this value has played a trick on civilization. In this consumption driven world, people have started to be driven by the belief in economic prosperity as the guarantee of human freedom. Material prosperity has become implicitly related to the extent of individual freedom. Personal wellbeing gradually has turned from a tool of liberal values into a competing goal, gradually devaluing and marginalizing these values. That is why the

threat to prosperity standards (leading to unbridled economic growth) is being seen as the erosion of freedom.

"Instead of lamenting about the crisis of democracy, we need to debug and upgrade the democratic mechanisms reflective of the new drivers, uncertainties and systemic challenges, rescue democracy from being a hostage of traditional geopolitical considerations and banal economic growth concerns."

As a result, human development and personal status have become hostages of economic performance, deforming basic civilisation's ethical matrix. Democracy, with economic issues dominating parliamentary agendas, has gradually been reduced to an instrument of economic optimisation. In the political sphere, the end of the Cold War has paradoxically accelerated this process. After World War 2 many people of the world were attracted by the Western model, by its "soft power". Its high economic efficiency, rule of law, human rights turned the democratic system into a shining city on a hill for many especially when compared to the repressive and economically less efficient models.

The socialist system implosion has devalued and erased the stark comparative advantages of the Western political system. Not being able to use anymore the repressive models of the East block as a reference point, the West was challenged to start "sweeping in front of its door", to confirm and prove the democratic model's moral advantages in its own daily reality. But instead it has ceded the temptation to "establish" its gains in the Cold War victory, thereby quickly converting moral principles into geopolitical instruments.

The degree of euphoria that swept the ruling elite in the West after the collapse of the USSR was explicit in Condoleezza Rice's article "Rethinking the National Interest" in *Foreign Affairs*: "it is America's job to change the world... Democratic state-building is now an urgent component of our national interest". Well, as they say, "we wanted the best, you know the rest...", in many places the world (including where we are now) is still facing the consequences of the "democratic state building" program. And indeed, after Abu Ghraib, WikiLeaks and Snowden revelations it was difficult to expect that people would continue to see a "torch" of the future in the Western model. However, instead of lamenting about the crisis of democracy, we need to debug and upgrade the democratic mechanisms reflective of the new drivers, uncertainties and systemic challenges, rescue democracy from being a hostage of traditional geopolitical considerations and banal economic growth concerns.

Already in 10-15 years, the world may be completely different. We are looking at communications and technology revolutions occurring in very abbreviated time frames. Soon, billions of people will interact via a fast data-transferring Metaweb, and it will change social standards as well as human behaviour patterns. Integrated global economies functioning as holistic entities will spur a deep reframing of global governance, shaping a new configuration

of political, economic and military power. One can hardly expect that these changes will leave democratic mechanisms intact.

1. *What are the implications of an integrated global economy for democracy? How can we sync democracy with globalization? How can we enable the democratic decision-making mechanisms at the global level?*

Since the dawn of the modern democratic era in the late 19th century, democracy has expressed itself through nation-states and national parliaments. But globalisation has changed national politics profoundly. People today engage in social issues mainly through civil society and the use of social media as their primary tool. This holds fascinating prospects for de facto global citizenship and action, but it does something to the old type of representative democracy.

2. *What are the probable outcomes of the evolving new balance of political, economic, and military power, shifting the "centres of gravity" from West to East, from North to South, and from nation-states to private actors? Will it recreate a new "multi/uni/bi- polarity" of the world or give birth to a lateral self-adaptable and heterogeneous international network instead of a traditional states-based system?*

The present-day social reality reveals new growing and influential actors. Alongside the notorious process of globalization, there is another process that receives much less attention. This is the process of "lateralisation"—the establishment of vigorous, polyphonic groups that benefit from the broad access to the IT and communications, financial, organisational, and technological means of the post-industrial world.

These "asteroids" of the social universe include various "ambitious" corporations (Apple, Uber), global diasporas, influential NGOs, various think tanks (such as Library of Alexandria), criminal consortia, etc.; all of them make up a new flexible Hybrid Universe, without any 'formalized' sociological "cartography" as yet but leaving ever-growing footprint on the political mechanisms.

3. *How can the IT and communications revolution change social standards and human behaviour patterns, and thus the world order? What will happen to the traditional democracy content elements (political parties, elections, representative mechanisms)?*

We never anticipated a technological revolution so extreme in its productivity that it could actually reduce marginal cost to near zero for a whole array of goods and services, making them essentially priceless, abundant and beyond the market.

In the last 20 years, we've seen the zero marginal cost phenomenon invade entire sectors of the world media, knowledge and information industry.

It's a pivotal moment, not only for the global economy, but now for all of us because we are facing paradigm changes in our way of life. We clearly need a new political vision that is deliverable quickly.

From internet of information, to internet of energy, internet of things and what's next?

Sensors are being connected to everything—every device and every human being—in one neural network. We have 14 billion sensors now. By 2020, there'll be about 50 billion sensors and by 2030, 100 trillion sensors. The first reaction is wow, we're going to connect the human race. The second reaction is, this is scary! Because all these sensors will change not only our life, but us as well!

"Democracy isn't dying, it's evolving."

Internet of politics? The internet makes it easier to organise and agitate; in a world where people can participate in reality TV votes every week, or support a petition with the click of a mouse, the machinery and institutions of parliamentary democracy, where elections happen only every few years, where one supports a political party, look increasingly anachronistic (already today no political party has youth organisations). Internet of Politics will inevitably archive party politics. Douglas Carswell, a British member of parliament, likens traditional politics to HMV, a chain of British record shops that went bankrupt, in a world where people are used to choosing whatever music they want whenever they want via Spotify, a popular digital music-streaming service.

"Democracy can be reset if it can provide a platform for collective judgement and individual development—in a value-driven process, when values manifest themselves in concrete and socially meaningful issues, and are not reduced to economic optimization and politics of the wallet."

There are big questions about who's going to control the networks, information flows, data security, privacy, information transparency. But there is even a bigger and more fundamental question: what are the long-term goals? what is the meaning of world development in the twenty-first century, the answer to which will define the future of democracy?

To conclude, democracy isn't dying, it's evolving.

As Alexis de Tocqueville pointed out in the 19th century, democracies always look weaker than they really are: they look confusing on the surface but have lots of hidden strengths. Being able to install alternative leaders offering alternative policies makes democracies better than autocracies at finding creative solutions to problems and rising to existential challenges, though they often take a while to zigzag to the right policies. But to succeed, both fledgling and established democracies must ensure they are built on firm foundations.

Complacency in these matters could easily lead us towards whatever we associate with the opposite of democracy in the years to come.

My point is that the people are not estranged from democracy. They are concerned about the eroding environment, poverty, corruption, unhealthy food, ineffective crime

policies, unfair educational system, the erosion of care for the sick and elderly. They feel that "traditional democracy" does not do well in addressing these concerns, let alone solving them. People haven't abandoned politics, but politics, they feel, has abandoned them. So, democracy can be reset if it can provide a platform for collective judgement and individual development—in a value-driven process, when values manifest themselves in concrete and socially meaningful issues, and are not reduced to economic optimization and politics of the wallet.

In other words, the only remedy to resolve the crisis of democracy is more democracy.

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Social Responsibility and Self-governance by the Scientific Community

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Abstract

Over the past century there have been many profound scientific, technological, economic and social transformations. In the near future, the most dramatic breakthroughs will probably be achieved through combinations of various scientific disciplines, such as work cutting across physics, molecular biology, neurosciences, biotechnology, nanotechnology and microelectronics, chemical genetics, energy technologies, etc. There are many who, facing the next century, wonder if it will be possible and/or desirable to continue along the path of such prodigious changes. Technological advancement in new products and new ways of organizing human work is one of the most important concerns of our future. These changes in technology are not followed by change in human spirituality. In fact, looking at the time scale spirituality changes linearly in contrast to technological advancement which changes exponentially. On top of that, technologies pose threats, either by accident or through malevolence, to the natural and human environment. Thus, in time scale there is a bigger and bigger difference between what we do and who we are. Preservation versus dynamism is one of the many important unknowns in the coming future. Therefore, understanding the full potential of tomorrow's technologies to contribute to human well-being calls for a better understanding of the ways in which technological changes interact with the human capacity to accept them.

There is in Plato's *Phaedrus* a story about Thamus, the king of a great city of Upper Egypt. For people such as ourselves, who are inclined (in Thoreau's phrase) "to be tools of our tools", few legends are more instructive than his. The story, as Socrates tells it to his friend Phaedrus, goes this way: "Thamus once entertained the god Theuth, who was the inventor of many things, including number, calculation, geometry, astronomy, and writing. Theuth exhibited his inventions to King Thamus, claiming that they should be made widely known and available to Egyptians. Socrates continues: Thamus inquired into the use of each of them, as Theuth went through them expressing approval or disapproval, and judged Theuth's claims to be well or ill founded. "It would take too long to go through all that," Thamus is reported to have said for and against each of Theuth's inventions. But when it came to writing, Theuth declared, "Here is an accomplishment, my lord the King, which will improve both the wisdom and the memory of the Egyptians. I have discovered a sure receipt for memory and wisdom." To this, Thamus replied, "Theuth, my paragon of inventors, the discoverer of an art is not the best judge of the good or harm which will accrue to those who practice it. Those who acquire it will cease to exercise their memory and become forgetful;

they will rely on writing to bring things to their remembrance by external signs instead of by their own internal resources. What you have discovered is a receipt for recollection, not for memory. And as for wisdom, your pupils will have the reputation for it without the reality: they will receive a quantity of information without proper instruction, and in consequence be thought very knowledgeable when they are for the most part quite ignorant. And because they are filled with the conceit of wisdom instead of real wisdom they will be a burden to society."

Over the past century there have been many profound scientific, technological, economic and social transformations. There are many who, facing the XXI century, wonder if it would be possible and/or desirable to continue along the path of such prodigious change. No reasonable person could deny that science and especially technology have been a major force in making the world we live in a better place, but it is always important to keep in mind that in this process they have not operated independently of the society in which they are imbedded. In this process we are facing risks of ignoring the potential that they offer for improving the condition of humankind and the state of nations by over- or underregulation, and over- or undercapitalisation of new developments. On top of that, we keep accepting uncritically the enthusiasm about new developments while neglecting the social, economic, political constraints, and have practiced to overlook secondary effects which are often more significant than the basic problems. An increased opportunity for human agency is thus offered by social constructivism rather than technological determism. It is not likely that the ability to influence the course of technological change will be evenly distributed among the population as a whole. To the contrary, social constructivist analyses have often shown how differences in power and access to resources have shaped technological change. Often particular technologies may be devised, selected, and disseminated because they serve the interests of a particular group, possibly in opposition to the interests of other groups. No doubt, technology confers power, as C. S. Lewis has reminded us, "Man's power over nature is really the power of some men over others with nature as their instrument."

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The full potential and governance of science and tomorrow's technologies and innovations as contribution to human well-being, seem to be depending heavily on the capacity and risks for a better understanding of the ways in which performance trends interact with societies' readiness to embrace economic, social and technological changes. The emergence of these

risks is shaped by forces other than pure scientific feasibility, and will depend not only on the extent of the actual and comprehended dangers of new scientific discoveries and in particular technologies but also, and crucially, on social and political choices. An analysis of the governance of scientific knowledge in the contemporary world shows the practical incompleteness, fragility, obsolescence and often failure of attempts to govern science.

"Scientific advances are most likely to arise, or are most easily promoted, when scientists from different disciplines are brought together and encouraged to free themselves from disciplinary constraints."

Scientific progress can be of various types/discoveries of phenomena, theoretical explanations or syntheses, tests of theories or hypotheses, acceptance or rejection of hypotheses or theories by the relevant scientific communities, development of new measurement or analytic techniques, application of general theory to specific theoretical or practical problems, development of technologies or useful interventions to improve human health and well-being from scientific efforts, and so forth. Consequently, many different developments might be taken as indicators, or measures, of progress in science, but very few as controlling it.

One of the best known modern theories of scientific progress is that of Thomas Kuhn. Science, in Kuhn's view, is usually a problem-solving activity within clear and accepted frameworks of theory and practice, or "paradigms". A quite different account is that of John Desmond Bernal* who was inspired by Marxist social science and ideals of planned social progress. Whereas in Kuhn's view science progresses according to its inner logic, Bernal asserted that intellectual and practical advances could be engineered and managed. Derek Price's vision of a quantitative "science of science" has focused less on how innovations arise than on how they spread and how their full potential is exploited by small armies of scientists. There are also evolutionary models of scientific development, such as that of the philosopher David Hull. Extending Darwin's view of evolution by variation and selection, Hull argues that science continually produces new ideas, which, like genetic mutations, are essentially unpredictable.

Autonomy has traditionally been seen as a major characteristic and crucial precondition for scientific progress. Even when science and technology have manifested problems of considerable magnitude it is often more difficult to terminate a problem than to continue with it, which is one of the greatest defects of our system of governing science and technology. Ernest Fitzgerald said: "There are only two phases to a major military program. The first: It is too early to tell, the second: It is too late to stop."

* See http://www.brainyquote.com/search_results.html?q=john+desmond+bernal

The idea progresses in the view that scientific advances are most likely to arise, or are most easily promoted, when scientists from different disciplines are brought together and encouraged to free themselves from disciplinary constraints.

Gaining an understanding of the meaning of words is often the beginning of knowledge. The linguistic roots of the word "technology" can be traced to the Indo-European stem *tekhn-*, which seems to have referred to woodworking. It is the source of the Greek word *techne*, which can be variously translated as "art", "craft" or "skill". It is also the root of the Latin word *texere*, "to weave", which eventually took on the larger meaning of fabrication or construction. The term "technologist" was occasionally used by Aristotle and others in his time, but in their usage it referred to a grammarian or rhetorician. By the early eighteenth century the word had come close to its present meaning when an English dictionary defined it as "a Description of Arts, especially the Mechanical".

Significant progress, which is an uncertain process with many unforeseeable consequences, is likely across a broad spectrum of technologies such as computing, genetics, brain technology, new materials, in particular miniaturization and smart composites, energy, transportation and environmental tools and systems. But, perhaps the most dramatic breakthroughs in the not-too-distant future will be achieved through combinations of various scientific disciplines. For example, work cutting across biochemistry, physics, molecular biology, neurosciences, biotechnology, nanotechnology and microelectronics is all set to make significant advances in the field of bioelectronics, and neuroinformatics. The major advances in other cross-disciplinary fields could take to the creation of synthesized gene-derived enzyme catalysts, non-existent in nature; biological processes to fabricate molecular structures and more complex materials; bioengineered plants to produce pharmaceuticals and raw materials for plastics, and many more.

History has demonstrated that the availability of a particular scientific discovery or innovative technology is no assurance that its potential would be extended only to useful applications, or that it would diffuse widely or render its fullest utility to those who might use it most productively. No doubt tomorrow's technologies will contain destructive potential that will be both powerful and difficult to control. They could pose threats to the natural and human environment, either by accident or through malevolence. Furthermore, purely technological risks involve the possibility of greater vulnerability to systems. Many fear that as the world becomes more diversified, decentralized and dependent on technology, there will be a higher risk of unmanageable failures in either the physical or social systems that underpin survival. Certainly, at the same time, one should not ignore effects related to ethics, values and mindsets, having in mind that everything depends on a complex interaction with underlying economic, social and political conditions.

American sociologist W.F. Ogburn began to wander in the tracks of Marx, as early as 1922, arguing that inventions occur most often in the field of material technology, perhaps because the advantages of improvements in technology are self-evident. A strain or stress has been set up between the new technique and various organizational aspects of the social

system. The result being disequilibrium between new technology and old social organization, which is termed social lag.

"Technological change does not take place in a social vacuum. Science and technology are human creations, and because humans are social creatures, scientific and technological change is necessarily a social process."

The theory of cultural lag formulated by William F. Ogburn is predicated on the belief that habits, thoughts, values, and social arrangements often fail to change at the same speed as scientific and technological innovations. They move ahead, but many other things lag behind. Our spirituality does change very slowly in time compared to scientific and technological advancement, what in time scale makes us human beings more different compared to what we experience in practice. The belief that technology acts as an independent force in our life, unaffected by social forces, is known as 'technological determinism' and if it is true, we have become the servants of technology instead of its master.

Technology has deeply altered our modes of life. With each development in technology there comes, however, some disturbance to the effective working of the existing social order. The institutions of family, religion, morality, marriage, state, and property have been altered. On top of that inventions and discoveries in science have shaken the foundations of religion while at the same time strengthening nationalism. People are becoming more secular, rational and scientific but less religious in their outlook. The function of the state or the field of state activity has been widened. Modern governments which rule through the bureaucracy have further impersonalized human relations. In brief, people in the Middle Ages believed in the authority of their religion, no matter what; today, we believe in the authority of our science and technology, no matter what, not taking much care of how they are controlled.

The interrelation of science, technological and cultural changes is especially relevant in the globalized era in which we live. Closely associated with a belief in technological determinism, convergence theory argues that the nations of the world are becoming more similar to one another—that is they are converging—as they make use of the same technologies. Although this belief has been widely accepted, much of the evidence for convergence theory is impressionistic and anecdotal. Although the case for convergence theory is possible on both theoretical and empirical grounds, the role of technological change in promoting the convergence of societies is less certain. It would certainly be inadmissible to think of technological change as a universal solvent that dissolves all prior cultural, religious and social patterns so that they are dictated by modern technology.

Certainly, possible applications of technology two or three decades from now call for a better understanding of the ways in which scientific and technological performance trends interact with societies' readiness to embrace and control economic, social and technological

change. In this case, it is important to keep in mind that technological change does not take place in a social vacuum. Science and technology are human creations, and because humans are social creatures, scientific and technological change is necessarily a social process. In recent years, the study of technological change has been strongly influenced by a perspective known as "social constructivism". According to this approach, technological change does not occur because new devices and processes demonstrate their clear-cut superiority over other ways of doing things. For social constructivists, the analysis has to begin with the need to explain why certain technologies are assumed to work better than others.

Today's science and technology leaves us both exhilarated and terrified. Recent technological developments have presented us with such marvels as spacecraft leaving the solar system, instant access to billions of Internet web pages, and diseases cured through gene therapy. At the same time, the inexorable march of technology has produced global pollution, they could pose threats to the natural and human environment, overpopulation, and the threat of nuclear annihilation. On many occasions technological change has also produced social disruptions, as when automation destroys jobs in a particular industry or a new weapon upsets the balance of power between nations. Ever since technologies were employed these tools often have had a double edge—not only for survival but also for conflict. Scientific achievements and technological advances *per se* provide no foregone conclusions about how they will be used. Even the initial steps in the long-term development and diffusion of radical innovations could pose unusually strong challenges to existing ethical and cultural standards, and put greater burdens on people's tolerance of the unknown and foreign. This could generate serious social unrest.

As Bacon expressed, it is a world in which the idea of human progress has been replaced by the idea of technological progress. The aim is not to reduce ignorance, superstition, and suffering but to accommodate ourselves to the requirements of new technologies.

The answer is perhaps given by Vaclav Havel posed in an address to the U.S. Congress. "We still don't know how to put morality ahead of politics, science, technology and economics, we are still incapable of understanding that the only genuine backbone of our actions—if they are to be moral—is responsibility. Responsibility to something higher than my family, my country, my firm, my success."* And that is the most important responsibility to the future.

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Foundations of Economic Theory:
Markets, Money, Social Power and Human Welfare

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Abstract

The future science of Economics must be human-centered, value-based, inclusive, global in scope and evolutionary in perspective. It needs to be fundamentally interdisciplinary to reflect the increasingly complex sectoral interconnections that characterize modern society. It must also be founded on transdisciplinary principles of social existence and human development that constitute the theoretical foundation for all the human sciences. This paper examines three fundamental aspects of modern economy to illustrate the types of issues and perspectives relevant to a reformulation of Economics framed within a broader political, social, cultural, psychological and ecological context. It examines the social forces responsible for the present functioning of economies, which can be effectively addressed and controlled only when they are made conscious and explicit. Whatever the powers that have shaped its development in the past, the rightful aim of economic science is a system of knowledge that promotes the welfare and well-being of all humanity.

Markets and money are instruments for the conversion of social potential into social power. They harness the power of organization to transform human energies into the capacity for social accomplishment. The distribution of rights and privileges in society determines how these social institutions function and who benefits. Freedom means access to social power and is only possible in the measure all forms of that power—political, economic and social—are equitably distributed. The current system is inherently biased in favor of privileged elites reinforcing domination by the more powerful. The emergence of the individual is the vanguard of social evolution and the widest manifestation of creative individuality is its pinnacle. This emergence can only be fully achieved in conditions of freedom and equality. Economic theory needs to make explicit the underlying forces determining the distribution of power and its benefits, so that conscious policy choices can be made to reorient markets and money to serve their intended purpose promoting human welfare and well-being.

1. Introduction

Less than a decade after the most severe global economic crisis in a century, the world economy is once again veering toward the edge. Economists, central bankers, corporate leaders and politicians are scrambling to understand and respond to the threat. But as in 2008, debate focuses on how to tinker and patch up holes in the existing system. Few are willing to recognize the deeper implications. Centrally planned economies were discredited a quarter century ago, leading to a resurgence of neoliberal theory and public policy that

dismantled social welfare systems, disempowered labor unions, liberated the wealthy from the burden of taxation, and enabled multinational corporations to stalk the earth unhindered by competition and rule of law. Prevailing economic philosophy is a reversion to obsolete concepts and policies.

The call for New Economic Theory arises from many sources and resonates with many different concerns. The present crisis has exposed the inherent fault-lines and structural deficiencies of the existing economic model. Meanwhile most economists remain preoccupied with theorizing about what went wrong within the confines of the existing theoretical framework rather than re-examining the fundamental premises on which it exists and looking beyond for a more viable alternative. Ten years ago such a call would have met with derision from leaders, economists and the public-at-large. Today there is a growing sense of unease, inklings of Hamlet's deeper perception that all is not well within the state of Denmark. A shift in focus is needed from efforts to reinforce an inherently flawed and failing system to conceptualizing a better one. That necessitates a reexamination of the social and political foundations of modern economic systems to fathom the underlying forces that have shaped their development and are now driving evolution to something else.

The quest for new theory needs to lay bare both the explicit assumptions and implicit premises on which current theory resides. It needs to reject the notion of immutable economic laws in favor of the concept that economic systems are human constructions framed under the pressure of prevailing circumstances and forces in the past and, therefore, capable of continuous evolution and radical improvement. Formulation of new theory should commence with a thorough reexamination of economy from first principles. In an age of rapid globalization, accelerated social evolution and unprecedented integration, it is necessary to reexamine the narrow spatial, temporal and conceptual boundaries that circumscribe current economic concepts, models, institutions and policies. The future science of Economics must necessarily be global rather than national in scope and evolutionary rather than static in perspective. It needs to be fundamentally interdisciplinary in order to fully embrace the increasingly complex sectoral interconnections that characterize modern society. It must also delve beneath the surface of economic activities and institutions to identify the transdisciplinary principles of social existence and development which constitute the theoretical foundation for all the human sciences.

This paper examines three fundamental aspects of modern economy to illustrate the types of issues and perspectives relevant to a reformulation of Economics. It seeks to frame the functioning of economy within a broader political, social, cultural, psychological and ecological context. It seeks to unveil underlying social forces responsible for the present functioning of economies, which can be effectively addressed and controlled only when they are made conscious and explicit. The notion that economies work the way they do because of intractable social forces may be deemed expedient by practitioners, but it cannot serve as the basis for valid scientific theory. Economy and Economics are both human inventions. Whatever the forces that have shaped their development in the past, the only legitimate objective of economic science is a system of knowledge that promotes the welfare and well-being of all humanity.

The central argument of this paper is that markets and money are remarkable inventions designed to organize human relationships into power for social accomplishment. They are instruments for the conversion of social potential into social power. They harness the power of organization to transform human energies into social capacity. The distribution of rights and privileges in society determines how these social institutions function and who benefits. Freedom means access to social power and is only possible in the measure all forms of that power—political, economic and social—are equitably distributed. The current system is inherently biased in favor of privileged elites reinforcing domination by the more powerful. Fullest development of individual and social welfare can only be achieved in conditions of freedom and equality. Economic theory needs to make explicit the underlying forces determining the distribution of power and its benefits, so that conscious policy choices can be made to reorient markets and money to serve their intended purpose promoting human welfare and well-being.

"The only legitimate objective of economic science is a system of knowledge that promotes the welfare and well-being of all humanity."

We start with the premise that the purpose of any economic system is to maximize the economic security, welfare and well-being of its citizens. In comparison with the past, the current system has had remarkable success providing unprecedented levels of prosperity to an expanding global population. Any critique of the current system must commence with a deep appreciation of its achievements.

2. The Market

Modern market economies are a subset and component of a much larger set of social institutions on which economy is founded and depends for its accomplishments. The birth of the primordial market was a simple device designed to bring buyers and sellers together at a specific place and time to exchange goods. The traditional village fair gradually coalesced into centralized urban market centers linking different regions of the countryside with one another and through sea and land routes to more distant places. The rise of the annual cycle of Champagne Fairs during the Middle Ages marked an early stage in the emergence of All-European markets based on the same principle.

The wealth of modern economies is founded on the ever-expanding organization of human relationships. The market is a simple but extremely powerful example of social organization that acts as a catalyst for production by stimulating exchange. Before markets, farmers had little incentive to produce anything more than they required for personal consumption and local exchange. Markets broaden and elevate the power of economies by shifting the center from production to exchange.

The creation of markets transformed subsistence agriculture into commercial agriculture by providing farmers with an incentive to maximize production and exchange it for an increasing diversity of essential and exotic goods. Eugen Weber documents how grape

farmers in an isolated corner of rural France without access to regional markets used to feed their excess grape production to the pigs, since there was only so much fruit and wine they could consume locally. Within a year after bridges and roads were constructed connecting the village with wider markets, they were exporting wine to the Middle East.[1] Adam Smith recounts the time before improvements in transportation supported the development of national markets in Scotland. Feudal barons controlling large extents of land had little incentive to increase production beyond the level needed to feed their families and large contingents of armed retainers, since surplus production beyond this level had little value. Once connected to urban markets, large landholders drastically reduced the number of their dependents—in one case from several thousand to just 50—in order to convert surpluses into a wide range of luxury goods.[2]

All social accomplishment is the result of the process of generating, releasing, directing and channeling human energies by organizing and coordinating the interactions and relationships between individuals, activities, and institutions. The immense capacity of market economies for production and innovation arises out of the freedom of choice and action they accord for individual initiative and innovation and for organized and finely coordinated collective action. Freedom liberates productive human energies. Market opportunities direct those energies for productive purposes. The evolution of intricate networks of markets at the local, regional, national and international levels channels those energies effectively to maximize the production and exchange of goods and services. The spatial expansion of markets enhances the range and variety of goods available and enables buyers to source products from producers with the greatest comparative advantage.

From earliest times, economy and politics have been inextricably intertwined. Freedom of production and exchange meant little without ensuring ownership and security of property, enforcing contracts, arbitrating disputes, and protection against arbitrary seizure. The most productive market economies developed in places where the rights of the individual, rule of law and protection for property were most respected. Thus, democracies and market economies evolved hand-in-hand and were mutually reinforcing. So too, markets thrived in communities with the best infrastructure for transportation and communication, as well as the most skilled, literate and well-educated people.

At a time when the power of monarchs and emperors far exceeded the capacities of any commercial enterprise, Smith opposed the mercantile policies of European governments which promoted the interests of the crown and a small community of prominent traders at the expense of the general public. He never imagined the emergence of huge multinational corporations whose economic and political power would exceed the wealth and influence of many nations and even have the capacity to undermine the ecosystem of the planet. The rise of huge trading corporations during the 18th century and private transcontinental railways and massive industrial enterprises during the 19th century shifted the balance of power and the source of threat to free markets from governments to producers, traders and transporters. The multiplication of social power generated by the Industrial Revolution generated unprecedented economic capacity while posing new threats to human freedom and creativity.

The development of market economies during the 20th century is inseparable from the development of political systems to govern the actions of enterprises, educational systems to provide the skilled manpower required, scientific research institutions to support rapid technological innovation in products and production, continuous advances in transportation and communication, combined with a dense fabric of laws and judicial mechanisms to define and protect rights and responsibilities, preserve competition, ensure fair treatment of workers and consumers, protect and support communities, and safeguard the environmental rights of present and future generations.

The enormous productive power of modern economies is a subset and an inseparable element of the growing power of an increasingly sophisticated and complex global social organization encompassing virtually all aspects of human existence. Modern economies have evolved in conjunction with stable national governments, democratic systems of governance, peaceful international relationships supported by rapid development of international law and an expanding network of international institutions, transparent judiciary systems, banking and market regulatory institutions, independent media, systems of education and research, social welfare systems, consumer and environmental protection agencies, and a plethora of other organizations.

The central importance of this underlying social fabric is dramatically illustrated by recent attempts to rapidly introduce market economies in countries that lack the capacity for democratic governance, rule of law, and social justice. The history of Ukraine and other countries of the former Soviet Union over the past 25 years presents startling evidence of how totally dependent development of an equitable market economy is on the prior and proportionate development of all the other institutions of modern social organization.[3]

3. Myths of the Market

However remarkable and unprecedented its achievements, by comparison with any conception of optimality, the present market economic system fails to impress. Judged in terms of its contribution to maximizing the security, welfare and well-being of all citizens, it dismally fails to effectively harness the superabundance of available productive capacity to meet the ever expanding needs and aspirations of the world's population. It fails to effectively develop and fully engage the precious and perishable human capital which represents the foundation, peak and core of humanity's advancing civilization and culture. Today approximately 200 million workers are unemployed and an estimated billion or more are underemployed. The labor force participation rate is falling while youth unemployment is rising. The present system fails to ensure an equitable distribution of the extraordinary benefits of modern economic processes to all human beings. Levels of economic inequality have risen to their highest in nearly a century. Meanwhile the basic needs and aspirations of billions of people remain unmet and levels of poverty are rising in some regions. The system fails to provide the level playing field which is the *sine qua non* for a true market economy. Multinational corporations enjoy unprecedented freedom from national accountability in a wild west of globalization. Mergers and acquisitions are restricting competition on a global scale. The present system also fails to effectively utilize financial capital for the welfare

of society. Today, the supply of money is superabundant but only a small portion of it is utilized for productive investment. Out of approximately $250 trillion in global financial assets, probably less than 20 percent is actively engaged to support the real economy.

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However impressive today's achievements by historical standards may be, they fail to impress when compared with the magnitude of unmet needs and underutilized capacities. All these failings are symptoms of an economic system increasingly divorced from human needs and the welfare of society. Financial markets which are intended to serve and support development of the real economy have become autonomous and increasingly divorced from it. The unbridled application of new technologies has created a rapidly widening gap between production and employment at a time when welfare systems have been cut back and individuals possess no alternative means of meeting their consumption needs. Economic activity is increasingly threatening the security of individuals, the stability of society and the sustainability of the planetary environment.

Perhaps the most compelling argument given in support of the existing market economic system is that it is better than the known alternatives. There was a time when it could well be said that monarchy was better than the alternative of a politically divided system of independent feudal barons or when the introduction of coinage represented a considerable advance over barter. That has been true of thousands of social advances in the past, each of which in turn has been eventually superseded by something better.

The deep appeal of the market economic system stems from its association with universal human values. The market is a compelling symbol of freedom, self-reliance, individuality, innovation, and creativity. By eliminating the intervention of self-enriching, tyrannical monarchs, it presents itself as the democratization of economy. Basing itself on universal principles, it purports to be guided by the social equivalent of the universal laws of nature discovered by science that govern the natural world.

The intellectual appeal of neo-classical economic theory is a mirage founded on prevailing myth and profound misconceptions which prevent intelligent debate. The market economy is not a phenomenon of nature but a creation of humanity. It is not founded on immutable universal laws, but rather on principles and rules formulated by human beings to serve specific interests, which continuously shift over time. The market economy is not a construction of God or Nature. It is a social construction of reality and our understanding of it is powerfully influenced by socially constructed ways of thinking. In quest of a natural science of economy,

the Newtonian equivalent of the laws of motion, Economics is based on the conception of a mechanized, clockwork system miraculously independent of the consciousness of the human beings by whom it has been fashioned, who formulate the rules by which it is governed, and who make the countless decisions by which it functions. We attribute almost mystical powers to the market to rationally maximize efficiency and human welfare with impartial equity and justice for all. But these powers are largely mythical. The notion of markets as impartial, unbiased, independent playing fields is a fabricated illusion.

Markets as they function today are not rational, fair, equitable or efficient, and they certainly do not maximize human welfare. The notion of fairness and equity is undermined by patent and copyright laws, which according to *The Economist,* accord rights far beyond what has been proven to be socially beneficial.[4] It is distorted by uncompetitive monopolistic practices, excessive consolidation of industries by M&As, and tax policies that favor capital investments or employment of people and the wealthy over other income groups. It is subject to powerful influence by the lobbying of vested interests, the temptations and allurement of corrupt politicians, and biased procurement practices. It is biased by the rent-seeking of a plethora of privileged communities, including licensed professionals, which permeates the entire policy environment governing the operations of the market. For instance, an artificial constraint on the number of medical school seats in the U.S., which has remained flat from 1980 to 2006 despite a 37% increase in the population, allows doctors to extort higher prices from middle class Americans.[5] *The Washington Post* recently drew attention to the obscure example of dentists in the USA who have exercised their influence to maintain monopolistic prices more than twice the market level on non-medical practices such as tooth whitening.[6]

The efficiency of markets is largely a question of one's definition and book-keeping. Markets do indeed encourage efficient means of production when narrowly defined at the level of the firm. At the same time they foster socially wasteful competitive activity and generate huge social costs, which are treated as externalities. The bias for capital and energy-intensive technologies over labor is not a law of nature, but rather a consequence of policies that incentivize capital investment, tax labor, price energy far below its true replacement cost, and ignore the true social costs of pollution. While the firm may maximize efficiency by replacing labor with machinery, society as a whole incurs enormous financial and social costs resulting from rising levels of unemployment and underemployment, poverty, crime, physical and mental illness, social alienation and violence. A study by Randall Wray in the USA estimated that the social costs of rising levels of unemployment equal or exceed the direct cost of employing people.[7]

As economist and former investment banker Tomas Björkman points out in his forthcoming book *Market Myths*, our adherence to orthodoxy prevents us from seeing the glaring gaps between the myth of the market and the highly unrealistic assumptions on which the neo-classical economic model is constructed, on these theoretical models and the actual way in which markets work, and on the way markets work now and alternatives that could be created while remaining within the framework of market economies.[8] Economists are so preoccupied with understanding the minuscule characteristics and idiosyncrasies of the

present system that little thought is directed toward questioning the basic premises on which it is based or on exploring more attractive alternatives.

Economics is still governed by a mythical concept of market equilibrium. If markets tend toward equilibrium, why is economic inequality rising to historically high levels? Why have multinational corporations consolidated domination of one global market after the other? Why has oil soared to $150 a barrel and then fallen to $30 a barrel within a short period of time? Why do financial and property markets swing so widely from one extreme to another? Why do central banks have to suppress irrational exuberance and then try to stimulate higher investment and consumption? Why is unemployment rising inexorably in spite of the dismantling of protective labor legislation in many countries? The Newtonian conception of a world in equilibrium was rejected by physicists a century ago. Today it is universally accepted that we live in an evolving and rapidly expanding universe. The conception of eternally static forms of life was replaced by Darwin's conception of biological evolution in the 19th century. The startling speed of scientific and technological evolution is too blatantly apparent to require illustration. Yet economic theory clings to a concept of static equilibrium by externalizing the powerful forces compelling the rapid evolution of the entire global political, economic and social system.

It is understandable that the wealthy, the corporate sector, politicians dependent on them and central bankers obeying narrow constitutional mandates should cling to the present dogma and endeavor to hold it above scrutiny or reproach. But that does not explain why the vast majority of economists engage themselves in analysis and tinkering rather than in-depth questioning of the underlying premises and efforts to conceptualize a better alternative.

4. Evolution of Human-centered Economics

Society evolves by a progressive organization of human activities to an increasing extent in space and time, with increasing coordination between its myriad activities and increasing integration between the multiple layers of the social fabric. The market is an extraordinary product of human ingenuity, a social organization capable of managing inconceivable and ever increasing levels of interconnectedness and complexity with ever greater velocity and precision. Yet it is only a form of social technology. Like democracy and other forms of social technology, *its value depends on the central purpose for which it is applied, the values by which it is guided and the principles on which it is founded.*

The failings of mainstream economic theory recounted above are really minor in comparison with its most fundamental flaw—deviation from its central purpose. Social institutions are created to serve society. That is their rightful claim to legitimacy. Yet they have a nearly irresistible tendency to diverge from that intended purpose over time, as the church, the state, the military and other institutions have so often done. Like other institutions, the market has veered from the intended purpose which Smith extolled and has been diverted to serve powerful vested interests. That purpose can and must be restored. It may be argued by some that markets have always functioned in this manner subject to the same distortion, just as governments have always served the interests of an élite, regardless of their proclaimed

ideals. This is indeed the case, but does not weaken the justification for rectification. Just because every democracy has failed in its pursuit of liberty, equality and justice for all, that does not justify the *status quo*. Rather it calls for evolutionary or revolutionary action to realize the original ideal.

What is needed now is nothing less than a Copernican Revolution in Economics to liberate our minds from the myths, illusions and misconceptions on which current theory is founded. But this should be a revolution in reverse. Copernicus challenged the anthropocentric, geocentric conception of the physical universe that grossly distorted and exaggerated the place of earth and humanity in the universal scheme of things. Instead, he projected a heliocentric perspective that placed earth as a mere satellite of the sun, a tiny dot in an infinite universe. Humanity was dethroned from its place at the center. It was a humbling experience for God's chosen. In contrast, the prevailing economic model perversely positions the market, money and technology at the center and places the interests of humanity at the periphery. Its goal is to maximize economic activity, not human security, welfare or well-being. It thrives on unlimited consumption and mindless ecological destruction. It maximizes accumulation of wealth among a few, rather than dissemination of economic welfare among all. It worships illusory Gods of the market and attributes unassailable wisdom to blatantly flawed processes. *Reversing the model, we need to reposition human beings at the center of economic theory and conceive of a market system that will maximize the freedom, security, and welfare of all people.*

The choice is not simply between regulated and self-organizing free markets. Self-organizing markets are rarely or never free. The self-organizing character of the Internet does not prevent a few giant firms from controlling an increasing share of all web traffic and revenues. Free markets exist and only exist within the structure provided by democracy, rule of law and regulatory authority. Regulations that enforce rules of law, fair practices, humane standards and prevent monopoly are essential to the operation of a market economy. But that does not mean that direct regulatory intervention by government is required for the smooth functioning of every market. Much can be done by ensuring the laws and rules governing the operation of markets are fair and equitable.

A historical perspective on the origin and development of current laws and practices will make evident that other social forces have continuously intervened to distort the workings of the market in favor of the privileged and powerful. That is why a true science of economy has to be founded on a science of society which comprehends the sources of social power and the means by which the rightful exercise of that power is diverted to serve the interests of a privileged class.

The debate between public and private good is misconceived. *Markets are founded on fundamental principles of human relationship and social organization.* All knowledge, all wealth, all discovery and invention are the product of collaboration between enterprising individuals and the communities in which they function. *There can be no optimal private good for all individuals in this world without simultaneously optimizing the benefit to society as a whole. Every individual achievement is founded on the cumulative achievements of all*

humanity over millennia. Digital computing today owes its astounding accomplishments to invention of the zero, Hindu numerals and decimal place by Indian mathematicians more than 1600 years ago and their transmission by Persian scholars some four centuries later. Nothing can be thought, expressed, invented or produced without drawing on that universal reservoir of social wealth. So too, there can be no social advancement, discovery, innovation or creativity without the aspiration, inspiration and invention of creative individuals.

Markets have evolved from rudimentary origins in the distant past. In addition to growing in scale, diversity and complexity, they have also become more equitable and humane over time. There is no reason to think that the present system is the most just and perfectly attainable. Rather there is every reason to believe it is a partial and highly imperfect form of a social system with immense potential for further evolutionary advancement. The increasing concentration of wealth today and divergence of money from the real economy impose severe constraints on the further development of economic prosperity worldwide. Democracy has proven a far more powerful and stable form of government than any monarchy because it enables every citizen to enjoy political rights and freedoms. So too, market economies can only fully realize their potential for wealth generation when they create opportunities for all citizens to productively contribute and enjoy the benefits of society's labors.

Social systems evolve along multiple dimensions. The quantitative capacity, geographic reach and speed of operation of every system are a function of organization and technology. The qualitative values they manifest are a function of conscious awareness, choice and political will. A human-centered science of Economy needs to reexamine the purpose, values and principles on which the market economy functions to optimize its capacity to meet human needs, promote human welfare and foster human evolution.

5. Money

What is true of markets is equally true of money. Conventional economic theory describes the function of money as a means of exchange, unit of account and store of value. But this oft repeated formula fails to describe the reality of money or to adequately explain its remarkable powers as a catalyst for economic, social and human development. A fuller understanding of the reality of money reveals the enormous scope for more effectively harnessing its creative powers to promote economic and social welfare. Its most fundamental contribution is to human psychological development, which is the ultimate aim of civilization.

5.1. Money as Organization

The power of money arises from the fact that it is a social organization in the same way language, market and the Internet are social organizations. Language is an organized system of letters, words and sounds. The words we use have no intrinsic value other than the value we assign to them by social convention and psychological association. The power of words arises from the fact that they carry a commonly shared meaning. If each person had his or her own language, it would be useless for communication with others. The more widely a language is shared, the more powerful its words as a medium of communication. Social convention rather than intrinsic value makes words powerful.

The same is true of money. Most people regard money as a thing, even though most of the money we utilize today no longer takes the form of a tangible object. Money is not a thing in itself. It is a social convention for harnessing and organizing the power of human relationships which derives its power from the fact that the convention is shared. The development and acceptance of a common convention and standard of acceptability of money have evolved over many centuries. That convention is made possible by the institutions that issue it in standardized forms; the laws that govern its issuance, acceptance as legal tender and the rights of ownership; the procedures and mechanisms for its transference, transport, storage and convertibility; methods of accounting for it, lending and borrowing, etc.

The power of money arises not from any intrinsic value of its own, but from the complex social organization which supports its creation and utilization. The utility, productivity, use value and social power of money derive from this organization and can be multiplied without limit by enhancing the quality and reach of that organization. The wider the population covered and the greater the quality, reliability, trustworthiness and accountability of that organization, the greater the power of money. Thus, we see in times of financial uncertainty and political unrest that the value of money can shrink dramatically and even collapse altogether.

Money is a social organization consisting of an intricate network of tangible social agencies. But the reality of money is confined to its external form, structure and economic function. Money is also an intangible social institution that transcends the finite boundaries of the organizations through which it is created and operates. It is governed by informal social practices and conventions, social values and acquired rights, social influence and power that enhance its utility but are not limited by that utility. The hallmark of great speakers is not confined to their vocabulary, the content of their messages, clarity or strength of voice or correctness of grammar. It arises from a sense of trust, confidence, credibility, sincerity, conviction, courage, strength of personality, logical coherence, idealism, insight, inspiration or other intangible qualities conveyed through the act of speaking. These intangible factors can and usually do exert a far greater influence than the verbal content of the message conveyed. Thus, Churchill, Mahatma Gandhi and Martin Luther King attracted crowds in the hundreds of thousands and stirred entire nations to act on their words.

The same is true of money. The real power of money derives from the subtle fabric of society which is an unlimited reservoir of knowledge, energy and capacity for creativity and wealth-creation. Money is a subtle force. Like knowledge, it multiplies when it is shared, as Google has grown exponentially to become the most valuable company in the world based on a core strategy of free services to the global public. The immense creativity released since the advent of the Internet two decades ago reveals only the tip of the iceberg of the creative social potential which lies unperceived and unutilized. It was an understanding similar to this that prompted US President Franklin Roosevelt to address the American people on radio as soon as he assumed office in 1933. The country was in the midst of an unprecedented nationwide financial panic that had already led to closure of more than 6000 banks. Nothing FDR had learned studying Economics at Harvard prepared him for handling a crisis of this magnitude. None of the conventional policy instruments applied by President Hoover during the previous three years had been effective. Roosevelt understood that the real foundation of the banking

and monetary system was psychological and social. The value of money depends on public trust in the system, the government and the underlying economic system. In his address, he recounted to his audience the great strengths of the American people—their courage, enterprise and ingenuity. He attributed the bank failures to the cancerous spread of fear among the public, which he urged them to reject. He called on his fellow countrymen to act with courage and faith in their nation, by redepositing their hard earned savings in the bank. The following week the panic subsided and the banking system was saved.

"The New Deal humanized capitalism."

Crises arise from opportunities that we are unable to absorb through appropriate social organization, either because the existing system is inadequately developed or because entrenched forces powerfully oppose progress. The Great Depression was not essentially a financial or economic crisis. It resulted from the resistance posed by outmoded institutions and vested interests to a great evolutionary social transition. The New Deal humanized capitalism. It marked a new phase in social evolution, leading to unprecedented growth and prosperity.

5.2. Money as Symbol

Organization is an immense power for social productivity. But the power of money does not issue solely from being a social organization. Money is also a mental symbol and symbols possess an extraordinary power of their own that multiplies the power of organization. A 2015 report rated the value of the Apple brand at $170 billion and as the most valuable in the world.[9] The company's logo of an Apple with a bite taken out of it is a symbol that represents not only the company, its products and financial assets, but all the energy, creativity, innovation, glamor and prestige associated with it. Apple products are a status symbol. A job at Apple qualifies one as a member of an élite group of hi-tech professionals. To sit on the Board or Management Team of Apple opens closed doors around the world. The CEO of Apple can meet any monarch or head of state, even the UN Secretary General or the Pope, just because of his position.

What does money symbolize? At the most basic economic level, money is a symbolic representation of all those things—products, services, technologies, physical and intellectual property, companies, and other forms of capital, etc.—for which it can be exchanged. At a deeper level it symbolizes the economic capacity of the nation that issues and honors it—the natural resources with which it is endowed, the education and skills and enterprise of its people, its physical infrastructure and industrial capacity, etc. Still deeper, it represents the degree of public trust and confidence in the stability of the society and its government, the strength and integrity of its political institutions, its capacity for self-defense and self-preservation, the quality of its educational system, its aptitude for innovation and invention, the value it accords to human life and individuality, its legal protection of property and other rights, and the prevailing cultural values such as those related to freedom, integrity and hard work. The American dollar is accepted today as a *de facto* world currency because it is regarded as a symbol not only for the enormous wealth, resources and productive capacities

of its economy, but also for the energy, social organization, individualism, creativity and freedom on which American society is based.

Symbols such as the national flag, the President's seal of office, an Academy Award, Nobel Prize, the policeman's badge, a PhD or MD from Harvard or Cambridge carry far more than utilitarian functional power. The world listens to Nobel Prize winners when they speak, even on subjects for which they have no educational or intellectual qualification. Consumers buy perfumes, watches, designer garments, and sports cars because of the actors and sportsmen depicted in advertisements. Symbols exercise an influence far beyond their utilitarian value.

As a symbol, money can be used to represent many other things, including virtually every type of product, service and material or immaterial asset that is available for purchase or sale in the world. Money also represents other social powers, the capacity for transport and communication, access to education and entertainment, influence over politics, legislation and administrative decision-making, legal recourse to enforce or defend one's rights. Possession of money also carries with it an intrinsic power to access and attract more money. The more money a person has, the more likely it is that others will entrust one with more money. Moreover, the mere possession of money imparts social importance, respect, acceptance and influence over other people which is inherently productive. In combination these powers not only make money valuable and productive, they also make it extremely creative. Money has the capacity to create new opportunities and circumstances, to bring together and combine people, resources and organizational capabilities in innovative ways, to promote the discovery of new knowledge and development of new technologies.

None of these symbolic powers of money is adequately described or explained by conventional economic theory. Nor are they effectively harnessed and utilized for public good by the application of conventional economic policy. But, all of them contribute tangibly and immensely to the productivity and catalytic role of money and its capacity for multiplication and self-multiplication. Only when the subtle nature and deeper powers of money are fully taken into account can the creative capacities of this unique social institution be fully leveraged to maximize human welfare and well-being.

5.3. Human Value of Currency

But the real value of money cannot be effectively judged in any of these terms. The true value of any economic or other social system must be weighed in terms of its capacity to promote the security, welfare and well-being of its people. Similarly, markets should be valued in terms of their capacity to stimulate production and promote mutually beneficial exchange between individuals, organizations and nations. So too, the value of money lies in its role as catalyst to facilitate, accelerate and maximize the harnessing of all available social resources for the betterment of humanity. A monetary system that promotes the security and welfare of a few is no better or fairer than a political system that reinforces the power and privilege of an authoritarian party, a military dictator or an aristocratic class.

The real value of money must be judged in terms of how effectively it serves the fundamental purpose for which it and all other economic institutions have been created—to

promote and ensure the welfare and well-being of people. The real value of money cannot be judged in terms of what it can buy. The real value of currency is its human value in service of humanity. By that standard, money, like markets, dismally fails to live up to its social mission. As markets are distorted and biased in favor of the economically and politically powerful, the functioning of money in modern society is subject to a wide range of overt and subtle influences that distort its functioning, impact and influence.

The social power of money to legally and illegally influence public elections, government legislation and administrative policy decisions is universally prevalent to varying degrees. It is utilized to influence government spending and subsidies, tariff barriers, export and import policies, patent and copyright laws, rates of taxation on incomes and payroll, capital gains and wealth tax, defense spending, and environmental protection, to name only a few. It explicitly or implicitly determines the actions of central bankers to favor stability of present wealth over policies to stimulate new wealth, job creation and equitable distribution. It skews public policy in favor of technology and energy-intensive investments rather than human capital-intensive investments. None of these influences are taken into account in a narrow consideration of money as an economic tool. But all of them powerfully influence the ultimate impact of economic policies and activities on human welfare and well-being. A right understanding of money can enable nations plagued by corruption to convert the destructive power of mafia into constructive energies for nation building, on the same principle that inoculations and vaccinations are used in medicine to generate a protective immune response and the repeated assault of viruses and identity theft on the Internet have been used to dramatically elevate the overall level of Internet security.

5.4. Signals

Recognition of the wider role of money in society complicates immensely the attempt to reduce Economics to a set of universally valid laws, policy prescriptions and quantitative equations. But efforts to filter out the real complexity of money represents a striking example of what Herbert Weisberg refers to as 'willful ignorance.'[10] The character of willful ignorance is to collapse reality into a simplistic, manageable set of assumptions detached from the real world and therefore incapable of effectively managing its complexity and uncertainty. Tomas Björkman came to the same conclusion about the models of the market which only vaguely resemble the real world and are most definitely not the only possible or best system we can conceive of.

There are abundant symptoms today of the distorting and confining influence of prevailing economic concepts that prevent us from perceiving, comprehending, seizing and harnessing the fuller productive powers of the global community to promote human welfare.

1. *Multiplication of Financial Assets:* According to McKinsey, global financial assets have risen 12 fold from a mere $12 trillion in 1980 to about $225 trillion in 2012. Real Gross World Product grew only fourfold during the same period.

2. *Financial Instability:* According to the International Monetary Fund, in the four decades between 1970 and 2010, there were no less than 145 banking crises, 208 monetary

crashes, and 72 sovereign debt crises around the world. This adds up to an astounding total of 425 systemic crises—an average of more than 10 countries in crises each and every year!

3. *Global Savings Glut:* Although Ben Bernanke alluded to it in 2005 during his term as Chairman of the US Federal Reserve, other economists have been quick to dismiss the notion that there is a glut of money in the world today. He attributed the steep rise in real estate and other asset prices to global surplus savings that are in excess of investment. The onset of the global financial crisis in 2008 lent greater credence to this assertion. While many other explanations have been offered for this phenomenon, the essential fact is that abundance of wealth generated over the past 35 years is not being optimally utilized to enhance the welfare and well-being of the world's people.

4. *Rising Inequality:* One obvious reason is the increasing inequality in the distribution of wealth and income globally during this period. Increasing concentration of wealth at the top among those whose consumption needs have already been met to saturation has the minimum impact on growth in global demand for investment in productive assets. This is also associated with rising levels of unemployment globally. In demand-short economies, the greater equity achieved through more progressive taxation means more spending and fuller employment of resources.

5. *Unemployment:* Rising levels of unemployment globally is another indication that the money is not being productively employed. Today there are upwards of 200 million people unemployed and more than a billion are underemployed globally. This figure grossly underestimates the real deficit. Alternative measures of labor force participation rates in the USA indicate the rate of underemployment is at least double the unemployment rate.[11] According to ILO, the number of working-age individuals who did not participate in the labour market increased by some 26 million to reach over 2 billion in 2015. Vulnerable employment accounts for 1.5 billion people, or over 46 per cent of total employment. In both Southern Asia and sub-Saharan Africa, over 70 per cent of workers are in vulnerable employment. Underemployment reaches as high as 75% in some countries.[12] In a world with rapidly expanding population and a few billion people at or below the poverty line, there is an ever increasing need for basic goods and services and rising number of people eagerly in search of work opportunities to generate the incomes needed to obtain them. The mismatch between surplus money and productive capacity and unmet human needs signals a dysfunctional financial system. Under these circumstances, greater equity achieved through more progressive taxation would result in more spending and fuller employment of both human and financial resources.

6. *Global Casino:* Another reason for the global savings glut is the rapid growth of global casino capitalisms following deregulation of banking in the 1990s. This was supported by the fact that companies with strong profits and cash flow accumulated huge cash hoards, rather than increasing investments for business development.

7. *Divorce of Financial Markets & Real Economy:* Foreign currency exchanges exceeded $5 trillion per day in 2015, fourfold higher than they were 20 years ago.[13] It has

been estimated that only 2 or 3 percent of these fund flows is related to real trade or investment; the remainder 97% takes place in the speculative global cyber-casino.[14] The real economy thrives on stable, predictable price levels and stable sources of long and medium term investment. Financial markets have become increasingly divorced from the real economy. An increasing proportion of capital is circling the world in search of speculative returns unconnected with the real economy. Originally established as an effective means to pool the huge amounts of capital needed to support international commerce and industrialization, today computer driven financial markets specialize in leveraging minute differences in prices for fractions of a second. Hedge funds place huge short term bets on exchange rates and asset prices, leading to increasing instability. After deregulation even banks enjoying the support of the central bank joined the bandwagon. As Stiglitz observed recently, "When banks are given the freedom to choose, they choose riskless profit or even financial speculation over lending that would support the broader objective of economic growth."[15]

8. *Rising Forex Reserves:* The steep rise in global foreign exchange reserves is another indication of a system functioning in highly unstable conditions. Total forex reserves were in excess of $21.7 trillion in 2014 compared to $2.1 trillion in 2000.* Countries are compelled to hold higher levels of reserves as protection against the increasing instability and uncertainty of the global market economy.

9. *Negative Interest Rates:* Money represents productive capacity and social power. An economic system that cannot productively employ the available money to promote economic security, welfare and well-being for all is inherently inefficient and ineffective. In turn, if money does not serve this essential social purpose, then it loses value. One result is the price it attracts in the market place. Today interest rates are negative in economies which account for 25% of global GDP, including Japan, Switzerland, Sweden, Denmark and the Euro area.[16]

5.5. Money Myths

The market myths Björkman highlights are not the only myths in town. The gap between our conception of monetary systems and the way they actually work is as great as that which separates economic models of the market from the real world. The gap between the way they work now and better alternatives is equally wide and comprehensible, once we break the conceptual barrier—Canadian Mathematician William Byers' 'blind spots'—that prompts us to cling to distorted images of reality instead of discovering the real thing.

Most of the essential recipes for a more human-centered monetary system are already well known and debated. A tax on short term speculative financial transactions will encourage rather than hamper stable, longer term investments in the real economy. That will help stabilize financial markets which are hypersensitive and unpredictable. A progressive capital gains tax inversely proportionate to the period of investment would have a similar impact. Eliminating the payroll tax and replacing it with a tax on energy will shift the investment

* See World Bank http://data.worldbank.org/indicator/FI.RES.TOTL.CD

curve from technology to people, removing the artificial bias caused by accelerated depreciation. Reinstitution of progressive income tax rates will support policies conducive to more equitable distribution. Negative interest rates will be a stimulus to both consumption and investment. And so forth.

> *"Only when we have the intellectual honesty and courage to squarely confront the truth about money and markets can we hope to change the system."*

A more serious objection to reform of monetary systems is the opposition of vested interests and the power of plutocracy, which present serious barriers to reform. The misuse of social power is indeed a real impediment to policy initiatives as it has been throughout history. But that is no excuse for preserving the illusory notion that the present system is either equitable or the best possible. Only when we have the intellectual honesty and courage to squarely confront the truth about money and markets can we hope to change the system. It is time to lift the veil that conceals the underside of society behind the façade of economic theory. Therefore, the concluding section of this paper turns to address the deeper reality so often ignored during discussions of economic theory and policy—the reality of social power.

6. Social Power

A rational assessment of the present political, economic, social system needs to be founded on an understanding of the underlying reservoir of social potential, how it is converted into effective power, how that power is distributed and how the special interests skew its distribution and usurp that power for private gain. It is thus necessary to develop a vocabulary that distinguishes between the unstructured field of energetic *social potential*, the organized structures and activities wielding *social power*, and the informal mechanisms, both legal and illegal, that result in vast *social inequalities* in the distribution of power and the benefits it generates.

6.1. Social Potential

To truly understand the role of social power, we must look beyond the structures and systems that define the formal organized institutional framework of modern society to the infinite reservoir of creative social energies, knowledge, resources and opportunities which represent the zero-point energy field from which all social constructions and achievements emerge. Because it lacks structure, this intangible field of political, economic, social, cultural and psychological energies is difficult to perceive, define, grasp and manage, therefore it is largely neglected by the social sciences which thrive on definition and measurability. Yet this reservoir of power is the source and driving force for social development and evolution and its power exceeds that of the formed society to the same extent as the foundations of an iceberg hidden below sea level exceed the proverbial tip visible on the ocean's surface. This unstructured amorphous field of society is an inexhaustible reservoir of social potential.

In practice, we are able to grasp the magnitude of that social potential only after it is organized and assumes the form of a social structure. Before the Sears mail order catalog in the 1890s, no one conceived that a company could become the world's largest retailer without operating a single retail store. A century later Amazon repeated that achievement for book retailing in cyberspace, and e-Bay created the first global store in which every consumer can become a merchant. Until Bank Americard morphed into an international credit card system called Visa International a half century ago, no one imagined that electronic credit card transactions could ever replace currency as the dominant medium of exchange. Today global credit card transactions exceed $12 trillion annually. Before Über, no one conceived that a global alternative to local taxi services could be created almost overnight by harnessing the vast unorganized reserve of private cars and car drivers with time to spare and the need for extra cash. Before AirBnB, building a global hotel chain required decades and tens of billions of dollars' investment, because no one conceived that vacant rooms in private homes around the world could be woven in a few years into a global network. Imagine a system that can effectively harness a portion of the world's unemployed and underemployed and you begin to grasp the magnitude of the social potential waiting to be organized.

6.2. Social Power

In its widest sense, social power is the capacity of the society to achieve the goals and aspirations of its people. Social power is generated by releasing, directing and harnessing social energies for effective action by creating effective laws, social systems and institutions to organize the diffused energies. Thus, ten thousand years ago migrant tribes of hunter-gatherers evolved into settled communities by adopting a new organizing principle for obtaining food—agriculture. Minute observation of the processes of food production in Nature led them to comprehend the essential role of seeds, water, sunlight, soil and season in food production. They reorganized the entire life of the community to replicate and culture these natural processes. The resulting gains in productivity enabled the world's human population to multiply tenfold.

Social power expresses as the power exercised by individuals. It is the quantum of power an individual can draw from the society as permitted and supported by formal rights, laws, rules and social systems and by informal institutions, customs, usage and values. Each new technology such as the cell phone, each new freedom such as the extension of voting rights, each new law enhancing social security and equality magnifies the power of individuals and of the society as a whole.

Today global society possesses unprecedented and ever expanding power. That power takes innumerable forms: such as the power for transport, communication, production, exchange, security, governance, education, entertainment, research, invention, discovery and creativity. Over the past half century humanity has witnessed an exponential growth of many forms of social power. Democracy, human rights, rule of law, open markets, entrepreneurship, scientific discovery, technological innovation, globalization, higher education, and access to information have been major drivers of this growth. These gains have led to significant progress in enhancing human security, welfare and well-being, but *the progress has not been*

commensurate with the potential, because the distribution of the power generated is skewed and biased to favor small economic and political élite.

6.3. Social Equality

Effective power refers to the actual way in which total social power is exercised so as to determine who benefits by it and in what measure. There have always been vast inequalities in the way social power is distributed among the population. In 1880 the 29 greatest British landowners possessed enormous estates. They all had titles; 12 of them were dukes. Fourteen owned more than 100,000 acres each. The Duke of Sutherland, whose holdings were largely in the Scottish Highlands, had well over a million.[17] In addition, this small group occupied the top positions in government, the military and the church. Until 1918, only substantial land owners were permitted to vote in elections. Even long afterwards tenant farmers throughout the country were under obligation to vote for the candidate of their lessee's choice. The higher education needed for social advancement and to gain entry into the seats of power was largely confined to the upper classes. English women only acquired the right to vote in 1932. Needless to say, rights of their overseas colonists were even more limited.

Historical evidence confirms that the greatest social power is generated and the greatest social welfare achieved when the benefits of social advancement are widely and equitably distributed. Modern democracies are far more politically powerful than the monarchies and feudal societies of the past because they are able to more effectively release, direct and channel the energies of their people through freedom and rule of law. Similarly, market economies achieve greater productivity and wealth creation by empowering a much wider section of the population to freely and productively engage in commercial activities.

By historical comparison, the sheer power and productivity of the current market system far excel all previous economic systems. But when the restraints on distribution of social power are fully taken into account, it becomes evident that the present system is far from optimal. There is a vast gap between the total magnitude of social power and the results it generates in society. Vast inequalities in the distribution of social power impact on total social power in the same manner as vast inequalities in the distribution of income and wealth limit the total wealth and prosperity of society. The greater the equality of distribution, the greater the total power generated and the greater the overall benefit to society as a whole. The total effective power of democracy far exceeds that of earlier forms of governance. So too, the dynamism of the market far exceeds that of centrally planned economies. By the same token, a more equitable distribution of social power would dramatically enhance the overall effective power of society to fulfill the needs and aspirations of its citizens. It is noteworthy that since the collapse of communism, economic theory has remained remarkably silent on this issue, as if the subject were taboo.

The world today has the capacity to provide high quality education to every human being, yet access to education and educational attainments remains far lower and the unequal distribution of wealth is a major reason. The same is true for nutrition, healthcare and other critical needs. Björkman argues that these inadequacies arise from the way in which the

market system is being utilized rather than an inherent insufficiency in the system itself. The same basic system can be restructured to generate very different results.

"The greatest strength of democracy is its capacity to foster the development of individuality in its members."

Today the barriers to social equality are prodigious. They take the form of laws and public policies consciously skewed in favor of vested interests, informal support of government for big business, powerful lobbying groups influencing legislative agendas, the influence of money power in elections and consequently on tax policies favoring the rich, along with more overtly illegal forms of corruption and crime that usurp public power for private benefit. Today more than one hundred countries function under the rubric of democracy, yet they vary enormously in the manner in which they elect officials, protect human rights, empower individual citizens, enforce rule of law, legislate and execute policies, etc. A plutocracy or oligarchy masquerades as democracy in some places where huge amounts are spent legally or illegally influencing the outcome of elections. In others a corruption of political power confiscates public wealth for private purpose. Law too preserves an unequal playing field in the form of tax loopholes for the rich, extended patent and copyright privileges, and countless other distorting influences. None of these distortions are essential to the functioning of democracies and market economies, but they have an inordinate impact on the social consequences of the way the systems operate. Yet they are largely ignored and unnoticed.

The distribution of social power has been radically altered over the past few centuries. Monarchy has given rise to democracy, slavery has been abolished, feudalism and serfdom have disappeared, imperialism and colonialism have been supplanted by national self-determination, women and minorities have made great strides toward more equal rights, the blatant aggressive exercise of superior military power—once prevalent throughout the world—has lost legitimacy and is in the final stages of decline.

Historically, all progress has been through violence. Democratic revolution shifted power to the people. Radical shifts in social power have been the result of violent revolutions as in America, France, and Russia and wars of total destruction as the American Civil War, the two world wars and wars of national liberation. It is only during the last seventy years that we have witnessed peaceful social revolutions of enormous magnitude, as in America's New Deal, India's Freedom Movement, the American Civil Rights Movement, the end of Apartheid, the fall of the Berlin Wall and collapse of the Soviet Empire. Still the threat of violence loomed as a very real force threatening to burst through if peaceful means proved ineffective. Fear of communism was a powerful motive for the humanization of American capitalism under the New Deal.

Thus, the violence avoided by Gandhi burst forth as communal conflict immediately following India's Independence. The Occupy Wall Street Movement of a few years ago is only a reminder that the further distribution of social power is an evolutionary compulsion that is inevitable. The collapse of communism resulted in a temporary lull in the pressure for

social equality, enabling reactionary economic thought to regain respectability. But this lull can only be temporary and when the next reaction comes it is likely to be far more powerful and effective when freed of the obvious limitations of authoritarianism that undermined the credibility of communism.

> *"Economies thrive in the measure they release the energies of their people, channel them in productive activities, and develop the capacities of their members to contribute productively, dynamically and creatively."*

Today powerful vested interests violently support widening economic inequality, which is a legalized violence of the rich and powerful which has to be outlawed to enfranchise all. Historical precedent is no justification or rational basis for the future persistence of social injustice. It is time for economic science to fully acknowledge and impartially examine the underlying fabric of social forces and processes governing the operation of economy today.

7. Human-Centered Economics

What is Economics? As Political Science is conventionally described as the science of governance, Economics has been traditionally conceived in terms of production, exchange and consumption of goods and services. But it is evident that these descriptions are far too narrow and self-limiting to reflect social reality today. Governance today relates to the entire gamut of human needs and aspirations, from securing the nation's borders and the physical security of citizens and their property to upholding individual rights, promoting social harmony, meeting minimum needs, developing the economy, managing the national currency and budgets, ensuring economic opportunity and security, safeguarding and improving public health, providing quality education, protecting the environment, and countless other activities designed to promote the greater welfare and well-being of all its members.

Democracy is the best means so far developed to accomplish these myriad objectives and it has proven immensely more successful than feudalism, monarchy, military dictatorship and other forms of authoritarianism. At its core, the objective of modern democratic governance is to guarantee basic rights and foster the fullest possible development of the potential of every citizen. Democracies thrive in the measure they are successful in releasing the energy of citizens and providing them with the knowledge, skills, organizational infrastructure and conducive atmosphere needed for their free, full and creative expression. The right to vote and choose a representative government of, for and by the people is a mechanism developed to achieve maximum protection of human rights and equality before the law. But, ultimately, the accomplishments of democracy depend on its capacity to not only protect and permit but also to actively support and foster the fullest possible development of the capacities of each individual.

The great humanistic psychologists of the later 20th century described the self-actualizing individual as a person able to think for oneself, choose for oneself, rely on one's own capacities, and act freely to realize one's highest aspirations, while respecting and supporting the equal rights of others and accepting the responsibility to contribute to the security, welfare, well-being and fullest development of the entire community. This conception of mature individuality contrasts with the much narrower, one-sided individualism embodied in the phrase 'every man for himself.' The greatest strength of democracy is its capacity to foster the development of individuality in its members.

By extension and necessity, the ultimate purpose of Economics must be the same. Although focused on the economic dimension of human activities, economy permeates and exerts a powerful determinative influence on every aspect of social existence. Freedom has little meaning in a country where people lack economic access to food, housing, mobility, information, education and other goods and services. Freedom without job opportunity and an ensured source of income is like dangling a carrot in front of a horse just out of reach. Economies thrive in the measure they release the energies of their people, channel them in productive activities, and develop the capacities of their members to contribute productively, dynamically and creatively. Here too, individuality is the key. It is the very essence of the entrepreneurial spirit that manifests in the capacity to think and act creatively with self-confidence and courage in pursuit of unrealized opportunities.

The individual plays a unique role in the development of society. Individuals are the birthplace of the rising aspirations, creative ideas, inventions, organizational innovations and dynamic initiatives that characterize a vibrant productive society. The individual is the most precious form of capital any society possesses and the source of its highest achievements. A truly human-centered science of Economics dedicated to the fullest promotion of human welfare and well-being reaches maturity when it conceives and supports measures designed to promote the greatest well-being and blossoming of individuality in all.

Individuality is the basis and ultimate source of social power. Social power is a measure of individual empowerment. Confiscation and seclusion of power as in income and wealth inequality and high unemployment disenfranchise and disempower both the individual and the society. A true science of economy must encompass these wider social and psychological dimensions.

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The Market Myth

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Abstract

The Market can be understood as a self-organizing system that is constantly evolving. Like all social institutions, it is governed by principles and rules created by society, not by any universal laws of nature. If it does not work the way we want it to, we have the power and freedom to change its rules. However, prevailing notions about the market are veiled in myth. Many have argued that there is a vast gap between economic models of how the market is assumed to work and how it actually functions, but there is also a gap between the way it now functions and alternative possible ways it could be structured to more effectively promote social welfare and equity. 'Unveiling the myth' is therefore necessary to alter its enduring influence on us, for the betterment of humanity. Some have referred to this myth as 'neoliberalism', but this is not the emphasis here. The point, rather, is to show that understanding theories and models of the market in terms of the seven myths discussed in this article allows us to change the ***constitutive rules*** *of the market and radically improve the pre-distribution of social benefits while preserving the dynamic freedom of the market, thus limiting the need for* ***regulating rules****.*

1. Introduction

The word *myth* is used in two main ways that are often conflated or confused:

1. A widely held but false belief or idea.
2. A traditional story—a narrative—especially one concerning the early history and enduring purpose of people or one explaining natural or social phenomena, typically involving supernatural beings or events.

The market fulfils both of these meanings. First, it is a myth that the market produces fairness or that it maximises the common good. We will come across a number of other myths of this kind; things most experts know are wrong but which we somehow keep believing as "folk-knowledge" about the markets. Second, the market is also the "big story"—the meta-narrative—of our time: it's the story that explains the foundations of our new global world. It even involves supra-physical forces like the so-called 'invisible hand'.

The first meaning of the myth is obvious. We dismiss stories as myths all the time. The second meaning is more interesting. This is the meaning, for example, of the myth of the creation of the world or the Tower of Babel. When we say these are myths, we are not necessarily dismissing them as false. We are saying they are not necessarily true in the

narrow sense that the Battle of Hastings is an historical fact. We are saying that they are important stories that help us make sense of the world, of life and of our human predicament. Human beings need meaning, and the myths we construct about life help us to put a symbolic frame around our reality so we can find structure and meaning in an otherwise chaotic and random existence.

"The market like every other social institution is a product of our conception and invention and if it does not work the way we want it to, we have the freedom and power to change it."

The Cambridge University Reader and the World Bank economist Ha-Joon Chang highlights the way these new myths, just like the old religious myths, are insulated from factual reality:

> *"You have to know that academic economists today are not even interested in the real world. In the economics profession today, interest in the real world is an indirect admission that you are not very good. If you are really smart you do really abstract mathematical modeling. If you are a bit less good you do econometrics, basically manipulating statistics. If you are really down in the pits you are interested in the real world…It's a strange academic culture… when you say these uncomfortable things, people refuse to listen to you."*[1]

In the transitions from the Renaissance to the scientific revolution, to the Enlightenment, to full-blown modernity and its post-modern critics, we see our place in the universe being pushed farther and farther into the periphery of reality itself; we are no longer God's chosen children, not at the centre of the world, and even our emotions, thoughts and choices are beyond us—our sense of free will is considered an illusion. At the same time, in what seems to be a strange and wonderful paradox, each time we are dethroned by the history of science, we rise above our previous understanding and become—usually unwittingly—more intimately involved in co-creating the natural, inner and social worlds, both external/objective, internal/subjective and social/inter-subjective reality.

If we want to reduce the savage inequalities and insecurities that are now undermining our economy and democracy, we shouldn't be deterred by the prevailing myth of the 'free market'. The central message of this essay is that the market like every other social institution is a product of our conception and invention and if it does not work the way we want it to, we have the freedom and power to change it. We can only do that when we overcome the conceptual illusion of the false dichotomy between a "free" market and a "regulated" market. We need not conform to the limitations of the current market system. We can make the system even more efficient *and* just. There is no inherent conflict between these two fundamental aims. We need a revolution in Economics as momentous as the one unleashed by Copernicus but in reverse. We need to fashion the future of economy on the principle that *human beings are sovereign, and need not be subject to 'the market' as if it were a natural feature of the world outside of their collective control.*

2. Myths of the Market

I have set out below what I believe are seven key myths—in the sense of false beliefs—of the market. These are not the only false beliefs that society holds about the market, but they are arguably the most dangerous ones. They are part of a bundle of propositions, shared perhaps most strongly by economic policymakers—possibly the group of people farthest from the frontline of business. Together, these type one myths about particular features and functions of the market are subsumed and thereby shielded from criticism from the type two myth of 'the market' as a shared societal given.

Myth #1: The invisible hand makes sure that the market is fair and maximises the common good in society.

Myth #2: The market takes care of long-term interests, and it does so by taking everyone's interests into account.

Myth #3: The market creates diversity and freedom of choice.

Myth #4: The agents in the market are rational decision-makers maximising their individual 'utility'.

Myth #5: The market tends towards equilibrium where supply and demand meet.

Myth #6: Private for-profit corporations will always be the best organisations for maximising efficiency and creating wealth, and their way of functioning can never be changed.

Myth #7: That the 'free' market is a natural system.

3. Origins of the Myths

Where did these myths about the market come from, the false beliefs that fuel the rhetoric of politicians and popular sentiment about economics? A number of world-changing key historical events and influential individuals came to create the fertile soil for the myths; the result of which we harvest today. We will here look briefly at two of these influential persons—Adam Smith and Friedrich von Hayek—and some interesting historical incidents.

Adam Smith, who was to become the founding father of modern economy, met in 1750 with the philosopher David Hume, a key player at the dawn of the Scottish Enlightenment. Hume was enormously influential in Smith's construction of economic theories. Hume did not believe in causation—at least he was sceptical about whether you could 'see' what causes what under a microscope—and Smith likewise fell back on an economic "mystery" of a crucial unseen ingredient, which he called the 'invisible hand'.

Smith also taught rhetoric. His choice of the 'invisible hand' was to describe what was happening in what he called a "more striking and interesting manner".[2] The economics professor Warren Samuels investigated the original meaning of the phrase, arguing that contemporary economists had misunderstood it.[3] They have interpreted Smith as if he were calling for less government or regulatory intervention, due to the self-regulation of "the invisible hand" when he on the contrary unambiguously demanded regulation to defend

property and for the defence of the poor against the rich. Smith had in his sights supporters of the prevailing doctrine of 'mercantilism': the idea that economic trade is a zero-sum-game and that each nation needs to protect its own market at the expense of other nations.

"Smith provided a spirited attack on mercantilism for its extraordinary restraints, but he did not extend the attack to government and law in general," writes Samuels.[4] "Indeed, many of those who do extend the attack, wittingly or otherwise, are silent about Smith's candour." So, Smith was arguing for free trade but realised that the market is very dependant for its functioning on the formulation of its rules and that these fundamental rules need to take the interest of the poor in mind.

The difficulty for us now, two centuries later, is that Smith's insights have settled in the minds of those who rule us in ways that are alien to what he meant. We are confusing Smith's arguments about *free trade* with a mythical *free market* mysteriously free from any rules at all. This is one important origin of the *Myth.*

Another very important historical event in the creation of the *Myth* occurred in 1947 when the Austrian economist Friedrich von Hayek arranged a conference that launched an academic society that was to become influential enough to shift the way at least Western leaders viewed economics. This was to be known as the Mont Pèlerin Society.[5] It was at this conference that the neo-liberal market myth was first spun in its current form.

Hayek's manifesto, *The Road to Serfdom,*[6] was published in 1944 just as the allied forces were liberating Europe, and was aimed at the post-war world. Hayek respected the economic authority John Maynard Keynes, whose theories seriously challenged the old so-called "neo-classical view" of the 18th century economists. Hayek, having his own "neo-liberal" agenda, did not challenge Keynes' ideas until after Keynes' death in 1946. At that point, however, Hayek invited 36 friends and allies to meet him at the Hotel du Parc in Mont Pèlerin, near Vevey in Switzerland. There, in April 1947, he and his influential friends Milton Friedman, Karl Popper, and Michael Polanyi discussed the defence of what they called "liberalism" in post-war Europe. Their aim was political rather than economic and they thought that the old neo-classical economic theory could, in a twisted way (as will see), be made to prop up a policy of general non-governmental intervention: the ideological agenda of Hayek. The foundation for a systematic revival of the old neo-classical economic thinking was thus laid.

The events in Mont Pèlerin in 1947 demonstrate that the concepts and rules of the market are under discussion, and can be changed through systematic effort. It is a strange paradox—and it lies at the heart of the story—that those who proclaim that markets are natural phenomena, which should not be manipulated or shaped, are themselves shaping markets day-by-day! I am an enthusiastic participant in open markets, and in principle I don't believe we should put up barriers that make it more difficult to do business. However, we risk losing the real quality and value of the openness of markets if we don't understand what 'markets' are, how they change, and why they need to change.

The Mont Pèlerin Society was born and continues the same work to this day, and meets at the same hotel every year. In small steps it launched a movement in economics that has

become the new orthodoxy. It has been transmitted partly through academics with Chicago in the lead and partly through think tanks like the Institute for Economic Affairs in the U.K. and the Heritage Foundation in the U.S., founded by two Republican staffers in 1973. It was those staffers' ambitious document *Mandate for Leadership* that was handed to top Reagan official Ed Meese just two days after Ronald Reagan's election to the presidency in 1980. By 1982, there were leaders committed to the 'neoliberal' economic agenda in the U.K., U.S. and West Germany, and the victory of Mont Pèlerin was all but complete. The rest, as they say, is history.

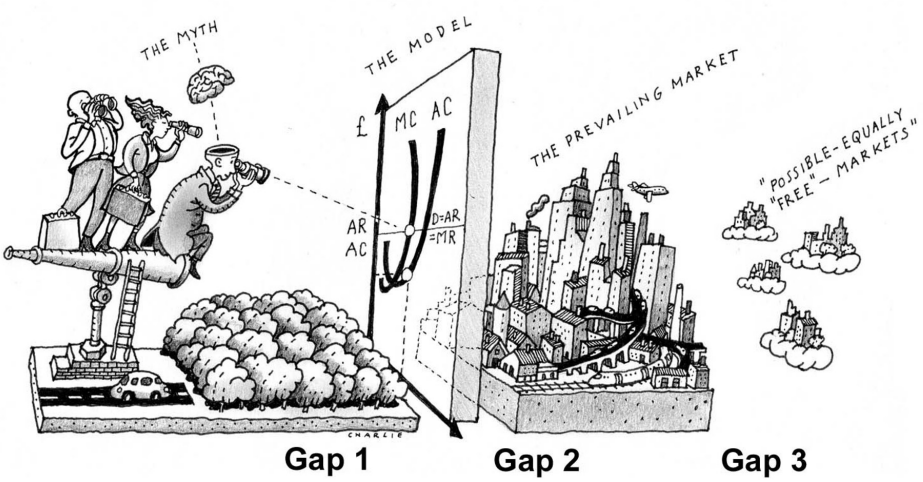
4. The Myth, the Model and the Market

There is not just one yawning gap between the myth of the market and the market as it exists; in my view there are at least three.

Consider the figure below. Between the Myth and the Market, there is a third peculiarity: the neo-classical Model of the market—the way the market is supposed to fit the mathematical language of economists. We have to understand the gaps between all three: the common understanding (the Myth), the prevailing model of the market (the Model), and the real market, in all its multifarious complexity (the Market).

Then there is a third gap, between the Market as it is now and the Market as it could be—between the actual and the possible. It is into each of these gaps that the distortions creep.

Figure 1: The model is obstructing our clear view of the prevailing market, and the prevailing market is blinding us from other possible, equally "free" markets.



Let's look at these gaps a bit more closely.

"Our collective failure to see that the market is a contingent social construct gives rise to myths that treat the market as a fixed reality."

Gap 1: between the myth and the model. The myth of the market, our common understanding of it, is a very crude picture of the prevailing academic 'neo-classical economic model'. In fact, there is a huge gap between what the *model* is actually telling the economists and what we as the general public tend to believe it is telling us. Such beliefs are often not explicit, as we have seen, but creep in as underlying assumptions in language and policy making. Examples include forgetting that the model only works for private goods, overstretching it by somehow believing that the market could take care of public, sometimes called collective goods as well. Or not understanding that the so called "Pareto-optimal" distribution that the model predicts is not very "optimal" at all, and definitely does not make any claims of being in any way a just or equitable distribution. Or that the "perfect market" that the model refers to is just a set of rather unrealistic mathematical assumptions necessary for the *model* to work, not some perfect ideal that the real *market* should aspire to.

One could say that this gap 1 is really an unnecessary gap based on confusion of language and misunderstanding of the predictions of the neo-classical model. The effects of this gap are myths like #1, #2 and #3 above that are all unnecessary misunderstandings of what the neoclassical model actually predicts.

Gap 2: between the model and the prevailing market. Then there is the other gap between the neo-classical economic *model* of the market and the real *market*. All economists know that the neo-classical model is not based on the real market. However, we tend to forget the very specific assumptions made in this model, and also the very limited scope within which the model has predictive value. The model is based on a set of very limiting assumptions of a 'perfect theoretical market'. How far these assumptions are true for the real world is indeed debatable. More and more recent research into the assumptions shows that they are utterly unrealistic. We can do nothing about this gap; it is necessary for the model to work in theory. The problem is that we tend to confuse these crude but necessary assumptions for real facts about the market. We start to believe that a good consumer actually is rational, or at least ought to be. We start to believe that we all could be fully informed if we just try hard enough. We might even start to believe that it is acceptable in the market to only act out of self-interest and that the "invisible hand" takes care of the big picture.

The neo-classical model needs these assumptions to work. But we should remember that they are only assumptions. When we mistake them for facts we get myths that are based on the confusion of assumptions and facts.

Gap 3: between the prevailing market and other possible markets. We make yet another mistake about the market: we assume it is a fixed reality when it is in fact man-made through a complicated, contingent, historical process that is still on-going. The gap here is between the *prevailing market* as we know it and other kinds of market there could be—markets that

might look very different and work very differently. This is the gap between the existing market and *possible markets*.

Our collective failure to see that the market is a contingent social construct gives rise to myths that treat the market as a fixed reality.

5. The Neo-classical Model

It should be noted that economic models in general are not designed to model the actual world. They are designed as a way to investigate what insights a number of theoretical assumptions and abstractions might lead to.

The originators of the neo-classical model did not make a blunder. They were not under any illusions about its links to reality, or lack thereof. The problem is that outsiders to economics are usually not really aware of tenuous assumptions on which the model has been built, and even economists often confuse their models for the way the real world works. As a result, they misinterpret these theoretical models, and incorporate them into the meta-narrative that supports the official worldview of the West—the *myth*.

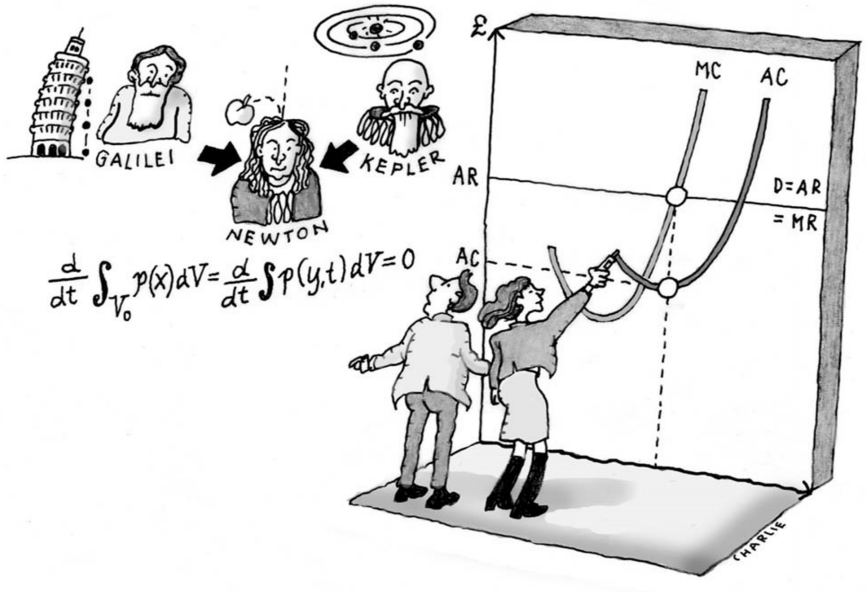
It is difficult to look more closely at the myths, because doing so seems to undermine important foundations of our worldview. There are incentives, economic, political and academic, to stick to the prevailing view. In the language of mental developmental theorist Robert Kegan,[7] it is not so much that we have this worldview—in the sense of freely and flexibly choosing it—it is more like this worldview 'has us' in the sense that it shapes the structure of our attention, our perception of value and our sense of the possible.

Despite this mental limitation of ours, the neo-classical model of economics is coming under attack these days. In response to these detailed attacks, many economists have insisted that critics provide an alternative "scientific" theory. Doing so, they don't seem to realise how much their own model uses metaphors to build theories.

For example, many economists don't understand how much their economic thinking has been bounded by the Newtonian language, and by their search for natural laws of the economy that work alongside the Newtonian laws of mechanics. The elegant synthesis of Galilean terrestrial mechanics and Kepler's celestial mechanics into simple mathematical formulas expressed in Newton's newly invented mathematical language of calculus came to be the lodestar for every science during the 1800s. As I elaborate in my book *The Market Myth,*[8] the neo-classical economists sought, very understandably, to express economic phenomena in the same, very potent language of calculus.

The neo-classical economists knew what they wanted: a simplified model of the market that could be expressed in the mathematical language of Newton. They also knew that to succeed, they had to make unrealistic assumptions about the operation of the market. Some of these assumptions we now mistakenly hold as truths about the market. They wanted a mathematical model of Adam Smith's faith in the invisible hand that self-organizes the economic system.

Figure 2: The neo-classical economists knew what they wanted: a simplified model of the market that could be expressed in the mathematical language of Newton.



Had the 19th century economists had the computer tools we have today to model complex self-organizing systems, they might have opted to use those tools instead. But they did not have them, and they did as good a job one could do given the tools available in their time. But we have to remember that Newtonian calculus is not at all made to describe a complex system. It can actually only handle very simple systems, like two bodies moving under the force of gravitation. If we in this example add a third body, the Newtonian power of prediction breaks down.

To succeed in making a Newtonian model, they actually had to make a number of assumptions that simplified economics, fully aware that they were not quite real. In order to arrive at a model that could be expressed in the mathematical language that has been so successful for describing nature through physics, they had to make massive simplifications. They had to assume for example, as we will examine below, that all actors in the market are perfectly rational, that there is perfect competition and that all market actors are fully informed about everything going on in the market.

6. Interlude

Am I kicking in an open door here? Are not all students of Economics 101 told these days, to remember that 'it's just a model'? It is true that very few people would today explicitly subscribe to an unproblematic application of the model to the real world (whatever the 'real

world' may be). Yet it somehow sneaks in, as we have seen, into public consciousness and becomes a myth. I would even venture to claim that many intelligent and well-informed individual scholars, citizens and policy makers, are together moved by a *malignant invisible hand*—towards preposterous conclusions and dire analytical fallacies, with resulting pathologies and instabilities in the market and society at large. The false belief in the model resides within the walls and pillars of our daily institutions, rather than with the individual student of economics.

"The neo-classical model of the market assumes that the operation of the market, just like planetary motions, is fixed once and for all, with given "utility functions"."

So, what are the unrealistic assumptions of the model? Well, the model assumes that consumers are predictable, perfectly rational and conscious in their decisions. It assumes that they act from self-interest, are completely clear about what they want to buy and that they do not change their decisions.

It assumes that goods bought and sold in the market are *private goods*, owned by individuals and can be traded. It runs into difficulty when it comes to *collective goods*, sometimes called *public goods*, like military defence, culture or clean environment.

It assumes there is perfect competition, with a broad range of products from different suppliers competing on price and quality. It assumes there are always alternatives readily available in the market. It assumes perfect information, and that consumers and producers have access to all information about the item and of any alternative choices, as well as the infinite knowledge and time to evaluate it all. It assumes all actors in the market can predict the future consequences of their choices.

It is important to remember that all the above assumptions are made in order to make the model expressible in simple analytical mathematical language. The assumptions are not statements about the actual market; they were never meant to be. The idea that they are actually statements about the real market is one of the main reasons for the myths around the market: see gap 2 above.

7. The Market as a Man-made, Self-organizing System

Adam Smith was right; the market is a complex self-organizing system. But we have to realize that, in contrast to the many natural self-organizing system we learn about in biology,[9] it is a *man-mad*e self-organizing system with a particular history that could have been different. The neo-classical model of the market assumes that the operation of the market, just like planetary motions, is fixed once and for all, with given "utility functions". But the market system is fundamentally different from physical systems. Not only in the sense that it could be regulated from the outside with *regulating rules*, but also in the sense that the

constitutive rules, the rules that by definition are necessary to even have a self-organising system in the first place—like property rights and qualifying market agents—are man-made constructs.

This distinction between these two kinds of rules governing systems was introduced by the philosopher John Searls,[10] to mark the ontological difference between rules of a socially constructed system or game that are necessary for there to be any game in the first place—like the rules that determine the movements of chess pieces in a game of chess—and rules that regulate the game once it is operating—like setting a time limit to a game of chess or a price regulation in the market.

With this distinction we realize that even a market free from any *regulating rules* will always need *constitutive rules* to start self-organizing. In a *natural* self-organizing system these *constitutive rules* are the feedback loops governed by physical constants or chemical reaction patterns that we humans can do nothing about. But for any *social* self-organizing system like the market, those *constitutive rules* can be implemented in many different ways: with very different self-organizing outcomes as result. Examples of *constitutive rules* include any definitions of property rights or corporate rights. The outcome of the market's self-organising process that Adam Smith called the "invisible hand" will therefore be dependant on the specific formulation of the *constitutive rules*. Hence, even the "free market" is always man-made. "Just how God or nature determine the strength and direction of gravitational forces, man determines the strength and direction of market forces."

8. The Two Invisible Hands of the Market

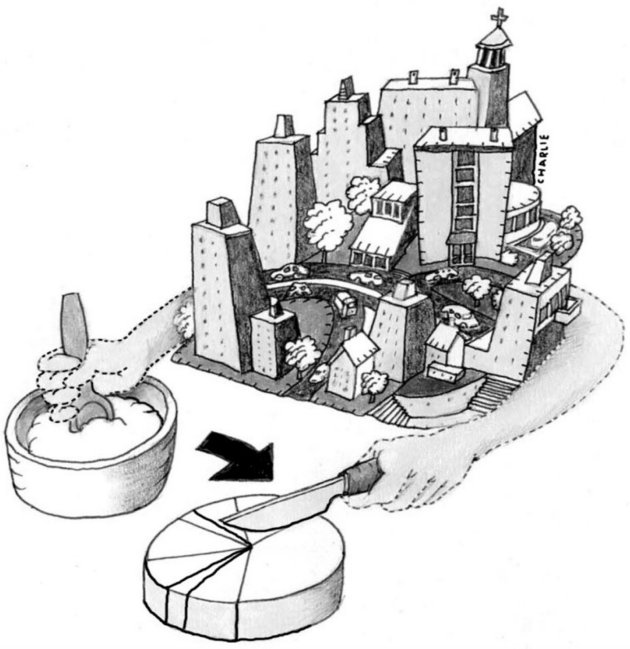
Different *constitutive rules* will result in different market outcomes both with respect to the amount of goods produced and their distribution. One would therefore want to construct the *constitutive rules* in a way that maximizes the efficiency in production and promotes a distribution of wealth that is considered fair. Once the *constitutive rules* have been optimized there might still be need to impose *regulating rules,* but in this way the administration and efficiency loss that is always the effect of *regulating rules* can be kept at a minimum.

It could be beneficial for our understanding of the market as a self-organizing system to extend Adam Smith's metaphor to include *two* invisible hands: one that bakes the cake and one that divides it. The first invisible hand takes care of the non-zero-sum game of creating wealth, trying to bake as big and nice a cake as possible. With respect to this invisible hand we are all more or less on the same side, all wanting a big, nice cake out of the oven of the market. But when it comes to the operation of the second hand, we all tend to want a bigger piece of the cake for ourselves. It is important to always keep in mind that the market's self-organising process constantly performs both of these functions, and that the outcome of each of them—the cake in the oven and the piece you get—is dependent on the *constitutive rules* of the market.

This means that, when we design the *constitutive rules* of the market, we need to take into account how such rules influence both the processes of production and distribution. For example, when we set the rules governing the length of patents and copyrights, we have to

take into account that the length of the property right will influence both the efficiency of the market and the distribution of wealth. If we have no copyrights, the market will provide much less incentive for creative production. If, on the other hand, we have too far extended copyrights, this will limit the possibilities for reusing ideas for new productions that would benefit everyone. For example, and given the short-term view of the market, I would estimate that around 10 years might be an optimal trade-off. From the economic perspective of an individual copyright owner wanting a bigger piece, the longer is of course better. No wonder big copyright holders are lobbying lawmakers to increase copyrights to 150 years. Copyrights are a good example of *constitutive rules*; they would not exist without legislation. On the one hand, one needs to shape the rules to encourage investment, which is the main purpose of intellectual property. On the other hand, one needs to shape the rules in such a way that diversity and competition are also possible and that the overall needs of society are most fairly and effectively addressed, and therefore limit the length of property rights.

*Figure 3: The two invisible hands of the market. One hand bakes the cake and the other divides it up. It's a metaphor that helps us to remember the relative independence of the two simultaneous self-organising processes of the mar*ket.



We all need to ask some simple questions, when it comes to handing over any important task to the invisible hands of the market:

1. Will the market really be able to bake this particular cake? Are we using the market in the right way? Is the task structured in such a way that a meaningful (efficient, just)

self-organisation will occur in the economic system? Might this be a *collective good* or a *merit good* that the market is unable to handle? Will the market work effectively in this case, or do we need to use a different tool?

2. Will the cake look and taste good when it comes out of the oven? What other human values—in addition to economic efficiency—do we want to achieve in this matter? How do we make sure these values emerge as a result? How can we formulate the task and construct the *constitutive rules* around this problem so that the result of the market's self-organisation is in line with the services or products we want it to provide?
3. Given these rules, how will the market share the cake? What will be the distribution effects of these rules? Who will be the winners and who the losers? Can we design the *constitutive rules* otherwise to make the division of the cake more in line with what we would find reasonable and desirable?

"When we begin to understand social reality better, strangely, we find that it cannot be understood without understanding ourselves as its historical co-creators."

And is it now the time to change the already existing constitutive rules? Because we now need rather different rules to shape our free market. Perhaps, in particular, we need to:

- Continue to create new ways of measuring results, a bottom line that extends beyond the purely financial. It will change the emphasis of business laws on protecting capital and investments and make their duties broader.
- Provide shareholders with wider responsibilities. We need to re-impose obligations on shareholders and broaden the obligations on board members and directors beyond shareholder interests.
- Limit companies' status of personhood. Businesses still need to be individual legal entities, but to give them human rights and freedom when they have overwhelmingly more power than most people jeopardises democracy.
- Promote a long-term view on business. Short-termism is a persistent problem for public limited liability companies. Perhaps if you commit to owning shares for ten years you ought to get ten times the voting rights.
- Democratise decision-making in business. Perhaps forms of participatory democracy can be incorporated so that employees have efficient ways of making their voices heard in the overall development of the company. This could be supported and facilitated by new legal forms of corporations.

When we realize that the way the market self-organizes is always a function of not only individual consumer decisions but collective political decisions about the constitutive rules as well, we will no longer be able to hide behind the concept of a "free" market. We humans

need to take responsibility for the outcome of the market. In order to do so, we need some kind of a reference frame to judge the market from. We need a reference frame greater than the market, a meta-narrative greater than the market. The problem is that we now have the correct post-modern insight that all meta-narratives are also man-made. This forces us to focus on the political process of formulating a new meta-narrative.

9. Need for a New 'Meta-narrative'

My fear for our society is not so much the various external threats we face, but rather the kind of emptiness and meaninglessness that can destroy society from the inside.

I believe that humanity has moved from *not* being at all aware of economics and the market, to understanding the market as a system of its own in the classical model. And that we are only now discovering how the economic reality we have taken for granted was really a mirror image all along, a reflection of our own inner lives, our hopes, fears, ideas and desires. When we begin to understand social reality better, strangely, we find that it cannot be understood without understanding ourselves as its historical co-creators.

Back in 1945, philosopher Karl Popper described the difficulty the market has—not in achieving efficiency—but in generating significance, meaning and value systems. His master work *The Open Society and Its Enemies*, warned us against this lack of meaning as well as against the classic totalitarian forms of control. In earlier societies, it was the lack of food and material goods that was the biggest problem; the richest societies now instead faced a lack of meaning and purpose, he said.[11] Market logic has relegated the role of citizens to passive consumers.

This is even true at the political level, where citizens are expected to push the political 'shopping trolley' between producers of political goods. When it comes to religion, they are reduced to choosing an individual product aimed at their personal needs. Even our love lives are reduced to a commodity where potential partners are considered as products to be kept or dumped, and who rarely live up to the marketing promises of magazines and media.

The market system needs no sense of meaning to work, but both society and individuals do need a *symbolic system* to create meaning. We need to operate within a context to know that we are part of something meaningful, something greater than ourselves that frames our lives and provides language and reference points to understand and navigate it. Without a larger frame, society unravels into a collection of individuals who are mere economic entities in the market. A society cannot consist of consumers and producers only, yet this is the vision of our world promoted under the current market-liberal worldview.

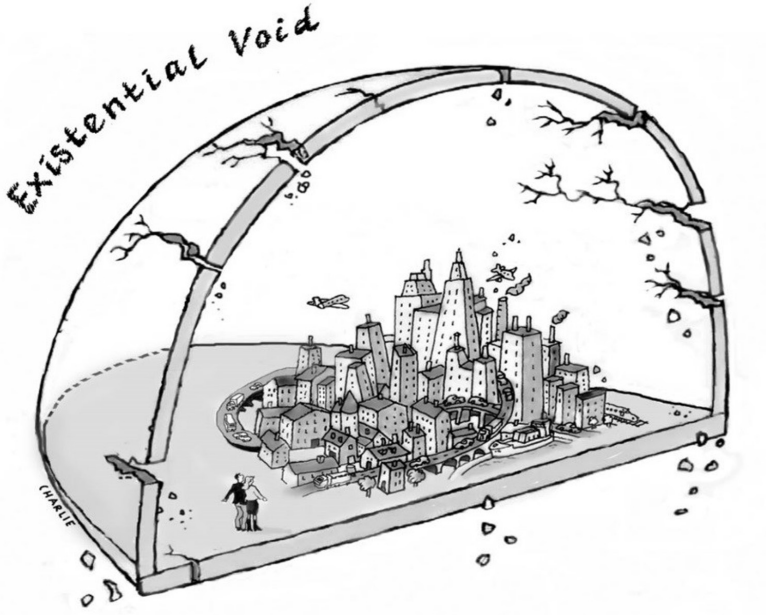
As discussed earlier, one definition of myth is this larger frame: the ultimate justifier and ultimate authority in a society. This kind of myth provides the meta-narrative—the big story—that keeps our society together in what may be an arbitrary, but also a necessary way. The American sociologist Peter Berger calls it "sacred" because there is nothing beyond it that can help us value it.[12] The myth is untouchable and beyond our judgements. It 'just is'. It shields us from the fact that we have to provide our own ultimate authority on which to build

our otherwise completely arbitrary society. Like a "sacred canopy" it shields us from our collective existential void: it hides the fact that it is all up to us to create the symbolic system in which human values, meaning and purpose can be formed. This symbolic system and its meta-narrative are per definition a shared collective good, which, like all other collective goods, the market cannot produce.

"How do we balance our needs today with the needs of future generations?"

Every society, every culture, has got its own outer boundary: its meta-narrative. For our emerging global society it is the Market. After the fall of the Berlin Wall in 1989, there was just this one contestant for a global meta-narrative remaining. The market claimed to be the ultimate "sacred canopy". This was the "end of history".[13] This would suggest that we have abandoned our search for collective meaning, replacing it by a pursuit of individual utility. In practice, the Market serves the same purpose as God or Science once did: to provide us with an external ultimate authority. We have reverted to living under false absolutes, rather than living authentically, as the existentialist philosophers urged us to do. We believe that somehow, and uniquely, the market 'just is'. We are, in short, *still alienated from our systemic freedom*: the freedom we can only exercise collectively in order to change the internal workings of our socially constructed systems.

Figure 4: The "sacred canopy" of our symbolic system and meta-narrative shields us from our collective existential void. Our present sacred canopy—the Market—is starting to crack and fail as a shield, and so more and more of us are starting to notice the void.



The market has evolved as the unreflective answer to our need for collective coordination in today's world and our need *for an ultimate authority*. As an ultimate authority the Market myth is very thin. As efficient as the market is for allocating private goods, it is that poor at providing a satisfying shield against our collective existential void. And many can now feel the cracks in this shield. It must address the important common question of efficiency, and must also address questions about other common human values like justice, equity and meaning. Collective questions like 'How do we balance our needs today with the needs of future generations?' require a bigger framework to be answered.

Hayek and his friends at Mont Pèlerin in 1947 were myth-makers in both senses of the word. They were busy re-writing the story for our times and, as we have seen, this was propagated to the world as more than just economic doctrine. But at least that shows that it is possible for humanity to grasp the myths that govern the world and to rewrite them. Hayek and his colleagues did it. We need to do the same.

So far in history we have handled this by pretending that this *collective systemic freedom* does not exist. We have deferred our decisions to an external "ultimate authority" of different kinds in different societies and different points in history: God, Science or the Market—at each step increasing the complexity of our meta-narrative to meet the increasing complexity of our world. And now we need to do this again. We need a means by which we can agree on the common good that is the ultimate purpose of the economy. What do we want "the two hidden hands" of the self-organizing market to deliver? How do we define the common good? How do we define equity and justice? How do we balance our needs today with the needs of future generations?

And, again, the important insight is that these collective human values—as opposed to individual values like beauty—cannot pertain to the individual and her preferences alone. Ethical values must per definition have a collective aspect as they refer to the relations *between* individuals. Justice and meaning do not exist outside our common social reality. They are created in the relationships between individuals, not within single individuals. They are integral parts of our socially constructed world that we share with other people.

The world has become too complex and too fast moving for us to be able to formulate utopian visions of the future. We cannot any longer say what we want the world to look like in fifty years. But our inability to formulate precise visions must not stop us from taking responsibility for framing the future. However, the focus needs to shift from having a vision of the good *outcome* of history to having a focus on what a good *process* might look like. In our democratic market-society, "politics" and "the market" are the two most important processes that constantly form the future. We need to look closely at the *constitutive rules* of both these processes. Good rules for the political process are a prerequisite for creating good rules for the market. Our new narrative will have to be a narrative about the good man-made *processes* rather than utopian end results of the historical process.

10. Conclusion

First insight: We as humanity hold a *systemic freedom* to shape the inner workings of the market as a self-organizing system. A freedom we can only exercise collectively.

Second insight: We are in dire need of a bigger common framework than that of the Market, in order to be able to use our systemic freedom to create our social reality; not only for efficiency and individual interests, but also for the common good. We need a new meta-narrative.

"How do we build a new meta-narrative when we have so many different, irreconcilable perspectives?"

The third important insight: We will never find this frame of reference, this meta-narrative, 'out there', as an object in the natural world, like we thought we had done with God, Science or the Market. We realise that all meta-narratives are in some way arbitrary and they are all man-made—but we still need them in order to survive and flourish, both as individuals and as humanity.

Now we have to face the fact that we can look for no other place to find this meta-narrative than amongst ourselves: in the dialogue between humans. Our biggest frame of reference is always man-made and arbitrary. This is a source of enormous collective existential angst and the reason why we mobilise all our internal defences to avoid addressing it. It feels so much better just to continue pretending that we are in the hands of an external ultimate authority.

Previous generations might have looked to religion to provide the framework of a narrative by which they could judge the market, but that is not a path that is really open to us now. This is both a problem and an opportunity. The problem is that we can't rely on any other external authority to provide an objective meta-narrative. The opportunity is: *we are free to create one.*

But why *one* meta-narrative? In a pluralistic and multi-cultural society there is surely place for more than one narrative! Yes, and in order for those narratives to be able to co-exist and to interact in a positive, constructive way that enriches our understanding and provides multiple perspectives on our world, rather than interact in a negative, competitive and violent way, we will need a good, meta-cultural "holding environment" for these multiple cultures/narratives. That meta-cultural holding environment will also have to be part of the new meta-narrative.

This brings us back to the main problem: how can this new global meta-narrative and meta-cultural container be formulated, especially when we have no means of agreeing on anything globally, and when the prevailing post-modern world view is suspicious of collective ideas of all kinds? So how do we build a new meta-narrative when we have so many different, irreconcilable perspectives?

We will never reach a final form of this narrative. It will have to be an open-ended process, and the narrative will be about this process. Still, it is within our powers to create a

good narrative forming process with rules that continually challenge the narrative and keep the dialogue alive. It is, in that respect, the most important project in human history: it began many millennia ago, but it has also only just begun. As complexity in our society increases, every so often this process gets stuck in a cul-de-sac—as it has done recently—and needs to be kick-started again.

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Twelve Action Lines for a Better World:
Finally Realizing the Four Major Responsibilities*

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Abstract

This article describes a global governance system that—from the author's point of view—would lead to sustainability and allow the implementation of the Sustainable Development Goals (SDGs), which have just been adopted at the UN level. Major elements are (1) the integration of existing international regimes in the area of the UN, WTO and the world financial system into an integrated "Global Governance Body". (2) This institution would, among other functions, be responsible for the major global commons and put a fee on their usage with two aims: (i) to protect them and (ii) to generate money for financing global development and the SDGs. (3) To monitor the income and property distribution by politics with the political mandate, to keep it in the so-called "efficient inequality range". This may need international co-financing. (4) It will, if done properly, prevent two-class societies, it will furthermore allow the building-up of social systems everywhere in the world with the aim to have a reasonable balance of wealth in all states, and also between states. (5) It will also be of help if artificial intelligence systems took over hundreds of millions of jobs for highly qualified people in the next decade. (6) This global institution would also be able to pay in defense of cultural diversity and for the protection of the environment, e.g. rainforests. (7) This would also allow us to do what is needed for avoiding uncontrolled climate change, e.g. improve the recent Paris accord concerning climate.

A. Complementing the Four "Major Freedoms" with the Four "Major Responsibilities"

Important components of a liberal economic system are the so-called "**four freedoms**":

- Freedom of property
- Freedom of concluding contracts
- Freedom of innovation
- Freedom of borrowing and lending of money, respectively

* The main ideas of this paper were presented by the author at the Annual Club of Rome Conference in Winterthur, October 15-16, 2015. They can also be found in the paper "A better governance for a better future". "A green and inclusive global economy—the key for a sustainable future" is to be published in the *Journal of Futures Studies*, special issue on "Exploring paths to a viable future: obstacles and opportunities, requirements and strategies" and incorporates the unanimous UN Decision on the Sustainable Development Goals of September 26, 2015 in New York and the recent Paris climate accord.

"Freedom without responsibility has its limits. In particular, focus should be on the equality of freedom."

The world owes a lot to the enforcement of these freedoms, especially with respect to the production and the implementation of innovations. However, freedoms are not enough to ensure sustainable development or to implement the Sustainable Development Goals (SDGs). Freedom without responsibility has its limits. In particular, focus should be on the equality of freedom, otherwise this would be a freedom of the strong to plunder or abuse the weak. In an era of globalization, this is unfortunately a frequent pattern. Therefore, freedom needs limits and the acceptance of responsibility. Responsibility includes the respect of limits.

The enforcement of limits of freedom of individuals, companies and states is a topic of Global Governance or of regulation and therefore means a takeover of responsibilities by the society, more especially the global community. The collective nature of this task makes the issue difficult. There is a danger that a situation arises where no one is really in charge. This is because of the distributed nature of responsibility. However, the implementation of the SDGs until 2030 requires at least as much the establishment of an adequate global governance and the enforcement of such conditions as the global enforcement of the four major freedoms.

"A working global governance system is the key to sustainability."

Four major responsibilities in times of globalization are:

- Responsibility of the establishment for a sustainable international regime
- Responsibility of economy and the financial sector for common welfare
- Responsibility for human dignity worldwide
- Responsibility for environment and nature

B. Assume Responsibility for Establishing Sustainable Global Governance

A working global governance system is the key to sustainability. Markets must honor what we officially claim, not the contrary. Prices have to tell the truth. The internalization of external cost is a must. We have to deal with the further advancement in intelligent systems, platform capitalism and the need to protect privacy. Here, the "great transformation" (towards sustainability) and the digital transformation (towards a digital future) have to be seen together.

1. Integrate Global Regimes Coherently

Integrate UN rule sets, WTO ruling and world financial market rulings into one coherent Global Governance regime (including co-financing). This should follow the principle of subsidiarity and favor a green and inclusive economy, human rights, a world-democratic

perspective, the implementation of Sustainable Development Goals (SDGs) and sustainable development.

2. Protect Cultural Diversity

Protect cultural diversity (also against economic forces favoring uniformity).

3. Develop Technology Appropriate for Common Welfare

Take care of strict data security, generate much less data with a personal identity link, control machine intelligence, govern the internet (and the upcoming internet of things/entities) in the interest of humankind, and promote global governance favoring human rights and green and inclusive markets.

C. Enforce Responsibility of the Economic and Financial Sectors for Common Welfare

This is about utilizing the strong transformational power of the economic system and the financial system. Since the financial crises, we know that the financial sector is not the "brain" of humankind. It is an important subsystem—also potentially a dangerous subsystem—that needs careful regulation in favor of common welfare.

4. Secure Transparency and Responsibility of Property

Make property (via cadastres) and financial transactions (via documentation) transparent to the (international) taxation and financial authorities. Take care of all property taking social responsibility. No legal protection of intransparent property ownership and of intransparent financial transactions.

5. Prevention of Excessive Market Power of Companies

Create a global antitrust body. Avoid companies from becoming too big and too powerful.

6. Hedge the Finance Sector Appropriately for Common Welfare and Tax it Suitably

Implement a strict regulation of the global financial market, control "wrapping", dry off tax havens, make aggressive tax avoiding schemes impossible. Build on current G20/OECD work on these issues. One hundred states have by now agreed on an automatic data exchange between the banks of those countries and the financial and tax authorities responsible for the account holders. This is a big step forward. Eventually the world must succeed in also getting the US into this automatic data exchange system. Via its FACTA (Foreign Account Tax Compliance Act) law the US side gets all the tax data on foreign accounts it needs. But the US still refuses to help others to reach the same condition.

D. Assume Responsibility for Human Dignity Worldwide

Human dignity is a global challenge. Balanced income distribution (with corresponding distribution of property) is the key. Social security systems are required—everywhere.

International support for the establishment of such systems in developing countries is required. Each state has the responsibility to provide basic services. The world as a whole has to support this.

"What global governance system should we establish in times of tough future crisis? This article makes a proposal about the direction we should aim at."

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7. Enforcement of a Balanced Distribution of Income and Property

Care for a proper balance of the distribution of income and property (stay in the efficient inequality range). In statistics, deal carefully with the application of mean and median values. Go for a proper, progressive taxation of income, property and heritage.

8. Construction and Financing of Social Security Systems for Every Human

Implement social systems worldwide and co-finance them (create a Global Marshall Plan).

9. Ensure State Responsibility for Basic Services

The states on their territory and all states together have the responsibility for issues related to basic needs, infrastructure for all, healthcare, education systems and social security. In particular, guarantee a minimum daily allowance for every human and overcome hunger, once and for all. Involvement of the private sector is possible, but only under adequate regulation, leaving untouched the final responsibility of politics for the delivery of all basic services.

E. Assume Responsibility for the Environment and Nature Worldwide

A fair dealing with the Global Commons is important for securing our future. It also holds the key for organizing global cooperation much more than today. To make clear the order of magnitude, to implement the SDGs alone may cost about US $1,500 billion annually in global development partnerships of various kinds.

10. The International Community has to Assume Responsibility for the Global Commons

Considerably increase the financial power of the international political field. In particular, care for and appropriately tax the use of Global Commons. Use this money for co-financing international concerns, in particular the implementation of the Sustainable Development Goals (SDGs, 2016-2030).

11. Preserve and Protect Biological Diversity

Protect biological diversity, preserve important biological sites and regions, especially rainforests. Pay for protection.

12. Counteract the Climate Issue

Solve the climate problem/create new energy technologies/promote voluntary climate neutrality of the private sector/invest massively in biological sequestration (global reforestation programmes/enhancement of agriculture and preservation and recultivation of wetlands)/co-finance necessary technological developments and the transition to a post-carbon energy system. Fill the green climate fund and promote other forms of financial transfers to realize at least the promised US $100 billion transfer from rich countries to developing countries within a year. This is to support countries in development in climate-related fields of action.

F. Conclusion

This is a bold program, but it can be done. Usually, humans only act in times of crises under extreme outside pressure. Unfortunately, more crises and outside pressure will come. We have to be prepared for this situation. What global governance system should we establish in times of tough future crisis? This article makes a proposal about the direction we should aim at.

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Relevance of Spiritual Principles for Solving Global Social Challenges

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Abstract

Society unknowingly follows the course of spiritual evolution. Spirituality is the quest for self-existent order and harmonious perfection. The evolution of society is driven by an irrepressible aspiration for the values that are the translation and embodiment of that order. The history of civilization is a record of its progressive emergence. Spirituality is the quest for a unifying reality that transcends all limitations, distinctions and differences; an inner oneness that unites rather than divides us; a faith in and quest for perfection in all its myriad forms; and a power accessible to human beings to overcome impossible obstacles and achieve the inconceivable. It is founded on the principles of absolute freedom, equality and unity. In the modern era, faith in spirit is embodied in the realization of the intrinsic value, extraordinary endowments and unmanifest potentials of the human being. We find expressions of it in the idealism and power released by revolutionary social change. We revere its power in great individuals. The aspiration for perfection in any form or field of endeavor is spiritual. So also we recognize expressions of spirit in the movements of the masses. Spirituality is not confined to pursuit of the otherworldly or unattainable. It is a living power for the transformation of human consciousness and the solution to the compelling challenges confronting humanity.

Spirituality stands for a self-existent order and society shares the aspiration for such an order. The history of civilization is a history of a growing social order and in that sense society is heading in that direction. Ancient Greece expressed this aspiration in its quest for objective rational criteria for the determination of Truth. The high mental culture it developed expressed in its development of logic, philosophy, science, ethics, and drama etc. In ancient Rome, it expressed as the quest for a perfect organization of social life through development of law, governance, military, commercial and civic life. In France it manifested as intellectuality while in Germany it expressed itself as music, philosophy and a taste for physical perfection and punctuality. In England it appeared as honor and integrity. Spirit in India expressed itself as pursuit of knowledge and truth. Such social manifestations of spiritual aspiration appear in different forms in different nations. America experienced it as the quest for freedom, while Russia sought it as emotional fullness. In China, it expressed itself as a well-developed physical mentality while Japan developed it as a sense of beauty, cleanliness and orderliness.

The central importance of spirituality is universal and remains pervasive even in an age of extreme scientific materialism. Although the concept of spirituality means a great many different things to different people, it does possess some characteristics which may be considered universal. Spirituality is the quest for a reality that transcends all limitations, distinctions and differences; an inner oneness that unites rather than divides us; a power accessible to human beings to overcome impossible obstacles to achieve the inconceivable; a faith in and quest for perfection in all its myriad forms. Spirituality is founded on the principles of absolute freedom, equality and unity. It seeks freedom not only from the constraints of external political, social or economic deprivation and oppression, but also liberation from the limitation, subordination, domination and possession of the individual by ignorance, falsehood, desire, passion, egoism and all forms of psychological imprisonment. For spirituality is the quest to contact, experience and unite with an Infinite spirit, an Eternal reality, a transcendent Truth that is the origin, foundation and creative source of all that is finite. Rationalists conceive it as a utopian ideal to be sought after, even though attainment may be impossible. Some perceive it as a living presence active in the universe and in the lives of every individual.

In our modern era, our faith in spirituality is embodied in the realization of extraordinary endowments, capacities and unmanifest potentials of the human being. Today humanity has come to recognize and cherish the value and potential of each individual. We have discovered the wonders of human ingenuity and resourcefulness in the soaring aspiration and resourcefulness of penniless immigrants seeking a new life in a new world, the incomparable courage and self-confidence of Churchill and Gorbachev, the idealistic values of Washington and Lincoln, the humility and self-abnegation of Gandhi and Mandela, and the unlimited creativity of Leonardo and Beethoven.

1. Powers of Spirituality in Human Affairs

The march of civilization is a progressive unfolding of the powers of spirituality in human affairs.

1. Humanity has an irrepressible aspiration for freedom, truth and progress.
2. Spirituality is unbounded, unconditional freedom.
3. Freedom appears in the field of politics as Liberty.
4. True freedom is attained only when it is extended to the whole population.
5. When freedom shows itself as political equality, only then does it truly become effective.
6. Political equality is availed of by the citizenry through extension of franchise.
7. Economic equality can be assured only by giving employment opportunity to all.
8. Money is a very fit instrument to achieve that equality.
9. Political and economic equality become real only when society is mature enough to look at all its citizens with an equal eye.
10. When psychological equality becomes real, all other forms of equality also gain strength.

11. Spiritual equality which eliminates fundamentalism is the rock on which all other social edifices stand.
12. Society has been built up by Man and therefore it must serve his needs and not the other way around.

2. Applied Spirituality

Though many spiritual changes have taken place in society, they are only seen as political changes. The emergence of democracy is spiritual though it is not seen as such. When some impossible thing becomes possible it is recognized as spirituality in action. India's winning of independence through non-violence is seen as a political achievement. Only in 1943 did India lose some 3 million people to the severity of a famine in Bengal. In 1965 she received a warning from U.N that she would face an imminent famine threatening the lives of some 100 million people due to an impending food shortage. The nation woke up and successfully staved off the challenge by increasing food production by another 50%. Such accomplishments are spiritual though we don't recognize them.

"We insist on being blind as if it were our birthright."

Currently, global warming appears to be an intractable problem defying any solution. The nations that participated in the Arab Spring revolution in the Middle East present another insoluble problem. Millions of refugees are fleeing their home countries and looking for asylum in other countries. They have to be accommodated somehow. Robots are increasingly taking over our jobs and at this rate some experts fear total take over by robots of the job market with nothing left for people to do. After World War I expanding populations were seen as a great hazard. But the issue is seen in a different light now. Especially if the population is a skilled one, it is even seen as a valuable asset in itself. Robert McNamara, former American Secretary of Defense, who vigorously pursued the Vietnam War, later gave it up and started calling for the abolition of nuclear weapons. Currently, Ukraine seems to be on the brink of disaster. In such a situation, the question of the relevance of spiritual principles to solving such problems arises and further it is highly interesting to find out how such principles are relevant to the issues at hand. We also need to inquire into what man should do to solve such problems.

On a certain day, the heads of Germany and U.S.S.R wondered about the future of Berlin Wall not even knowing that it would be demolished in 2 days. If we study all the psychological, economic and cultural factors that went into the break-down of the Berlin Wall, we will know all the secrets about the relevance of spiritual principles to our social ills. As with six blind men who struggled to understand an elephant, we too are equally blind and what is worse, we insist on being blind. The reality today is that America dominates the world with a show of her military might and economic wealth. She derives that wealth from the productive capacities of the Individual. The European serf came to the U.S and instead of seeing all his production go to his Lord, was pleased to see all of it coming to himself. It signified a political freedom for the entire peasantry. So great was the impact of this freedom that it reversed the economic fortunes of America and Europe and made the former give economic aid to the latter. Freedom is spiritual and when it comes to a very large

section of the population it becomes very effective. We are unaware of this simply because we do not want to be aware of it. We insist on being blind as if it were our birthright. Indian Prime Minister Indira Gandhi ruled for 11 unpopular years and then suffered a humiliating defeat. But after 3 years in political wilderness, she came back to power in an astounding manner which was not understood by any political observer. It is here that all the secrets of spirituality lie waiting to be discovered. It is a wise approach to learn valuable lessons from the past. When Man truly wants to know, these truths reveal themselves and they also reveal the process by which they go into action.

"Stock markets were originally created for collecting funds from the public for business use. That original purpose has been reversed now."

It may sound strange to hear that Man is in love with his suffering and does not want to be freed from it. This would mean that slaves don't want to be freed of their slavery and the poor don't want to be liberated from their poverty. Worse, they actually make an ideal out of their poverty. Spiritual relevance cannot exclude these two issues. If these two issues are left out, we may find the spiritual relevance still real. Malthus' prediction was real when he warned about the threat of the explosive growth of population. Such a warning prompted humanity to awaken to the reality. Reality included not only the threat of catastrophe but also the possibility of human resourcefulness. Unwillingness to make use of human resourcefulness is not to be appreciated.

3. Spirituality is Power

The only object that has evoked man's universal admiration and has retained it over the centuries is Money. It contains an enormous symbolic power that man is subconsciously aware of. Currency contains enormous social power and thus, money rules the world today as nothing else does.

When Greece joined the E.U it was doing fairly well and had a flourishing economy. Her joining the E.U was a sign of her political maturity and a good indicator of the political potentials of the E.U itself. Later developments show a parallel to what happened in U.S.S.R. The U.S.S.R realized the folly of having become a state economy and as a result moved towards market economy. It is to be regretted that she took the advice of IMF. The market economy of the West grew on its own strength and later succumbed to many artificial ways. Under the guise of the market economy Russia accepted many of these artificialities. A country is a whole by itself and draws its strength from its foundations. Each country sustained on the strength of its foundation can, by joining others, contribute to the union. This was apparently the understanding at the time of the formation of the E.U. The formation of the Euro came as an expression of the political advancement of the E.U. The real power of the Euro issues from the political authority of the E.U. The Euro as it has turned out, is dominating E.U., its creator, which is a very retrograde step.

In the 19th century, American President Andrew Jackson tried something along these lines but failed in his attempts. The emergence of the computer and economists winning Nobel Prizes by developing algorithms for stock market trading only shows that this tendency has returned. As a mark of protest for this tendency, the two Nobel Prizes that were given should be withdrawn. It should be noted that Monetarism is only a part of the Economy which is the whole. Economy is a part while Society is the whole. Further Man is the center of Society and not its subordinate. Speculation has put a check on money serving Man by reversing its spreading tendency and concentrating it in fewer and fewer hands.

"Conservative philosophies belong to the past and have no future. The future belongs to human-centered values."

Money arrived on the scene by way of trade. Farmers related to their fields by directly making use of the produce of the field. Trade made farmers relate to other people. It made them get in touch with civilization and not be totally lost in the soil. This widened the range of their relationship with others. Trade generated wealth through a system of productive values. Coin is a symbol of that activity. While coins are limited by the scarcity of metal, paper currency removed that impediment. By enabling money to purchase anything available, Society immensely improved the power of money. As a result Money became all-pervasive and very nearly omnipotent.

Money became Man's most powerful social instrument. This was followed by the arrival of banks. The institution of banks gave a solid physical form to the conceptual form of money. Agriculture ceased to be the fountainhead of productivity. The creative role shifted to trade and its instrument of money. Banks through which trade was conducted then gained enormous social power. This enormous power has been used to benefit society. Stock markets were originally created for collecting funds from the public for business use. That original purpose has been reversed now. Money kept on accumulating and later acquired a destructive character. It is in the midst of this situation that Greece got entangled in the debt trap of the E.U.

While Greece struggles with its financial problems, a parallel problem has appeared in the form of refugees. The world looks at refugees as a national problem while in reality it should be looked at as a global one. As a world government is in the making, the problem of refugees can be solved only if the nations of the world adopt a similar approach. Money that used to be a market instrument is no longer so. The market has become too small a place for the 21st century. Society has emerged all important and is demanding a global government for itself. Money has risen in its value to become a comprehensive power that includes educational, cultural and social power of society. However, truth demands that all these powers serve Man rather than vice versa. He must be able to dominate those institutions that are supposed to be his instruments. If such a perspective is gained, the present disorders in society will acquire the capacity to automatically set themselves right. Neither royalty, nor aristocracy nor the racial purists of Nazi Germany have any great future. It is democracy, liberty and

equality and such other values that have a bright future. Man is short-sighted and myopic in the extreme. It is pardonable to be a little myopic but it becomes unpardonable when myopia is venerated as something divine. Even the superstitious will protest the elevation of myopia to this divine level. Chamberlain was at his myopic best when he called Hitler a gentleman but suffered the rude shock of seeing Hitler break the agreement. Conservative philosophies belong to the past and have no future. The future belongs to human-centered values.

Spirituality is relevant to all of us in our daily lives. During 1940, patriotism was the spirit of the British people. For India, it was breathing freedom without taking recourse to war in 1947. Refusal to surrender was a spiritual moment for the European nations during World War II. Thus, we see that any social problem can be solved. As for E.U, the greatest step it took was when it formed itself very much like the American union in 1865 after victory in the civil war. When the depression hit the U.S in 1929, FDR displayed spiritual courage in taking the steps he did to conquer the depression. The winning of Freedom by India was a clear demonstration of the relevance of spiritual principles at work. Green Revolution was one more demonstration of this point. Present-day problems look formidable when we know that world leadership as such does not exist. Spiritual law says that attacking the problem straight may end up energizing it rather than destroying it. So it would be wise to focus our energies on strengthening counter measures to the evils that the world is facing today. The world has successfully fought and tried to eliminate such evils as epidemics, terrorism and violence, hot and cold war etc. Commensurate with these achievements, the stature of man has also risen. In spite of all adverse criticisms, it can safely be said that the world is a much better place to live in today than a century ago. Instead of energizing the evils that exist today, let us as a countermeasure enhance our human rights. We can issue a call to Muslim women to come out in the open and assert their human rights. Environmental groups such as Green Cross are worried about availability of water which is a legitimate worry. Its availability can be enhanced if we choose to pay more attention to water. In Tamil Nadu, a lot of water is wasted in agriculture. The state government chose to conduct an experiment to recharge the aquifer in all the towns. Building rain-water harvesting devices was made compulsory in all households. Tamil Nadu normally gets 40" of rain per year. But in the next year after the scheme was implemented, Tamil Nadu got 80" of rain which was simply double. This perfectly proves the power of the spiritual principle of attention.

In conclusion we can say that the present problems faced by the world are the result of shortcomings of our mentality such as narrow outlook, lack of adaptability, lack of wide-ranging vision and ignorance of our inherent potential. Spiritual principles have no such shortcomings and exhibit the very opposite of these qualities. They are comprehensive in outlook, highly adaptable, have a long-range and multifaceted vision and are abundantly productive. We have seen so far that rational approaches to solving the world's problems are not yielding any promising results. If so, it is advisable that humanity looks for solution in the direction of suprarational approaches and as such spiritual values and principles which are suprarational eminently deserve consideration.

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A Brief History of Mind and Civilization

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Abstract

The rational mind is the highest evolved status of human consciousness. The evolution of mind and civilization has proceeded hand in hand for millennia. The development of new capacities of mind made possible the development of tools, language, agriculture, permanent settlements, towns, cities, religion, trade, transportation, communication, government, law, money, literature and the arts, education, nation states, scientific and technological research. So too, each stage in the development of civilization has shaped the evolution of the human mind and its faculties and the way they are applied in life. The limits to our knowledge and accomplishment reflect limits to our rationality and the utilization of our mental potential. Our knowledge consists of fragmented, piecemeal, compartmentalized theories, when the reality we seek to understand is inclusive, complex and integrated. Our conceptions are based on mechanistic, static, inflexible equilibrium models, whereas the world we live in is alive, dynamic, organic, conscious, responsive, creative and continuously evolving. Our science assumes the poise of an impartial observer of objective reality, whereas all knowledge without exception is colored by the subjective perspective of the observer. Our science strives to be neutral and value-free, whereas the knowledge we need should help us realize universal values. We need to evolve ways of thinking that reunite the objective and subjective dimensions of reality and reflect the integrality, dynamism and vibrancy of evolutionary nature. That is the challenge and adventure before us.

1. The Paradox

The advance of knowledge over the past two centuries has been awe-inspiring. Our understanding of the physical universe and our own evolutionary past now extends millions of light years across the universe and billions of years back in time. Our capacity to measure and process data, transmit and disseminate facts, formulate new concepts and ideas, discover and invent, organize and educate, create and imagine, and harness the forces of Nature for human ends has multiplied exponentially.

Knowledge is power and never before has humanity known so much about the world in which we live. Yet never before have we faced challenges of such unparalleled magnitude and complexity, which defy solution by existing knowledge. Our progress has had unintended consequences. Efforts to develop a truly global civilization on the foundations of science and technology have been accompanied by rising levels of economic insecurity, political turmoil, social unrest, displaced populations and environmental instability. Our economic system

leaves billions in poverty and promotes widening inequalities. Our mechanical inventions displace, alienate and dehumanize us. We are dominated and oppressed by the monetary system intended to enhance human security. Our inability to establish effective instruments for democratic global governance leaves us powerless to address the existential threats posed by nuclear weapons and climate change. Our way of life ravages the Earth. In spite of ever increasing knowledge, our sense of uncertainty and insecurity is increasing. In spite of ever greater power of control and mastery over the forces of physical nature, there is an increasing sense of powerlessness to control the forces we have unleashed and the future course of our own evolution.

"Social power refers to the cumulative capacity of society to accomplish whatever goals it aspires for."

Concerted efforts are being made at the national and global levels to address each of the political, economic, social and ecological threats confronting humanity in the 21st century. New policies have been applied to enhance control. New institutions have been created to improve coordination. Yet these efforts have been largely ineffectual and often counterproductive. A quarter century after the end of the Cold War, political tensions are on the rise and nuclear weapons continue to proliferate. The recent flood of refugees into Europe threatens to undermine decades of progress toward European unity. In spite of unprecedented inter-governmental coordination, global financial markets remain unpredictable, unstable and uncontrollable, and multinational corporations increasingly operate beyond the reach of national governments. In spite of institutional and policy initiatives at the national and international levels, all of these problems appear to be growing. No effective solutions are in sight to counter the rising number of unemployed youth and displaced migrants, the spread of nuclear weapons, depletion of soil and water, the drug trade, cultural conflicts, terrorism, and climate instability.

The World Academy of Art & Science has traced the roots of these multiple challenges to a common set of underlying factors. They are all global in nature and defy solution at the national level. They are all interrelated and defy solution by fragmented, piecemeal sectoral strategies. They are all the result of rapid globalization in the absence of effective institutions for global governance. They are all impacted by the increasing difference in the pace of technological innovation and cultural evolution. They are all perpetuated by outdated social institutions. As Canadian mathematician William Byers insightfully summarized it, "What looks like a series of disparate crises is really one crisis that manifests itself in various ways—one all-encompassing crisis that arises from inner contradictions that are inherent in modern culture."[1]

Research by the Academy has led to the conclusion that these multiple crises are the result of three deeper root causes. First, they all reflect the limitations of prevailing knowledge in the social sciences. The failures of policy measures and institutional reform reflect the insufficiency of our understanding about how human society grows, develops and evolves. This has led WAAS to conclude that a radically new paradigm in thought is needed to support a new institutional and policy framework founded on the values of human welfare and well-

being.[2] For the past five years WAAS has been promoting initiatives to foster new thinking on human-centered economic theory, on a conceptual framework for a comprehensive paradigm for human development encompassing all dimensions of social existence, on basic principles of a transdisciplinary, integrated, value-based science of society, and on the unique catalytic role of the individual in social development.[3,*]

The second conclusion from this research is that the present crises are a result of the current distribution of social power in the world. Theoretical knowledge of society is incomplete so long as it fails to comprehend the way in which social power is generated and distributed. Social power refers to the cumulative capacity of society to accomplish whatever goals it aspires for. Never before has humanity possessed so much power—power to interact, communicate, exchange, transport, produce, discover, invent, educate, experiment, prolong life, entertain and enjoy. Yet never before has the distribution of social power and its fruits been as uneven and inequitable as it is today. At a time when society possesses more than sufficient capacity to ensure sufficient food, clothing, housing, education and health care to meet the needs of all human beings, billions of people still struggle for bare survival. Existing social institutions and policies have failed to remedy the situation and existing economic and political theories largely ignore this underlying problem. This has led WAAS to initiate an inquiry into the theoretical and historical origins and determinants of social power.[4]

Third, and most importantly, this research has led to the conclusion that all these causes are themselves founded on a more fundamental cause arising from the way modern society has developed the faculties of the human mind. The crises confronting civilization today are rooted in the way we use our minds—in the way we think.[5,6,7]

2. Mind

The basic premise of this paper is that the course of human civilization has been the result of fundamental evolutionary advances in development of the human mind, its faculties and powers for knowledge and conscious action. The central thesis is that the dilemma confronting civilization in the 21st century reflects inherent limitations in the specific way in which modern civilization utilizes the powers of mind; namely, that the present combination of analytic and systems thinking in concert with mathematics and the scientific method is inadequate to comprehend and effectively deal with the root causes and complexity of the challenges we face. Moreover, the institutional and social authority presiding over the present intellectual framework has itself become a major impediment to the formulation of more effective knowledge, particularly in the human sciences. The central conclusion of the paper is that we need to consciously strive to enhance our understanding of the characteristic ways in which we think, to increase our awareness of the inherent limitations and blind spots generated by those characteristics, and to develop the capacity to think creatively in a more comprehensive and integrated manner outside the confines of the existing conceptual framework.

* See World Academy of Art & Science project site on New Paradigm http://www.worldacademy.org/new-paradigm?quicktabs_new_paradigm_main=0#quicktabs-new_paradigm_main

2.1. Mind, the Instrument

Mind is humanity's most developed instrument for knowledge of self and world. Like every other instrument, mind has certain capacities and is subject to certain limitations. Science has expanded our knowledge of the world around us by developing the microscope, telescope, X-rays, chronometer, spectrometer, computer and an endless variety of other tools. In each case it has discovered both the utility and the limitations of these tools, the range of their effectiveness, the distorting factors that influence their accuracy and the inherent limitations to their power. Knowledge about the characteristics of each instrument is essential for using it appropriately. Modern civilization is founded on the primacy of scientific discovery. Minute attention is focused on the procedures and processes for validating scientific hypotheses and developing new instruments to extend the reach of our senses and the computational capabilities of mind, yet very little attention is devoted to learning more about the creative processes of mind itself, which are the source of great scientific discoveries. Having utilized mind as our principal instrument of knowledge for thousands of years, it seems ironic that there is so much about the nature, functioning, and limits of the mind and its faculties that we have yet to understand.

Our preoccupation with using the instrumentation of mind has nearly eclipsed serious inquiry into the nature and operation of mind itself. Neuroscience has recently made significant strides in understanding the structure and functioning of the human brain and its relationship to memory, sensory and motor functions. Computer science and artificial intelligence have discovered how to mimic certain mental capacities, such as memory and computation. But our understanding of fundamental processes of conscious awareness and knowing, self-consciousness, thinking, reasoning, insight, creativity, willing and decision-making remains rudimentary. Indeed, we still lack even a clear definition or conception of what mind is, the myriad faculties it possesses, the various types of thinking that characterize human cognition, and the other processes it consciously utilizes for knowing and willing. Consciousness determines power. We cannot have mastery over that of which we are not conscious. This paper examines the relationship between the way we utilize our mental faculties, most particularly our faculties for thinking, and the course of development of civilization.

This brief history of mind and civilization traces some important stages in the evolution of our capacity for thinking and its impact on the type of knowledge we have acquired and the development of civilization. It covers the broad sweep of human history in an impressionistic, anecdotal manner, highlighting landmarks central to the argument and ignoring others that are not central to the thesis being developed. An effort is made to draw particular attention to aspects that seem most relevant to the present and likely future stages of our mental and civilizational development.

Mind excels in a linear, step-wise, chronological analysis of unidimensional processes in the physical world. However, it is unlikely that the process we are attempting to trace is linear in its development. For it occurs on multiple levels of our existence, involves complex interactions between innumerable factors, alternating between progressive and regressive movements. The actual evolutionary process is far more complex than any description of

it. A major source of this complexity is the fact that our existence contains both objective and subjective dimensions—the world around us and the world of conscious awareness and activity within ourselves. These two complementary dimensions sometimes develop in tandem and sometimes in apparent opposition to one another—subjective belief claiming sovereignty over our knowledge of the material world or apparent material fact dictating the terms of reality for our psychological self-experience. The history of civilization seems to fluctuate between these extremes, reacting periodically to restore the balance. Thus, a narrative of mind and civilization is a dance between our inner and outer worlds.

Another complicating factor is that we live and act on three planes of existence. Apart from sensations, actions and events that occur in the physical plane, human beings are aware and act simultaneously in life or vital plane in which we perceive, relate, interact and react nervously and emotionally with our environment and with other people. We also exist in a mental plane of facts, thoughts, opinions and ideas in which we observe, conceive, understand, create and decide. The evolution of mind occurs simultaneously in all these three planes. As civilization transits through different stages or phases of development, it also undergoes shifts in the relative emphasis it places on each of them. Ancient Indian culture organized its thought and life around spiritual truths. Hellenic culture centered on the mind and its conceptual ideas. Modern society is preoccupied with the application of mind to the physical world and society by means of technology. Humanity's understanding of its place in the universe, of our relations with one another, of our own psychological processes and capacities for knowledge are continuously evolving. This historical narrative will examine significant developments in relation to all three planes and the interactions between them.

The application of mind for the development of civilization has occurred in four major spheres of social activity that are expressions of four interrelated components of the human mentality—the capacity for conceptual thinking and logical reasoning; the capacity for ethical thinking and moral discrimination; the capacity for aesthetic creativity and appreciation; and the capacity for physical design, practical organization and efficient application for execution of activities in space and time. Philosophy, religion, the arts, science and technology are civilizational products of these capacities.

3. The Conscious Thinking Animal

Mind is a faculty of consciousness. Human beings are distinguished from other animals by the development and progressive emergence of conscious mentality. Lower order species possess to a limited extent many of the characteristics that we associate with conscious mentality, including language, purposeful actions, specialization of function, organization, and development of tools. But the mental capacities and 'knowledge' other species possess are mostly in the form of subconscious instinctive behaviors driven by biological urges, rather than conscious learning processes and conscious volition. The language of animals appears rudimentary in comparison to the extraordinary diversity, complexity, versatility and richness of human speech. Other animals seem to lack the mental capacity for self-awareness and reflection on their own existence which is characteristic of human beings. Do apes ever wonder why they were born or what it would be like to be human? Animals learn

but seem to lack the capacity to consciously pass on learning from one generation to another. Animal behavior and social existence remain relatively unchanged from one generation and one millennium to the next, whereas human beings have continued to evolve higher forms of knowledge and new forms of civilization.

The principal faculties of mind include conscious awareness, self-awareness, perception, observation, memory, symbol formation, thinking, judgment, imagination and decision-making. Each of these faculties can be further subdivided in innumerable ways. This paper focuses primarily on the faculty of thinking, and the characteristics of the various types of thinking human beings have developed for the pursuit of knowledge, and the relationship between the ways we think and development of human civilization.

Thinking in earliest times seems to have been narrowly focused on specific actions designed to meet specific physical needs and interactions with the physical environment. The capacity of human beings to conceive of and fashion tools and instruments represents a rudimentary form of thinking. The earliest known stone axes were made 2.7 million years ago. Evidence of campfires are about 790,000 years old. Constructed dwelling places date back to 350,000 BC. Blades, needles, grindstones, paints, fish hooks, spear points, harpoons and mining instruments appeared in succession before 50,000 BC. The needle is of particular significance because it made possible fashioning of tightly fitting warm fur garments that in combination with fire enabled early Homo sapiens to survive in very cold northern climates such as Siberia, which eventually became the land bridge for the peopling of the Americas about 25,000 years ago.[8] These inventions demonstrate that early man had the capacity to translate conscious thoughts into action by a process referred to as decision or will. The development and spread of tools are indicative of what Merlin Donald calls mimetic thinking. Early man learned to cooperate and coordinate their activities as members of social groups. They learned from one another by example before the advent of spoken language facilitated oral communication and transmission of knowledge.[9]

Apart from these physical preoccupations, no evidence is available to determine at what stage early human beings began to reflect on the factors that differentiated them from other animals, the reason for the changes of season, the morality of their actions, their own mental and psychological reactions, or the purpose of their lives on earth. These higher forms of reflection required the prior development of language with a sophisticated vocabulary, concepts and ideas.

3.1. Symbolic Thinking

Mind has the capacity for pure self-awareness. We know that we exist without the intermediacy of senses or even of thought. But the faculty we call thinking is a form of indirect knowledge. Our mind receives sensory data about the world around it, interprets that data and derives knowledge from it. It hears a loud cry, identifies it as an animal, and analyzes it to determine whether it is that of a prey or a predator. The data of the senses is distinct from the objects of sensation and the knowledge derived is distinct from the data. It is indirect knowledge. “Mind can only have the direct consciousness of self in the moment of its present being; it can only have some half-direct perception of things as they are offered to it in the

present moment of time and the immediate field of space and seized by the senses. It makes up for its deficiency by memory, imagination, thought, idea-symbols of various kinds."[10] We try to identify and judge the subjective intentions, mood, and capabilities of another human being by their behavior, expressions and gestures. We have no direct capacity to perceive their subjective state.

Thinking is also a separative form of knowledge. The thinking mind does not directly perceive reality. It perceives thought-forms and formulates thought-symbols representing reality but separate from it. Physical sensation and experience impact on mind in the form of mental energy. The loud cry of an animal generates a mental sensation that activates the mind to full alertness. But until the mind interprets the sensation and identifies it as friend or foe, it does not possess knowledge. As soon as it recognizes the sound as the roar of a lion, it converts the energy into a mental form, a thought expressing the danger of an approaching lion. Then and only then does it also possess the capacity to transmit that knowledge to other minds in the form of symbols, signs or words. All symbolic, theoretical, conceptual, scientific knowledge is separative knowledge. It is knowledge of symbols that represent reality, not reality itself. Relativity and Quantum Theory, medical diagnoses of disease and econometric model of markets are conceptual representations of reality, not reality itself.

Thinking is a symbolic form of indirect, separative knowledge. It may begin with the primitive symbolic representation of the forces of nature as images or sounds or gestures. Cave art dating back 30,000 years confirms the development of symbolic thinking long before the emergence of complex languages. Evidence from this period of the widespread worship of the mother goddess most probably signified belief in the unique power of women for procreation. This suggests that man had not yet realized the relationship between sexual intercourse and the act of child birth nine months later. The symbol of the mother goddess reflected the sense of wonder and power associated with the act of procreation.

Primitive man shook with fear at the occurrence of a solar eclipse or an inauspicious configuration of the planets because he took these events as powerful symbols relevant to his own life. Symbols became the means for the creation and perpetuation of powerful superstitions. Superstition is the subconscious formation of a relationship between two or more things based on the perception or imagination that they are related with one another.

Symbolic thinking ushered in a transition from utilitarian thought focused on gratifying immediate needs to cosmological speculation regarding the nature of reality. Merlin Donald terms this as the transition to the stage of mythic culture in which language was first used to create conceptual models of the universe, grand unifying syntheses.[11] The German historian Karl Gotthard Lamprecht and the Indian philosopher Sri Aurobindo both describe a symbolic stage of psychological development in which man felt a great Reality behind all life which he sought through symbols and symbolic thinking which pervaded primitive society's thought, customs and institutions.[12]

These symbols were often laden with immense power. Historian Peter Watson identifies the idea of God as one of the three most significant acts of cognition in the long evolution

of civilization.[13] Thus, numbers acquired mystical significance in many ancient societies as symbols of fundamental truths of existence, long before the rational mind had developed either the understanding or the linguistic capacity to render these truths into words. In Vedic India, intuitive knowledge of human consciousness and the universe was rendered into myths and symbols of profound insight, remarkable beauty and power, unintelligible to the modern intellect trained in analytic discourse. It seems likely that they were the result of intuitive faculties of mind that are no longer well developed or may one day yet become far more prevalent, as the capacity to read, write and calculate was at one time a rare endowment and considered a sign of genius. The brilliant Indian early 20th century mathematician Srinivasa Ramanujan regarded zero as the symbol of God, the apparent nothingness and unmanifest potential from which all emerges, and infinity as the deployment of that potential in creation. In the period of the Upanishads, symbolic images developed into symbolic words born of intuition, rather than rational thought. They sought to depict truths of existence rather than to describe and explain them in rational terms.

In fact, all words are symbols. All thoughts, concepts, theories and models are symbols. They are mental forms or images utilized by mind to represent reality, never reality itself. Today we utilize the same symbolic capacity of mind to infuse power into a currency note, a wedding ring, a policeman's badge, a scientific hypothesis and a doctoral degree. As early man came to accept the symbol as the reality, today we often mistake modern scientific theories for truth rather than abstract representations of truth and constructed mathematical or conceptual models of reality for reality itself. The sophisticated scientific theories, philosophical systems and theological doctrines that have influenced the development of knowledge and the evolution of society are all attempts to represent truths of existence in symbolic form accessible to human thought and communication.

3.2. Causality & Invention

Thoughts are a means of relating things with one another. The capacity to relate two or more things is a basic characteristic of thinking. But correlation is distinct from causation. Symbolic thinking attributes significance and power to things, but does not necessarily represent causal relationships. The capacity to relate cause with effect is a more advanced power of thinking, and one essential for the development of civilization.

One may wonder why it took so long for primitive human beings to learn how to imitate natural processes occurring right before their eyes. The invention of agriculture took place around 10,000 years ago and met an essential precondition for the evolution of human civilizations. We can only speculate now regarding the mental processes that led to the invention of agriculture. The discovery of which plants, fruits, leaves, roots and flowers were edible and nutritious must have been a labor of many tens of millennia. The observation of where they grew and when they flowered and ripened must have taken even longer. But understanding these relationships was not sufficient to give rise to agriculture. Without language, these observations could not be communicated. Without written language, they could only be preserved by oral transmission from generation to generation.

It was also necessary for early man to closely observe the relationship between crops, soil types, rain, sunlight, temperature and the changing of the seasons. A long slow process of subconscious observation eventually must have led to the first conscious realization that human beings could replicate and even improve on the natural process. Instead of roaming the earth to find food, human communities learned how to imitate Nature. It fostered the development of sophisticated cognitive skills for planning, organization, specialization of function, and timely execution of complex sequences of activities. It led to the concepts of land as property and principles governing ownership. Agricultural surpluses spurred the development of trade and the advent of money, as a symbolic form of social power. The field of human productivity shifted from the land to the marketplace, from toiling on the soil to mutually beneficial interactions with other people. It spurred the rise of commercial centers, towns, cities, kingdoms, and overseas empires.

3.3. Early Civilizations

Archeologists associate the emergence of early civilizations with four important social developments: the invention of written language, the creation of cities with monumental architecture, specialization of work, and organized religion.[14] Organization is a characteristic power and action of mind. Mind organizes objects, ideas, beliefs, people, activities, events and countless other things. Civilization represents the outward organization of the life of the collective. It is made possible by the further development of a range of mental faculties and cognitive abilities.

The development of written language around 5000 years ago required a sophisticated capacity for precise definition, organization of thought and expression, and formulation of grammatical rules. The development of cities involved the orderly physical arrangement of structures, a division and categorization of activities, a hierarchical arrangement of authority and decision-making. Specialization of function required the capacity to break down complex activities into their parts, to arrange the sequence of steps and coordinate the relationship between multiple activities.

The development of religious symbolism and ritual long preceded the emergence of organized religion, which combines a mental construction of beliefs and ethical rules of conduct, a hierarchical organization of authority, social organization of the community and physical organization of events. The close and structured association between larger groups of people in cities was a catalyst for rapid advances in law, formal systems of weights and measures, trade, development of money, public administration, participative governance and education. These capacities in combination necessitated the systematic application of mental faculties at three levels—mental, social and physical.

3.4. Dividing Mind

Definition, categorization, organization, specialization, coordination and hierarchy are complex human endowments founded on the mind's capacity to differentiate aspects of reality, compare and contrast them, and express their relationships with one another in terms of space, time, characteristics, function, authority, action, and causality. These capacities derive from the power of mind for division and aggregation.

Mind is primarily and quintessentially an instrument of division. In its pursuit of knowledge, the characteristic action of mind is to divide reality into parts and deal with each of the parts as an independent whole. It distinguishes and categorizes these parts by comparison and contrast.[15] The earth is an undivided whole, but mind perceives it piecemeal, dividing it into geographic, geological and climatic regions, each with its own characteristics. All human beings share common characteristics, but they can be distinguished and sorted by size, sex, age, familial relationship, place of origin, skills, etc. The identification of differences is the basis for the mental faculty of definition, the delineation of characteristics, properties, qualities, categories, territories, social position, occupation, powers, privileges, varieties of behavior, personality traits, species of plants and animals, types of minerals, etc. There are innumerable ways in which the elements of any whole can be distinguished from one another. Therefore, there are an unlimited number of ways in which reality can be divided and subdivided. Thus, Wikipedia lists 27 types of snow and the Eskimos of Scandinavia have more than 200 words to describe different varieties of snow and ice.

Division is the origin of the mind's capacity for analytic thinking. The more it divides, the more it distinguishes, separates, compares and contrasts things with one another. It comes to consider each thing as a separate object of reality distinct from all others. Division also leads to abstraction of objects from their context. Thus we observe a ripe mango fruit as something separate and distinct from an unripened fruit, the inedible leaves, branches and trunk of the tree on which it grows, the soil in which the tree is planted, the sunlight and rain by which it is nourished, and the season in which it ripens. Similarly, mind divides us from one another and from the world around us. It separates the pursuit and dissemination of knowledge through science and education from the life of the community. It even divides our own inner psychological existence into thoughts, opinions, beliefs, sentiments, emotions, feelings, urges, desires, impulses and sensations. The mind's capacity for division is the origin of foundational concepts of modern science—the Cartesian divide between mind and body, the independence of the observer and object, and the distinction between objective and subjective forms of experience.

Mind also has a complementary capacity to aggregate the elements of reality it has divided in order to construct some conception of the greater whole of which they are the parts. Mind synthesizes the parts generated by analysis to create greater wholes. As the division of reality into parts is always based on a specific set of characteristics and differences, the aggregation of the elements to form a whole also depends on the characteristics used to reassemble them. Modern science has identified a diverse range of micronutrients known as vitamins, which are derived from a wide variety of very different sources and support the entire gamut of physiological functions, yet are grouped together to constitute a whole. In this case, the very small quantity required is the common factor between them that serves as the basis for combining otherwise very dissimilar substances. The whole can never be fully represented by an assembly of its parts, any more than the living human body can be represented by the sum of all the minerals, molecules, types of cells, anatomical organs, physiological functions and systems of which it is constituted. Thus, the whole is more than the sum of its parts, as Aristotle said. Analysis and synthesis, the capacity of the mind to divide and aggregate

reality, lie at the root of all mental knowledge, the languages mind has evolved to formulate and express that knowledge, and the civilizations that have resulted from these developments.

3.5. Birth of Reason

What is described above is a simplistic rendering of the primordial stages of mental evolution in prehistoric times leading up to the creation of written language and the founding of civilizations. The capacity of the mind for acute physical observation, symbol and language formation, definition, categorization, correlation, organization and causation evolved gradually over very long periods of time in different places and grew through contact, exchange and imitation between early civilizations.

Thinking is primordial. The formulation of principles for valid reasoning was a later invention. The symbolic and intuitive knowledge of ancient India became in ancient Greece conceptual knowledge based on rational thinking and gave rise to the development of formal logic. They pondered the nature of definition and sought to identify the principles of effective reasoning. The Greeks sought to render reality into terms intelligible to the rational thinking mind. The Egyptians were concerned with the practical application of geometry. The Greeks transformed the practical tools of geometry developed in ancient Egypt into principles validated by formal proof based on logical reasoning. Greece lived in a world of ideas that were considered valuable in themselves, not merely for their practical utility.

Greece marked the transition from practically effective knowledge to ideative truth affirmed by rational mental processes. The combination and correlation of thoughts led to the development of complex abstract ideas and theories of knowledge. The birth of logic vastly augmented the mind's capacity for analysis by clarifying definitions and refining thought processes. The development of logic coincided with the conception that the universe is essentially a rational place that can be explained in rational terms.[16] The Greeks established science as the pursuit of knowledge of a rational universe knowable by observation and reason. Their science was wide and borderless, not confined to narrow conceptual boundaries or cut off from other forms of knowledge. It encompassed both natural science and philosophy. They developed democracy, mathematics, education, formalized the role of hypothesis and evidence in law, and based medicine on observation of symptoms and rational diagnosis.

The Hellenic period was remarkable for its development of rules for discernment by reason and logic and rules for communication through rhetoric and dialectic in quest of metaphysical and scientific truth. But it also applied analytic thinking to questions of justice, right and wrong, ethics and morality, which are at the core of organized religion and social thought. Nor did its rationalism prevent Plato, Aristotle and others from extolling the virtue of intuition in their mystical quest to realize transcendent spiritual truths.[17] The ancient Greeks also excelled in the application of the mind's aesthetic powers for the creation, appreciation and enjoyment in literature, architecture and sculpture. They invented a wide variety of expressive literary forms—historic, epic, philosophic, tragedy and comedy, pastoral and lyric, oratory and didactic. Reason, discrimination, judgment, imagination and intuition all contributed to the efflorescence of Hellenic civilization.

Hellenic civilization was extraordinary in one other way. It affirmed the value of individuality and individual uniqueness. Ancient Greeks never allowed strict rules of logic or mechanical laws of nature to infringe on the place of independent thinking, free will and creative imagination. They revered mathematics but would have scorned the indiscriminate application of statistical probability when applied to conscious human beings.

What is most impressive about Hellenic culture is its inclusiveness, sense of proportion, balance and harmony. Perhaps unique in history, the Greeks simultaneously pursued knowledge in all fields and by all means—in philosophy, metaphysics, polity, religion, the arts and applied science. They affirmed intuition and logic, aesthetic sensibility, mathematical precision and ethical conscience. They embraced the objective and subjective dimensions of reality. They applied the analytic powers of mind with great depth and precision, yet never lost sight of the larger reality which is eclipsed by the focus on minute particulars. They accomplished this by a remarkable tolerance and respect for diversity of perspective. While individual thinkers may have proclaimed with insistence the sole reality of the physical, their assertion was not permitted to overshadow or obscure contrary points of view. This sense of inclusiveness and proportion might well be the finest contribution of Hellenism to humanity. It appears all the more precious in the current age of exclusive concentration on the objective and the physical. Ancient Greece was able to aggregate an impressive range of perspectives, but it could not truly synthesize and integrate them to form a comprehensive conception of reality.

Rome inherited the Greek reverence for the powers of mind. But while in Greece, the principal field of application was mental knowledge and the creative arts, the mind of Rome was concentrated on social organization. Rome harnessed the powers of mind to organize the life of the polity, law, the military, economy, education, civil administration and civic life. It developed a written body of law and a theory of jurisprudence. It organized education, establishing a widespread system of schools with a standardized curriculum. Greece gave birth to the modern mind. Rome gave birth to modern social institutions. Greece developed the intellectual and aesthetic faculties of mind to rare heights. Rome gave birth to the modern state founded on a culture of duty and discipline and based on development of the ethical faculty. The Greeks worshipped beauty. The Romans worshipped character.

4. Rise of Empirical Science

The evolution of mind in Europe was submerged for centuries during the Middle Ages by the collapse of the Roman Empire, the reversion to a feudal social structure, and the weight of church doctrine. Important developments during this period prepared the way for the explosive outburst of mentality that characterized the Renaissance, Reformation and Enlightenment.

4.1. Quantification of Reality

Quantification is an inherent power of the analytic faculty of mind that divides reality into smaller and smaller parts. The full development of the analytic mentality required the development of symbols, concepts and logical principles governing the use of numbers. The

ancient Greeks gave emphasis to the geometric application of numbers for measurement, as in the fields of architectural engineering and astronomy. Indians made important advances with the development of the Hindu numerals and applications of trigonometry to astronomy at the end of the 5th century AD. With the perfection of the decimal system and solution to indeterminate equations and the addition of the zero symbol in the late 9th century, a decimal based system of positional notation was fully in place. The introduction of the Hindu numerals and algebra into Europe from Arabia gradually supplanted the Roman numerals. Precise quantification was extended to many fields of life. The use of letters in place of numbers in mathematics was introduced in the 13th century. The operational symbols in arithmetic were devised in the 14th. This was accompanied by a significant change in written notations. The order of subject, verb and object, the separation of individual letters into words, sentences, and paragraphs, the adoption of punctuation, chapter headings, headlines, cross references and alphabetization as an organizing principle were major advances. In combination, they facilitated the spread of literacy and the use of numbers. The spread of mechanical clocks from the late 13th century enhanced the consciousness of time. The development of musical notation combined symbols and mathematical concepts to denote both octave and tempo. The introduction of double entry resulting in the separation of assets and liabilities, debits and credits greatly facilitated the development of commerce and banking.

4.2. Return to Nature

While Greece focused on the application of mind to ideas and Rome focused on the organizing power of mind in society, the modern period began with intensive concentration of the powers of mind on the physical world. The power of the analytic mind turned its attention to the physical world of Nature. It gave rise to methods of inquiry that replaced the authority of Church doctrine with validation by physical observations.

A brief survey cannot do justice to the many stages through which modern science has developed or the complex array of civilizational advances that influenced that development. The founding of universities, spread of learning, and rediscovery of the Greek classical legacy gradually restored the preeminent authority of logical reasoning and empirical experience. It led to the development of inductive and systematic testing in the 12th century and the reemergence of mathematics, philosophy and metaphysics in the 13th century. A commercial revolution led to important innovations in agricultural production, manufacturing, entrepreneurship, trade, shipping, banking and insurance. This in turn gave rise to a bourgeoisie of unprecedented wealth and sense of independence, which spurred a radical reorganization of society with increasing freedom and independence from feudal and church authority. The revival of Platonic philosophy legitimized the pursuit of metaphysical truth through number, geometry and intuition, laying the intellectual groundwork for the emergence of rational, secular humanism and individualism in the 15th century.[18] The invention of the printing press facilitated that rapid reproduction and inexpensive dissemination of ideas. An efflorescence of originality in the arts coupled with the rise of individualism gave birth to the concept of genius, an idea unknown in the medieval world-view.[19] The Reformation brought with it a more tolerant and more secularly intellectual atmosphere for considering alternative viewpoints in the 16th century. The founding of learned societies and scientific journals in the

17th century established an 'invisible college' of independent thinkers to challenge orthodoxy, exchange new ideas and explore new discoveries and inventions. During the same period a new type of combinatorial mathematics developed based on analysis of gambling situations which ultimately gave rise to the inductive method of statistical probability. The spread of democratic ideas during the 18th century promoted freedom of thought and expression. The spread of education increased the population that could engage in and benefit from new ideas and scientific discoveries. All these factors gained far greater significance when the Industrial Revolution demonstrated the enormous power of science for generating wealth and military power during the 19th century. Although most of the early inventions of this period were developed by skilled mechanics rather than trained scientists, it soon became evident that a systematic study of scientific principles could vastly enhance the process of innovation. The marriage of science, technology and economy spurred the development of technical education in engineering, agriculture and medicine.

The remarkable achievements of science over the past four centuries are too vast and self-evident to be given adequate treatment in this paper. The focus here is on the profound impact the rise of empirical science and the scientific revolution has had on our conception of knowledge and the way we utilize the powers of mind to discover it. If inordinate attention seems to be placed on the limitations and unintended consequences of science as a pursuit of knowledge, it is with the hope that a greater understanding of these limitations and consequences will provide insight into the need and potential for evolving more effective instruments of knowledge and more successful forms of civilization in the 21st century.

4.3. Mind and the Scientific Method

Our primary concern is the relationship between these developments and our approach to understanding the world. Physical observation, measurement, analytic thinking and experimentation formed the foundations of modern science. Minutely detailed and careful observation of physical phenomena that could be independently verified by other observers was the starting point. Scientific instruments were developed to extend the reach of the senses and improve their accuracy. But the real power of modern science issued from a marriage of observation and measurement with analytic thinking.

The Copernican Revolution dramatized the limitations of sensory data as the basis for knowledge. From ancient times it had been known that sense impressions could distort reality. Copernicus applied logic and precise mathematics to refute the notion that all heavenly bodies move around the earth. Galileo confirmed this heretical view by using a telescope to observe four moons orbiting around Jupiter. Copernicus' discovery led to the formulation of a radically different world view that contradicted both the evidence of the senses and the prevalent conception. It ushered in what Kuhn calls a scientific revolution, based on a new conceptual system and a new method of knowing reality.[20]

Newton combined acute observation, precise measurement, reflective analytic thinking and mathematics to change the way science viewed the world for three centuries. His discovery of universal laws of nature and the invisible force of gravitation had profound impact on our conception of reality and knowledge. Newton applied new concepts and a new

mathematics to arrive at a more precise understanding of the physical world. The concept of immutable laws of governing an orderly, machine-like universe became a conception in science. His work spurred advances in mathematics as a field of knowledge in its own right and as an instrument of knowledge applicable to all fields of existence. As a consequence, modern science has come to identify valid knowledge with mathematical proof and to search for knowledge in places where the light of mathematics can shine brightly.

4.4. Intellectual Impact & Cultural Consequences

The rise of modern science altered the course of global civilization, the evolution of the human mind and the development of our conception of knowledge in fundamental ways.

1. *Physicalism:* It led to the materialization of knowledge. The exclusive focus on knowledge of physical nature eventually led to the implicit premise or explicit belief that the physical is the sole plane of reality, a conclusion which Newton and other early scientists would have vigorously rejected. This premise is now pervasive even in the social sciences, where genetics and neuroscience seek to unveil the mechanisms governing psychology and even conscious mentality.

2. *Deterministic Mechanism:* The scientific revolution led to the conception of knowledge as a set of immutable, universal laws determining the functioning of a static, mechanical universe. Knowledge of reality became synonymous with certainty and predictability until challenged by the discoveries of quantum mechanics nearly three centuries later. Outside Physics this premise remains largely unchallenged. The Newtonian quest for immutable, universal laws of Nature was later extended to identify universal laws governing polity, economy and society. For the past two centuries economists have attempted to reduce human behavior and interaction to external factors and mechanistic processes governed by universal principles. The study of general principles has obscured the unique role of the individual in social development, innovation, discovery and creativity. The mechanical view of reality has led to the rejection of human free will as an appearance and neglect of individual uniqueness.

3. *Specialization:* Mind's capacity for division and analytic thinking inevitably led to a proliferation of separate disciplines, to specialization, and compartmentalization of knowledge with immense consequences. Over the last five centuries, the number of intellectual disciplines has multiplied from five to around 1000 disciplines and sub-disciplines. As the study of reality is divided up into smaller and smaller pieces, specialization has led to increasing fragmentation of knowledge. Viewing each field independently has generated precise knowledge of the parts, but obscured the complex interactions and relationships between elements that are essential for knowledge of the whole.

4. *Quantification of Knowledge:* It led also to the quantification of reality—the confusion of data and information with real knowledge and the misconception that mathematical models and statistical probability are true and accurate representations of the real world. Mathematics is an extremely powerful tool for the discovery and validation of

knowledge. But increasingly it has come to be regarded as knowledge itself. In String Theory, mathematical consistency has become a substitute for measurable, verifiable evidence. The awarding of two Nobel Prizes in economics for development of computer algorithms that model the functioning of financial markets is only an extreme example of a widely prevalent phenomenon. Its consequences during the financial crises of 1998 and 2008 underline the extreme danger of mistaking models for reality and mathematical formulas for knowledge.

5. *Measurement of Randomness and Uncertainty:* An unintended consequence of the Scientific Revolution has been to redefine the notion of chance. The conception of the universe as a giant mechanism subject to universal laws of causation made it possible to also postulate its very opposite, a complete absence of causality, pure randomness.[21] The development of probability theory originally aimed at obtaining knowledge about complex causal processes, but later was applied to situations assumed to be characterized by a total absence of causality. The merger of probability and statistics in the early 20th century resulted in the new hybrid field of mathematical statistics. Under the influence of positivism the philosophical dimension of causality was dropped and probability came to be viewed purely in mathematical terms as an expression of randomness.[22] The application of *a posteriori* induction to ascertain the likelihood of future events dramatically broadened the application of mathematics to the human sciences, with profound consequences.[23] The concepts of uncertainty and randomness were inadvertently elevated from philosophical questions to the status of objective scientific fact.

6. *Dominance of the Objective:* Modern science commenced with an exclusive focus on the study of observable external phenomena in the material world which lent themselves to measurement, verification and experimentation. This led to the rise of the philosophy of positivism, founded on the premise that information derived from sensory experience, interpreted through reason and logic, forms the exclusive basis for all authoritative knowledge. Only knowledge that can be independently verified can be considered authentic. Thus, knowledge of the objective world and knowledge acquired by objective methods alone is valid. The study of subjective phenomena and subjective forms of evidence became inadmissible and invalid. Introspective and intuitive knowledge were rejected. In the 20th century logical positivism rejected metaphysics as pure speculation and attempted to reduce statements and propositions to pure logic.

The contributions of modern science to the march of civilization are immeasurable. Even its tendency toward exclusive concentration on physicality, the objective world, the measurable, quantitative, and universal has had salutary effects of great value. Materialism has wiped away much that was merely superstitious or speculative. Its irreverent questioning of acknowledged truths has unleashed an insatiable curiosity and spirit of adventure. Its ruthless rejection of unfounded opinion and prejudice has helped discipline the thinking mind to challenge opinions, shed preferences and prejudices, question conventional beliefs and challenge established authority. Even its atheism has helped cleanse religion of pious posturing and vacuous moralizing. It has served as a basis for the democratization of our

lives as well as our minds, at least within the boundaries of the world as science perceives and understands them.

Each of these characteristics has contributed positively to the advance of scientific knowledge and is partly responsible for its collective achievements over the past five centuries. At the same time, each of them has imposed arbitrary limits on the development of knowledge. After reigning victorious for four centuries, today we see the weaknesses and insufficiencies of modern science rising to the surface, staring at us with its unvarnished flaws and glaring inadequacies. Byers used the term 'blind spots' for intrinsic limitations to what can be known through science.[24] It behooves us to generously recognize its enormous contribution, and yet equally to acknowledge and inquire into its errors, omissions, blind spots, prejudices, pompous presumptions, superstitions and intolerances—the very characteristics against which it first arose in rebellion and has since fought for centuries to eliminate. An impartial consideration of their role will help us understand both the strengths and weaknesses of science today and reveal opportunities for the further advance of both knowledge and civilization.

4.5. Objectivity & Subjectivity

The initial concentration of modern science on physical nature was justified as a logical choice and practical necessity. The rise of positivism converted practical necessity into philosophical dogma with profound implications for the development of science and the further evolution of mind. The transition was abetted by confusion regarding the ambiguity of the terms objectivity and subjectivity, each of which has a double meaning. The study of physical nature is the study of inanimate objects and subconscious life forms which can only be observed objectively ("observe as object") in the external environment, since we have no access to their subjective intentions or self-experience. Descartes' body-mind dualism encouraged the idea of the scientist as an objective ("impartial") witness standing outside of nature, rather than as an involved participant in the world he observes. Gradually, the notion of objectivity as the study of external objects without impartiality merged with the very different notion of objectivity as the absence of 'distorting personal preferences' of the subject and came to be regarded as one and the same thing. This led eventually to the philosophical premise that reality consists solely of objects that can be studied objectively and by extension that all subjective phenomena are secondary results of objective causes.

The word subjectivity also has two meanings which have gradually become conjoined and confused with one another. Subjectivity ("experience as subject") is the psychological field of conscious human experience that is not directly accessible to external observation. Only its behavioral expressions can be observed by others. But it is also used to connate subjective ("personally biased and preferential") factors contributed by the observer, such as preconceived notions and prejudices, the legacy of traditional beliefs and superstitions prevalent at the time.[25] In its quest for impartial knowledge of physical objects in the world around, emphasis was naturally placed on eliminating this distorting influence. So the idea of subjectivity as the psychological experience of a conscious individual came to be regarded as an unscientific and invalid form of evidence and to some extent an invalid form of experience.

As in the anecdote of the man who lost his keys on a dark street and searched for them down the block under a street light where there was better light, science sought to discover ultimate knowledge by the exclusive study of physical factors that could be observed by the physical senses and measured by material instruments. In the process the entire subjective dimension of reality, the dimension which distinguishes human beings from all other species, was subordinated to the objective dimension observable by the senses. Eventually it resulted in philosophical and scientific efforts to reduce all non-physical phenomena solely to physical causes.

The course of science exerted a subtle influence on the development of mental faculties and concepts of truth, knowledge and logic. It displaced the Greek conception of truth as that which could be known in the form of pure ideas accessible to logical reasoning, but not necessarily to physical observation or measurement. Rationality itself came to be narrowly associated only with that which can be perceived and verified physically. The old adage that I will believe it when I see it acquired the status of scientific dogma, even when applied to aspects of reality beyond the reach of the senses. This phenomenon might be termed the materialization of knowledge.

4.6. Fragmentation of Reality

Divide and subdivide reality ever so much and we still arrive at some smaller portion of reality that eludes our grasp. The infinitesimal is infinite. The dominant role of the analytic intellect in modern science resulted in the dissection of knowledge into smaller and smaller fragments resulting in the proliferation of specialized fields of study. Analysis is an extremely powerful instrument. It harnesses the dividing power of mind to separate reality into smaller and smaller parts. By so doing, we acquire more precise, detailed knowledge of the part and are enticed to drill down to ever deeper levels of minuteness. As its focus narrows to laser-like precision, the surrounding fields and interconnected aspects of reality grow proportionately out of focus and obscure. The more we know the part, the less we know about the integrality of the whole.

Physical science has compensated for this divisive tendency by aggregating knowledge from different specialized fields to form a remarkably cohesive and coherent conception of the physical universe. It has successfully incorporated the fundamental principles of physics into chemistry and the principles of both into astronomy, geology, the material sciences, climatology, oceanography, soil science and innumerable other disciplines. While the same fundamental principles are consistently applied, the interactions between subsidiary fields founded on these principles have been less effectively related and integrated. Partly, this is due to the complexity arising from these multiple interactions, but also partly because research and theorization have largely proceeded in a compartmentalized manner. Raging controversies regarding climate change are partly attributable to the fact that for so long the complex array of phenomena that influence climate have been studied piecemeal, independently from one another.

The consequences of compartmentalization and fragmentation become more evident when we look at the life sciences. Here the effort to overcome compartmental barriers is far

less advanced. Interdisciplinary and cross disciplinary research have become more common, but the fundamental principles applied in different fields remain largely autonomous. For decades, evolutionary biology remained preoccupied with the exclusive role of random mutation in the evolution of species, ignoring important biological and environmental factors that impact on the chemistry and biology of genetic materials.

In medicine, specialization has led to remarkable progress in our understanding of specific pathologies, but it has taught us relatively little about the overall concept of health. Moreover, the piecemeal treatment of specific illnesses often has consequences quite detrimental to the overall health of the patient. In allopathic medicine health is conceived primarily in negative terms as the absence of disease; whereas in traditional systems of medicine such as Ayurveda, developed by reliance on more synthetic and integrative mental processes, health is conceived in positive terms as the property of a balanced and harmonious living organism. This becomes even more evident when we take into account psycho-somatic phenomena. Research on the 'placebo effect' dramatically demonstrates the impact of the patient's attitude and expectations on treatment outcomes and general health. Indeed, recent findings indicate that the placebo effect is increasing over time. This and other phenomena directly connecting physiological and psychological processes testify to the need for a much more synthetic conception and approach.

5. Naturalization of the Social Sciences

The six characteristics of empirical science discussed above have each had profound impact on the development of mind, knowledge and modern civilization. Re-examining the implicit and explicit premises underlying modern science is vitally needed to further the advance of knowledge in all fields. But the limitations of the prevailing approach are most apparent in precisely the fields of knowledge closely associated with the challenges humanity confronts in coping with rapid and radical global social, economic, political, intellectual, technological and cultural evolution. Therefore, it is especially necessary to consider whether the application of the analytic methods of the natural sciences to the social sciences is itself one of the root causes of the current problems confronting humanity today.

A comparison of the natural and social sciences needs to take into account the significant differences between these two bodies of knowledge. The most obvious is the fact that systematic study of physical and biological phenomena began several centuries before the systematic application of the scientific method to the study of society. By comparison the social sciences are still in a very early stage of development. Furthermore, there is an enormous difference in the intricacy and complexity of the phenomena being studied in the two realms. Living organisms are far more complex than inanimate material objects. In addition to possessing all the attributes of material things, they also superimpose on their physical base structural and functional characteristics and environmental interactions not found in inorganic forms. This adds enormously to the complexity of living things.

The same is even more true of the phenomena studied by the human sciences. To the complexity of physics, chemistry, biology, genetics and earth sciences, is added the

complexity of conscious, self-aware purposeful human beings living in complex social and cultural environments, interacting with myriad social institutions and organized activities, utilizing a vast array of tools and instruments, and influenced by the cumulative knowledge and experience of countless generations of humanity. Moreover, the level of individuation, complexity and uniqueness observed in human beings is far greater than that found in other life forms. The behavior of every electron, every atom of hydrogen and every red blood cell may be identical, but the behavior of every individual human being is characterized by a very large degree of variation and uniqueness. The range of factors influencing behavior and outcomes defies numeration. Physical and biological factors apply, but social, cultural and psychological factors play a determinative role. Individuality may safely be ignored in the study of physical and biological phenomena, but it is central to the knowledge of conscious human beings.

5.1. Fragmentation in the Social Sciences

The problem of compartmentalization of knowledge in the social sciences becomes evident when we consider that each discipline has developed its own set of fundamental principles and applies them relatively independently from the rest. Different concepts and hypotheses regarding human behavior are routinely adopted by political scientists, economists, sociologists, anthropologists, lawyers, and management scientists, yet all with application to the same subject—individuals and groups of individual human beings. No universally accepted principles are uniformly applied across fields.

The consequences of this fragmentation are apparent in the problems we confront related to environmental degradation, unemployment, political instability, social alienation, crime, drugs, and psychological disorders. For two centuries Economic theory developed without giving serious consideration to the impact of human economic behavior on the physical environment. Similarly, the development and application of technologies for economic purposes have been done without regard for their impact on employment, social stability, human welfare and well-being. Many economic theorists ignore the central role of political regulation in the successful operation of free and competitive markets. Legal theory has become increasingly divorced from political principles, social aspirations and human rights. The humanitarian rights of humanity are rejected on the basis of legal principles that recognize only the rights of sovereign nations, not of their citizens.

The same fragmentation of knowledge occurs within disciplines supporting an increasing divorce between different aspects of our social existence. Backed by fragmented theoretical conceptions, financial markets have become divorced from the real economy and the economic welfare of people which they were originally intended to support. A similar fragmentation has led to the treatment of a wide range of psychological problems as if they are simply physical in origin.

The Cartesian divide also isolates and insulates social science from society and the social consequences of its theories. Theorists assume no responsibility for the failures arising from application of their flawed conceptions, as exemplified by the global crisis of 2008. Scientists in leading universities refuse to acknowledge or apply the findings of educational researchers

in the same institution about the most effective pedagogy to promote learning. Medical doctors are licensed without receiving any training in managing patient and family relations. The list of gaps and short-circuits is endless.

"Human evolution is a complex conscious process involving continuous interaction among the objective and subjective dimensions, physical facts and mental conceptions, natural forces and human aspirations, creative individuals and social groups."

5.2. Legitimacy of the Subjective

The phenomenal success of the natural sciences spurred efforts by early social scientists to imitate and replicate the same approach. The discovery of immutable universal laws governing the physical universe led to a search for similar principles applicable to society. The extension of the concept of law to conscious human behavior, individual and social, has been the source of endless confusion and error. The governance of political systems and the functioning of our economies are not determined by natural law. They are the result of conscious choices made by individuals and groups in the past, which have undergone a continuous process of evolution over the centuries and are always subject to modification by conscious choice. The resistance posed to social and psychological change by established habits, beliefs, self-interests and inertia may indeed be formidable, but no social arrangement is unchanging or inevitable.

In the field of Economics, the enunciation of principles and the construction of mathematical models similar to those in Physics have fostered a basic misconception regarding the factors that govern economic systems and the scope for altering their outcomes. For nearly two centuries the Newtonian concept of equilibrium in a static universe that dissipates energy and tends toward the lowest possible energy state prevailed almost unchallenged in Economics. The theory of perfect, instantaneous equilibrium is inapplicable to social systems that function far from equilibrium, adjust gradually, organize energy and continuously evolve higher levels of orderliness.[26] The extension of the principle of scientific laws has fostered passivity and resignation before social injustices, political oppression, economic inequality, and other social ills. The vastly disproportionate distribution of the world's wealth, the displacement of human beings by machines, the subordination of women, the political influence of the rich, and the social exclusion of minorities are the results of human choice, not natural law.

Similarly, the Darwinian concept of the evolution of subconscious biological forms narrowly viewed as competition and survival of the fittest was inaptly applied and later rejected with respect to conscious social systems. Society evolves by processes that are conscious and subjective. Aspiration, curiosity, observation, thinking, creativity and imagination are more fundamental than external forces in human social evolution. Competition takes place within a wider and more fundamental framework of cooperation. As this narrative affirms, human evolution is a complex conscious process involving continuous interaction

among the objective and subjective dimensions, physical facts and mental conceptions, natural forces and human aspirations, creative individuals and social groups. Analogies between the natural and human world may provide useful insights into similarities and parallels between the two domains. But the automatic extension of physical principles to conscious living beings conceals more than it reveals, obscures rich complexity by overly simplistic assumptions, and reduces the profound creative complexity of human existence to rudimentary mechanical models and quantitative equations.

"In denying the validity of subjective forms of knowledge, science invalidates itself."

The consequences of the conflation of objectivity with reality and subjectivity with unreality as discussed earlier are most evident in the study of humanity's conscious social and psychological existence. It is here that the confusion regarding impartiality and reality has imposed the most serious obstacles to the progress of knowledge. The identification of knowledge with objective fact has erected a serious barrier to the progress of knowledge. The sciences of society and psychology are concerned with the actions of conscious human beings. Those actions include not only the physical movements of our bodies, but also our mental actions of observation, thought, will, imagination and creativity. They also encompass our vital actions of perceiving, feeling, emoting, aspiring, fearing, desiring, loving, enjoying, playing, and so forth. The effort to discount, dismiss, or delegitimize our subjective experience is to reject all that is most truly human about us, simply because it does not lend itself to observation and measurement in physical terms. The effort to compress, reduce or reinterpret all subjective experience solely in terms of neurophysiology is akin to looking for lost keys under the street light, because that is the only place our eyes can see.

It seems reasonable that the physical scientist studying matter assumes the position of an observer mind witnessing an independent physical reality. Yet the same premise does not equally apply to a psychologist examining a subject's conscious and unconscious mind. Self-experience is the most vividly real and tangible experience of which human beings are capable. Indeed, we can never experience anything else so directly and intensely. When we impartially examine the supporting evidence, we realize that the reduction of all subjective experience arises from the initial premise of physical science rather than from either rational or evidential justification. The fact that there are neurophysiological correlates to our conscious experience no more proves that our thoughts and feelings are the result of neurophysiological phenomena than the fact that adjusting the dials on a television proves that the program being broadcast originates from the TV.

Nevertheless, the pursuit of extreme hypotheses such as this one and the presumption that human intelligence and machine intelligence are the same may serve an evolutionary purpose. Indeed, it can help us understand the mental and social processes by which both mind and civilization have advanced up to the present stage. Undoubtedly there are correlations between our mental and physiological processes. An impartial observation of both the similarities and differences between them may generate valuable insights. But this requires that we remain conscious of the hypothesis we are testing.

The problem of objectivity goes still deeper. In regarding reason as an impartial judge and witness of reality, we overlook the implicit biases that colors all rational thought. Reason has a pronounced tendency to concentrate on facts and ideas consistent with its premises and to ignore or differently interpret those that contradict it. Science is itself a subjective discipline for generating knowledge governed and framed by philosophical conceptions that are themselves inherently 'unscientific' because they cannot be validated by the scientific method. The effort to exclude philosophy from science suppresses open discussion, but can never eliminate its subjectivity. In denying the validity of subjective forms of knowledge, science invalidates itself.

5.3. Quantifying Humanness

The application of statistics to social problems has brought to the front inherent problems with the quantification of human experience. Nassim Taleb argues in *The Black Swan* that for over a century social scientists "have been operating under the false belief that their tools could measure uncertainty."[27] The enormous power of quantitative methods has progressively obscured the important contribution of qualitative components of reality and individual differences in the social sciences. Taleb seeks to challenge a blind or misguided sense of confidence in the reliability of political and economic decisions based on statistics. He concludes that the problem lies in the structure of our minds.[28] On the other hand, Weisberg argues that precious qualitative information relating to individual differences is being consciously suppressed or neglected in clinical fields such as medicine and psychology by what he terms 'willful ignorance'.[29] Both these viewpoints reinforce the need to reexamine fundamental philosophical issues with respect to the application of quantitative methods to the social sciences.

The point here is not to criticize either science or social science. It is rather to emphasize the inherent limitations and untoward consequences that arise from a partial, one-sided and unbalanced development and application of our mental faculties. The knowledge we need is very unlikely to be discovered by objective analytic methods, quantitative measurements or experimental neuroscience. It lies in our conscious experience and can be most directly accessed by reflecting on our own mode of functioning as scientists, rather than hunting for answers through mountains of clinical experiments. Mind has been the instrument of all humanity's achievements and it lies at the root of the problems confronting civilization today. No other field of scientific inquiry has so much to offer.

6. Synthesis

Long before the development of logic, the ancients discovered the profound truth that reality is one and indivisible. What mind infinitely divides for the purpose of analysis remains at all times a unified, integrated whole. Mind's capacity for analysis and its capacity for synthesis are in constant tension. The more we divide reality for the purpose of understanding its component parts, the more we lose sight of the interconnections, relationships and interdependencies that reflect its underlying unity. Division and aggregation present complementary perspectives of reality. The microscope and the telescope are instruments

fashioned by these compensatory needs to zero in on a specific target and zoom out to see the big picture.

The inherent limitations and inadequacy of the knowledge generated by extreme specialization, compartmentalization and fragmentation became increasingly apparent in the 20th century and inevitably gave rise to efforts to reunite that which had been torn asunder into tiny fragments. Compartmentalized universities introduced interdisciplinary, cross-disciplinary and multi-disciplinary studies and research, which sought to bring a variety of different perspectives to bear on problematic issues. But the inherent limitations of these efforts soon became evident. Each brought to the problem a different set of concepts, theories and evidential data to talk about the same problem, without any shared conceptual framework indicating the relationship between these disparate perspectives, their interdependencies or the unifying factors underlying their different expressions.

6.1. Systems Thinking

The limitations of aggregating multiple sets of data based on different theoretical frameworks gave rise to efforts to conceptualize the relationships between all the parts by viewing the whole as a complex interconnected system. Cybernetics evolved as the study of control systems in the early 20th century in the fields of electric network theory, mechanical engineering, logic modeling, evolutionary biology and neuroscience. Its insights contributed to the theory of complex systems. It stimulated transdisciplinary research in information theory, artificial intelligence, robotics, medical science, economic systems, biology, cognitive science, management, sociology, and the earth sciences. The systematic application of mind's capacity for synthesis led to practical applications of immense importance in computer science and communications. A similar approach has been adopted to build systemic theories and models of global financial markets and the global economy, as well as to comprehend the complex array of forces that govern the climate of the earth and on the impact of human behavior on the planet.

Systems theory has helped compensate for the extreme fragmentation of knowledge resulting from specialization. It has restored a vision of the totality of existence within specific fields and with relation to specific problems. The significance of this change in thinking is most dramatically reflected in the development of the Internet and World Wide Web over the past few decades, giving rise to the world's first truly global social system. Conversely, the practical development of cyberspace has provided a tangible example, symbol and metaphor for systemic thinking and has been a catalyst for the development of more comprehensive, inclusive thinking in all walks of life.

But the development of core complex systems theory extends beyond the mind's capacity for aggregation and synthesis. At a more fundamental level it seeks to identify universal principles that underlie and govern the behavior of complex adaptive systems in a very wide range of applications, such as network effects, emergence, self-organization, and self-reproduction (autopoiesis). It represents a serious effort to move from the aggregation of specialized knowledge through multi-disciplinarity to the search for unifying trans-disciplinary principles.

6.2. Barriers to Systems Thinking

In spite of these momentous developments, the advance of knowledge remains encumbered by several other characteristics of the Scientific Revolution which have yet to be seriously challenged. The first and most obvious of these is the mechanization of reality. The perception and conception of reality in mechanical terms still dominate scientific thinking, even with regard to living beings and conscious individuals. The idea of a simple clockwork universe has given place to more complex network models, but the models remain very largely mechanical and mechanistic. Science still tends to perceive all phenomena, even life, consciousness and society, in physical terms, and to reduce them to theirs lowest identifiable physical denominators. Our physical conceptions have become more complex and sophisticated, but the underlying materialistic mechanistic thinking remains. Computerized modeling of financial markets and economic systems remains the primary instrument for both theorizing and policy-making. Neurological models of human behavior that have proven effective for the tracing of sensory pathways and muscular responses seek to reduce all conscious human experience to chemical and electrical events, resulting in a dramatic increase in use of drugs for the treatment of conditions with obvious psychological and social origins, such as attention deficit disorder.

The second limitation of the current approach is the persistent emphasis on the universal aspects of behavior. Science is the quest for knowledge. It began with the study of fields in which the type predominates and individual variation is of little or no significance. The physical elements readily lend themselves into categorization on the Periodic Table. The known subatomic particles come in a few discrete varieties. The laws of motion and thermodynamics apply uniformly within broad boundaries as do the principles of relativity and quantum mechanics. Plants and animals lend themselves to classification in terms of phylum, class, order, family, genus, and species. The tendency to view reality in terms of categories and types has been extraordinarily effective in advancing knowledge in the natural sciences. It is inevitable that the same approach would be extended to the study of individual and collective human behavior. The classification of similarities and differences has led to important advances in the social sciences, but it has also imposed serious barriers to knowledge of human beings. Comparison of types inevitably results in suppression of individual differences. Uniformity of type is characteristic of the inanimate and subconscious ranges of reality, but the most significant attributes of human consciousness are individuality, innovation, creativity and uniqueness. The human sciences remain grounded in the bias of natural science for viewing reality in terms of similarities and differences and ignoring the single most momentous development in the history of the universe—the evolution of conscious individuality. This bias is programmed into the way we use our minds and imprinted in our very conception of reason and logical thinking. Our very notions of rationality and logic, the rules by which our minds seek knowledge, are based on implicit biases and limitations that retard the development of knowledge.

The third major limitation of modern systems thinking inherited from natural science is the suppression of the subjective dimension of reality. Indeed, most complex systems are an attempt to define and represent all subjective experience in physical terms and to reduce

conscious experience to automatic subconscious processes. The collapse of the subjective into the objective dimension is dramatically illustrated by prevailing economic models of society. The assumption that human beings make rational decisions is only another way of saying that individual decision-making can be modelled in mechanistic terms without recourse to consciousness, just the way we say that plants lean toward the sun and their roots reach out for water. The obvious fallacy in this assumption has compelled economists to introduce terms such as irrational exuberance to explain the extreme fluctuations in the behavior of markets under extraordinary circumstances, while leaving intact the underlying premise for normal applications. Economic behavior is characterized by myriad subjective factors—aspirations, attitudes, preferences, the search for status, fear, insecurity, ambition, interest, curiosity, attraction, ideas, misconceptions, superstitions, prejudices, opinions, beliefs, ideals, values,—that vary markedly from person to person, moment to moment. The consequences of the near exclusive emphasis of economics and other social sciences on the objective dimension of human behavior are apparent in the inability to comprehend and manage the increasingly complex social world in which we live. The effort to reduce complexity so we can manage it can only be successful in the measure our conception embraces the full scope of that reality.

Fourth and as a consequence of the other three, the efficacy of systems thinking is impacted by inherent limitations in the concept of randomness and the measurement of uncertainty as applied to human systems. As Byers has argued, randomness and uncertainty are ambiguous concepts. The appearance of randomness may result from the real absence of causation or from a lack of information, effective measurement and valid knowledge. Black swans may surprise and overwhelm us because a phenomenon is truly random or simply because our concepts, models and measures are grossly inadequate to represent what is really going on. They are likely to become increasingly prevalent, so long as our study of human behavior neglects subjective factors, individual uniqueness and conscious human choice.

7. Integration and Unification

All knowledge seeks unity. The greatest discoveries in natural science have been those that led to the unification of phenomena that had hitherto appeared to be unrelated to one another. Thus, Newton unified inertia and motion. Maxwell unified electricity and magnetism. Einstein unified space and time, gravity and acceleration. WAAS Fellow Abdus Salam unified the electromagnetic and weak nuclear forces.[30]

The capacity to identify relationships between apparently unconnected or contradictory phenomena is one of the defining characteristics of genius. The quest for unification in Physics has spurred efforts to formulate a Grand Unifying Theory reconciling the physical macrocosm and microcosm. Should it ever succeed based on the present premises, it could only apply to the plane of inanimate matter and energy. A Grand Unifying Theory of Life or of Mind or an integrated theory encompassing all three would remain elusive.

A mere aggregation of variables to encompass the totality of phenomena is not sufficient to achieve true integration and unification. Synthesis can combine and relate the parts, but it

cannot arrive at true integration. Although the word is widely used in a more limited sense as synonym for totality, comprehensiveness, holism and interdependence, true integration that is the basis for unification is something more fundamental. It may be best described in the words of the Upanishads as *all is in each, each is in all, all is in all*. Integration is a state in which each element in a totality is not only related to the totality but also to every other individual element in the totality.

The struggle of climate scientists to construct accurate and effective theories and models of climate change is compounded by the fact that the entire earth with its myriad zones, geographic and geological characteristics is in constant interaction with the life forms that inhabit it and the conscious and subconscious activities they carry out. Climate is impacted not only by physical factors, but also by the biological functioning of living things and the conscious and subconscious actions of human beings. Our capacity for analysis and synthesis is poorly suited to manage complexity of this sort.

The remarkable integrality of the human body is an excellent example and analogy. Medical science has created an abstract conceptual framework to represent the functioning of the body. It is divided into anatomical structures and physiological functions. The structures include cells, tissues, organs and systems. The functions include respiration, digestion, circulation, reproduction, and so forth. But both of these classifications are themselves abstractions. There really is no such system as the circulatory system distinct and independent of the skeletal, muscular, nervous, lymphatic and other cells, tissues, organs and systems. Each cell, tissue and organ forms an integral component of the overall body. But the functioning of each type is also integrated with the functioning of other types. Thus, a prick of the surface tissue of the finger may evoke a response from the skin, capillaries, blood cells, heart, brain, glands, circulatory, nervous and lymphatic systems. Moreover, as the Placebo Effect and other well-documented neurological, psychological and sociological phenomena amply testify, the body's physiological functioning is also seamlessly integrated with a host of other factors—nutritional intake, physical environment, type and amount of physical activity, the endless flow of sensations, impulses and emotion occurring consciously and subconsciously, mental conceptions, opinions, attitudes, beliefs and aspirations of each individual, as well as the ever-changing physical, emotional and mental interaction between the individual and the physical, social, and psychological context in which it is situated. The limitations in prevailing conceptual models of reality severely hamper efforts to pass beyond an aggregation of physical parts and functions to a truly comprehensive integral conception of human health.

The conclusion that present knowledge is inadequate to guide the further evolution of human civilization is not an indictment of the vast body of specialized knowledge of society generated by science up to now. It is rather a realization that more of the same will not suffice. Relativity Theory did not invalidate the principles of Newtonian Physics. Rather it placed them in a wider context, in which their limits became evident. Today, there is a need to venture beyond the limits of the present conceptual system in search of one that is more inclusive and effective in reconciling our knowledge of the world with the persistent failures and recurring problems that stand in contradiction. The first step in the evolution of

a new conceptual system is to acknowledge and embrace these contradictions and willingly reexamine the premises which constitute the foundations of the present conceptual system.[31]

7.1. Integration in the Social Sciences

The need for transcending the limits of both analytic and synthetic thinking is most apparent in the social sciences where compartmentalized, fragmented knowledge persists as the dominant pursuit and each field is founded on a discipline-specific set of principles with little relevance beyond the narrow borders of specialized applications. This approach has generated a condition resembling the psychological syndrome of multiple disconnected personalities known as dissociative identity disorder. In both instances it is symptomatic of deeper disorder. In an effort to arrive at rational, scientifically valid knowledge, we have fallen prey to the natural tendency of the thinking mind to separate itself from the objects of study in a static universe and regard them from a detached perspective objectively and impersonally. In doing so, our sciences of living human beings have become mechanical, materialistic, value-free and lifeless. They lack the vibrancy characteristic of living things. They lack the depth and insight needed to plumb the rich complexity of the individual psyche and collective soul. "Classical, deterministic science is a science of stasis. It misses the essence of life".[32]

This realization has been the driving force behind the efforts of the World Academy of Art & Science and World University Consortium in partnership with other organizations to advocate the need for a new paradigm in human development, a human-centered economic theory, and a transdisciplinary science of society. Our work has identified critical respects in which the new conceptual framework needs to transcend the limits of the present one. The new paradigm should be value-based rather than value-free. It should be transdisciplinary rather than discipline specific or merely multi-disciplinary, which means it should seek to discover the underlying principles governing human behavior in all fields of social existence. It should embrace and reunite the objective and subjective dimensions of reality, recognizing the central role of human consciousness and human aspiration in human affairs. It should be founded on the creative process governing the interaction between the individual and the collective. It should rise beyond the mechanistic, materialistic models of natural science to establish knowledge based on the dynamic living process by which human beings release their energies, consciously and purposefully direct them, channel those energies through formal organizational and informal institutional structures and systems, and express them through skilled action to accomplish results. And as a foundation and central pillar of this work, it should strive to advance our understanding of the human mind and thought processes, the sources and obstacles to creativity and their relationship to the evolution of civilization.[33]

Preliminary work has been done by members of the Academy on many elements of a new approach, but the real purpose of the project is to influence the general direction and course of our collective intellectual progress. Decades ago Former WAAS President Harold Lasswell made a profound contribution to the study of law by liberating it from the narrow confines of legislatures and judiciaries and viewing it in the context of evolving social and political processes and the affirmation of values by individuals and institutions in society.[34]

In a remarkable contribution to rethinking economics, Orio Giarini strove to break down the arbitrary conceptual barriers imprisoning contemporary economic theory. He expanded economics to encompass the non-monetarized sector, introduced the concept of negative value to account for economically detrimental activities, emphasized that in a modern service economy value must take into account the entire utilization time from conception through final disposal, replaced the classical notion of equilibrium with one of continuous evolution, and affirmed the principle of uncertainty as central to all economic activity.[35] Building on his seminal contributions, WAAS is engaged with other institutions and scholars in a collaborative effort to frame new economic theory.[36,*] A fuller exploration of these findings lies beyond the scope of this paper, but it may be helpful to briefly examine a few of its central tenets.

> *"Values are the governing principles of human evolution, just as natural laws are the governing principles in physical nature."*

7.2. Value-based Science

Popper warned against the tendency of the social sciences toward 'misguided naturalism'.[37] The effort to free the study of the natural world from religious doctrine rejected the imposition of human values on the natural world. The role of the natural scientist is to observe dispassionately and reflect rationally. Freedom from prejudice is essential for discovering knowledge. With respect to physical nature, this implies not imposing human values on the behavior of lower life forms. We cannot accuse the lion of evil because it instinctively hunts other species for food. But the social sciences involve the study of conscious human beings living together. The discovery of universal values governing conscious human evolution is the social equivalent of the universal laws governing physical evolution. The purpose of social science is not merely to impartially understand but also to consciously intervene to enhance the effectiveness of social systems to realize the aspirations and values of humanity. It must necessarily be value-explicit rather than value-free.

Values are not merely prejudicial judgments. They are a form of knowledge and a powerful determinant of human evolution. To strip our study of society of all values is akin to viewing the material world as random, chaotic, directionless meanderings of chance stripped of all insight into the forces influencing it. Values are the governing principles of human evolution, just as natural laws are the governing principles in physical nature. Universal values such as freedom, equality, peace, security, tolerance, trust, integrity, goodwill, organization, cooperation, collaboration, fraternity, self-giving, harmony and truthfulness represent the quintessence of knowledge and wisdom humanity has derived from millennia of experience. Values are knowledge of the process of human accomplishment and evolution. They are central to the practice of science as they are to every other field of civilized human activity.

* For information on the partners and working papers, see www.neweconomictheory.org

7.3. Principles of Society

As already mentioned, the development of economic science has been strongly influenced by the success of the quantitative physical sciences, most especially Physics. It has taken the form of a quest for universal laws or principles of economy and mechanistic, quantitative models to represent the workings of economic systems. The economy we have today is the result of choices made in the past, of a long evolutionary process founded on ideas, values, beliefs, and social institutions established for the benefit of specific sections of the population and preserved by force of social influence. If it is not able to equitably meet the needs of all human beings, we have the power to change it.

The rejection of immutable laws of economy does not mean that there are no principles governing the development of economy and society. But it does suggest that these principles are more fundamental than what commonly passes for economic principle, as the principles governing chemical interactions are founded on a more fundamental set of physical principles. Economy is a subset of society. An understanding of the principles governing the development and operation of economy needs to be founded on principles applicable to the development and evolution of the wider society of which economy is a part.

The success of organizational theory and systems theory in identifying principles applicable to a wider range of human and non-human activities marks a first step toward development of truly transdisciplinary social science. Organization is a unifying principle found at all levels of existence—the structure of physical matter, the dynamic systems of life, and the conscious organization of ideas, activities and things characteristic of mind. Energy is another unifying principle—the physical energy of material systems, the vitality and social energy characteristic of living systems, and the conscious mental energy expressing as curiosity, imagination and creativity in mind. Conscious awareness, aspiration, values, evolution, self-multiplication, authority, hierarchy, networks and conceptual frameworks are fundamental principles common to all human activity. Transdisciplinary science founded on principles such as these would mark a significant advance toward a new conceptual system for the social sciences. It should shift the perspective of society from inanimate, mechanistic organization to conscious living organism, from a perspective that focuses exclusively on objective, superficial processes to one that encompasses both the subjective and objective dimensions of reality, from an emphasis on general patterns confirmed by statistics to one founded on the complex creative interaction between creative individuals and the conforming social collective.

8. Deep Thinking

8.1. Changing Conceptual Frameworks

If mind starts from division and possesses only constructed understanding of unity, the question naturally arises as to what mental faculty is needed to achieve true integration and unification. As Sri Aurobindo observes, mind "thinks, sees, wills, feels, senses with division as a starting point and has only constructed understanding of unity."[38] If the analytic and synthetic faculties of the thinking mind are not sufficient, what alternative is left?

Mathematician William Byers uses the term deep thinking to describe creative intellectual processes that transcend the conceptual limits of existing thought and the rules of logic. He observes that all thinking occurs within a conceptual system. The system may be explicit and implicit, conscious or subconscious. The definition of every word is a conceptual system determined by prevailing cultural norms, social context and individual psychological experience. Every theoretical concept is defined, populated and delineated by defining and limiting perspectives. The boundaries and tenets of any conceptual system are supported and reinforced by forces that resist any assault. Among these forces is the sense of security derived from existing knowledge, the inertial resistance to a major reconsideration of beliefs on which so much has been invested, the egoistic identification with a particular viewpoint, and unconscious bias for elements that conform to its existing premises and rejection of those that undermine or contradict it. Logic and mathematics are conceptual systems. Science itself is a conceptual system. This paper identifies some of the pillars on which science is based that are implicitly accepted as valid, but rarely subject to examination.

Byers argues that all major intellectual breakthroughs involve a breaking out of the existing conceptual system. Since the boundaries of the system are often implicit and unconscious, they are not easily accessible to identification or scrutiny. Therefore, the creative process of transcending the existing system usually begins with the contemplation of questions that are not easily addressed within the existing context. These questions often take the form of conflicting viewpoints, contradictory facts or unresolved ambiguities, which the current framework is unable to assimilate and reconcile within existing premises. The willingness to recognize and embrace the tension of ambiguity, contradictions and paradox releases energy and generates the force needed to breach the boundaries or challenge the fundamental premises of the existing system. The Copernican Revolution and the other major intellectual advances referred to by Thomas Kuhn as paradigm shifts are classical instances of this process.

The process of deep thinking and the obstacles to it are illustrated in Arthur Conan Doyle's stories of Sherlock Holmes. In many cases the police arrive at a conclusion regarding the facts of a crime and the guilty party by carefully constructing a plausible hypothesis that either consciously or inadvertently overlooks apparently insignificant contradictory evidence. In "Silver Blaze" the police develop an airtight theory of how a race horse was stolen and its trainer murdered by the thief and they make an arrest of a suspect with both motive and opportunity to have been responsible. Holmes alone is bothered by apparently insignificant questions. Why didn't the watch dog bark during the theft? By what coincidence was the stable boy served a dinner that was sufficiently spicy to mask the flavor of an opiate? Embracing the implied contradiction which the police chose to ignore, he constructed an alternative hypothesis that led to an entirely different conclusion. The trainer was actually killed by the horse while attempting to maim its ankle muscles so it would lose the race. The deep and lasting appeal of Doyle's fictional character derives from the fact that he points the way to a higher evolutionary pathway.

Viewed in this manner, the possibility of consciously fostering the process of creative thinking is stripped of its mystical shroud. The process requires a willingness to question

implicit assumptions and established tenets and the strength to embrace rather than reject or ignore conflicting points of view. There is no guarantee that stepping outside the secure boundaries of an existing conceptual system will necessarily lead to fruitful creativity. It may be just as likely lead to a loss of certainty and confusion. Stepping out is a necessary, but not sufficient condition for mental creativity. But without taking that risk, real creative thinking is extremely unlikely. Byers argues that we have all had the experience of transcending an existing conceptual system in the process of learning about new ideas. As students we learn to make the leap already made by others before us. Creative thinking requires the ability to make the leap for ourselves. But either way the process is the same.

8.2. Intuitive Knowledge

The instances of scientific discoveries in Physics cited above demonstrate that integration and unification are indeed possible, but they appear to be the work of rare geniuses whose processes we neither understand nor have the capacity to emulate. The testimony of great scientists themselves attributes such discoveries to sudden bursts of insight or leaps of thought rather than linear, systematic rational thought processes. Popper argues that "There is no such thing as a logical method of having new ideas or a logical reconstruction of this process… every discovery contains 'an irrational element', or 'a creative intuition' in Bergson's sense." Einstein speaks in a similar vein with regard to the discovery of universal laws. He refers to an intuitive experience that leads to psychological identification with the object of experience. "There is no logical path leading to these…laws. They can only be reached by intuition, based upon something like an intellectual love of the object of experience."[39] During his brief lifetime, Srinivasa Ramanujan compiled nearly 3,900 mathematical identities and equations, of which nearly all have now been proven correct. The Ramanujan prime and the Ramanujan theta function have inspired a vast amount of further research. When his notebooks were first scrutinized by leading British mathematicians, they responded with skepticism, suspicion and extreme disbelief, for he had arrived at original findings of unparalleled complexity without passing through the traditional process of mathematical proof. When questioned, Ramanujan explained that he saw the theorems in his mind.

Thomas Kuhn regards intuitive thinking as an essential condition for the type of radical change in paradigm associated with scientific revolutions. "Paradigms are not corrigible by normal science at all... normal science ultimately leads only to the recognition of anomalies and to crises. And these are terminated, not by deliberations and interpretation, but by a relatively sudden and unstructured event like the gestalt switch. Scientists then often speak of the 'scales falling from the eyes' or of the 'lightning flash' that 'inundates' a previously obscure puzzle. On other occasions the relevant illumination comes in sleep. No ordinary sense of the term 'interpretation' fits these flashes of intuition through which a new paradigm is borne."[40]

Our understanding of intuitive processes is quite limited, in spite of the fact that throughout history insight and intuition have been cited as the source of new discoveries and new knowledge. We live in times characterized by an unquestioned faith in the power of rational thought, systematic training in logical argument in formal education, and supreme regard for orderly argument based on factual evidence and logical reasoning in judging the validity

of any proposition. It is very likely that this extreme reliance on the analytic and synthetic modes of thought impedes the development and exercise of these faculties in our times.

The philosophy and methodology of modern science focus almost exclusively on the tenets of the scientific method to validate hypotheses. So great is the identification of science with analytic and synthetic modes of thinking, that it devotes almost no attention to the creative process of discovery on which its greatest achievements are actually based. One reason for this reluctance to focus on the intuitive process of scientific creativity is the mystique associated with artistic creativity and mystical experiences. If so, then rationality and logic dictate that science should strive to learn as much as possible from these other modes of thinking.

Intuition may be far more common than we think. Today we recognize it only when it is associated with outstanding discoveries recognized by the whole world and in circumstances when it is associated with a number of other traits conducive to high intellectual achievement—high intelligence, the courage to challenge prevailing ideas, an unconditioned mind capable of independent thinking, and intense aspiration that generates the energy and effort for unstinting application and perseverance. It is very likely that the capacity itself is far more prevalent and expressing as creative insight at different levels of society in many fields that go unnoticed. There was a time when the ability to read, write or calculate was considered a sign of genius. Since then humanity has evolved, our minds have evolved and our civilization has evolved so that what was once extraordinary has become the norm. Today the idea of learning to think intuitively may sound outlandish. But it may well be that once we pierce the veil of superstition surrounding it, we will discover means to consciously develop it on a large scale. The first essential step is to remove the stigma or scientific skepticism surrounding ways of knowing that transcend logic and rationality.

9. Limits to Rationality

The term ‘limits to rationality’ is inherently ambiguous as well as unsettling, even disturbing. It is ambiguous in the sense that it can be used to imply both limits to the extent to which rationality is being applied in the pursuit of knowledge and also to suggest that rationality is itself subject to inherent limits in its capacity to arrive at certain knowledge. For both these reasons the term is also unsettling and disturbing. It is unsettling because we human beings possess or are possessed by such a strong aspiration to arrive at certain knowledge. It is disturbing because it suggests that the mental instruments so far developed and utilized by us in quest of that certainty are subject to inherent limits both in their application and in their powers of discernment.

This historical narrative on the evolution of mind and civilization supports these conclusions. It confirms that even our most sincere, scrupulous, impartial and disinterested seeking for knowledge is subject to limitations imposed by conscious and subconscious perceptions, conceptions, assumptions and perspectives through which we seek for reliable knowledge. As Byers emphasizes, the very nature of a conceptual system is that it is self-limiting. For regardless of how broad and open its premises, it is a construction built and

viewed from inside itself and is unable from the vantage point to fully perceive the foundations on which it is constructed. In setting forth the principles on which his geometry is based, Euclid never conceived of a context in which two parallel lines could meet. That conception belonged to a different conceptual framework that was only discovered 2000 years later. So too, when Newton presented his laws of motion, he never qualified the limits within which these laws held true. He naturally assumed that space and time were invariable constants. The new paradigm conceived by Einstein challenged assumptions that were so basic they had never before been questioned. Quantum Theory challenged notions so fundamental that even Einstein rejected them as implausible.

Our resistance to entertaining premises that contradict established viewpoints arises not only out of an inability to imagine or conceive something different, but also out of a marked preference for justifying the existing system. So strong is this tendency that our reason carefully selects for its attention ideas and evidence in support of its viewpoint and ignores or discounts that which contradicts it.[41] Science has made great advances in establishing criteria for falsifying hypotheses, but it possesses no remedy to the urge of the scientific collective to admire the clothes of the reigning emperor of scientific authority. A greater awareness of the social and psychological barriers to a truly impartial exercise of reason would be a major contribution.

10. Deep Learning

The perspective that emerges from a historical examination of mind and civilization has important implications for education. This paper argues that the principal challenge confronting humanity today is not to fine-tune the incremental progress of knowledge acquisition, but rather to consciously support and accelerate the development of radically different, more synthetic and integrated ways of thinking and knowing.

History confirms that a change in the way we think is unlikely to be made by those already in the middle or later years of life. Most seminal changes in society occur only with the passing of generations raised in and conditioned by the past and with the coming of new generations unconditioned by earlier experience. Education is the principal means developed by humanity to foster conscious social evolution. Therefore, it must necessarily constitute the core of any strategy to accelerate the development of our mental faculties.[42]

One clear implication is that an exclusive preoccupation with imparting more knowledge content is not sufficient and may even be counter-productive, because it only goes to reinforce the existing conceptual framework and analytic skills, and divert energy from the creative enterprise of enhancing our mental capacities.

A few tentative suggestions can be made regarding how future education should differ in method and content from the prevailing.

1. *Balancing Analysis, Synthesis and Integration:* Reality is multi-dimensional and integrated. Consequently, so should effective knowledge of that reality be. It is always shaped by a multitude of aspects, perspectives, forces. The tendency to condense and

compress reality into simplistic formulas is a form of willful ignorance that facilitates transfer of knowledge and multiple choice examinations, but conditions the mind to think simplistically and suppress important dimensions of reality. No single statement, no single theoretical perspective can ever be comprehensive. Therefore, the approach to education in all fields should emphasize the multi-dimensional, many-sided character of reality and our knowledge of it. Education in all subjects should stress the complexity of knowledge rather than reduce it to simple formulas to be memorized. It should encourage young minds to examine contrary, opposing and contradictory perspectives. Precise mental knowledge of the totality is never possible, most especially with respect to the complexity of human experience. Therefore, a precise analytic knowledge of the individual contributing elements should be balanced by a holistic vision of their harmonious integral relationship to and within the whole. The capacity of the mind for differentiation and delimitation must be transcended by also fostering an intuitive faculty for integration and unification.

2. *Reuniting the Surface and Depth, Objective and Subjective Dimensions:* As there are multiple dimensions to reality, there are also multiple levels or depths. Effective education should simultaneously cultivate observation, perception and perspective at multiple levels of reality. These levels are represented in the natural sciences by the physical, chemical, biological, genetic, metabolic, neurological and other processes present in the functioning of all living beings. The discoveries of Copernicus, Einstein and Heisenberg arose from a willingness to reexamine fundamental premises. In the human sciences, reality is governed by myriad mental, emotional, vital, social, cultural, technological, organizational and environmental factors that provide the foundation and context for all social phenomena. A comprehensive study of the factors leading to the Italian Renaissance, abolition of slavery, the Great Depression, the two world wars, the end of colonialism, the founding of the UN, the beginning and end of the Cold War, the hippy movement, the birth of the European Union and the Internet, climate change, the 2008 financial crisis, Occupy Wall Street, and the European refugee crisis would be illustrative. In each case comprehensive knowledge must necessarily include an understanding of prevailing ideas, intellectual atmosphere, beliefs, aspirations, anxieties, threats, emerging evolutionary social forces and values, opposing vested interests and reactionary forces, and emotional sensibilities. It should include a view of surface movements, distinct and separate elements, oppositions, conflict of forces, fine shades of variation and individuality. It should also include a perspective based on the underlying oneness, inner unity, harmony in law of movement or being, greater reconciliation, the center from which all aspects emanate and to which they return.

3. *Reconciling Contradictions:* As Niels Bohr said, "It is the hallmark of any deep truth that its negation is also a deep truth."[43] In each area of observation, education should cultivate a sense of the complementarity between difference and oneness, subjective and objective, individual uniqueness and collective type. Rather than categorizing reality in terms of simple polar opposites, education should develop varying perspectives arising from different viewpoints and different levels of consciousness and experience. What

appear as contradictions at one level and from one perspective represent complementary aspects of reality from a wider or deeper perspective. Studying things from the differing perspective of the mental, vital-social, and physical planes will foster a capacity to clearly distinguish these movements, separate and better control them.

The approach will naturally vary and is too complex to be dealt with in this paper. One example may suffice to illustrate some of these aspects. In March 1933 Franklin D. Roosevelt become President of the United States in the midst of the most severe banking crisis the country had ever faced. Since the Great Crash in 1929, more than 6000 US banks had failed and closed. Daily millions of Americans were lining up at the remaining banks to withdraw their savings before their bank also declared bankruptcy. During the previous three years every economic policy initiative thought to be relevant had been applied, but failed to stem collapse of the system. FDR knew that the principles of economics he had studied at Harvard were inadequate to stem the crisis. He understood that the collapse of the system was the result of subjective factors that could not be readily addressed at the institutional or policy level. So he addressed the American people on radio in the first of what became known as his fireside chats. He explained to them that all the objective factors that had made America prosperous were still present—the rich natural resources, hard-working people, huge industrial infrastructure and continental market. He diagnosed and told them that the real problem was not any objective factor. It was rather their own loss of self-confidence and faith in America. He appealed to their courage and national pride. In immortal words, he told them that the only thing they had to fear was fear itself. During that week legislation was passed instituting insurance on bank deposits and other safeguards. He asked the people to return to their banks on the following Monday and redeposit their hard earned savings. Once again long lines grew in front of the banks, but this time most of the people had come to redeposit their money and the bank crisis subsided.

This famous event illustrates several important aspects of the change needed. First, it illustrates that economy, politics, society, and culture are inseparable dimensions of a single integrated reality. The perennial public debate over the role of government in regulating markets is misplaced. There are no markets without government regulation. Without an infrastructure of law to protect property and contract rights, without a judicial system to enforce those rights, without public institutions to prevent collusion and monopoly control, no market can be free and functional. So too, any economy is dependent on the prevailing social norms, values, educational system, and a host of other social factors. Development of a real science of economy will only be possible when economics is viewed as a subset and integral aspect of the larger society of which it is a part.

Second, this event illustrates the equal or greater importance of underlying subjective factors in the effective functioning of society. Every economics student is taught that the economic system is founded on trust and confidence. Without it money has no value and financial institutions cannot function. But although it is recognized as a necessity, it rarely figures in the prevailing conceptual framework of economy, because economic theory is so strongly grounded in objective, material factors. Like every social institution and activity,

economic performance is the result of conscious choices of countless conscious individuals. Those choices depend not only on their confidence in the system but also on their theoretical understanding of how it works. Money is commonly regarded as an objective reality, a thing in itself. In fact, money is merely a convention adopted by human beings as a symbol of social power. Money has no value outside of a social context, e.g. on a desert island. Like language, it is a networking tool to facilitate interactions between people. The value of money depends on the overall productive capacity of the society which is founded on the knowledge, skills and values of its individual members.[44]

Third, this event dramatically illustrates the role of the individual in social development. Mainstream economics and social science deal with broad generalities and statistical averages. The individual is just a number. But in reality, the individual is the source of all creativity and innovation in society. As education is the instrument for conscious social evolution, the individual is the catalyst for the evolutionary process. History documents the fact that a single individual thinker, leader, inventor or entrepreneur has the power to change the world. Indeed, as Margaret Mead once said, all significant changes in human history have been the result of actions by small groups of individuals.[45]

This incident also illustrates the fundamental paradox that crises are opportunities. FDR's remedy for the banking crisis of 1933 led to measures which provided for the stable development of the American financial system for more than six decades until the protective measures were systematically withdrawn in the 1990s, resulting in the 2008 financial crisis. So too, history confirms that virtually every tragic event has had positive consequences. The Black Death in Europe led to the collapse of feudalism, paving the way for the rise of democracy. Two horrendous world wars led to the founding of the UN and the international charter of universal human rights. This brief narrative is only intended to illustrate that every known fact, event and concept acquires greater significance when viewed from a more comprehensive, integral perspective.

11. Evolution of Knowing

This narrative traces broad developments in the history of mind, its faculties and the quest for knowledge. It highlights some of the relationships between the evolution of our subjective faculties for self-awareness and knowledge and the evolution of the external facets of human civilization. The historical record reveals a one to one correspondence between inner and outer. The development of mental faculties and mental conceptions has led to the progressive development of our collective social existence. It also reveals the dependence of that mental development on the openness, tolerance and active support that society offers to the exploration, dissemination and application of new knowledge. This interplay between inner and outer, mind and civilization, the individual and society, human consciousness and the institutions we create has been a central determinant of the course of human evolution.

Today humanity confronts intractable existential challenges. Given our history, it seems plausible to assume that the problems we face correspond to limitations in the ways we are employing our mental faculties. Given the extraordinary developments that have taken place

in the past, it seems equally reasonable to assume that we have not yet exhausted the limits of human consciousness, individually or collectively. Challenges are opportunities. Crises are a spur to evolution.

Mind has a remarkable capacity for adaptation and development. But it also reveals a tendency to tenaciously cling to its past achievements, adamantly persist in its present line of activity, resist evolutionary departures and circle around for long periods in repetitive affirmation of what it already knows and believes. Our current preoccupation with physical, technological and organizational solutions to problems is an instance of that repetitive tendency. The perspective of history reveals larger movements and longer cycles that vary from age to age, civilization to civilization. It may well be that we are approaching the end of one of those cycles and need to prepare for a more significant reframing of the basis for knowledge and civilization in the age to come.

11.1. Science, Philosophy and Religion

Symbolism, intuitive insight, metaphysical intellect and experiment science have all made important contributions to the evolution of civilization. Stages can be identified in which each of them has played a dominate role in deciphering and representing reality. The profound truths of existence arrived at by the great religious traditions were the result of direct spiritual experience which could not be rendered into logical discourse or confirmed by the experimental methods of modern science. So too in great periods of philosophy, the rational mind sought for answers to questions that still and in all likelihood will always lie beyond the purview of experimental science. Science in turn has uncovered patterns, laws and formulas in the mysteries of physical nature that generate a sense of wonder as profound as the visions of mystics and logos of sages.

All three have contributed to the collective quest of humanity for knowledge. At different periods of history, each has attempted to dominate the other two, even to the extent of nearly or completely eclipsing their role. Science and philosophy developed side by side in ancient Greece and during the enlightenment. The breakdown of dialogue between them acquired the character of a divorce only in the second half of the 20th century.[46] Today intellectual discussion regarding fundamental questions of nature has very largely been supplanted by experimentation and data-based analysis within existing conceptual framework of modern science.

Experimental science, philosophic speculation and spiritual experience represent developments of three different and complementary powers. They only appear contradictory from the narrow vantage of any one perspective. That explains why even in our advanced scientific culture, great scientists point to intuition as the source of their greatest creative contributions to the progress of knowledge. Thus, the cryptic formula in the Upanishads "*One indivisible that is pure existence"* and in the Bhagavad Gita *"Indivisible, but as if divided in things",* were rendered into intellectual statements about oneness, unity, and union by the classical Greek philosophers more than a thousand years later and confirmed by science in the discoveries of physicists two thousand years after that.*

* Chhandogya Upanishad translated and quoted by Sri Aurobindo in *The Life Divine,* p.70, 159,231.

The persistent intellectual and practical problems humanity confronts today are an opportunity to recall that our powers of knowing as well as our body of knowledge are evolving simultaneously. The apparent limitation of present knowledge is a reminder that the progress of knowledge depends on expanding our field of vision to encompass wider ranges of reality and deepening our perception from the observation of external appearances to integrate and unify the objective and subjective dimensions of reality.

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The Integration of Knowledge

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Abstract

The exponential growth of knowledge demands an interdisciplinary reflection on how to integrate the different branches of the natural sciences and the humanities into a coherent picture of world, life, and mind. Insightful intellectual tools, like evolutionary Biology and Neuroscience, can facilitate this project. It is the task of Philosophy to identify those fundamental concepts whose explanatory power can illuminate the thread that leads from the most elementary realities to the most complex spheres. This article aims to explore the importance of the ideas of conservation, selection, and unification for achieving the goal.

We live in a fascinating time for the integration of knowledge. In particular, we have developed three great theoretical pillars whose immense explanatory power is destined to contribute to the unification of knowledge, a goal sought by so many visionary minds throughout the centuries: fundamental physics, evolutionary biology and neuroscience.

1. Physics, Biology, and Neuroscience

Physics has accomplished the feat of condensing the structure of the universe in a succinct elenchus of equations, such as the field equations of general relativity and the Schrödinger equation. It has not discovered *the* equation that rules the complete description of the universe, but it has notably approached this titanic dream; a utopia illusory for many, yet unquestionably legitimate. Physics is built upon two fundamental models: general relativity and quantum mechanics. We do not know how to harmonize these two divergent pictures of reality. General relativity offers a geometrical theory of gravitation, where the idea of relativity of all inertial frames of reference is generalized to cover accelerated frames of reference. It has led to the formulation of covariant equations whose sophisticated mathematical expression—through the language of tensor calculus—has given us the finest, deepest, and most rigorous description of the large-scale structure of the cosmos. According to the theory, gravity emerges as the effect of the geometry of space-time, as the result of the curvature produced by the presence of a density of energy and momentum.

However, for understanding the three remaining fundamental forces of nature, quantum mechanics has proven uniquely powerful. Unlike general relativity and its geometrical image of force, quantum mechanics recapitulates our understanding of the physical world through a theory of fields in which the force is mediated by a set of elementary particles of bosonic nature.

The 20th century has therefore seen a formidable extension of the unifying power of the human mind. Major advances in the domain of the physical sciences have stemmed from the epistemological questioning of their basic concepts. Neither the work of Einstein nor the developments in quantum physics can be fully grasped without the examination of this profound immersion, with vivid philosophical resonances, into the fundamental categories of physics and the logical criteria required to stipulate a meaning for our notions about the objects of experience. With Einstein, ideas like space, time, simultaneity, and privileged states of motion underwent an exhaustive interrogation. This reflects a search for concepts that could be unambiguously assigned to the properties observed in the course of experiments. An analogous comment can be made about Heisenberg, whose famous Uncertainty Principle (a humbling truth for humankind) is the fruit of a careful revisiting of the meaning of basic kinematic and mechanical concepts.

This criticism of our intuitive notions has triggered key theoretical—and therefore also practical—advances, propitiating the fusion of pure thought and empirical knowledge. It constitutes the most faithful reproduction of the intimate functioning of a human mind in its restless quest for unification.

Biology, the science that tries to understand the world of life, bestows upon us a wonderful unifying tool: the theory of evolution. This model unifies ecological, morphological, and genetic knowledge about living beings. Through the lenses of evolution, the elucidation of the history of life allows us to delve into the structure and explore functioning of biological entities.

Neuroscience is on its way to developing a unifying instrument of immense power and amplitude: the scientific understanding of mind. From the level of the nerve cells to the sphere of the activity of the brain as a whole (the synchronization of its different regions), progress has been steady, though insufficient. As soon as we understand how the mind works, the origin of its abilities and the scope of its capacities, we shall be ready to unify the domain of the Humanities, a goal which until very recently seemed unattainable for science, as if it were fragmented in irreconcilable approaches and inimical cultures. Through a neuroscientific theory of mind we will be able to examine the source of the human being's symbolic creations. This task will contribute to building the neuroscientific foundations for the study of society, law, religion, and art.

2. Conservation, Selection, Unification

One of the neuralgic principles of reality elucidated by the physical sciences refers to the idea of *conservation* of certain quantities in the processes experienced by the objects of nature. According to Noether's theorem, we know that any differentiable symmetry is associated with a law of conservation. The most important concept used to express this principle of the working of nature is *action*, perhaps the most relevant and profound of all physical categories. Invariance under time translation yields the principle of conservation of energy; invariance under space translation yields the principle of conservation of momentum; invariance with respect to rotation yields the principle of conservation of angular

momentum. In quantum physics, a gauge symmetry related to the conservation of charge has also been discovered. In summary, physics has unfolded principles of conservation which, from the realm of subatomic particles to the domain of thermodynamic systems, are capable of establishing laws of apparent inviolability (the status of the principle of conservation of energy in a cosmological scale is under discussion).

> *"Knowing involves unifying, connecting, integrating that which is different on the basis of shared relations."*

In biology, the category of *selection* is as important as the concept of *conservation* is in physics. Transmitted through the power of replication that living beings possess, variability is selected by the environment in accordance with its reproductive efficiency.

If we ascend in the scale of material complexity and reach the universe of human consciousness, is it possible for us to identify a principle endowed with similar theoretical power? I believe that such a principle is the idea of *unification*. The conscious mind unifies the perceptions which it receives. The result is the integration of data susceptible to subjective assimilation. With the exception of some sensory systems (like the visual system), we do not know the precise mechanisms through which this phenomenon occurs, but we do know that the human mind holds the unusual privilege of unifying the multiplicity of the world through the filter of its rationality. This unitary grasping of reality (Kant's "unity of apperception" in the *ich denke*) means the insertion of nature into logical patterns that consciously revert to the subject. It is one of the most remarkable progresses in the long path of evolution, for it represents the dawn of knowledge as the most powerful force of life and the pinnacle of its activities. Knowing involves unifying, connecting, integrating that which is different on the basis of shared relations. Behold the most genuine meaning of the Greek term *logos* and the philosophical scope of the verb *legein* since Thales and the pre-Socratics.

3. The Unity of Nature

These three notions (conservation, selection, and unification) are not strictly discontinuous. Any hypothetical tripartition of the universe in matter, life, and consciousness obeys instructive and epistemological schemes, not reality as such, independent from the judgement of human intelligence. Along its history, nature has been capable of rising on its own from one level onto another, and this suggests a profound ontological continuity between all realms of reality. It is in fact possible to draw a narrow analogy between a principle like the law of stationary action in physics (the action integral of a particle will manifest extreme values—i.e. maximal or minimal—so that the value of action may be stationary) and the idea of natural selection, a mechanism that seeks an optimal point in the relationship between genetic variations and the surrounding environment. Also, to unify, the act of integrating perceptions in a unitary consciousness of external and internal reality can be contemplated as a simultaneous optimization in the value of the information coming from the world and the information elaborated by the subject, with the goal of reducing the

boundless multiplicity of phenomena into the unity of the conscious being. An entity capable of extracting, from the copious concatenation of stimuli, information of greater value, more profitable and meaningful, is certainly more conscious of the world and its own being.

"The integration of knowledge cannot seek to eradicate any trace of contingency or to reduce every explanation to a physical proposition, but should rather serve to expose the inextricable imbrication that binds all domains of reality."

The reduction of chemistry to physics has been accomplished, thanks to the quantum theory of orbitals. Our deep understanding of how electrons are distributed in atoms is illuminated by quantum principles like Pauli's exclusion principle. Physics has therefore conferred upon human rationality an appropriate tool for understanding the periodic table of elements and the organization of chemical elements. The almost infinite universe of inorganic and organic reactions can be harmoniously inserted into the scientific view of the world that emanates from the physical sciences, from its small but powerful elenchus of laws and fundamental forces. This is one of the most admirable achievements of quantum mechanics: the complete explanation of the atomic structure of elements and the justification of their principal physical-chemical properties. With no need to incorporate theoretical principles of substantive newness, or principles that cannot be easily deduced from basic laws, physics has allowed for a fluid integration of the vast domain of chemistry.

Evolutionary biology covers a new semantic field of science: life. Of course, it is based upon the fundamental laws of physics, mediated through chemistry (specifically, organic chemistry, which elucidates the structure of compounds like aminoacids and nucleic acids). However, it assumes a series of concepts which are virtually absent in the domains of physics and chemistry. These notions are essential for our understanding of life and its development. They are crystallized in the theory of evolution, a model of exceptional explanatory power. We should not forget, however, that we lack a complete theory of evolution. Research in the fields of genetics and epigenetics could actually lead to a substantial revision of some fundamental concepts of evolutionary biology. Nevertheless, as a paradigm, the evolutionary frame has not been surpassed, and it is highly improbable that it will be substantially overcome in the future, at least in its capital aspects. But just as classical physics was not suppressed by 20th century physics, which rather showed the limits of its approach and expanded its theoretical power, future progress in biology can actually broaden the scope of this science and enlarge its categories.

The thread behind the transition from physical chemistry into biology has not been entirely elucidated, for we do not know how life flourished from inert organic matter. However, it is legitimate to hope that we shall soon solve this intricate problem. It is reasonable to think that life on Earth appeared by virtue of a set of chemical conditions which facilitated the creation of molecules susceptible to replication, whose increasing degrees of autonomy from the

environment allowed them to induce certain metabolic reactions in the interior of cells. But in the absence of a fully convincing itinerary as to how inert matter conquered the domain of life, we still have to distinguish physics from evolutionary biology, even if a congruent framework with the scientific view of the universe clearly points to the existence of profound coherences and continuities between the inert and the living worlds.

The impossibility of reducing the biological level to the physical-chemical level does not stem from an intrinsic prohibition but from the overwhelming complexity of the system. As soon as we unveil the origin of life, there is no *de iure* interdiction forbidding the unfolding of the fine thread connecting the world of chemistry and the realm of biology. Of course, the complexity of biological systems is not the sole result of their intrinsic elements but of a factor which becomes extremely relevant for biology: the effect of contingencies. The study of life demands knowing the prolix historical itinerary through which organisms have passed. History contains necessity but above all it is permeated with contingency. Only Laplacian intelligence could have foreseen the arrival of a meteor whose devastating consequence for most of living species triggered the massive Cretaceous extinction. Also, we know that there are unsurmountable uncertainties in the quantum scale. Therefore, the integration of knowledge cannot seek to eradicate any trace of contingency or to reduce every explanation to a physical proposition, but should rather serve to expose the inextricable imbrication that binds all domains of reality. This goal highlights the power of the human mind to perceive the fundamental principles behind the unity of such heterogeneous spheres.

In considering history, we cannot override the shadow of contingency. However, we can understand the human constants that pervade spaces and times. Thanks to the scientific study of mind, it is possible to understand human motivations, their logic and—why not?—the seeds of their admirable creative capacity. This yields a fundamental framework for understanding great civilizations and the most sublime productions of the spirit. Even without exorcizing the specter of contingency, it is still feasible to identify the fundamental axes around which human action gravitates. In our days, this knowledge comes from the neurosciences.

It is not utopian to dream of an explanation for the neurobiological bases of consciousness. Again, this goal does not exhaust the understanding of every specific consciousness, because this power of *Homo sapiens* is nurtured by sustained interaction with both the external and the internal environments. It is utterly impossible to reproduce every single detail that forms the vivid experiences of conscious subjects (we would need a rigorous replication of every physical and psychological condition in which this capacity is manifested, as if we were trying to draw a 1:1 scale map). But this deep obstacle does not prevent us from uncovering the neuroscientific foundations of consciousness, which probably lie in certain anatomical structures responsible for connecting perceptual and associative areas, like the claustrum and the superior longitudinal fasciculus.

4. The Integration

Science is in possession of the most rigorous and universal language that the human mind has developed: mathematics. The progress of this discipline over the last few centuries,

especially in the elucidation of its fundamental principles, its scopes and limits, has granted us an unsurpassed formalism for describing the structure and functioning of the universe. We know, however, that this depiction of reality cannot be complete for at least two reasons: first of all, these models tend to use the language of differential equations, while our knowledge of matter has revealed the discontinuity that exists in the fundamental levels of nature, in particular at a quantum scale. Secondly, the use of mathematical language compels us to draw a distinction between formal and material equality. When, in the field equations of general relativity, we find the number π and in the Schrödinger equation we contemplate the imaginary number i, it is clear that the notion of equality needs to be interpreted as the equivalence of pure objects of thought (abstractions which do not necessarily enjoy ontological independence in the realm of nature). The mathematical expression of physical categories represents the deepest and finest approach to the material universe conceived by the human mind, but only in an asymptotic limit, in whose ideality material objects fully converged with the pure objects of thought; it would be correct to say that one member of the equation is strictly equal to another.

"Our mind, our logic, our intuition…, must be in a constant state of improvement through their interaction with reality, so that the deciphering of the basic axes of the universe will also unveil the true possibilities of human intelligence, of its logic and its language."

The indubitable advantage of mathematical language resides in its versatility, for it is flexible enough to cover the practical totality of natural registers. The invention of new mathematical tools throughout history is the best proof of this fruitful plasticity. This is the reason why the limits of thought do not inexorably seal the frontiers of being. Against Parmenides' thesis, the realm of mind is eminently ductile and it can adapt itself, both in its language and its categories, to the pressing challenges posed by reality. We have even managed to expand the limits of our imagination. Before Cantor, it was generally accepted that infinity could not be properly scrutinized by reason. After Cantor, we have learned that different types of infinity exist and that we can have infinite sets which are numerable. The borders of thought have been wonderfully extended, helping us discover unexplored territories of both the real and the possible.

Beyond the difficulties, it is admirable to reflect on the achievements of our Promethean longing for knowledge, in our indefatigable desire of grasping the vastness of the universe in the lightness of the concept. Every act of cognition is guided by logic, whose premises and operative rules articulate human reasoning. However, its quantitative expression has only reached an adequate expression in sciences like physics, chemistry and—to a lesser degree—biology. Attempts at extrapolating this language onto social studies have been successful only to a limited extent. But logic is equally applied regardless of the field of

knowledge. A physicist's mind is not governed by different logical rules compared to the mind of a philosopher. Any advance towards the improvement of our logical categories and the unveiling of their possibilities, their elasticity and foundation, will provide the human intellect with new and more acute tools for apprehending realms of reality which until now have remained beyond the scope of our knowledge.

Of course, the struggle to integrate knowledge by founding the most complex realities upon the simplest ones cannot be claimed to exhaust our understanding of reality. The world will surely never cease to amaze us with unforeseen wonders, and blessings for our intellect. But the richness and inexhaustibility of the world do not prevent us from identifying the fundamental principles behind its vast and astonishing nature. Our mind, our logic, our intuition…, must be in a constant state of improvement through their interaction with reality, so that the deciphering of the basic axes of the universe will also unveil the true possibilities of human intelligence, of its logic and its language.

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Mind, Thinking and Creativity

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Abstract

Global civilization is the product of diverse cultures, each contributing a unique perspective arising from the development of different mental faculties and powers of mind. The momentous achievements of modern science are the result of the cumulative development of mind's capacity for analytic thinking, mathematical rendering and experimental validation. The near-exclusive preoccupation with analysis, universal laws, mechanism, materialism, and objective experience over the past two centuries has shaped the world we live in today, accounting both for its accomplishments and its insoluble problems. Today humanity confronts complex challenges that defy solution by piecemeal analysis, unidimensional theories, and fragmented strategies. Poverty, unemployment, economic crisis, fundamentalism, violence, climate change, war, refugees, reflect the limitations and blindspots that have resulted from a partial, one-sided application of the diverse capacities of the human mind. Human monocultures suffer from all the limitations as their biological counterparts. There is urgent need to revive the legitimacy of synthetic, organic and integrated modes of thinking, to restore the credibility of subjective self-experience in science, to reaffirm the place of symbol, analogy and metaphor as valid ways of knowing and communication in education, to recognize the unique role of the individual in social processes, to recognize the central role of insight and intuition in science as in art. This article examines themes presented at the WAAS-WUC course on Mind, Thinking and Creativity, conducted at Dubrovnik in April 2016.

The Symbol Dawn

"Then something in the inscrutable darkness stirred;
A nameless movement, an unthought Idea
Insistent, dissatisfied, without an aim,
Something that wished but knew not how to be,
Teased the Inconscient to wake Ignorance."

— Sri Aurobindo's *Savitri*

The lines from the poem *Savitri* symbolically describe the awakening of a new consciousness on earth. First there is the darkness, inscrutable and ignorant. Then something stirs, originating from a dissatisfied, insistent idea. In the beginning, it is a nameless movement that does not know how to be, yet it wishes, and teases the inconscient awake. This dawn

that signals the commencement of day symbolizes the birth of every idea, movement and era in human history. Like the first faint rays of dawn that appear in the horizon and gradually rise to a glorious splendour, an idea born grows in strength and establishes itself firmly in the minds of men and women. Human civilization has seen this dawn, over and over again, across millennia.

"Thought is the ability to co-ordinate or see a relationship between two apparently un-related facts."

The early humans had one occupation, survival. All their mental faculties were focussed on the bare physical requirements. They ate what fruit they could find, and what animal they could hunt. They sought protection from the elements in caves and what shelters nature provided. They came together and lived and worked in groups. They tried to understand nature, then imitate it, and gradually gained mastery over it. This slow process of the evolution of human civilization is an expression of the underlying evolution of mind in humanity.

One of the first stages in the development of mind in humans is seen in the creation of tools. There have been in the animal kingdom very primitive instances of tool making. But we are the first species to make increasingly intelligent and sophisticated tools. Thought is the ability to coordinate or see a relationship between two apparently unrelated facts. When early man saw a stone on the ground, remembered his requirements during hunting, and saw the use the stone could be put to, he was thinking, like no species before had done. Michelangelo said that in every block of marble, he saw a statue as plain as though it stood before him, shaped and perfect in attitude and action. He had only to hew away the rough walls that imprisoned that statue. The early man similarly saw, much before the sculptor, that sharpening and polishing the stone, and fixing it to the end of a stick would give him a spear, which would make his hunting safer and more effective. This symbolized the birth of the mind. Primitive tools that made life easier were fashioned from stone and wood. Clothing was fashioned from plants and animals. Houses were built. Tool making marked the transition for humanity.

The natural progression of the mind was from observation to mimesis, the capacity to observe and imitate those around. Humans learnt to swim like the fish; birds inspired flight. Animal skin provided clothing, their fur kept people warm. People also imitated each other, which is the main source of the spread of new behaviour.

Moving from seeing the relationships between two objects to seeing that one causes the other is a more advanced stage in the ascent of mind. This was a very important phase in evolution, one that resulted in agriculture. Acute observation over years, centuries and millennia enabled human beings to discover how the seed sprouted, grew into a plant or tree, and bore fruit which contained more seeds. Mere observation was not enough, one had to be able to discern the causal relationships, between the tree and all its parts, the soil, water, sun and season. This progress in the faculty of the mind, from seeing correlations to understanding causation meant that people did not need to go in search of food anymore.

Farming and animal rearing enabled them to give up their nomadic lifestyle and settle down. Villages sprang up. Excess produce was exchanged or sold, and trade developed.

The history of civilization is an expression of the development of many mental capacities at different levels: the ascent of mind from observation and imitation to causation.

The development of symbolic thinking represented another enormous leap forward separating human beings from the rest of the animal kingdom and opening up unimagined vistas for the development of civilization. This upward move to thinking and communicating through symbols gave rise to the imagery of language, art, letters and numbers. When humans became capable of understanding symbols, they developed vocal symbols that represented objects and actions. Combinations of these vocal symbols led to the creation of the first spoken symbols. The widespread acceptance of particular sounds to represent particular meanings led to the evolution of early spoken languages. At its heights of expressiveness, it led to the great symbolic poetry of the Vedas and other ancient scriptures seeking to reflect the reality of subtle spiritual truths of existence.

The rendering of objects and ideas into symbolic images was the first step in the gradual development of written language. These images sought to represent life impressionistically, through art. In the cave paintings, early humans were not simply decorating their homes, they were communicating, telling their stories, and passing on knowledge. Hieroglyphics, alphabets and numbers followed some 30,000 years later. This development of symbolic thinking resulted in the emergence of all forms of written literature. Today, we have a great variety of vocal and written symbols and infinite combinations of these symbols, and in the virtual world of internet and communication technology, we continue to create new symbols at an accelerating pace.

In ancient India and other parts of Asia, symbolic thinking and imagination eventually gave rise to the development of insight and intuitive thinking, to represent the perception of relationships and truths of existence in the form of aphorisms and analogies as embodied in the spiritual culture found in the Upanishads. Only centuries later did metaphysical forms of rational, linear thinking emerge that argued from facts to conclusions or thoughts to ideas.

The development of logical thinking was a major achievement of ancient Greece. The Greek civilization developed rules for logical reasoning to establish the inherent validity of any thought. Greek philosophy focussed on reason and inquiry. The ascent of mind to logic supported an efflorescence of philosophy, arts and science. Socrates, Plato, Aristotle and hundreds of other thinkers and philosophers flourished in the atmosphere that stimulated intellectual thought and produced treatises on philosophy and works of poetry and prose. The Greek philosophers have made a deep impression on humanity, their influence can be traced through medieval philosophy, Islamic thought, European Renaissance, Enlightenment, even upto modern day science.

The capacity for organization is one of the most prominent characteristics of the thinking mind. The evolution of civilization progressed by a gradual organization of objects, sounds, words, activities, people, groups, information, knowledge, thoughts, ideas and beliefs,

giving rise to the military, governance, production, trade, religion, education, etc. The enormous contribution of mind's capacity for organization to the advance of civilization is illustrated by the application of mind to organize the entire life of all society in the ancient Roman Empire. From the hunter-gatherer onwards, everyone knew that together they could do more and better than when alone. Hunting was more effective when done in groups. Living in a community gave physical protection and social security to the individual. Individuals and groups of people complemented each other, and accomplished far greater than before. It was in Rome, however, that the power of organization was clearly understood, perfected, and applied to every aspect of life.

"All through the history of the world, an ascent of mind was the catalyst for a corresponding advance of civilization."

The Romans harnessed the power of the mind's capacity to compare and contrast things, categorize them and arrange them on an infinite number of different criteria. They organized governance, warfare, trade, law, and every aspect of society according to mental rules and principles, rights and duties. This period saw significant advancements made in all fields of life, the calendar, the postal system, aqueducts, apartment complexes and indoor plumbing, which were either developed or improved upon in Rome, and as the saying goes, all roads led to it. It was to a large extent due to its organizational skills that the Roman Empire was, at its heights, the most extensive social and political structure in the western world.

All through the history of the world, an ascent of mind was the catalyst for a corresponding advance of civilization. When religious thinking underwent a revolution, the Reformation resulted. Mental individuality found expression in the Renaissance.

The age of discovery and scientific revolution was the result of the application of a particular form of rational thinking—analysis—to a study of physical nature. Analytic thinking seeks to discern reality by dividing it into smaller parts and regarding each part as a whole in itself. Analytic thinking is well adapted to focus on the objective physical dimensions of reality observable through the senses, which readily lend themselves for experimental verification. It harnesses the mind's capacity for exclusive one-pointed concentration to reveal the intricate details of nature down to the level of the infinitesimal. It led to the classification of physical elements, the plant and animal kingdoms, and countless other discoveries. When combined with the powers of abstract mathematical thinking, it led to the discovery of laws governing motion and thermodynamics, heredity, physiology, and many other remarkable achievements in the physical and biological sciences.

As one consequence, specialization of knowledge became increasingly prevalent and the number of fields of knowledge gradually multiplied from a handful to over a thousand separate, distinct, compartmentalized disciplines. Systems or holistic thinking evolved during the 20th century as a reaction to the resulting fragmentation of knowledge and the problems that arose from viewing complex reality in terms of independent elements and systems.

Another consequence of the exclusive reliance on analytic thinking has been the insistence on explaining all phenomena exclusively in material, mechanistic terms applicable to

physical systems and a rejection of subjective forms of knowledge based on self-experience so essential for an understanding of individuals and groups of human beings. This has led to the search for general principles and laws to explain all human phenomena, resulting in neglect of the unique characteristics of individuals, as if human beings were as similar and interchangeable as different classes of subatomic particles.

Today, greater access to knowledge enables technological innovation which is bringing us closer and closer, eliminating space and abridging time. As a species, we started 200,000 years ago, but the pace of our progress has been accelerating. The changes that took millennia and later centuries, can now be seen in mere decades and years. Every component of our lives is immeasurably more sophisticated and complex. We have made great strides in longevity and in all aspects of human welfare. Education is no longer the privilege of the aristocracy but a universal right. Human rights is a recognized ideal. We have discovered, invented, created and cured. We have explored ocean beds, sent back photos from outer space, split the atom, and decoded the DNA. We have cloned animals, created virtual worlds and fit them into cell phones, moved from printing images to printing objects, toppled dictators using social media, and now consider occupying Mars!

This accelerating progress has been possible because each period and each generation has built upon all the achievements of earlier periods. The global civilization we see emerging today is the result of contributions by many different cultures over many millennia—each from a unique perspective arising from the development of different faculties and subtle powers of mind. Each age developed and expressed different faculties. Modern civilization is a product of this totality and integration of diverse evolutionary advances. The momentous achievements of modern science are the result of the cumulative development of wide ranging powers of mind and their application for the development of many facets of civilization. Each civilization and century added a tier to the base and climbed up, which is why we tower over everyone before us.

Paradoxically, at the same time we also see that each age has tended to focus on the development of some faculties to the exclusion or rejection of others. Ancient India on the application of intuition to discern spiritual truths of existence, Greece on the application of logical thinking in philosophy, the Middle Ages on ethical thinking in religion, the modern period on scientific rationality, mathematics and experimentation applied to the physical universe. Throughout the ages, religion, philosophy and science have each in turn succeeded in acquiring a dominant position of importance for a time, temporarily eclipsing the importance of the other two. There was a time when the church decided on the origin of man, the position of earth in the universe, and the cause of disease.

Today, the predominance of analytical thinking in science and other fields asserts with as much authority and tenacity. Early scientists such as Galileo, Copernicus and Descartes were powerfully constrained from proclaiming new knowledge by the all-powerful influence of prevailing religious teachings. Today the authority of positivistic, reductionistic analytic thinking plays a similar inhibiting role in the development of knowledge, especially in the social sciences, and on the further advance of civilization.

In spite of the tremendous progress we have collectively made, we find complex challenges that continue to defy solution by narrow, piecemeal, fragmentary forms of knowing. Poverty, unemployment, economic crisis, fundamentalism, violence, climate change, war, refugees, shortage of essentials constitute a formidable list. Each of these problems reflects the limitations and blindspots that have resulted from a partial, one-sided application of the diverse capacities of the human mind.

Exclusive preoccupation with analysis, mechanism, materialism, objective experience and general principles has suppressed essential insights into the role of intuitive thinking, subjective experience and the unique role of individuality in the advance of civilization. All the capacities that we need to accomplish are already there, we only need to accord appropriate respect to all the faculties developed by civilization in the past. We have created all of our problems, and we can solve them too, but only if we move to a new paradigm of thought and action. This was one of the core messages of the WAAS-WUC course '*Mind, Thinking and Creativity*' conducted on April 12-15, 2016, at Inter-University Centre, Dubrovnik, Croatia. We need to recognize the legitimacy of all the different faculties of knowing that we have developed so far, and also recognize that we are capable of developing new faculties.

Moving to a new paradigm of thinking demands creativity, individuality and original thinking. The analytic thinking that we practise today has no doubt led to great discoveries in modern science. But for all the phenomenal progress, our challenges too seem to be growing immensely, and they are unlikely to be solved by the faculty of analysis alone. We have a lot of specialists today, but not many generalists. So we are unable to find holistic solutions to problems. Our academic institutions have divided and subdivided disciplines, and our research labs have delved deep into each compartment. What we need to do is move out of compartmentalized knowledge and transcend the limits of our narrow approach.

One way to overcome the limitations of analytic thinking is to foster the use of symbols, analogies and metaphors in education and knowledge formulation. These are not just literary genres and devices to enhance the aesthetics of writing. They are tools that can foster deep thinking and deep learning. The symbolism of a poem can paint in a few lines a picture so beautiful that pages of prose cannot imitate. The description of the Symbol Dawn quoted at the beginning of this article, for example, describes a movement that begins with an idea, a dissatisfaction, an insistent and apparently aimless stirring that teases the unconsciousness to awaken. When it awakens, it does not awaken to knowledge, but rather to a first awareness or perception of knowledge which is described as a type of ignorance. This metaphor can be applied to understand the umpteen movements and revolutions we have seen in history. The Boston Tea Party, for example, was the outcome of such a dissatisfaction. There was no intention of starting the American Revolution. Freedom was not on the mind. The English king had levied tax on tea, and the Americans wished for something, but knew not what or how—as the poem says—this stirring of an insistent, dissatisfied, nameless idea resulted in the Boston Tea Party and the American Revolution. Similarly, the lady who began the Civil Rights movement that ended racial discrimination in the US, Rosa Parks, did not set out from home one day with the intention of ending segregation. She was travelling by bus, and was

asked to give up her seat and move to the back of the bus, to make room for white passengers. She refused to comply, she had obtained a seat, in the area reserved for black people, and was not inclined to bow to this demand. The simmering discontent among all black people and the aspiration for equality helped awaken the aspiration for freedom and equality. One fine day, one woman refused to give up her seat, and the Civil Rights movement was born, eventually leading to the unimaginable day when an African-American could become President of the USA. Similarly, the story of Mahatma Gandhi began with his being forced off a train while in South Africa. Any major movement—the abolition of slavery, women's liberation, the end of colonialism or the Cold War, the Arab Spring and the overthrow of dictators—begins with a symbol dawn.

Poetry is a form of symbolism that can reveal and communicate profound insights and sublime ideas in a few words. There are many valid and important ways of knowing that transcend the limits of analysis, mathematical formulation, experimental data or rational argument. Symbolism is one of the higher ways of knowing. It is not often that poetry is associated with knowledge, information, science or data. But the symbolism of poetry is a powerful way to communicate. Symbolism enables us to think holistically and keep in mind the integrality of life.

The same is true of analogies. The three words 'emperor's new clothes' is a powerful analogy applicable to a variety of people and situations. It communicates a universal human phenomenon of social conformity through a simple humorous incident. A complex, abstract idea can be communicated easily using a comparison with something that is already familiar. Take the idea that we often go by sense impressions and mistake the form for reality. In the course of our academic training, the study of abstract theories, models and formulas is given importance, whereby the underlying reality they seek to represent often gets obscured. Such forms are mere shadows of reality, such as the mathematical models used in String Theory, the simplistic theories applied to describe the global economy, or the psychological constructs applied to explicate human personality. Plato illustrates the fallacy of formal representation by his analogy of the cave. He describes men chained in a cave, facing the wall. All that they get to see are the shadows of objects that are behind them, on the wall they face. Not having ever seen the real objects, they live believing that the shadows are the reality. The analogy shows clearly the importance of the subjective experience over empirical evidence. Also, it makes clear how an analogy can be used to describe a situation, phenomenon or a complex idea succinctly.

Symbols, analogies, idioms, metaphors, similes, proverbs, sayings, parables and fables are types of figurative languages that can be used in our education and training to create imagery that breaks down the linear thought process and integrates multiple dimensions. Tradition tells us that there is a higher knowledge, which we call wisdom. The use of symbols, analogies, metaphors and imagery can assist in gaining and imparting wisdom.

The immense importance of the subjective dimension was another theme explored in the course on *Mind, Thinking and Creativity*. Positivistic thinking and analysis have suppressed the place of subjective knowledge even with regard to our understanding of conscious

individual behaviour in the social sciences. Subjectivity is often denied validity in scientific and academic thought. Even a cursory look at all great events and achievements in history shows the significance of the subjective experience.

"The strength of human aspiration and will is not a quantity that can be measured using any equipment or analyzed in a laboratory, and so it often fails to acquire authenticity and credibility as evidence."

The knowledge of the significance of the subjective dimension of economy was a key to halting the banking crisis that spread ruin during the Great Depression in the 1930s in the US. The stock market crash in 1929 led eventually to the failure of 6000 US banks, and unemployment of a quarter of the country's workforce. Stocks were down 75% from 1929. As each bank shut down, longer lines of people formed outside the banks that still survived. There was a wave of fear among the people desperate to withdraw their deposits while there was still a chance. That fear alone could have completely destroyed the American banking system, if nothing else did.

Franklin D Roosevelt became President at such a juncture. He was fully convinced that the country could tide over the crisis, and emerge successfully. He refused to continue the policies of President Hoover. He came up with bold reforms and regulations. But he found that the Economics he had learnt at Harvard and the counsel of his advisors was not adequate to address the crisis. He understood that the roots of the crisis were psychological and not financial. The problem was a loss of public trust. So he went on radio, and spoke to the people. He reminded them of their glorious past, and instilled in them faith in the government and confidence in their own capacities. He drove out the panic by famously saying that there is nothing to fear but fear itself. Restoration of people's self-confidence stopped the banking crisis. His success illustrates the importance of subjective factors in the understanding of social phenomena. Physicians familiar with the placebo effect know the central role of the patients' subjective understanding and attitude in curing any disease.

The importance of developing the capacity for independent thinking and creativity and individuality of action was a central theme in the course on *Mind, Thinking and Creativity*. Yet too often theoretical knowledge today based on general principles applicable to the social collective ignores the central catalytic role of the individual in social advancement. Individual accomplishment is a function of knowledge. But also and perhaps more importantly of will and determination. The strength of human aspiration and will is not a quantity that can be measured using any equipment or analyzed in a laboratory, and so it often fails to acquire authenticity and credibility as evidence. Yet they are essential determinants of human accomplishment in public life, business, science and academia. The social equation *Knowledge + Will = Reality* is as valid as any equation in physics or chemistry.

A humorous and entertaining illustration of this equation is depicted in Jules Verne's famous novel *Around the World in 80 Days*. The hero Phileas Fogg accepts a wager that he can travel around the world in 80 days or less. Fogg is a peculiar man, strong, determined, calm under all circumstances, and most important of all, aware that it is his choice, not chance, that determines his capacity for achievement. When his friends caution him about the risk of storms, robbers, accidents and unexpected delays along the journey, he calmly replies that the unpredictable does not exist. The entire journey is fraught with risks, but Fogg, whose reputation, fortune and occasionally even life are at stake, acts as if his will—which happens to be very strong—determines the turn of events at every point in the story. While in India, he sees a princess about to be killed, and decides to save her. She is surrounded by a large crowd, and the palace guards are keeping watch over her. But sometime after even what is called the last minute, the impossible happens and she is saved from death. The story is full of such astounding feats. During the sea voyage from America to England, the ship's captain tells Fogg, in the middle of the Atlantic Ocean that they have run out of fuel. Fogg is not perturbed in the least, to find himself on a ship without fuel in the middle of the ocean. He orders all the timber and canvas on board to be used as fuel, and manages to reach home in the stipulated time, and win the wager.

"Just as the mind has developed this far, there is no reason to assume that it has reached the limits of development."

Fogg's thorough knowledge of train and ship timings, routes, fuel and weather conditions accounts for only half the reason for this success. The other half was the will, the total conviction that a particular thing should and could be done. This is fiction, but history, biography and even the daily papers record more astounding feats than the most imaginative of fiction.

Winston Churchill said in the face of a strong Nazi attack during WWII, that *we shall never surrender*. He declared this, when his country's air force was outnumbered and technically inferior compared to the foe. England was expected to surrender in 6 weeks. It had a frontline strength of 1660 aircraft as opposed to 4000 on the German side. Germany trained 800 pilots a month, and Britain, 200. Had Churchill gone by these objective facts, he could not have declared his intention to fight in the beaches, hills, landing grounds and fields, with growing strength and growing confidence, if necessary alone, to go on to the end, whatever the cost may be. Every phrase, every word of his was saturated with his strong will, with which he inspired and energized his soldiers and civilians. He said he had nothing to offer but blood, toil, tears and sweat. Every one of his country men and women repeated it silently. This inspirational leadership played an important role in the Battle of Britain, and ensured an incredible victory to the underequipped and undermanned side.

Knowledge is only half the requirement. It is will, along with knowledge, that adds depth to learning. When it comes to life, when it comes to human affairs, there is no such thing as objective knowledge. The possibility of an event occurring, the success of a task, and the extent of the success are not independent of our understanding, commitment and will.

A concluding theme in the WAAS course was that, our study and understanding of the mind are still at a nascent stage. We have great accomplishments to our collective credit, and every one of them is a testimony to the ascent of our mind, starting from the time we struck two stones together to create a spark. But just as the mind has developed this far, there is no reason to assume that it has reached the limits of development. Today the major emphasis is placed on developing mind's analytic and computational capabilities and extending our mental powers through Artificial Intelligence and trans-humanistic visions. But that touches only the mechanical dimension of the human mind and leaves most of its rich endowments untouched.

In order to address the challenges and opportunities of the 21st century, humanity must have the imagination and creativity to think beyond the physicality of analysis and computation to embrace and develop the full spectrum of mind's capacities. The role of insight, decision-making, intuition, imagination and creativity in scientific discovery and spiritual experience testifies from different ends of the spectrum that higher powers do exist. The challenge before us is to discover how to systematically and widely develop them to evolve a global culture that is truly synthetic, organic and holistic based on knowledge that is truly integral.

The WAAS-WUC course on *Mind, Thinking and Creativity* cannot be seen only as a successfully completed four day lecture series. It is the beginning of a new paradigm in thinking, one that sees the complementarity in contradictions and the interdependence in disparate elements, that seeks to harmonize and integrate, and find comprehensive solutions to the major challenges of today. It can also be seen as a symbol dawn that takes humanity from the mental to a supramental level.

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Knowing Beyond the Structure:
Maximizing Social Power through a Synergistic, Values-based Approach on Diversity

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Abstract

In this article, a principal place is given to the question of how the ways we conceptualize the use of our mind influence the generation of social power. We define social power as the potency of socially integrated individuals to accomplish specific predetermined values. These values can be related to anything from concrete material prosperity to abstract social and cultural goals. How are the goals accomplished? Are there principles or laws that govern the process? What is the role of the individual in this process?

We argue that the development of social power requires an understanding not only of the heterogeneity of individual and social structure, but also of the subtle phenomena that give dynamism to the structure itself. We assume this intangible factor to be the container of social energy and consider that stimulating unique individual capacities to its maximum expression is crucial for the production of social power. Accordingly, we ask ourselves what progress in the way we think can bring us closer to the maximum expression of individual capacity. Maximum contribution of each individual in diverse aspects of social functioning is an applied form of unity in diversity—diversity referring to a unique capacity of each individual, and unity being a harmonious collective of unique individuals. As a case study, we choose the phenomenon of multicultural environment, as a context in which the highest variety of individual frameworks are brought into relationship with one another.

1. The Attainment of Maximum Social Potential through Social Structures: An overview

When we consider a society, our thought goes mostly to the structure that defines it: economy, politics, law, and material culture. We define structure as an organisation of heterogeneous elements making a whole that finds its purpose in realizing a particular concept. But what about the intangible and subtle aspect of the society that gives life and dynamism to its structure? Present forms of official education are among the examples of limited human conceptualisation which leave the unstructured potential ignored. So-called reforms in education mostly concern either the organisation of work and schedule or the adjusting of program content in relation to a standardized perspective on what needs to be known. The reforms forget about the potential of professors who transmit the knowledge and students who are actually the target. How much does a class depend on the mastered capacity

of a lecturer to communicate the knowledge and how much on a student to engage in the reception of knowledge? The standardized character of innovation seeking structure ends up covering uniformity over uniqueness, thus enclosing immense creative possibilities. Each individual is a unique source of this energy, while the medium of expression is the structure. Both need to be fitted adequately and complement each other, which means that the structure must stimulate the individual expression and that the individual must effectively use the structure as a ground for expression. The social structure is supposed to organize the social energy in a way that would facilitate and support its expression rather than retard and obstruct it. Education must not restrict the expression of students' potential, but promote its uniqueness and support its shaping for a socially functional form. How can we attain the highest level of social energy, i.e., the maximum of the potential expressed through the social structure?

Our hypothesis is that this subtle reservoir of social energy could be manifested to its fullness in a harmonious unity of individuals expressing their unique capacities. We consider that each individual capacity can contribute to the society in a productive way. By this the individual would not only attain self-satisfying accomplishment, as a result of realization of unique potential, but would also find his/her unique path to social contribution. This accomplishment is not only for the benefit of individual prosperity, but is the expression of maximum social potential. What better example than the artist completely devoted to his/her work which one day becomes exquisite cultural heritage of the world, inspiring new creations centuries thereafter? Finding passion in any kind of work means expressing our organic fullness through a structure. Some find maximum accomplishment in their work roles, some in their family roles, nevertheless, there is enough room in the society for each unique contribution. Even those who declare themselves out of society, like sages and ascetics, contribute immensely to the world knowledge with their profound experience.

2. The Synergistic Approach to Attaining Maximum Social Power

What are the values that could support and encourage this perspective and how do they relate to social advancement? It seems clear that here, our ideal could be defined as a united collective of individuality. The concept that we choose to pursue is one where the individual attains maximum accomplishment and freedom of expression of a unique potential, while at the same time contributing to the community that functions as a united harmony of individuals. The individual potential should be open to free exchange with the social environment through beneficial interaction and cooperation. We consider this synergistic approach to be a possible perspective for attaining maximum social power.

We consider collaboration/cooperation to be the key element that connects individuals into a harmonised unity, with the inclusion of a synergistic effect. Not only does the individual work for his/her own benefit and accomplishment, but the same expression of capacity contributes to the collective by returning the favour through the synergistic product of cooperation. Scientific and professional conferences, medical institutions, schools, libraries, banks, insurance societies, and even competitive market economies are built on this concept. Even though cooperation/collaboration is the basis of modern society, due to a miniscule expression and interrelation of human potential via the social system, we are far

from reaching the optimal level necessary for its prosperous and harmonious form. What would a musical orchestra or a theatre production express without conscious harmonious cooperation of individual performers? Our schools teach us how to learn and express common knowledge as single units, but they do not teach us how to be unique in using and developing the knowledge.

> *"Inertia ties us to the known and the secure, opposes change and innovation, suspects the different, and, in general, stands firm against any dynamics."*

Education must raise the individual's consciousness of being a unique piece in a puzzle of collective evolution. How many government and non-governmental organisations across the world today are working on a limited number of social questions and how many actually consider each other as partners? The relations of supremacy justified by the necessity of competition for the limited number of places in the social system rule out a great amount of cooperative opportunities. How many collaborative interactions and exchanges are there between different intellectual spaces considering human values? Diverse organisations of people build concepts of universal global development, progress, peace and unity from different perspectives. How much more could we learn if we were to unify these perspectives in a wider framework through cooperation? These constructive relationships are the greatest creative source of all human achievement in knowledge, know-how, culture, governance, etc. However, cooperation is a conscious process that requires willing investment of individual energy.

3. Inertia as an Inhibitor of Human and Social Progress

What then opposes the expression of human potential? We choose to address all inhibitors of the manifestation of human capacity as the inert elements of human progress and social evolution. Inertia ties us to the known and the secure, opposes change and innovation, suspects the different, and, in general, stands firm against any dynamics. It slows down and impedes progress and can manifest itself through different phenomena, sometimes very appealing to the laws of reason (such as need for trust, security and stability). Inertia results in a great number of expressions entangled in our everyday life, which we are more or less conscious of. Some forms of its manifestation are: lack of openness and receptivity to new perspectives and opportunities, resentment of challenges, dependence on the past and socially acknowledged dogmas and the resistance to empowering transformation of our internal individual and external social structures due to an attachment to established forms of authority. Even students realizing the importance of education succumb to different forms of inertia, thus losing their way in academic progress. Using our knowledge about health and environment in every-day consumption is a real challenge for the human population, whether it is in the individual level of body health or collective level of environmental protection.

If progress is our aim, whatever its context and definition may be, then we must consider this inherent human characteristic manifested through the individual as well as through the collective. Progress can be defined from different frameworks, but all these perceptions have a common essence, corresponding to the fact that it requires energy directed towards what is unknown to the subject. Whatever our vision of the future is, there is always a risk—a struggle between fear and hope. Going for a job interview can make people tremble in anxiety of all the things that could go wrong; the same situation could be captured as a great opportunity for achievement.

How can new ways of thinking help us overcome the inertia that up till now constrained our minds from seeing beyond the social structure? When thinking about the society, the mind tends to concentrate on the tangible constructions. In this work, we put forward what is beyond, in other words, the intangible factor as a container of social potential. The uncertainty of the subtle usually results in a call for protection by a fixed structure. Our idea is to put forward the opportunity of uncertainty and to place trust in the vast potential it offers, rather than to succumb to the fear of the unknown.

We must go beyond the social structure, into the "subtle". This widening of perspective appreciates change as an evolution, rather than destruction. It is a new framework. We have to take into account the fact that the human mind trusts what it already knows and that such a characteristic can result in closure and stagnation. Carl Rogers writes that most of the ways of behaving adopted by the individual are those that are consistent with the self-structure.

Another example of the result of tendency "to fix", which acts as an inhibitor of free expression of human potential, is the all-pervasive tendency to impose and preserve the superficially determined axiological structure as grounds for a hierarchy of human capacities. Should the product of our current social situation impose a value distinction between diverse human capacities or should we try to think beyond our present social structure? Should we make judgments on the value of unique individual expression based on current tendencies of, to name one, material prosperity? Intellectual and academic work have an enormous impact on human progress today. Art is one of the capital media of expression of the subtle human knowledge and vitality. Physical capacities are responsible for all things man-made in the world today and make social expression possible. Cultivation and development of each of the human capacities require conscious human effort. The modern society tends to judge the value of different human capacities by the social expression they give birth to. Are we conscious of the standard by which we assign social value? We attribute dominant value to the emerging skills that seem crucial for the future world from the current standpoint, sometimes undermining the ideological fundaments and the historical circumstances they were built on. Before running to any conclusions, we must first understand that for the society to function as a whole, it must embody an organisation of diverse capacities, just as the human body is an organisation of different vital functions. Each part plays its role, which is equally important for the generation and sustenance of the whole. We argue that every individual, by inborn potential, has his/her unique opportunity of expression in the society and an adequate place for accomplishment. The difference is in how much of this potential is realized in a social collective. Imposing value judgment on capacity rather than on the effort

invested for the constructive expression of the capacity is in our opinion a misplaced process of evaluation and an inhibitor of individual accomplishment. The latter is attainable only if adequately recognized by the social environment. Suppressing potential from childhood can not only result in individual dissatisfaction and frustration, but is a loss of opportunity for unique manifestation inherent to the individual. In India, a grand majority of children are directed towards higher education in medicine and engineering, their inborn capacities are not even considered in their mental, vital and physical development.

4. The Role of Multiculturalism in Social Development: A Case Study

Every contact is an opportunity for a constructive exchange. The wider the range of difference in the experience of a contact, the more there is to be learnt by the individuals and the collective. We consider multiculturalism to be an appropriate case study for the fundamental human phenomenon of the encounter between the different and the unknown. In order to grasp the importance of multiculturalism, we must conceive of its role in the development of humanity, without however forgetting its potency for conflict generation. Sparks and frictions in multicultural contact can result in beneficial exchange and progress on each side, but can also create conflict. Being aware of the process by which we evolve permits us to conceptualise more adequately our perspective on development.

Cultural intolerance is an attribute of human consciousness in certain stages of development. All societies have once embodied what we call barbarism today. The more educated, mentally developed and open to exposure of diverse contact, the more tolerant and receptive the collective tends to be. Taking into account historical facts such as crusades, colonisation and slavery, we can say that the destructive frictions are less present today than they were in the past.

Instead of looking for uniformity as an imperative for a harmonious collective, we must realize all the ways in which we benefit from the fundamental human characteristic of diversity. As genetic diversity has turned out to be crucial for human evolution, we consider cultural diversity to be a catalyst in social evolution. Our consciousness grows through contact with the different and the unknown.

Are we conscious of what multiculturalism has given us so far? The exchange of knowledge between cultures has existed since the very first intercultural contact. From the most basic material needs, such as shelter, food or clothing, through various technological innovations to abstract concepts, such as moral values or religious beliefs, humankind has always used this encounter of diversity in a positive way.

Multiculturalism gives us immense opportunity for interaction—seven billion unique individuals potentially capable of interacting with each other. What an immeasurable potential of knowledge exchange this is! All cultures played their role in what the world is today. Without India, we wouldn't have had Hindu numerals, decimals. How much do we owe to the English language, fertilized over years of spreading over the continents, as a mediator of conceptual exchange? No communication would be possible if science were not a multicultural field of interaction. Possibility of foreign trade made people discover new

continents. How much did we learn about ourselves from meeting with indigenous people from faraway islands? Even the concept of spirituality, growing over hundreds of years of diverse religious and non-religious cultural traditions, has come to encompass a grand number of unique definitions and interpretations. What would body practice in Europe be if it hadn't reached the Asian cultural heritage? This immense potential that lies in multicultural contact must be organized.

Today, this process is still evolving and we need to be conscious of it in order to maximize the realization of its potential. However, in our usual way of thinking, we still tend to hold on to the social structure and find difficulties in realizing the subtle possibilities for creativeness. One finds it difficult to look beyond the immediate, especially when it comes to urgent inconveniences. For example, instead of concentrating only on the threat that comes with the immigrant waves in Europe, why not develop the perspective for utilising this new social potential? This great amount of human energy is not the real concern, but its randomness and dispersion as a consequence of exclusiveness from the host-society are. There is a great need for social organization for channelling and directing this energy constructively. Environmental policies are an example of future-oriented programs of action which not only concentrate on minimizing the consequences of pollution, but also on developing new ways of thinking about consumption. Instead of perceiving predominantly opportunities for conflicts in multicultural environments, we must see the upside of intercultural communication. What we have achieved so far is the result of diverse contributing elements.

With our current thought, the first reaction in a new intercultural encounter is the tendency to secure and stabilize. When differences are encountered, we either choose the way of uniformity imposing a model determined by relations of superiority, or look for balance in connecting the diversities and recognizing their complementarities. Multicultural contact happens among individuals, who, facing an opportunity of transformation, cling to what defines them—identity and integrity. Therefore, for a multicultural contact to appear as an opportunity, rather than a threat, we must not jeopardize the concepts that ground the individual's collective existence. It must happen as an opportunity for free exchange of knowledge that offers a possibility of a higher unity than the individual culture—a higher structure encompassing harmoniously its elements and recognizing the subtlety of their connection. The process of exchange and construction of novel modes of knowledge and practice, however, requires conscious determination and energy. Here, we encounter the problem of inertia.

Multicultural environment is a field of opportunity for encounters between individuals and communities with different perspectives on values, knowledge, skills and ways of life. These differences provide rich potential for beneficial exchange, discoveries, growth, development and transformative experience. This encounter can result in a closure and refusal or an open exchange and acceptance, depending on our perception and reaction. Humanistic psychology tells us that one of the characteristics of a fully functioning person is openness to experience, without consciously preventing troubling stimuli from entering the consciousness. Carl Rogers, one of the founders of this discipline, writes that any experience inconsistent with

the self-structure may be perceived as a threat, and the more of these perceptions there are, the more rigidly the self-structure is organized to maintain itself. When the individuals accept into the self-structure all sensory and visceral experience, they understand others better. However, as they accept more organic experience, they find that they are replacing their own value systems with a continuing organismic valuing process. We argue that the outcome of a multicultural encounter depends very much on the level of consciousness of the individual and of the community in relation to the opportunity they are given.

"When freedom is given to individuals, they can use it as an opportunity to express a unique potential or misuse it in a way that turns out to be destructive to both themselves and the community."

5. Internalized High Values as a Determinant of Individual and Social Progress

We consider that the recognition of equal values of diverse human capacities is a necessary step towards the individual accomplishment* acquired through the expression of a unique potential. We consider this to be a crucial step towards the harmony between the individual and the collective, characterized by synergistic cooperation. Carl Rogers writes that a rich life, with continual aiming at full potential fulfilment, is another important characteristic of a fully functioning person.

Apart from considering a possible inhibition of the individual capacity by the collective, we dedicate our attention to the individual as a potential catalyst of his/her own expression as well as of the transformation of the collective. The individual is shaped by the natural and social environment, but he/she also manifests inherent human characteristics. Collective values are crucial for shaping the individuals by their environment, but they can interact with the inborn characteristics only when they are internalized by the individual. We say that the survival instinct is an inherent character of every living being and that it puts the individual wellbeing before any other. Have we never experienced a situation where people renounce their own basic vital needs for another living being? This form of behaviour is most visible in times of crises and war. In the recent Paris attack at the Bataclan Concert Hall, a number of individuals put aside the opportunity to escape and voluntarily exposed their wellbeing to danger by saving other people. Internalized values are susceptible to transforming the individual as well as the collective.

Values involve two types of dynamic organization: the collective and the individual. The collective consists of individuals connected through diverse structural and subtle relations, and

* We would like to point out the distinction between the above addressed accomplishment—defined by growth in supporting the complementary progress of the wider collective and the individual benefit—recognized as progress by individual standards, unrelated to the collective.

the individual has his/her own internal structure. As a model, we can look at the individual's internal structure, responsible for the physical, vital, mental and spiritual processes, at the productive part, and at inertia as the inhibitor of transformation. The embodiment of values depends on the depth and the intensity of interaction between the values and the dynamic organization. In the case of the individual, the concept must become not only mental but also a physical and an emotional aspiration. In the example given above, we see that the lives of other human beings have an impact on our own wellbeing and thus we consciously act not as egoistic units, but as a part of the collective. From another perspective, determined by the level of his/her consciousness, he/she can wilfully and purposefully act towards accomplishing the transformation by sublimating lower values to higher values.

"The collective has to see the individual as a unique heterogeneous organization and the individual must function in a harmonious unity."

The consciousness of a functioning whole determines the depth by which we internalize and embody values coming from the social environment. Our creative and dynamic aspirations struggle with inertia when it comes to developing this consciousness and applying it in life. There is always struggle when it comes to deep transformation. The embodiment of values is a transformation of the system of values which requires active individual engagement. In other words, the individual must wilfully invest his/her energy in what he/she perceives as progress.

One must be conscious of the importance of his/her contribution to the collective for his/her own accomplishment in order to freely engage himself/herself in open exchange and cooperation. Sincerely acting according to a certain value means to have embodied the particular concept to the level of physical and emotional needs. We argue that the embodiment becomes, with the raise in consciousness, not only mental but the embodiment of our functioning as an organic whole.

When freedom is given to individuals, they can use it as an opportunity to express a unique potential or misuse it in a way that turns out to be destructive to both themselves and the community. Giving small children absolute freedom of action before they develop a minimal level of consciousness related to their environment can result in causing inconvenience or material damage to other people and children themselves. To create an environment supportive of free expression does not mean to give infinite opportunity to individuals, but to provide as much as they can creatively and responsibly use. The latter depends on the depth of internalization and the capacity to apply collective values. Thus, if the individual strives for more opportunity for creative expression and freedom of action, he/she must first rise in consciousness relating to collective values.

How can the individual know "what is best for him/her?" How can we minimise the inertia that imposes struggle in each step of attaining consciousness? Besides the fact that

the individual needs to understand himself/herself to know what is best for him/her, he/she must also be aware that freedom and opportunity are as accessible as the individual's will to reach them. The will in the individual is the strongest when he/she functions as a unified organic whole taking into account his internal structural and subtle elements. When we pursue a goal that is highly ranked by our system of values, represents an emotional motivation and suits our physical capacity—either as a challenge or as a commodity, the grand individual energy is spontaneously expressed and directed towards the particular accomplishment. The collective has to see the individual as a unique heterogeneous organization and the individual must function in a harmonious unity. To understand a human being, we must take into account all its diversity. Only an interdisciplinary approach can help us understand the development of consciousness at all levels of human functioning.

"Perspectives that aim beyond the structure allow our mind to reach the intangible."

6. Conclusion

Multiculturalism, as a ground for the expression and interconnection of diverse individual potential, is an immense generator of social power. Taking into account its historical contribution to world progress, it is one of the greatest contributors to creative innovation and worldwide knowledge exchange. Each and every modern nation-state has grown through multicultural encounter. Diversity has two faces: offering infinite creative opportunity on the one hand and unreliability of the unknown on the other hand. Perspectives that aim beyond the structure allow our mind to reach the intangible. Today, we have the possibility of developing new ways of knowing and new mental frameworks characterised by recognition of the realm of subtle aspects of the society, which would help us identify the values that could maximise the expression of individual potential and, thus, the generation of social power.

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Ruđer Bošković and the Structure of the Experience of Scientific Discovery

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Abstract

Ruđer Josip Bošković (1711-1787) was a Jesuit priest and a scientist from the former Republic of Dubrovnik in today's Croatia. He published many works in such fields as mathematics, physics, astronomy and geodesy. According to Werner Heisenberg, Bošković's "main work, Theoria Philosophiae Naturalis, contains numerous ideas which have reached full expression only in modern physics of the past fifty years." The question that this paper seeks to elucidate is what enabled Bošković to anticipate the discoveries of modern physics. Because Bošković could not avail himself of the resources and instruments by which modern theories are validated, it is assumed that there exists a mechanism of subjective validation that allowed him to accept the truthfulness of his ideas. It will be argued that this mechanism of internal validation is very similar to the process of spiritual transformation. More specifically, using Polanyi's notion of twofold awareness (subsidiary and focal), it will be shown that this mechanism is best explained by the fact that when an idea has been fully internalized by a person so that it has become an instrument by which that person makes sense of the world and interacts with it, it acquires by this process an enormous credibility.

> *"To some extent, Bošković was able to identify many of the realities that constitute the conceptual framework of modern physics and chemistry."*

Ruđer Josip Bošković (1711-1787) was a Jesuit priest and a scientist from the former Republic of Dubrovnik in today's Croatia. He published many works in such fields as mathematics, physics, astronomy, geodesy and even archeology.* He is also known as being the first natural philosopher to have formulated a unified theory of forces that tried to explain all the phenomena of the observable universe. Bošković's theory is based on the concept of field, thus anticipating Faraday and Maxwell in their speculations about the substratum of phenomenal world. He also proposed an atomic model similar to that of Niels Bohr, that is, a model that accounts for the notion of discrete and stable orbits. His theory of forces foresaw

* See in the Bibliography a sample of the works published by Bošković in those fields. Although he mainly published in Latin, some of his works were translated into French and, more recently, into Croatian. As far as the author knows, only his main work, *Theoria Philosophiae Naturalis*, has been translated into English.

as well the existence of what came to be known in physics as quantum confinement. To some extent, Bošković was able to identify many of the realities that constitute the conceptual framework of modern physics and chemistry. Corroborating this affirmation, Werner Heisenberg said in 1958: "The remarkable concept that forces are repulsive at small distances, and have to be attractive at greater ones, has played a decisive role in modern atomic physics: In chemistry, in the constitution of matter out of atoms, Bohr's quantum theory of atomic structure can be related precisely to this concept, and the study of the atomic nucleus over the past thirty years has taught us that the particles which make up the atomic nucleus, protons and neutrons, are held together precisely by such a force."* And to highlight Bošković's power of anticipation, he added: "His main work, *Theoria Philosophiae Naturalis*, contains numerous ideas which have reached full expression only in modern physics of the past fifty years, and which show how correct were the philosophical views which guided Bošković in his studies in the natural science."† Finally, his theory of forces, which is represented by a simple curve identifying points of cohesion and non-cohesion, can account for the stability of material structures as well as their points of highest volatility. In other words, his theory easily accommodates the notion of attractor and that of point of bifurcation, notions that are important constituents of any modern theory of chaos.‡ One may ask at this point what exactly enabled Bošković to have these intuitions into the nature of reality.§

"Ideas are not isolated islands spread out over a vast ocean, but are rather part of a few continents in which continuity between their various features is to be found at a deeper level."

One possible approach for answering that question is to look, as just hinted, into the philosophical views underlying Bošković's theory. This approach assumes that our ways of looking at reality are expressions of a deep-rooted cognitive structure, a conceptual system, to use William Byers' expression that, once it becomes more explicit, allows us to see the interrelations between what appeared to be at first sight unconnected if not contradictory. To use an analogy, ideas are not isolated islands spread out over a vast ocean, but are rather part of a few continents in which continuity between their various features is to be found

* Cited in Dadić, *Ruđer Bošković*, p. 126.

† Idem, p. 127.

‡ In this regard, note the following passage from the *Theoria* (§468): "Suppose that from the sea there rises a mountain of considerable height, and that along the sides of it there lie immense masses of huge stones, and the higher one goes, the smaller the stones are; until towards the top the stones are quite small, and at the very summit they are mere grains of sand. Also suppose that all of these are just in equilibrium, so that they can be rolled down by a very slight force compared with their whole volume. If, now, a little bird on the top of the mountain moves with his foot just one grain of the sand, this will fall, and bring down with it the small stones; these as they fall, will drag with them the larger stones, and these in their turn will move the huge boulders. There will be an immense collapse and a huge motion; and as all these stones fall into the sea, the motion will communicate itself to the sea and cause in it a huge agitation and immense waves, and this vigorous motion of the water will last for a very considerable time. The little bird disturbed the equilibrium of the grain of sand with a very slight force; gravity produced the remaining motions, and it obtained its opportunity for acting through the slight motion of the little bird." [Child, p. 329]

§ In addition to one's understanding of the basic structure of reality, Stipe Kutleša, in his book *Ruđer Josip Bošković*, argues that Bošković "was able to formulate the continuum of real numbers, thus becoming a forerunner for German mathematicians Julius Wilhelm Richard Dedekind (1831-1916) and Georg Cantor (1845-1918). He predicted the problem of "geometry of nature", by giving instructions for the building of two fractal structures, i.e. curves which do not have tangents in any of the points (snow flake of Koch's curve—which is named after the Swedish mathematician Helge von Koch, 1904). The mathematical fractal theory, which was discovered in the 20th century, is based on this very thought." (Kutleša, p. 107).

at a deeper level, for instance, at the stratum of the tectonic plates. As examples of such continents, we have the notion of non-divisible material objects as the basis of all atomic theories of reality, theories that have triggered a search for the ultimate building blocks of our observable world. New speculations in modern physics, for instance those incorporating the notion of dimensionless quarks or the idea of string as fundamental elements of reality, seem to have frustrated this several centuries long aspiration. If these speculations have not completely led us to abandon such a search, at least they have forced us to consider the concept of a particle as nothing more than a useful device to make sense of our mathematical equations knowing perfectly well that this concept has no ontological pretensions whatsoever.

Another way to illustrate this first approach is to talk about, as Lee Smolin does in his books *Three Roads to Quantum Gravity* (2001) and *The Trouble with Physics* (2006), specific roads that have been followed by important scientists throughout history. These roads are distinguished by fundamental features like the nature of space and time, that is, whether it is absolute or relative. In this regard, Smolin says that a scientist like Newton always assumed a background dependent reality, namely, that "there exists a fixed, unchanging background that provides the ultimate answer to all questions about where and when."* In contrast to this fundamental assumption, we have Leibniz and Einstein who advocated the concept of background independence where there is no fixed framework of reference and consequently, that a reality is defined in terms of its relation to another reality. Smolin further argues that the progression of modern physics along these two roads has led it to a state of crisis and that a third road has to be opened for further progress, especially at the theoretical level. It is interesting to note that Smolin believes that this third road has already been opened by Faraday and Maxwell with their fundamental concept of field, the very idea that is, as mentioned earlier, on the basis of Bošković's theory.

It is up to the historians of science to determine how genuine is Bošković's intuition as one can always be fooled by false similarities occurring at the level of the language used to express views about reality. However, this first approach as a way to answer our initial question is valid only if we enjoy the benefit of a retrospective view of the evolution of scientific thoughts. Without this retrospective view, all intuitions and original ideas are more or less the same. There was a time when it was impossible to decide, empirically speaking, between a Copernican explanation of the solar system or a Ptolemaic one. For an external observer, an intuition is just a hypothesis, a figment of someone's imagination. Even for the person who generates a far-reaching intuition, it remains that there is almost no way to confirm its validity. Moreover, the reason why we say that an idea is far-reaching is because it presents itself as a solution to problems that were not yet formulated at the moment it was imagined. How then was it possible for Bošković, knowing the state of the intellectual environment in which he evolved, to have so much confidence in his intuitions to a point where he was ready to elaborate from them an entire system of thought? He was even willing to stake his own reputation as a scientist on such ideas that verged, at least for his 18th century colleagues, on lunacy, for example the claim that there is no such thing as hard matter, that it is possible to walk through walls or that we may consider the existence of multiple and parallel universes.

* Smolin: 2001, p. 25.

Thus, our initial question is not only related to determining the origin of an intuition, but also to understanding the reasons why those who generated such intuitions, and those who accepted them as true, are sometimes passionately committed to defending them even when the means to offer a clear objective proof for their validation are not available. In this regard, we may think of Galileo who had the courage to face the Roman Inquisition in order to defend heliocentrism or Einstein who knew about the validity of his theory of general relativity before Arthur Eddington confirmed it by his observations of the solar eclipse of May 29, 1919.* Consequently, we have to assume that there exists a mechanism of subjective validation that enables one's intuitions to persist over time and, to use an evolutionary model, to survive in a hostile intellectual and social environment. What exactly is this mechanism? What are its epistemological (its objective dimension) and existential (its subjective dimension) implications? These are the main questions that constitute our second approach by which I would like, in this article, to explain Bošković's power of anticipation or the source of his intuitions. This second approach is not meant to invalidate such means of external validation as experimentation, observation and measurement. It rather seeks to explore the nature of the connection between a knower and that which that knower holds to be true.

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Details of Bošković's epistemological approach are scattered all over his works. He nevertheless offers a summary at the beginning of his *Theoria Philosophiae Naturalis,* where he expounded his unified law of forces. It goes as follows:

> I put on one side all prejudices, and started from fundamental principles that are incontestable, and indeed are those commonly accepted; I used perfectly sound arguments, and by a continuous chain of deduction I arrived at a single, simple, continuous law for the forces that exist in Nature. The application of this law explained to me the constitution of the elements of matter, the laws of Mechanics, the general properties of matter itself, and the chief characteristics of bodies, in such a manner that the same uniform method of action in all things disclosed itself at all points being deduced, not from arbitrary hypotheses and fictitious explanations, but from a single continuous chain of reasoning.†

In order to highlight the existential component of his approach, I would like to juxtapose with this quotation a second one which is also taken from his *Theoria.* It is to be found in the dedication of his work to the Count of Migazzi:

> Of a truth, that well-known old saying, "What you do, DO," which from your earliest youth [...] had already fixed itself deeply in your mind, has remained firmly implanted there during the whole of the remainder of a career in which duties of the highest importance have been committed to your care. Your strict observance of this maxim in particular, joined with those numerous talents

* In fact, Einstein was so convinced of the validity of his theory that, when asked by Ilse Rosenthal-Schneider whether he was worried about the possibility of having his theory refuted by Eddington's observations, he replied: "I would feel sorry for the good Lord; the theory is correct". (Rosenthal-Schneider, p. 523)

† Child, p. 25.

> so lavishly showered upon you by Nature, and those virtues which you have acquired for yourself by daily practice and unremitting toil, throughout your whole career, forensic, courtly, and sacerdotal, has so to speak heaped upon your shoulders those unusually rapid advances in dignity that have been your lot.*

On the basis of these two quotations, I believe that it is possible to establish the fact that there is in Bošković's mind a close connection between the process of scientific discovery and that of moral development. This fact should help us better understand some of the implications of his scientific method.

First of all, we may assume that Bošković's use of the word *continuous,* in both the phrases *by a continuous chain of deduction* and *from a single continuous chain of reasoning*, indicates some form of sustained commitment. In this regard, Dubravko Tadić is also of the opinion that this continuous chain of deduction involved some degree of mental discipline. While discussing what could have been different in Bošković's approach from the modern scientific methodology, he says: "In the 'fundamental and incontestable' principles used by modern science there are some, at least minor ones, which resulted from Bošković's relentlessly thinking sustained by tremendously disciplined mental effort."† Such sustained efforts are, as it is well-known, an important requirement for any subjective transformation.

Secondly, Bošković's continuous chain of deduction has its starting point in the acceptance of fundamental principles that are incontestable as well as commonly accepted. Here, there is no indication that these fundamental principles were experimentally proven so that we have to presuppose, like the Count of Migazzi did with his maxim, that Bošković accepted them on trust.

Finally, the entire process led him to the realization of an idea whose plausibility was subsequently enhanced by observation of the phenomenal world. This realization is an objective event, as it can be communicated, evaluated, etc., like the Count's moral transformation which was witnessed, I assume, by many people.

The similarity between these two passages is therefore based on the fact that they share the same presuppositions with regard to the process of creation, be it the acquisition of a virtue or the emergence of a new idea. Indeed, it requires the acceptance *a priori* of an idea followed by some form of commitment to that idea. These would be some of the ingredients necessary to bring about an experience of creation. Here, it may be interesting to note that, from the point of view of the modern scientific discourse, especially the one supported by the positivist presuppositions, these ingredients are not acceptable as this discourse exclusively advocates the cultivation of an attitude of doubt toward all affirmations and the use of experimentation and quantitative measurement as the only means of validation.

Another important evidence that shows that there exists a connection between scientific creativity and the cultivation of virtues may be given by looking at the cognitive aspect of

* Idem, p. 24.

† Tadić, p. 121.

what is meant by the term *continuous*. If previous evidence suggested that this term refers to a sustained act of commitment, that is, as an expression of one's motivation, the present one is related to the type of mental activity that is being sustained and nurtured by this act of commitment.

In addition to the summary of his epistemological approach given above, Bošković often refers to the practice of *reflexio* as an instrument that guides him into his exploration of reality. According to Peter Henrici, *reflexio* is not to be understood in terms of the "psychologically reflective ability with which the consciousness (the mind) can perceive its own operation," but rather in the sense of "active thinking: "meditatio quaevis" or "rectae rationis usus"".[*] In this meaning, *reflexio* has above all the function of a critical examination and correction of ideas. It is also the ability to realize "the limits of our sensitive knowledge and thus also to think beyond these limits."[†] It is precisely this last function that makes *reflexio,* still according to Henrici, "the most important faculty of cognition"[‡] for Bošković, since it sets into place, as I am going to show, the conditions for the emergence of a new idea.

This practice of *reflexio* has its equivalent in Indian religions, especially within the various mystical schools of Hinduism and Buddhism. As a matter of fact, many terms are used to describe this practice depending on the intensity of the cognitive process involved. For example, there is *vicâra* (pondering over), *manana* (meditation), *nididhyâsana* (contemplation). They are sometimes regrouped under the term *tarka,* which, according to one of the mystical schools of Hinduism (Advaita Vedânta), "is needed (i) to ascertain the purport of scriptural passages, (ii) to remove doubts and contrary beliefs, and (iii) to convince us of the probability of the existence of what is to be known."[§] In other words, *tarka* is a cognitive operation that continuously questions the validity of the primary ideas derived from the senses, ideas that are tying us to a fundamental but deficient or limited way of looking at things. It also prepares the ground for the emergence of a new vision or 'conceptual system', to use Byers' terminology once again. It does so on the basis of accepting *a priori* a fundamental principle. A famous example of such a principle is the idea that the entire universe is Brahman, the ultimate reality, and consequently, that the phenomenal world, as we experience it, is just an illusion.

The comparison between *reflexio* and *tarka,* a cognitive function essential to the process of spiritual transformation, thus indicates that Bošković's approach to the investigation of the phenomenal world shares some features with the practice of mystical contemplation. What all mystical contemplations have in common, no matter the religious traditions they are issued from, is a relativization of sense experiences as means of knowledge. However, this relativization is not the product of following some kind of methodological diktat, but rather the fruit of a specific cognitive operation. Indeed, one can say that the purpose of *reflexio*, as well as that of *tarka*, is to add another organ of perception, this time, a mental one, by which the world is to be seen and investigated. In other words, prejudices resulting from an

* Henrici, p. 30.

† Idem, p. 36.

‡ Idem, p. 31

§ Satchidananda Murty, pp. 149-150.

experience of reality through the five senses are questioned or regulated, not on the basis of *a priori* doubt, but by adding another sense.

This way of relativizing sense experience is not different from what we usually do when we do not accept an idea produced by an experience derived from one type of sensation on the basis of another impression resulting from an experience caused by a second type of sensation. Similarly, today, when we look at a sunrise in the East or a sunset in the West, we "see" that it is the earth that is moving and not the sun. This impression is possible because we have internalized the idea that the earth moves around the sun. Thus, by accepting an idea as true and by cultivating an awareness of its implications by the process of intense contemplative reflection, it becomes part of one's cognitive apparatus with which we look at the world.

It might be worthwhile to consider more thoroughly this process of internalization by which an idea is transformed into an instrument of perception. Similar to using instruments like microscopes and telescopes, the validity of ideas accepted *a priori* is established by the quality of one's observation of the world. If, for example, it allows us to see phenomena in a way unnoticed before or simply to discover entirely new ones, we come to have more trust in them. Inversely, the impossibility of understanding a phenomenon by observing it through one's instrument, be it a physical device or an idea, forces us to question its quality and even its usefulness. From this point of view, one can say that there is no substantial difference between an idea that has become part of one's cognitive apparatus and a device like a telescope as both are instruments through which we look at reality.

We could go further in the analysis of this process by defining what is meant, cognitively speaking, by *quality of one's observations*. As mentioned above, this is the validating experience that confirms the trustworthiness of one's instruments of observation or *a priori* accepted ideas. Firstly, one may ask, what do we see when we observe the world? We see all kinds of things, but what essentially attract our attention are asymmetries. What are these asymmetries? There are discrepancies between our observation of the world and a tacit vision that accounts for our subjective or existential sense of order or harmony. It is tacit because, either it has been acquired from infancy in a more or less unconscious way on account of our interaction with the world—Bošković would even argue that parts of this vision were acquired while we were in the womb—or, if it has once been the object of a conscious and explicit realization, it has been pushed back at the level of implicit assumption by the process of internalization just mentioned. What the *a priori* acceptance of an idea is going to accomplish is to force us to refocus or redirect our attention so that we become more aware of the cause of the discrepancies and, by the same token, are able to formulate a question by which we are going to prepare the ground for the emergence of an answer. That answer will be accepted as valid if it brings about a new vision of reality—this is its cognitive component—and, as the existential component, an experience of reconciliation in the ways we interact with the world. Perhaps, another detour to the Asian spiritual traditions, more precisely the Zen tradition of Japan, might help us better understand the role of a question, issued from an idea accepted *a priori*, in bringing about a new reconciliatory view of reality.

The purpose of Zen meditation, especially in the Rinzai school, is to generate an experience of Satori or awakening through the resolution of a kôan. A kôan is like a riddle such as "Two hands clap and there is a sound. What is the sound of one hand clapping?" Victor Sogen Hori described the experience of Satori as follows:

> At the extremity of his great doubt, there will come an interesting moment. This moment is hard to describe but on reflection afterward we might say that there comes a point when the monk realizes that he himself and the way he is reacting to his inability to penetrate the kôan are themselves the activity of the kôan working within him. The kôan no longer appears as an inert object in the spotlight of consciousness but has become part of the searching movement of the illuminating spotlight itself. His seeking to penetrate the kôan, he realizes, is itself the action of the kôan that has invaded his consciousness. It has become part of the very consciousness that seeks to penetrate itself. He himself is the kôan. Realization of this is the response to the kôan.*

Thus, the idea which has been *a priori* accepted, that is, the fact that there is no essential distinction between an observer and the observed world, has crystalized itself into a specific question, which is here the kôan, to serve as a kind of pike that shatters the deficient dualistic vision of reality. This transformation is made possible not when an idea has been rearranged to fit with other ideas, in a way similar to what we do when we try to assemble the pieces of a puzzle—this would be an example of analytical thinking—but rather when the unique piece that seems to upset the previous vision of reality has become so to speak fully transparent. What does it mean to become transparent and why is this essential to the process of subjective validation? This is the last point that remains to be explained so that we have a complete picture of what this process consists of.

The experience of transformation that allows us to see a new order in the world does not imply that the elements that constitute that world are going to be revoked or occulted. On the contrary, as a result of a reorganization of their relations, they are seen with a renewed sharpness. To use an analogy, it would be like first seeing a triangle and then, by adding an inverted triangle within the first one, we come to see that it is in fact made of four smaller triangles. However, as we focus our attention on the four triangles, we somewhat forget about the first one. In reality, this latter triangle is still seen, but in a different way.

In this regard, Michael Polanyi suggested that the seeing of the four triangles is an experience of focal awareness, while the initial triangle is now being seen subsidiarily. It is important to note that without the subsidiary awareness of the initial triangle, the focal awareness of the four triangles is not possible. To explain what appears to be a causal relationship between two different ways of experiencing the world, he gives as an analogy of the impression of depth seen in a picture by using a stereoscope. A stereoscope is a device by which two photographs of the same object taken at slightly different overlooking positions are viewed as one picture. This new picture is qualitatively different as it is seen as

* Hori, p. 30.

possessing three dimensions. In this context, we can say that the two photographs function as instruments or are *subsidiaries* to our seeing the *joint* picture.

With practice, however, it is possible to experience the impression of depth without a stereoscope. To achieve this, one will have to undergo a training similar to that of the Zen kôan meditation where the possibility of seeing a three-dimensional picture is accepted *a priori* and the idea is used to bring about a distance from the sense experience that ties us to either one of the two pictures. In other words, we do not commit ourselves to the primary two-dimensional impressions derived by the senses while looking at the photographs individually. Like a mantra we keep repeating in our mind, we may try to cultivate that sense of distance by constantly telling ourselves that these two photographs can be seen in a different way. Eventually, if we sustain our effort, the joint three dimensional picture reveals itself and the cognitive experience of discovery is accompanied by an experience of emotional soothing.

Now that we have a model providing a general explanation of the mechanism of subjective validation, I would like to apply it to Bošković's continuous chain of deduction. This will enable us to see the cognitive structure of his theory of forces as a whole as well as the specific steps of its emergence. This will be accomplished by looking again at this chain, this time, not as a whole, but at its particulars.

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Since the formulation of the law of gravity by Newton, action at a distance was more or less accepted as a possibility to explain the cause of the interaction between objects. However, it still met with strong resistance especially by those who advocated that the cause of all movements had to be reduced to a physical contact. Which type of cause is real, which one is an illusion? Does nature offer two types of cause, one for the cosmological objects and one for the sub-lunar world? These were the questions that were generated by accepting the validity of Newton's discovery and which greatly preoccupied Bošković. In short, his solution will be to say that objects never touch each other and that their movements are regulated by one single force that can be attractive or repulsive depending on the distance between them. Let's see how he arrived at his solution.

According to Ivica Martinović, the deductive chain, or the line of reasoning that led Bošković to his original concept of forces acting between particles of matter, consists of four distinct elements: (1) analogy and simplicity in nature; (2) a critical approach to the results of experiments and to the capacities of the senses; (3) the distinction between mathematical and physical contact; and (4) the principle of continuity in nature.*

Superposing the model of subjective validation suggested above, we could say that the acceptance of the principle of simplicity as an *a priori* challenges the idea that there are two ways of creating movement in nature. Since that idea is the result of sense experiences, the acceptance of the notion of simplicity forces us to take a distance toward what is given from our observation of certain phenomena. This experience of detachment translates itself in the

* Martinović, p. 67.

present context into an explicit cognition, namely, that mathematical contact as a negation of distance between objects has to be a prejudice. This implies that even if we have an impression of contact between objects, they never touch each other or there is always a distance between them. As such, this explicit cognition is a negative statement, as it denies the possibility of having two types of contact, and it is at the same time a question in the sense that it forces us to imagine one single principle by which the fact of always having a distance between objects will be expressed. For Bošković, that principle was that of continuity, a principle that was already formulated by Leibniz, but is now the result of an experience of resolution brought about by an intensive investigation or *reflexio*. In other words, the notion of contact, as an expression of the idea of discontinuity, having been refuted, has now given room to that of continuity. Although it is for us impossible to verify, that realization must have been validated by an experience of cognitive and affective transformation as there is no obvious connection between absence of contact and continuity or, to use Polanyi's expression, a logical gap had to be crossed to bring about that realization.

It is to be noted that the principle of continuity is now a reality available to be tested, to be used as a new cognitive tool for probing the phenomenal world. As a matter of fact, Bošković is going to use it as the starting point of another cycle of investigation that will finally lead him to formulate his famous law of forces. Indeed, the principle of continuity is going to cause its own experience of detachment that will force the realization of a new prejudice, namely, the idea that sudden change of movement due to collision between objects is a mental construction. If we negate the existence of sudden change, then we have to ask, what exactly accounts for the changes of trajectories? The answer that came to Bošković was that there must be, in addition to Newton's notion of attractive force, a repulsive force acting between objects. It is the principle of simplicity again that forces Bošković to assume that we are not talking about two forces, but a single one. And it is the principle of continuity that brings him to accept that the changes in the distances between objects take place in a continuous manner, that is, without jumps.

Thus, similar to a blind man's cane that becomes an extension of his arm, the principle of simplicity was first used as a cognitive instrument *through* which the principle of continuity has been realized. To use Polanyi's model, the principle of simplicity is now seen *subsidiarily* while the principle of continuity is the *focus* image. Then, it is the principle of continuity that has been transformed into an instrument by which the notion of single force acting in the universe has been realized. This means that, Bošković's deductive chain is a kind of succession of cycles, where one moves from grasping an idea as an object of the mind to having it transformed into the content of a subsidiary awareness through which it will be possible to see or discover a new idea. The latter can in turn be seized to start a new cycle leading to another realization. As previously discussed in relation to the experience of validation of one's instruments of observation, each cycle of realization validates the finding of the previous ones. It is like constructing a building where each additional floor confirms the solidity of its foundations. By this process of validation, each floor in the structure, except the first and the last, has a double nature: it is a product of the preceding one as well as an instrument of the subsequent one. This process of successive validation is, I believe, that

which accounted for Bošković's confidence in his theory of the continuous curve of forces. Whether his theory has some validity for the progression of modern physics, this will be ascertained only by using external means of validation. However, one may wonder whether the process of subjective validation can occur if it were not corresponding to something real in the external world as both types of reality have to reconcile themselves in one way or the other.

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Towards an Understanding of Global Crises

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Abstract

This paper offers some elements for the construction of a theory of global crises. It distinguishes between man-made crises and human-induced crises. The conceptual framework developed draws upon the ideas set forth by Douglass North in his explanations of the historical process of economic change and by Ronald Heiner in his critique of the conventional rationality assumption. As case studies for the framework developed here, the paper discusses three of the most conspicuous global crises: the environmental, the demographic and the financial crises. In the case of the environment a brief discussion on current hydric and energy crises in Brazil is also offered.

1. Introduction

The world is traversing a dangerous and unprecedented period where several processes find themselves at critical stages. These emerging crises are of a global nature and their coincidence in time makes them even more threatening than they would be in isolation. I will single out three of these crises that are at a well advanced stage and whose presence, despite the fact that little action is being taken in their regard, is generally well recognized. These are the environmental, the demographic and the financial crises. I will not enter into a description of them at this point. I will just observe, in the case of the financial crisis that, although some may argue that this crisis has been surmounted, there are numerous signs that it is yet unfolding. At any rate, it is clear that the fundamental causes of the global financial disorder have not yet been addressed.

There are other potential crises looming in the future, for example the shortage of resources that is essential for the survival of human civilization (such as foodstuffs and fresh water) or the increasing disparities in social and economic conditions prevailing within and among countries. This paper does not pretend to compile a catalog of crises but rather intends to offer some contribution towards an understanding of the underlying causes of this complex of crises and some initial reflections on how we can deal with them.

This paper takes the view that the several crises currently affecting the world today, including the environmental, the demographic, and the financial crises, demand a unified explanation. They are not just interconnected in more or less subtle ways but especially share common underlying causes. First of all, these crises are man-made, the consequence of human and social action. We will also argue, in what follows, that the reason why these crises have not been mitigated and may yet fail to be averted lies in the inadequate response

of the global world system and, in particular, the failure to build suitable institutions to deal with them.

"Climate change is a consequence of human actions."

The paper consists of an introduction and four other sections. Section 2 dwells briefly on the nature of crises, distinguishing between man-made and nature-induced crises. It establishes that the global crises we are interested in are all man-made crises. Section 3 presents the seminal contributions of Heiner (1983) and North (2005) that constitute the basis upon which our theoretical framework is built. The basic idea is that uncertainty, as originally defined by Knight (1921), underlies the behavior of individuals as well as societies. Section 4 builds upon these ideas in order to offer some elements towards an understanding of global crises. This section also applies this framework to the environmental, demographic and financial crises. Finally, the last section offers some final comments.

"Uncertainty is not an unusual condition; it has been the underlying condition responsible for the evolving structure of human organization throughout history and pre-history."
– Douglass North

2. On the Nature of Crises

Crises can appear as the consequence of natural phenomena or they can be provoked by human action. Let us assume, for instance, that a prolonged and acute solar storm takes place. Such a phenomenon would severely impair air travel and the operation of communications and computer systems, creating huge disruptions to modern life and leading to a global crisis of large proportions. Clearly, the magnitude of the crisis would be related to the reliance of our modern way of life on electricity, communications and data processing. It is also clear, however, that the crisis would be caused entirely by natural processes. In other words, this would be a *nature-induced crisis* rather than a *man-made crisis*.

An important observation for our discussion here onwards is that all of the above-mentioned crises (environmental, financial and demographic) are primarily a consequence of human behavior. In other words, we are dealing with man-made crises rather than nature-induced crises. This understanding implies, of course, as per our agreement with the broadly accepted conclusion of the scientific community, as expressed in an increasingly forceful way by successive reports from the Intergovernmental Panel on Climate Change (IPCC), that climate change is a consequence of human actions.

A logical consequence of this observation is that changes in human and social behavior might, if adopted at an early stage and in a properly coordinated way, have an effect on these processes in such a way that crises are deferred either temporarily or indefinitely.

3. The Theoretical Framework

The conceptual framework adopted in this paper borrows from North's (2005) analysis of the historical process of economic change and from Heiner's (1983) critique of the conventional rationality assumption of economic theory. Uncertainty, a concept whose relevance to economic theory was first discussed thoroughly by Knight (1921), is central to this framework. In his seminal paper, Heiner pointed out that, contrary to established theory, which thrives in the absence of uncertainty, the behavior of economic agents is best explained by their response to the uncertainty that is ever present in any human endeavor. His contribution was largely ignored in subsequent years but was rediscovered by North. According to him, "the deep underlying force driving the human endeavor is (man's) ubiquitous efforts to render their environment intelligible—to reduce the uncertainties of that environment" (North, 2005, p. 4). He emphasizes as well the pervasiveness of uncertainty and the historical role the response to uncertainty has played in building social institutions. In his words "… uncertainty is not an unusual condition; it has been the underlying condition responsible for the evolving structure of human organization throughout history and pre-history" (North, 2005, p. 14). North also refines the concept of uncertainty as originally introduced by Knight and distinguishes between five types of uncertainty: that which can be reduced by increasing information given the existing state of knowledge; that which can be reduced by increasing the stock of knowledge; whose reduction requires altering the institutional framework; uncertainty arising from novel situations which requires restructuring beliefs, and; residual uncertainty that may lead to "non-rational" beliefs (e.g. magic, religion) (North, 2005, p. 17).

It must be observed that the mention of "novel situations" makes clear that uncertainty is not static and that, even as humans continuously tackle it by adding to their stock of knowledge, it does not necessarily recede. This has to do with the "ergodic" nature of our world whereby we cannot expect the future to keep repeating past patterns (North, 2005, ch.2). The preceding classification of uncertainty according to the five types hints at the dynamical process of change that North depicts in his opus. The drive to reduce uncertainty in the environment leads man to proceed to change the environment, which in turn will lead to new challenges of perception and transformation and feed a new cycle of change. Throughout this process of transformation of the surrounding environment, humans will create differentiated systems of beliefs and sets of institutions and the stock of knowledge will evolve. The institutional setup provides a set of guides and constraints not only to steer the behavior of societies but, most importantly for the long-term perspective, for determining how prevailing belief systems will be used in order to transform the surrounding environment.

In his enquiry, North distinguishes between the physical environment and human environment. In his drive to make the environment less uncertain man's action will transform both the physical and human environment. North is much more focused on the human environment, the evolving institutional makeup and system of beliefs underlying it. He argues at length (North, 2005, ch.7) that societies have largely tamed the physical environment; in his view, this "conquest" of the physical environment provides the context for the evolving

human environment and the challenges that economic and social change will face from now on. In the face of the very real environmental crisis the world faces this is, to say the least, a startling conclusion. While the framework developed by North is most useful for our analysis, we will disagree with his claim that apparently disregards the fact that transformations in our physical environment may affect it in unintended and undesirable ways.

4. Elements for an Understanding of Global Crises

Although North does not develop a theory of crises, it is clear that his framework provides us with a very convenient foundation for such an endeavor. A crisis appears whenever there is a serious rupture in the cycle that goes from a reaction to an uncertain environment to the establishment of institutions and belief systems and back again whenever novel facts arise or whenever the transformed (human and physical) environment is not properly interpreted by existing institutions or belief systems. Such a rupture could be due either to a failure of perception or understanding of the surrounding environment or a failure to adequately transform the institutional setup in order to comply with a new belief system. In the former situation we will say that a *knowledge failure* has taken place, while in the latter case, we will consider that an institutional or *governance failure* has occurred.

It needs to be stressed that crises do not take place at a precise moment of time but instead develop over time. They announce themselves subtly at first, being usually ignored at the early stage. As the crisis looms more threateningly, action may or may not be taken to counter it. Unless the causes for the crisis disappear by themselves (rather unusual), a crisis will always bring transformation of the environment, which will be either manageable or catastrophic depending on whether it was timely and properly addressed or not. Throughout the history of the world, societies have faced numerous crises and they have brought about change in either of these two ways.

The complex of crises the world currently faces is composed of crises relating both to the human and physical environments. The financial crisis, the demographic crisis and the global inequality crisis are all related to the human environment, while the environmental crisis and the resource crisis are clearly related to our physical environment. What they have in common is that they are all the result of human actions which, in some cases (though not always), have produced unintended results.

The current complex of crises is singular in that the crises composing it are essentially global in scope. Addressing them adequately would require a sort of global coordination and cooperation which has not been witnessed so far. It is certainly the case that these crises are rather well understood and that, from a scientific or technical viewpoint, there are numerous proposals for handling them. In that sense, we cannot say that the crises are being fueled by a knowledge failure. It is rather a case of institutional failure, which could be more properly termed a failure of *global governance*. As pointed out by Marien (2011), global governance is a popular term; it must be noted, however, that the authority of the global institutions that have progressively appeared since the late 19th century is still quite constrained by national sovereignty.

In the following three subsections we will engage in a brief discussion of three well-known crises. It must be kept in mind that the purpose of this discussion is not a thorough presentation of these processes but rather placing them in the context of the previous theoretical framework.

4.1. The Environmental Crisis

Global warming, the decrease in biodiversity, the acidification of oceans, ozone depletion in the stratosphere, and deforestation are some of the most notorious manifestations of the environmental crisis. Other measurable and threatening indications of this crisis, themselves consequences of the aforementioned more fundamental signs, are the melting of polar caps and glaciers, the rise of oceans, the deterioration of water quality worldwide, and the increasing severity of weather events. Despite all the technological advances achieved by mankind, our welfare and the very existence of our species are still dependent on a stable physical environment in the planet we currently inhabit. It is a well-recognized fact that the continuation of present environmental trends together with the exacerbation of its manifestations will have very serious consequences not only for the welfare of populations everywhere but also for political stability and international peace. Yet there is increasingly undeniable evidence that persistent human action is behind the environmental crisis and that disregard for the consequence of these actions is leading to its intensification. Quoting from the most recent report from the Intergovernmental Panel for Climate Change (IPCC, 2013, p. 17), "Human influence has been detected in warming of the atmosphere and the ocean, in changes in the global water cycle, in reductions in snow and ice, in global mean sea level rise, and in changes in some climate extremes… It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century."

Of course, humans have exerted influence on the physical environment since early times but, as in the case of other species, this has taken place in the course of normal interaction within local ecosystems. As it is by now widely accepted, the situation started to change from the beginning of the Industrial Revolution. The same scientific and technological advances that, in the words of North, enabled mankind to tame or conquer his physical environment were instrumental in transforming this environment in ways that would prove catastrophic. These advances had two other consequences that in turn also contributed to influence the physical environment. First, human populations escaped from the ecological cycles that governed all other species and started to grow unchecked, limited only by their human environment. And second, the rise in welfare made possible by increases in productivity led to a mounting demand for energy and other natural resources.

Despite the growing recognition of the negative impact of human action on the environment and the ever more confident scientific evaluation of the situation, the response of the international community, through its decision-making bodies, has been woefully inadequate. It is true that, starting from the Earth Summit convened in Rio de Janeiro in 1992 under the auspices of the United Nations, governments had begun to discuss environmental issues within the newly created United Nations Framework Convention for Climate Change (UNFCCC). Successive Conventions of the Parties (COP) have reached

limited agreements, most notably the Kyoto Protocol in 1997 and, more recently, the Paris Agreement in 2015. Although these are steps in the right direction, progress is slow and not sufficient to fundamentally relieve the worsening environmental outlook. This failure of global governance has a variety of explanations. In the first place, there is the ever-present resistance that national governments offer to the cession of sovereignty to international bodies. Secondly, well-established economic interests in the energy and agro-industry sectors, among others, have so far successfully resisted calls for a rethinking of their practices. This is due, in no small measure, to the intimate relations between business and political circles in most countries. Thirdly, the strikingly different perspectives on these issues held by developed and developing countries make international negotiations extremely complex and a meaningful agreement remote.

Even if we look at the environmental crisis at the national level where, in principle, governments are expected to have the capacity to formulate policies adequately, we notice failures of governance. Brazil is an interesting example of this situation. Powerful and well-connected industrial and agro-industry sectors have successfully prevented the country from dealing with the combined issues of air pollution, water pollution, deforestation (of the Amazon), progressive extinction of plant and animal species, and deterioration of soil quality among others. The atypical weather events affecting the country in recent years, with a combination of drought in some areas and flooding in others, have highlighted the delicate links between ecosystems in the Amazon region and the prosperous regions in the South and Southeast regions of the country. As a result of these weather events, as well as of inadequate preparation for this sort of contingencies, the country is facing critical shortages of water in some of its largest metropolis as well as a dangerously weakened energy system.

4.2. The Demographic Crisis

As it is well explained by Angus Maddison in his fascinating contribution to world economic history (Maddison, 2001), rapid population growth is a phenomenon of the past two centuries. Writing at the turn of the millennium, Maddison notes that the world population increased by about a sixth in the first millennium of the present era, by a factor of four in the period from 1000 to 1820, and by a factor of 5.6 in the period from 1820 to 1998. Average per capita income barely changed during the first millennium, going up by some 50% in the 1000-1820 period, and accelerating vigorously in the period from 1820 to 1998, increasing by a factor of 8.5 (Maddison, 2001, p. 27). Indeed, the demographic evolution of the human species in early times was not substantially different from that of other species. The development of agriculture, the onset of urbanization, and scientific and medical advances that made possible rises in income, decreases in mortality rates and the lengthening of the average lifespan, all contributed to a continued population expansion and to the extensive occupation of earth. Of course, as pointed out by Maddison himself and also by more recent studies from the United Nations' Population Division (United Nations, 2013), population growth has never been homogenous. Very densely populated areas, especially in Asia, coexist together with relatively sparsely populated areas, especially in the Americas and Oceania. Although unrestrained from ecological cycles, population growth is certainly not exponential and it has shown to be highly sensitive to economic conditions. The *demographic transition*, the

causal chain initiated by an improvement in hygienic standards followed by a decrease in infant mortality and sometime later by a fall in female fertility, is well documented and is progressively leading to a marked deceleration in population growth in all areas of the world, as pointed out, for instance, by Bloom et al (2001).

As it can be inferred from the preceding paragraph, the demographic crisis is not simply about uncontrolled world population growth but instead refers to a set of issues related to population, its geographical distribution, its age distribution, and its socio-economic conditions. From a developed world perspective, the dominant aspect of the demographic crisis is the aging of the population, an ongoing process that is the consequence of the lengthening of life expectancy and the steep fall in female fertility ratios. Population aging will cause serious economic, welfare, and even ethical problems and poses formidable challenges to policy makers in all developed countries. Middle-income countries are not far from entering into this demographic phase. On the other hand, for developing countries, especially in Africa and South Asia, the demographic crisis is dominated by a still booming population that seems destined, in the absence of human capital, to be doomed to poverty.

The linkage between these two facets of the demographic crisis, forcefully contributing to its global character, is given by international migration. Migration has been, throughout human history, a powerful driver of change but it has also entailed huge social dislocations, war and destruction. The conquest of the Americas by Europeans is a good example of the lasting havoc than can be brought by invading populations on well-established civilizations and peoples. In our times, once again, migrations display this ambiguity about their potential effects. In recent months the world has followed with anxiety the journeys of countless Africans struggling to make their way into the shores of Southern Europe. If we take into account the projections of African population growth during this century, and as further developed in Saavedra-Rivano (2014), what is observed now is a diminutive hint of a possible future where hundreds of thousands will desperately attempt to migrate from Africa to Europe and other areas of the world. Such a catastrophic situation can be avoided provided that the demographic crisis is grasped in its global character. This is of course another example of a man-made crisis that is, thanks to studies from the United Nations and others, rather well understood. What is still missing is a translation of this understanding into an establishment of proper global institutions with the means to tackle it.

4.3. The Financial Crisis

Of all the three crises discussed here this is perhaps the most widely known, given that it recently affected in a very visible manner the well-being of large segments of the population worldwide. It is also the least understood as most people believe that the financial crisis belongs to the past. As we shall see in what follows, this is not the case. Several excellent accounts of this crisis, such as Reinhart and Rogoff (2009) and Wolf (2014), are available and there is thus no point in entering into a detailed description. Suffice it to say that the recent economic crisis was triggered by a collapse in the housing prices in the United States in 2007. It soon spread to global investment houses and banks causing, in particular, the disappearance of Lehman Brothers in September 2008. By then the crisis had ceased to

be a purely financial event and it affected production and international trade. By 2010 the geographical center of the crisis had moved to the Eurozone, affecting most deeply Spain, Portugal, Greece and Italy. It is unquestionable that up till now the world economy has not fully recovered and that the evidence of its continuity is provided by a succession of disturbances moving from one region to another and from one economic sector to another. As a matter of fact, it can be argued that the underlying causes that led to the financial crisis in 2007 are still present. These causes are related to the huge power that the financial sector has accumulated within countries and internationally and to the absence of meaningful regulation of their activities, especially on the global economic stage, which would inhibit the irrational and unsecured expansion of their assets and liabilities. The interrelations between the financial and the political world, the sizable contribution to political parties in otherwise respectable democracies, the outsized remuneration packages of top officers of financial firms, and the revolving door connecting financial firms, government administrations, and international institutions, are some of the factors that have so far made it difficult to address the fundamental flaws in the world financial system. We have once again an enduring crisis that is well understood by the work of economists going back to Minsky (1982) but that persists due to a very serious failure of global governance.

"An adequate management of the complex of crises requires a profound revision of the political system that our irreversible global society requires, in particular the progressive transfer of sovereignty from nations to institutions."

5. Final Comments

A common trait of the environmental crisis and the financial crisis is that they have been provoked by excesses in our desire to transform our (respectively physical and human) environment. This raises the rather provoking question of whether the "deep underlying force" mentioned by North (2005, p. 4) may become, if unchecked, eventually self-destructive for mankind. Just limiting ourselves to the quest for transformation of our physical environment based upon the development of scientific knowledge, we can mention several situations where society seems to be playing with fire: nuclear technology, both the development of weapons of mass destruction and nuclear energy; genetic research (biological warfare, GM foods, genetic engineering of new life forms); and even artificial intelligence, as highlighted through recent warnings by prominent scientists and entrepreneurs.*

An obvious answer to the current situation is the strengthening of the institutional setup of global governance. This involves an extensive review of the goals and authority of existing institutions, such as the United Nations Environmental Program and the World Bank, and possibly the creation of new international bodies to address the pressing issues facing mankind. It must be recognized that an adequate management of the complex of

* Research Priorities for Robust and Beneficial Artificial Intelligence: an Open Letter (http://futureoflife.org/ai-open-letter)

crises requires a profound revision of the political system that our irreversible global society requires, in particular the progressive transfer of sovereignty from nations to institutions, which will steer a global governance deserving of that name. It is of course unrealistic to imagine that such a process of political globalization will take place without the parallel development of a vigorous global society and its corresponding institutions. These would be two important elements in the construction of a *new paradigm* for the future development of our world.*

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* See also the inspiring note by Šlaus et al (2014)

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The Crisis of Labour, Widespread Precarity and Basic Income

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Abstract

A feeling of uncertainty about the future as well as the perception that the past classical securities are gone are widely spread among people. Criticism or disaffection affects the majority of the traditional political forces of the European continent. It is not possible to talk about the European crisis without referring to the crisis of the wage-based society. All political options of the past century have de facto put labour at the centre of society. The post-classical era got its start in the '80s when, for the first time since World War II, the phenomenon of mass unemployment affected Europe. The crisis of wage labour cannot be regarded as a temporary economic conjuncture of an otherwise unlimited growth, all consequences of the phase must be contemplated in order to design at once a society based on new principles. For years, after the end of the Fordist system, nothing has been done to cope with the conditions of precarious workers. The issue of a guaranteed income is, therefore, crucial and inescapable in order to exit this long-term European crisis. The European Union should take a stand on the protection of human dignity and on the "right to exist". Could basic income at the continental level be the basis for a social Europe? We are looking forward to it.

It is not possible to talk about the European crisis without referring to the crisis of the wage-based society. All political options of the past century, liberalism or laissez-faire, progressivism, socialism, communism or the social democratic systems, and even the most radical ones, have de facto placed labour at the centre of society. They all not only regarded labour as the main engine of growth and economic well-being, but also as the driving force for the emancipation of the masses and the individuals. Even in the so-called "real socialist" economies, wage labour was one of the pillars on which the material constitution of society was based. All individual and collective rights pivoted on workers—by virtue of their own concrete social position—in order to protect and enhance their specific role as producers.

Just a few decades ago, the expectation of access to social life by finding an appropriate and stable job with planned career progression, and with consistency between training and employment was legitimate. Labour was exactly at the centre of the social system; it was a link between the public and private sectors: in reference to the public sphere, labour represented the contribution each subject offered to collective well-being, although remaining, on private

level, a means for merely individual self-realization. The centrality of wage labour was then sealed by public policies aimed at achieving the full employment goal. Besides, this model was guaranteed by a social security system delivering a range of social welfare schemes including provision for unemployment, illness, old age. The centrality of wage labour and the totality of social protections related to it formed a compact body of rules that can be rightly regarded as 'classical'. It was a real model, and more precisely it was what is commonly known as the European social model.

1. The First Mass Unemployment & the Crisis of the Wage-based Society

The post-classical era got its start in the '80s when, for the first time since World War II, the phenomenon of mass unemployment affected Europe. The oil shock and the start of a large-scale industrial reconversion brought out the problem of a massive and structural excess supply of labour; contemporaries were greatly impressed, and many did not hesitate to grasp the implications involved in it.

During the post-war years Europe had a constantly very low long-run rate of unemployment. In 1960, in the countries of the European Economic Community, the unemployment rate was approximately 2.5%, with regional differences ranging from less than 1% in Western Germany to 1.5% in France, and slightly more than 5% in Italy.* In 1970, the average unemployment rate was still 2.5%, while since 1975 there has been a dramatic increase in the unemployment rate which initially jumped up to 4.1%, and then slowly rose to 5.8% in 1980, to 6.9% in 1981, and to 8.1% in 1982 until it reached its peak of 9.3% in 1987. In the following years there was a partial recovery in employment, although the extraordinary economic growth performance of the '50s and '60s never occurred again. After the partial recovery of the early years of the 21st century, the decade ended with the most serious economic and employment crisis since the '30s, and therefore in the Euro area the unemployment rate reached the unprecedented threshold of 10.9% (after reaching its peak of 11.8%).

It's interesting to see how scholars reacted to the first emergence of the phenomenon of unemployment in the '80s, which was surely less serious than today. As opposed to the reaction these days, they didn't underestimate the problem, nor did they trust a miraculous recovery that would have allowed the economies to return to their pre-crisis levels as if by magic. On the contrary, it was clear to them that unemployment was a symptom of broken classical balances that could not be established again. Therefore, they tended to lay down the foundations for a new social contract.

Ralf Dahrendorf, for instance, talked of a new form of unemployment which differed from the large "classical" unemployment of the '30s that produced *excess* unemployment. Keynesian medicine could not work this time: this was not a situation of scarcity to cure through public investment, wages increase, and boosting aggregate demand. During the '80s, unemployment occurred in a situation of abundance, thus the risk was evident to a liberal

* These data and the following ones are derived from AMECO, the macro-economic database of the European Commission's Directorate General for Economic and Financial Affairs.

thinker like Dahrendorf that society would crystallize into three reciprocally separate and opposing groups: 10% of the population in top positions, 80% of the working class, and 10% of the unemployed underclass. The point was then how to deal with this marginalised group, and how to overcome the impasse that was threatening democracy. The analysis evolves into utopia, and the scholar is thus required to design the future by letting go of the past: "the work society is running out of work. What is happening today in the world is not just a hiccup in the history of the work-based society. Everyone clings desperately to the values of yesterday, while it becomes increasingly clear that they do not correspond to the reality of tomorrow".[1]

Therefore, the liberal sociologist warned us not to continue along already tested paths. The crisis of wage labour cannot be regarded as a temporary economic conjuncture of an otherwise unlimited growth, and on the contrary all consequences of the phase must be contemplated in order to design at once a society based on new principles.

In the same years, Oskar Negt echoed Dahrendorf's thoughts. The scandal of such a society that "risks to be suffocated by wealth and excess production, and at the same time it is not able to provide millions and millions of people for a minimum income that would allow them to live a dignified life".[2] These pages also invite a change in paradigm, and to reject the attitude of the so-called realists "who continue to conduct experiments by extending the present into the future or by funeral rites that push the past away" is not bearable.[3] To face the increasing decrease in jobs available that will lead to the disappearance of many of the current occupations, Negt believes it is necessary to have a deep change in perspective. The way to measure daily time needs to be changed: for centuries the organization of daily life has depended on the working day, while in the future it will be the opposite, that is, daily life will establish and decide how long the working day will last and how it will be articulated.

When Jürgen Habermas joined this debate, he included the phenomenon of unemployment within the wider frame of modern history: "the utopian idea of a society based on social labour has lost its persuasive power—and not simply because the forces of production have lost their innocence or because the abolition of private ownership of the means of production clearly has not led in and of itself to workers' self-management. Rather, it is above all because that utopia has lost its point of reference in reality".[4]

The refusal to accept any "minimalist" interpretation of mass unemployment that occurred during the '80s was advocated also in France, especially by the so-called *Regulation School* that insisted on the advent of a new era of wage-based society. Besides, it cannot be ignored that the lucid utopian idea of André Gorz who started from the dissolution of capitalist relations came to envision the advent of a "non-class of non-workers"; Gorz's radical critique of the ideology of work and of the ethics of production brought him to regard the rise of unemployment as an epochal crisis: "this crisis is, in fact, more fundamental than any economic or social crises. The utopia which has informed industrial societies for the last two hundred years is collapsing".[5]

Thus, in the '80s, the idea of important and maybe crucial forthcoming changes on the basis of the work-based society was sort of a common opinion among many experts, or at least among those who criticized the system of market economy. The very same utopian

inspiration was later expressed by Jeremy Rifkin in one of his bestselling books where he predicted the end of work: "after centuries of defining human worth in strictly "productive" terms, the wholesale replacement of human labor with machine labor leaves the mass worker without self-definition or societal function".[6]

2. The Advent of the Precariat

The opinions so far outlined can be divided into two main fronts: on the one hand, those who proposed a wide redistribution of available jobs by reducing the working hours, and on the other hand those who reclaimed an unconditional basic income in order to minimize the problem of unemployment, and at the same time to allow individuals to activate themselves beyond the formal productive sphere.

As we all know, public policies carried out so far have ignored both expectations. As for the hypothesis of reducing working hours, the response has been a complete fragmentation of the production system which has been replaced, from the '80s, by flexible production characterised by precarious and temporary jobs, and by a high incidence of self-employment.* Therefore, the transformation in the economic context and the fragmentation of work makes the reduction of the working hours by law a hypothesis scarcely feasible because of the collapse of the structural conditions that wouldn't allow planning of such challenging economic intervention. European governments have instead moved significant steps in the direction of an unconditional income even though they achieved incomplete and unequal outcomes in the various European countries. Besides generous systems (such as in Scandinavia and in some northern European countries) that are able to support individuals during their job transition without humiliating their dignity and autonomy, there are more restrictive benefit schemes as regards the access conditions (as in UK or in France), or even countries in which there aren't any universal and basic social protection benefits fixed by law (as in Italy).†

On the other hand, even those European countries known for their robust social protection systems have experienced in the last few years significant changes in their policies as they are shifting from welfare policy to workfare-based policy characterized by increasingly pressing obligations to accept any job offered in exchange for increasingly less generous unemployment benefits. This mechanism has represented, in hindsight, the attempt to artificially revive the idea of full employment. Anyway, the deregulation of labour market (even where it was combined with the introduction of new social protection programmes) certainly has not rectified the serious social crisis caused by the transformation of the work-based society. All those advocating for a deep reconsideration of the political foundations of European society as early as the '80s have not yet received an adequate answer, such as the right to a basic income at the continental level. On the contrary, the negative economic phase over the first 15 years of the new millennium has given rise to the issue of unemployment in terms even more dramatic, because besides the "unemployed" we now have "precarious

* Obviously, the advent of precarity also reflected in the theoretical and sociological debate, so much so that there has been a transition from authors who focused on the "lack of employment" to ones who now study "the transformation of work". To name a few, Ulrich Beck, Zygmunt Bauman, Manuel Castells, Richard Sennett.

† For a deeper analysis on social protection systems in Europe, see the publication by BIN Italia, *Reddito minimo Garantito. Un progetto necessario e possibile*, Edizioni GruppoAbele, 2012.

workers" and "working poor" who although formally integrated into the production system are still exposed to the risk of poverty and social exclusion.

3. The Precariat of First and Second Generations

For years, after the end of the Fordist system, nothing has been done to cope with the conditions of precarious workers, and that was not without consequences; the continuing inertia of politics in finding forms of regulation and social protection adequate to the advent of "flexible production" led to a new kind of precarious workers, that is those of the crisis of first and then "second generation".*

The transition from the first to the second generation of the precariat is marked as much by objective changes in the sphere of production as by surplus on the subjective level. The "first generation" of precarious workers—workers in the post-Fordist economy—were mainly employed in the service sector and in immaterial labour. They represented the end of the centrality of Fordist factory and of the employee status, and to some extent they strove for a flexibility that was able to offer them new job opportunities. Because of the social and historical proximity with Fordist workers, the first generation of precarious workers proved to be able to express political subjectivity linked to the old typical guarantees of the labour law. They did not seem alien to the grammar of rights and welfare protections which for decades were the basis of the political discourse carried out by the traditional workers' movement. The precarious workers of the first generation strove for a balance between innovation on a personal level and guarantees on the level of collective protections. The prefix post, which characterized them (post-Fordist, post-industrial, postmodern, etc.), clarifies their "amphibious" nature.

However, over time, precarity proceeded to such a generalization to cross also the social and cultural levels, thus winning (or better say dominating) the whole workforce. From the early years of the new millennium, about 20 years after its appearance, one can talk of precarity of second generation for whom it seems there is no other room than this condition that became structural and pervasive of the entire existence. For the precariat, rather than for post-Fordist precarious workers, there isn't any reference to the previous labour guarantee systems. Fordism and its rights are already definitely overcome, even in the memory, and they no longer represent a reference to the present struggles. Politically speaking, this subject of second generation no longer looks at past guarantees, and does not carry memories of labor law either.

If precarious workers of first generation could still have access to new production sectors (such as information technology, communication, services), the precariat of second generation faces the problem of the economic crisis which is no longer linked to society and its actual needs, therefore it doesn't know what to produce and why. Such economy has no more certainty about its capital accumulation process. Neoliberal and deregulation policies applied from the '70s to today (in labour relations, too) have determined an increasing social

* The first time we referred to the notion of the precariat of second generation was in S. Gobetti, L. Santini, "La necessità dell'alternativa. Il precario della crisi e il reddito garantito", pp. 46-57, in the publication by Basic Income Network—Italia, *Reddito per tutti. Un'utopia concreta per l'era globale,* Manifestolibri, 2009. About this notion see also A. Tiddi, "La soglia critica del reddito di cittadinanza", pp. 223-229, *Ibidem*.

fragmentation and a progressive isolation of the producer. Also, the social cooperation network no longer represents an adequate safety net for the new subject facing the uncertainty of the market economy. The content of work seems considerably standardised; technological and computer skills, that once were the exclusive prerogative of freelance workers, now have been depersonalised, reduced to homogeneous training modules, and depreciated according to market criteria. As a result, the precariat is no longer linked with a specific production sector but is embedded into the entire society, thus representing a paradigm of the entire production. He is far from the common tools of labour policies, he is not involved in trade unions and copes hence with this sort of "privatization of social risks" alone expressing his bewilderment and his difficulty to react.

Ultimately, the precariat of the second generation is considerably poorer than his predecessor, both politically and economically. The content of work becomes standardised, wages get reduced to mere subsistence levels, the capability to claim rights seems weakened by the acceptance of the *status quo*. The current precariat finds it difficult to make stable life-plans, as he lives in an eternal present where "now is the keyword of life strategy".[7]

As regards Italy, data show a discouraged workforce composed of about 3 million people aged under 30 who totally depend on their family of origin, live in a sort of existential limbo moving from one precarious job to another and without being involved in any training or working path. They are called the neet generation (Not in education, employment or training). This generation feels a mix of distrust for not having fulfilled their expectations, and anger for an unbearable social condition of pragmatic "refusal" of a labour system which doesn't give them nearly any chance of success and personal achievement.

4. Retired Precarious Workers and Future Poor: The Italian Case

On the 3rd of October 2005, a report published by Eurostat stated that many European countries were at risk of poverty. Italy was one of those countries with the highest poverty rate, that is 42.5% of the population was at risk of poverty in the next few years. Ten years after the Eurostat report on employment, figures on poverty and the risk of social exclusion have been increasing and unfortunately, the future will likely be worse because the right choices have not been made. We can actually say that today there are multiple generations who are victims of precarity. An increasing number of people who manage to save some money during their entire life may have enough to live on, otherwise they will be part of the first generation of new poor without any protection. But the point is that it is unlikely that this generation of precarious workers (first generation is aged 50-55, for instance) who are approaching retirement age would be able to save any money as their precarious living conditions would not have allowed them to do so.

Therefore, the first generation of precarious workers is required to work permanently and to accept any kind of job (in order to survive) even in old age. Besides, at some point we should deal with a typical element of the Italian context, the so-called "family-based welfare", namely the fact that the burden of lack of social protection has been actually transferred to intra-familial redistribution of resources. Delaying the implementation of

universal basic income measures, and having left families to take care of redistribution of savings within the household demonstrate how the risk of poverty can constantly increase in our country. It is easy to predict that savings accumulated in the previous years, especially by post-war generation, will be permanently eroded and intra-familial redistribution will undergo a final crisis. On the one hand, children and grandchildren can no longer count on their family support, and on the other hand they (precarious or neet) will not be able to support their elders. Precarious workers of the first generation will have no more aid from their own family, elders won't be able to support their children and the latter (precarious workers of future generations) won't be able to support their parents.

"The issue of implementing social protection schemes in favour of the "precariat" seems increasingly inevitable."

The risk of facing a "lonely crowd" of new poor is already here, or it is imminent: retired people or elderly of today, precarious workers of first generation (aged 45–55), precarious workers of second generation (aged 25–45), neet generation (aged 14–25), one parent families, one-income families with two children, disabled people who are permanently incapable of work, inmates or former prisoners, migrants, laid off workers, IT workers who are no longer needed because of their outdated skills are fuelling an army of people without rights! The point is, how will governments cope with the generalised risk of poverty? Will they create new "enclaves" of permanently poor people? Will they handle this enclave entirely by law enforcement agencies? Will there be a permanent war among the poor? Or permanent ghettos at the edges of large cities? Or, on the contrary, will they use some foresight so they will establish new rights in order to create a new sense of citizenship?

The issue of implementing social protection schemes in favour of the "precariat" seems increasingly inevitable. The lack of an adequate economic support, such as a basic income, makes precarious workers easy to blackmail, and the fact that their lives are permanently left at the threshold of exclusion forces them to give up their future. It is not too alarming, the analysis of Guy Standing shows that there is a very real danger that part of the "new dangerous class" made up of precarious workers will be drawn to support political populism and neo-fascism if the policies and institutions do not outline a strategy to respond to their needs, aspirations and fears. What should be done is what Standing calls "a politics of paradise" that is centred on the implementation of a tangible and effective measure such as a basic income.*

5. Difficult Scenarios for the Future

It is unlikely that spontaneous mechanisms of the market and a simple economic recovery will be able to rectify such a compromised social condition. OECD, applying very

* Guy Standing, "Il precariato: da *denizen* a cittadino?" [NdT, "The Precariat: from *denizen* to citizen?"] in the Proceedings of the Conference *Bella disarmante e semplice. L'utopia concreta del reddito garantito* [TN, Beautiful, Attractive and Simple: the Pragmatic Utopia of Basic Income] organised by BIN-Italia. See also, Guy Standing, *The Precariat. The New Dangerous Class, Bloomsbury*, 2011, and A.Tiddi, *Precari, percorsi di vita tra lavoro e non lavoro*, Derive Approdi, Roma 2002.

innovative analyses, has published a report that analyses the long-term growth prospects in industrialised countries.[8] This report shows that GDP in Italy, unless unpredictable factors of radical innovation occur, will register only an annual growth rate of 1.4%, which is a far too low growth rate to reabsorb the unemployment effects caused by the economic crisis of recent years. The other industrialised economies will face a substantially stationary situation: Germany will have an average annual rate of growth of GDP of 1.2%, and OECD countries will have an average annual rate of growth of GDP of 2%.

"The issue of guaranteed income is crucial and inescapable in order to exit the long-term European crisis."

The most reliable analyses, therefore, do not put on the agenda the possibility of sustained growth that will be able to relaunch accumulation and, consequently, employment. On the other hand, the outlook for exiting from the crisis suggests as production sectors of the future those sectors which are likely to create hyper-specialised labour force and productive processes characterised by short-term contract jobs, with a widespread precarity. Among those sectors that will be playing a key role in economic success of the near future we may include scientific research, applied medical science (mainly medical diagnostic equipments, and invention of new drugs), circulation of information, and logistics technology. Is it right to expect real and massive job creation through investments in these production sectors? On the other hand, a range of personalised services linked to care, nutrition, health, socializing (such as massage therapies, organic agriculture, organization of local events, etc.) is developing a sort of semi-informal economy. However, is it possible to think that this semi-informal economy can create stable employment and ensure adequate income security?

There is no doubt, then, that the future will be characterised by existential precarity. Any plan for job creation should be able to deal with these unavoidable structural problems.

6. Political Perspectives

The issue of guaranteed income is crucial and inescapable in order to exit the long-term European crisis. On this matter, public opinion throughout the continent seems indeed to be much less static than it appears be to. A series of initiatives on guaranteed income have been carried out lately. Here is a sketchy reminder of what has been done: in Spain, a law was filed on people's initiative at the beginning of 2015, and as a result a signature collection campaign for the introduction of "individual, universal, and unconditional" basic income was launched. In Switzerland, nearly 200,000 signatures were collected in favour of holding a referendum on the introduction of basic income based on a proposal involving Switzerland in granting a guaranteed monthly allowance of 2,500 Swiss francs to every adult citizen.

At the continent level, it is worth mentioning the European Citizens' Initiative (ECI) on unconditional basic income. The European citizens' initiative is a tool that allows presenting a petition, which has to be backed by at least one million EU citizens, by the European

Commission and the Parliament. Unfortunately, the campaign failed although the remarkable result of collecting 285,042 signatures of European citizens in 28 countries was achieved.

> *"Policies of individual nation states seem still dramatically weak and unable to implement bold decisions."*

Besides, there are some interesting proposals emerging in some European countries that aim to relaunch a guaranteed minimum income with less stringent forms of conditionality, such as for instance, the motion proposed at the Regional Council of the French region of Aquitaine,* the proposals on an unconditional minimum income existing in several municipalities in the Netherlands,† or the proposals from Finland‡ demonstrating a much wider debate on the issue of guaranteed income.§

In Italy, a citizens' initiative bill¶ was delivered to the Parliament on 15th April 2013. It was backed up by over 60,000 citizens and more than 170 bodies among which there were associations, committees, and political parties. The Bill was inspired by the best practices for social welfare benefits of various European countries, and it took into account the European Parliament resolution of 20th October 2010 on "the role of minimum income in combating poverty and promoting an inclusive society in Europe".

A second signature campaign called "100 days for a dignity income"** was launched in Italy in spring 2015 where over 80,000 signatures were collected. The document launching the campaign highlighted worsening social and economic conditions for large sections of Italian society because of the crisis, and urged the Parliament to introduce a measure of guaranteed income. This campaign gave promoters a specific time to take action, i.e. 100 days, and equally required institutions to debate and introduce a law on minimum guaranteed income within the same time frame. This second campaign collected even more signatures than the previous one. Hundreds of associations, local authorities, mayors, city councils from all over the country, trade unions and students took part in the campaign. The initiative, led by the 20-year-old anti-mafia organisation, Libera, received support from a wide range of civil society groups: Catholics, students, social justice movements, anti-poverty networks, political parties, and local authorities. This wide participation revealed that the issue of minimum guaranteed income is increasingly viewed as an urgent measure by thousands of people. The Ten-Point campaign platform clearly expressed some basic concepts for

* The Aquitaine Regional Council adopted a motion to conduct pilots to test the implementation of an "unconditional RSA". The Revenu de Solidarité Active (Active Solidarity Income), or RSA, is the means-tested national minimum income. The unconditional RSA would entail scrapping the work requirement, and would make the grant less discriminatory and less bureaucratic (www.bin-italia.org).

† In the Netherlands, local pilot projects to investigate the introduction of an unconditional basic income are increasingly spreading. Currently there are 30 Dutch municipalities interested in running basic income pilot projects. Among them, the city of Utrecht, which is the fourth largest city in the Netherlands, has recently attracted great attention—even at the international level—when it announced its intention to launch a pilot project by the end of the year in order to grant an unconditional basic income to its inhabitants (www.bin-italia.org).

‡ Before the general election held in 2015 there was a vivid debate among all Finnish political parties in order to define a proposal for nation-wide unconditional basic income. This proposal is now in the government programme (www.bin-italia.org).

§ On this topic, see the rich debate proposed by the worldwide network for basic income (BIEN) and the European Network (UBIE).

¶ For further information, browse the website www.redditogarantito.it or www.bin-italia.org

** For further information, browse the website www.campagnareddito.eu, www.bin-italia.org or www.libera.it

the approval of a law on basic income. It was a sort of "guidelines for the fundamental principles". It also called on MPs of different political parties to show their commitment to unify the various bills of law submitted to the Parliament* in order for them to lend their support to a single Bill. The campaign "ten days for a dignity income", therefore, strove for the institutionalization of a new right in the country. Unfortunately, the Italian government seems actually quite reluctant to undertake this path.

The pressure of the economic crisis and the achievement of a mature debate objectively represent important arguments in favour of the struggle for a basic income. On the one hand, policies of individual nation states seem still dramatically weak and unable to implement bold decisions, while on the other hand European institutions do not commit to implementing a measure involving all European citizens. The European Union should take a stand on the protection of human dignity and on the "right to exist". Could basic income and a system of financial transaction tax at the continental level be the core basis for a social Europe? We are looking forward to it.

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Homoeconomico-politicus, Scientific Consciousness, and the Defense of Fundamental Values in the Context of the Climate Change Crisis:
The Challenge of Scientific Responsibility for the Future of Economic and Political Science

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Abstract

The general framework of this paper is to focus on the evolution of scientific consciousness and the dramatic technological developments it has generated, which have vital and highly consequential consequences for social organization on a global basis. The central fact about the current technological revolution is the enormous challenges it provides for political and economic decision-making. The political and economic choices are often merged in a symbiotic wave of challenges. In politics, we have understood the background and challenges that confront homopoliticus. These challenges are even more pronounced as challenges for homoeconomicus. In short, homoeconomico-politicus is both an observer and a participator in the challenges of dramatic technological change. What ties these two concepts together is that they are fed by a form of scientific consciousness. Dramatic forces of change, now unleashed, literally require new paradigms of political and economic thinking to inform wise policy makers about sensible political and economic choices. Both economics and politics are dramatically interrelated and shaped by the philosophy of science known as Logical Positivism. The problem with this approach is that it demands a form of scientific objectivity that rigorously excludes the study of values in the science of politics and economics. But the broader level of scientific consciousness would virtually require that these disciplines adequately account for the value implications of their work.

These generalized comments may be an appropriate introduction to a deeper understanding of the impact of technological changes on the organization of political economy at all levels of social organization from the local to the global. One of the issues that we seek to underscore in this paper is a better understanding of the idea of economic consciousness. It would seem to be obvious that economic consciousness influences economic theory and practice. In this sense, economic consciousness would seek to have a connection to the idea

of political consciousness. The two are clearly intimately interrelated. In the field of political science, there is a well-developed theory of the power-oriented personality. When we connect the power-oriented personality to the personality focused on political economy, it may be appropriate to suggest the idea of a marriage of homopoliticus and homoeconomicus. This connection could be expressed in neologism: homoeconomicus-politicus. It is the centrality of the idea of economic and political consciousness that merges these ideas in the form of an inclusive level of consciousness, which we wish to explore. If we accept the idea of homoeconomico-politicus level of consciousness, the next assumption would have to be that this form of human consciousness is obviously influenced by science and the interposition of value-based analysis. These few introductory comments are simply used to raise the question of the role of values in the evolution of the technological capacity in economics and politics of the human family.

1. Introduction

Modern technological innovation has had a dramatic effect on the boundaries of the study of politics and economics. In part, this is a consequence of the dramatic changes that technology has produced in terms of its effects on social process. Therefore, we live in a world that is in the midst of an accelerating technological revolution. The consequence of dramatic technological innovation and change quite literally imposes dramatic changes on the way social process works. The physicist Albert Einstein put the dilemma this way: "There are only two ways to live your life. One is as though nothing is a miracle. The other is as though everything is a miracle." So dramatic are technological developments that they challenge the traditional grounding of human identity, spiritual aspiration, and transcendental consciousness. Today we live in a world that is radically transforming itself. First, we experience the radical transformations in communications and transportation technologies. Communication has been compressed between human beings so that information is instantly communicated across the planet and technological innovation in travel has radically compressed the distance of both time and space between human beings. In the context of major coercion and more, the development of modern armaments including thermonuclear weapons and delivery systems puts in the reach of human decision the basic question of whether humanity will be sufficiently shortsighted to destroy itself. In the areas of industrialization and mass production of goods and services, technological innovations are increasingly dependent on modern innovations and less dependent on human labor. This is an area where change requires a radical rethinking of the role of labor and social stability in human relations. Even more remarkable are the developments in the areas of artificial intelligence. Scientists predict that shortly within the grasp of modern science will be instruments of artificial intelligence vastly superior to those of the humans that created it. This may raise the difficult question of whether such artificial forms of intelligence may resist control by human agency. Other technological prospects include the radical new developments for the advancement of solar energy. Scientists have already determined that in the molecular structure of sand there are elements which, if isolated, could dramatically increase the collection, storage and distribution of solar energy. Since this is an inexhaustible supply of energy, it could have radial implications for political economy in the social process.

It is very apparent that the revolutionary changes in technology are a product of the massive expansion of scientific consciousness. To the extent that scientific consciousness will directly shape the contours of political economic inquiry, it is apparent that scientific consciousness will dramatically influence the consciousness of *homoeconomico-politicus*.

2. Science, Human Subjectivity, Consciousness and Modern Science

We would contend that values are implicated in virtually all levels of technological innovation. The problem with values in this context is that values are produced and understood by the same intellectual processes that generate technological innovation and change. In short, technological progress and the importance of values in understanding and providing normative guidance for such processes emerge existentially from the process of human consciousness. This is especially true in matters of politics and economics. The question is, what do we understand about human consciousness? For the scientists, human consciousness would simply be necessary for the development of scientific reason and scientific rationality. From the perspective of the culture of transcendental experience, human consciousness is the tool or lever for the development of spiritual conscious aspirations. In general, scientists tend to accept the idea that there does exist a form of consciousness which indirectly influences scientific reason and scientific achievements. However, scientists have had difficulty in understanding a possible connection between the study of the human brain and the study of human consciousness. The central problem is whether consciousness is a reality or an illusion. To some scientists the idea of consciousness is simply one of the great mysteries that confront scientific inquiry. To other scientists it is really a non-problem. Following this conclusion, many scientists believe that consciousness is insufficiently scientific to waste much time on it. At most, consciousness may simply be a byproduct of complex physical processes. Another problem is that in general, scientists tend to believe that consciousness is something that lies outside of the boundaries of normal science. An important contributing factor to the notion that consciousness is outside of science is the philosophy of science grounded in positivism. Positivism suggests that the concerns of science be completely objective and distinct from the contamination of human subjectivity and values. It insists on the principle that science has an exclusive preoccupation with the *is* and not with the *ought* implied in value analysis.

Modern physics has raised important questions, which implicate the process of consciousness; this further implicates the problem of values. In the 1920s, Werner Heisenberg, one of the founders of quantum physics, made a completely inexplicable discovery. He discovered that when observing subatomic phenomena, it was impossible to separate the observer from what was observed. The observer influenced the movement of subatomic particles. This means that the observer has a level of subjectivity that influences the object of observation. This is an uncomfortable conclusion for strict positivism.

Human subjectivity in the form of perspective* has been largely a field monopolized by the psychological sciences. It has been in a very important way also, a field dominated by

* The idea of perspective is an outcome of human subjectivity and human consciousness. Observers discern within the perspective of human subjectivity identifiable perspectives of identity, of value aspiration and of fundamental expectation.

religion.* Today this sharp division has been eroded as the field of quantum mechanics has disclosed properties and insights of micro-particles and waves. The experiments in quantum physics confirm results that are sometimes described as weird. The results do not make sense in the world of cause and effect as objectively observed. One of the insights of quantum physics is the role of the observer in shaping the behavior of the particles observed. This has raised the question that human consciousness, when focused on the particles, has an influence on how the particles behave. In short, observational consciousness appears to be a form of participatory interaction. It has been shown experimentally that the cells of the body and the DNA communicate through this subtle field of energy that is difficult to quantify or measure. More than that, it has been shown that human emotion has a direct influence on living DNA. These effects eliminate the interposition of distance between these objects. According to the physicist Amit Goswami, "when we understand us, our consciousness, we also understand the universe and separation disappears." The scientific results from quantum physics experiments indicate that the human DNA has an effect on the particles that constitute the matter of the universe. It is also established that human emotion has an effect on DNA, which in turn affects the particles the world is made of. Additionally, the connection between emotion and DNA has effects which transcend space and time. Scientists now believe that there is, in space, a matrix of energy that connects any one thing with everything in the universe. This connected field accounts for the unexpected results of experiments. It is further believed that the DNA of the human body gives us access to the energy that connects with the universe. Emotion is the key for tapping into this field. The following is according to the famous quantum physicist Max Planck. He stated that, "as a man who has devoted his whole life to the most clear-headed science, to the study of matter, I can tell you as a result of my research about the atoms this much: There is no matter as such! All matter originates and exists only by virtue of a force which brings the particles of an atom to vibration and holds this most minute solar system of the atom together… We must assume behind this force the existence of a conscious and intelligent Mind. This Mind is the matrix of all matter."[1]

The central insight of modern physics is that we live in a participatory universe. Human consciousness, it is believed, participates in this universe via human perspectives and emotions and represents a profound insight and even deeper challenge to the age-old question of the being and becoming of humanity. This is a critical challenge for the consciousness of *homoeconomico-politicus.* This participatory universe generates the future of multiple possibilities which gives strength and responsibility to the idea of creative orientation, another important challenge for *homoeconomico-politicus*. These possibilities may emerge as real and would therefore appear to be influenced by the emotion filter, through consciousness and observation. In short, there is more to the idea of focus of attention. A focus of attention generates the concern of human consciousness which may create a possible future reality. Scientists still dispute the precise meaning of the nature of possibilities and overlapping possibilities. There are three important interpretations. First, the Copenhagen Perspective. Theorists here focus on experiments which indicate that a person observing an electron moving through a slit in a barrier suggest that observation itself is what turns quantum

* For a deeper understanding of human subjectivity, see Colapietro, V. M. (1989). *Peirce's approach to the self: A semiotic perspective on human subjectivity.* Albany: State University of New York Press.

possibilities into reality. Second, there is the Many Worlds interpretation. This interpretation is similar to the Copenhagen Perspective but suggests that the possibilities are infinite and all of them exist simultaneously. However, in the "many worlds" view each possibility happens in its own space and cannot be seen by others. These unique spaces are called 'alternate universes'. Finally, there is the Penrose interpretation. Here, Penrose maintains the belief of many possibilities existing at the quantum level. However, his theory is distinctive as to what it actually is that "locks" into a particular possibility that becomes our reality. Penrose recognizes that each possibility has its own gravitational field. It takes energy to maintain this field and the more energy a probability requires the more unstable it is. The consequence is that without enough energy to sustain all possibilities they collapse into a single state which represents our reality. The conclusions that are drawn from the insights of quantum possibilities are that emotion is a part of consciousness, and human subjective perspective is the central factor in the choice of reality.

"Neither politics nor economics as academic disciplines can be value-free. Indeed, ignoring values would seem to be an exercise in academic irresponsibility."

From this point of view, it is the language of human emotion that speaks to the quantum forces of the universe and to Planck's intelligent matrix. The polar extremities of feeling and emotion, which may feed into human consciousness, are the extremes of *love* and *hate*. Thus, the greatest challenge presented in the world of quantum physics and human consciousness has a similarity to the challenges posed by great religious and mystical insights. For example, central to love is the idea of compassion, empathy and positive sentiment which we describe later as "affection". Positive sentiment in the form of compassion is according to the Buddhist tradition the feeling of "what connects all things". And compassion in this tradition is both a force of creation and an experience. In short, science and mystical experience seem to converge on the importance of positive sentiment for personal growth and transformation with large-scale existential implications. In short, it is love, compassion, empathy, and positive sentiment that we must embody in our lives and feelings as the way we choose to experience the world. On the other hand, there is the inevitability of choice in the orientation of emotion and feeling. Such choices may well reflect the framework of the pole of hate which is reflected in the existential fears in human experience in terms of abandonment, low self-worth, and lack of trust. The negative sentiment would be the feature for the creation of a negative utopia and the ultimate expression in reality of a negative utopia would be the practices and policies for the extermination of human aggregates. The fundamental insight of modern physics which implies that we live in a participatory universe, has large scale implications for the study of world politics and global economics. In short, it suggests that neither politics nor economics as academic disciplines can be value-free. Indeed, ignoring values would seem to be an exercise in academic irresponsibility. The perspectives of

economic and political theorists are infused with value choices and in particular the choice orientation of a form of positive sentiment and a form of negative sentiment that may shape political and economic inquiry. Bringing human subjectivity into the focus of inquiry is a basic historical problem for scientific objectivity. It should be noted that when we account for human subjectivity, we must also account for human values in the evolution of society.*

3. Human Subjectivity – Emotion and Consciousness as Drivers of Human Values: the Role of Positive and Negative Sentiment in Social Process

It may also be that, in general, societies take for granted the importance of emotion and sentiment in the construction of future generations. Here, intellectually, the idea of affection or positive emotional sentiment may need to be more explicitly recognized as an important cultural and policy preference. In short, emotion and sentiment permeate all human behavior. Emotion and sentiment may be the driving force for finding out what is right concerning the human prospect and what is required to avoid was wrong with it. Modern scholarship has drawn attention to the importance of the emotions encapsulated in positive and negative emotion.† We provide a provisional overview of positive and negative sentiment. Indeed what we suggest is that genocide is impossible when culture, law, and politics give due deference to the principles of positive sentiment or affects and heightens the prospect of genocide and atrocity when the negative symbols of emotionalized hate are dominant. Perhaps the most important insight here is that positive sentiment is a critical foundation for the culture of human rights. Negative sentiment is critical for the denial of cultural human rights.

Figure 1 is an illustration of modern psychological science connecting emotion to the ideas of positive and negative sentiment. The diagram does not quite explain that positive sentiment as it affects us is an identifiable social process.

To the extent that we are living in a participatory universe, positive and negative emotions require the guidance of basic values. Below, we set out a generalized model of positive and negative sentiment that we can assume permeates the culture of science and any other discipline. Negative sentiment is a psychosocial process of communitywide salience. Below we reproduce a model of the structure of negative sentiment as a social process.

The first line of inquiry must be the ubiquity with which human beings generate the culturally acknowledged and received symbols of identity.[2,3] We generally consider this to be a natural process. The "I" is born into a family, or analogous micro-social unit, and soon the identification of the "I" broadens to include the "we". But how inclusive or exclusive is

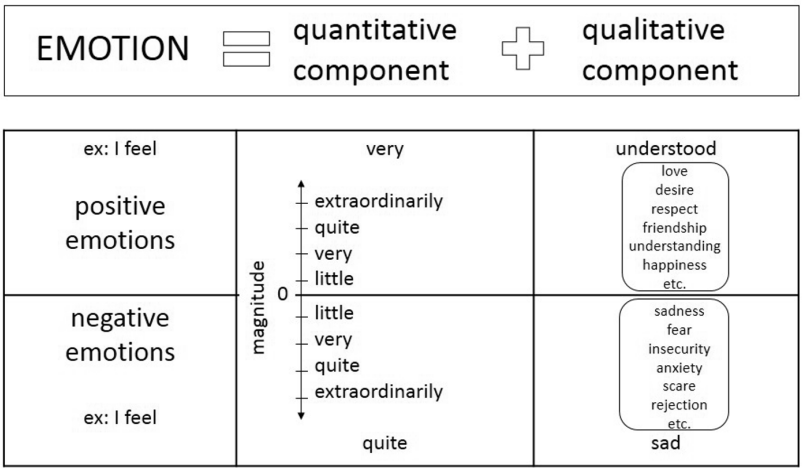
* Bringing human subjectivity to the center of an appropriate focus of inquiry for *homoeconomico-politicus* raises the critical question of the absence of objective measurable indicators of shared human subjectivity and shared professional consciousness. This is an issue that has generated an important interest in the measurement of subjectivity. A founding presence in this initiative was William Stephenson. Stephenson was an Englishman. He obtained a PhD in both physics and psychology. He is credited with developing a credible scientific method for the measurement of shared human subjectivity. His method was called the Q Methodology. The Q methodology is described as "a methodology for dealing with intra-individual data. Its relations to other methods of multivariate data analysis are described and, in particular, the implications of factor analysis for it… the practical applications to different fields, e.g. type psychology, social psychology, projective tests, etc." See Stephenson, *The study of behavior; Q-technique and its methodology* (1953).

See also Brown, "Q Methodology and Qualitative Research" (1996) Brown, "A Primer on Q Methodology" (1993), http://www.operantsubjectivity.org/

† For further reading see McCraty, R., Rein, G., & Atkinson, M. (1995). The Physiological and Psychological Effects of Compassion and Anger. Journal of the Advancement of Medicine, 8(2), 87-103.

the "we"? We realize that the expansion of the "we" is not unlimited and the boundaries of the "we" invariably demarcate those groups that constitute the "non-we" that is to say the group or class of "non-self others". This is an ordinary process that happens in all human communities.

Figure 1: Modern Psychological Science Connecting Emotion to the Ideas of Positive and Negative Sentiment



The social process also generates the identifiable markers of a social process of positive sentiment. Part of the positive sentiment maximizes within the personality of the individual self system the salience of affection, empathy and solidarity with humanity as a whole. As such, it is a process that is very fundamental to social organization that seeks to universalize the dignity of man. As such, a social process of positive sentiment is an antidote to anti-Semitism, to racial discrimination, to prejudice, to group domination and to group extinction. Since the social process of positive sentiment like negative sentiment is a form of emotion and a driver of human behavior, it is an important addendum to understanding the social processes that generate forms of social pathology such as anti-Semitism and Holocaust like the outcomes of behavior. The tables below outline the structures and the processes of positive sentiment of affect and negative sentiment of hate. It is important for us to recognize that every technological innovator comes to his craft with human consciousness influenced by human subjectivity and emotion; the same would apply to an economic scientist and a political scientist.* If we accept the guidance of Socrates, namely "know thyself", then we would have to admit that all scientists and the rest of humanity come to their vocation with a context of emotions, some positive and some negative.

* For further reading on measurements of subjectivity see Stephenson, W. (1982). Q-Methodology, Interbehavioral Psychology, and Quantum Theory. The Psychological Record, 32, 235-248.

Also see Goode, W. J. (1964). The family. Englewood Cliffs, NJ: Prentice-Hall.

Table 1: The Social Process of Positive Sentiment (Affection/Compassion): The Relevant Analytical Markers

Formal Myth System	The formal myth of love and affection may be concealed (or may otherwise appear informal), but it is nonetheless a real myth reinforcing the symbology of togetherness of the target of love and affection and those within the "in-group" of the community context.
Symbol-Myth System	The symbol-myth system of solidarity and affection is a crucial component of the perspectives of the community or its elite, or its traditional and opinion leaders.
Subjectivities/ Perspectives	These subjectivities or perspectives of positive sentiment are outcomes of complex behavior patterns, which are characterized by affective sentiments and strong portrayals of the target of affect as appropriate for the displacement of positive inference and meaning in terms of shared affect.
Emergent Patterns	Indications of emergent patterns that consolidate the collaborative behaviors of the "we" or the "in-group," vesting that group with the idealization of appropriate community acceptance as positive sentiment and love and the foundation for the licit family form which is also culturally preferred and valued.
Propaganda	There are further emergent, often graduated, behaviors in the primary group, which consolidate and sustain the image of community solidarity through patterns of collaboratively conditioned behavior conditioned by positive sentiment. These include the communication of discrete signs, symbols, operational codes, myths, narratives, and reified stereotypes, which symbolize the institutionalization of the ideals of love and a positive sense of shared affect in the community.
Denotation and Isolation	The process of affection also involves the manipulation of signs, symbols, codes, myths, narratives and stories between members of the "in-group" and between members of the "in" or "out-group." Positive sentiment may be used in a way that also isolates those not included in this universe of affect and solidarity.

Alliance and Allegiance	The system of generalized affective behaviors thus involves distinctive, and often, discrete patterns of communication of relevant signs and symbols of the "in-group" loyalty and solidarity, as well as signs and symbols that identify, disparage, or threaten members of the "out-group." The patterns of communication are sustained or enhanced by collaborative operations in the exercise of public or private power. This may mean repression and exploitation for some and the power to exploit the positive sentiment for base motives on the other. Thus, solidarity and patriotism may be promoted in such a way that it underlines by implication the vulnerability and validity of victimizing others such as the social pariahs, outcasts, those who are indifferent to the situation of all others.
Nurtured Pre-dispositions	Human beings conditioned to generate positive sentiment (affection) as an ordinary aspect of personal identity are obviously desired from a human rights perspective. The predispositions of the personality included to positive sentiment invariably create environments in which micro-social relations reflect the normative priority given to the reproduction of positive sentiment or affect. Thus, innocent child rearing and nurturing in which love and affection are a practice generates personality types better suited to reproduce personality types partial to democratic political culture. On the other hand, a person may be raised in a climate of negative sentiment where repression, deprivation and fear wittingly or unwittingly reproduce insecurity and intolerance of others in the self-system. Thus, the practices of negative sentiment in the family or affection units may be a dangerous social inheritance. When such personality types mature, they exhibit the partiality to anti-democratic perspectives such as authoritarianism and domination. They reproduce the cycle of negative sentiment.
Social Reinforcement through Positive Feedback Mechanisms	Reproducing the cycle of positive sentiment is critical to the culture of human rights and its sustainability on a global basis. Thus, the micro-social units (affection units) ostensibly specialized to positive sentiment or love and affection are critical for a healthy and normal society that does not institutionalize compulsive, neurotic or psycho-pathological outcomes. In short, a psycho-political culture of positive sentiment reproduces in effect the social and political foundations of the culture of human rights. Perhaps even more than that, it is giving to those committed to the love of God, the religious redemption of the love ideal through human rights.

Table 2: The Social Process of Negative Sentiment (Hate/Greed): The Relevant Analytical Markers

Formal Myth System	The formal myth of love and affection may be concealed (or otherwise appear informal), but it nonetheless obscures a real myth reinforcing the symbology of otherness of the target "out-group."
Symbol-Myth System	A symbol-myth system of prejudice, fear and hate is a crucial component of the perspectives of the dominant group or its elite and opinion leaders.
Subjectivities/ Perspectives	These subjectivities or perspectives are outcomes of complex behavior patterns, which are characterized by negative sentiments and negative portrayals of the "other," such that the symbolic "other" is reinforced as a target for negative inference and meaning.
Emergent Patterns	There are emergent patterns that consolidate the collaborative behaviors of the "we" or the "in-group," vesting that group with a sense of superiority, or "herrenvolkism," paternalism, and further, seeking to enhance the value position of that group at the expense of the "out-group".
Propaganda	There is further emergent, often graduated, behaviors in the dominant group, which consolidate and sustain the image of the victim group through patterns of conflict-conditioned behavior. These include the communication of discrete signs, symbols, operational codes, myths, narratives, and reified stereotypes on such issues as racism, anti-Semitism and more.
Denotation and Isolation	The process of group deprivations also involves the manipulation of signs, symbols, codes, myths, narratives and stories between members of the "in-group" and also between members of the "in" and "out-group".
Alliance and Allegiance	The system of generalized group deprivations thus involves distinctive, and often, discrete patterns of communication of relevant signs and symbols of the "in-group" loyalty and solidarity, as well as signs and symbols that identify, disparage, or threaten members of the "out-group". The patterns of communication are sustained or enhanced by collaborative operations in the exercise of public or private power that moves beyond discrimination, anti-Semitism, prejudice or hate to the possibilities of wholesale extinction of cultures and masses of human beings.

Nurtured Predispositions	Human beings conditioned to generate negative sentiment as a normal aspect of the predisposition of personality invariably create environments in which micro-social relations reflect the normative priority given to the reproduction of negative sentiment. Thus, innocent child rearing and nurturing practices although covered in an ostensible mantle of love may in fact impact on personality development so that the person that emerges is ill-suited to a democratic political culture. On the contrary, the person may be raised in a climate in which repression and fear unwittingly reproduce insecurity and intolerance of others. As such personality types mature, they exhibit partiality to authoritarianism and domination. They reproduce the cycle of negative sentiment. Therefore, the micro-social units ostensibly specialized to positive sentiment or love and affection may actually be specialized to do the opposite. In short, such a psychopathological political culture may be reproducing the "Anti-Christ of human rights."
Halting the Cycle of Social Reinforcement by Derailing Negative Feedback Mechanisms	Breaking the cycle of negative sentiment is critical to the culture of human rights and its sustainability on a global basis.

4. Technology, Scientific Consciousness and Social Responsibilities

It is widely acknowledged today that science, technology and innovation are some of the most powerful forces directing the future of our global social process. It is also recognized that technology represents remarkable advances as well as existential threats to humanity.[4] Some aspects of technology are, in fact, fairly strictly controlled politically. These areas include nuclear technology, pharmaceuticals, agricultural chemicals, and food additives. Other areas of technological development would appear to be somewhat more anarchic. These areas include the computerization of financial transactions, automation, biological research, and telecommunication systems. The speed of technological development and distribution appears now to be way ahead of the capacity of governance to adapt to the changes that technology generates. This results in social stress, uneven social development, social upheaval, displacement and mass-migration and vast disruptions of stability in social processes globally. Leading thinkers in international governmental institutions and global scientific institutions continue to stress the critical importance of the issue of values in scientific research and education and are of great importance in the formulation of wise public policy, as evident from their presentations and talks during the recent meeting at CERN in Geneva in November 2015 Michel Jarraud recently stressed the issue of social responsibility for the

management of scientific activity.* Ivo Šlaus, in a similar vein, stresses the acceptance of a collective and individual duty from a global point of view for a commitment to the realization of sustainable development objectives. Raymond Torres stresses the question of technology's imprint on global income inequality and insecurity. He also insists upon a socially responsible form for the governance of technological innovation. Marie-Paule Kieny from WHO also insists on a recognition of a mutual sense of social responsibility addressing the tension between the promotion of global health and the commercial objectives of pharmaceutical interests. Alexander Likhotal warns of the corrosive aspect of money-power on technology. Herwig Schopper underlines the special responsibility of scientists and intellectuals toward global society. Garry Jacobs draws particular attention to the problem of the perspectives of technological innovators. His fear is that their perspectives may be unduly influenced by selfish motives such as careerism, competition for grants and intellectual prominence. He insists on a refinement of scientific values in the public interest. Martin Lees is another important world leader who draws attention to the difficult problem of political responsibility versus intellectual and scientific responsibility. Christophe Rossel stresses the importance of classical scientific values and their ethical guidelines. He insists that regular assessments of the social and economic impact of technology are an urgent necessity. Momir Đurović draws attention to the problem that technological innovation has an incipient tendency to determinism. This means that human beings do not control technology; technology controls human beings. He too stresses the importance of strengthening mechanisms to improve the social responsibility factor. What is implicit in these important views is that technological innovation and development is a critical driver of paradigm change in the context of appropriately developing the theoretical frameworks to better understand, to better control and regulate the scope and character of revolutionary technological changes. It is apparent that there is a critical link between the issue of social responsibility and consciousness and the critical relevance of a deeper and more comprehensive understanding of the role of values in scientific consciousness, political consciousness, and in general, the consciousness of humanity.

This summary of the perspectives that stress scientific responsibility, the centrality of ethics and morality and values is, of course, the critical challenge of understanding the interrelationship of consciousness, technology, and human values. Alexander Likhotal puts this challenge in terms of a level of practicality when he states the following:

> *"Political leaders, in particular, badly need to be exposed to scientific vision. The mind, once stretched by a new idea, never reverts to its original dimensions. Unfortunately, we have to recognize that today's governments are ill equipped to understand science, sophisticated technological challenges, or the opportunities facing the world. New instruments are needed to ensure that science and technology are adequately applied to address the wide range of increasingly urgent global problems—and not just to make our smartphone batteries last longer. This will require a rapid transition to a different model of development; one*

* See Science, Technology, Innovation and Social Responsibility [Abstract]. (2016). WAAS Newsletter, Winter 2016.

*which not only takes into account the interest of short-term growth, but provides opportunities for sustainable and inclusive development."**

The discussion of consciousness and values in scientific culture has always been an uneasy business. From a scientific point of view, the proper scientific culture is to be value-free. If the discourse of science is permeated with values, it is permeated with human subjectivity and not scientific objectivity. On the other hand, we know that in human society the important stakes about community organization, endurance, and promise seem to be tied up with values in some form or the other. The traditional limit on the use of values from a scientific point of view remains a problem for the subjectivity of value-toned discourse. This aspect of scientific culture has highly influenced modern political and economic science. Let me seek to clarify this. Values in the context of intellectual culture are discussed in two distinct ways. First, values are used descriptively. In this sense, the scientific observer is merely observing the value-conditioned behavior of social or political participators. What does the observer see? He sees individual human beings acting in a community, energized to pursue the things that they desire or value. In this sense, viewed from an anthropological point of view, what we call things that are desired or valued might, in a basic sense, be the human needs that the individual seeks to secure in the social context of his or her life. This is simply a descriptive inquiry into what the individual wants, how the individual goes about getting what he wants, and what he does with the desired thing that he has gotten. This will give us a description of the system of community or public order as it is. This descriptive sense of human values is well illustrated by the psychologist Abraham Maslow in his hierarchy of human needs:[5]

1. *Physiological – hunger, thirst, bodily comforts, warmth*
2. *Safety/Security – out of danger, order, law, stability*
3. *Belongingness and love – affiliate with others, be accepted*
4. *Esteem – to achieve, be competent, gain approval and recognition*
5. *Self-Actualization – realizing personal potential, self-fulfillment, seeking personal growth and peak experiences*

Economists and Political scientists often use categories similar to Maslow's without recognizing that they are describing needs/values of actual human beings in social processes.

There is another sense in which the term 'values' is used. In this sense, the term is vested with normative importance. In other words, the question is not how values are produced and distributed but how they *ought* to be produced and distributed. This, therefore, is not a descriptive exercise; it is an exercise of normative judgment. In the case of values used as a description of community order as it is, we are dealing with propositions that can be proved or disproved by observation, creating a hypothesis about what is observed. Further observation may prove or disprove the hypothesis. This is an empirical inquiry. When values are used in a normative sense, we are really evaluating the goodness or badness of their production and distribution. The determination of the normative priority or the preference given to a value statement reflecting the "ought" will have to be established by some other criterion of validation. That criterion, at least in the context of moral philosophy, is based on

* Presentation at the Conference on Science, Technology, Innovation and Social Responsibility held on November 11, 2015 at CERN, Geneva.

the idea that a statement about a normative preference or "ought" can be validated by reasons external to the statement-maker. In short, there are objective, justifiable reasons that may be formulated to determine the currency, or lack of it, of a moral or value proposition .We shall be using the term 'value' in both a descriptive and a normative sense, but we will attempt to secure a sufficient clarity of exposition that while we discuss them as interrelated matters, we can keep them sufficiently distinct in order to establish different insights into the problems we are discussing about society.

5. Human Needs and Values in the Anthropological Sciences

The anthropological literature has given us a key to understanding life in a very elementary community. Life revolves around human beings energized to satisfy human needs. Anthropologists also identify the structures that emerge from society which are specialized in whatever degree of efficacy to facilitate securing those needs. When we map needs onto institutions, we emerge with a social process that is based on the interaction of energies directed at securing needs through institutions. These institutions direct human energies, in some degree, to the satisfaction of those needs. We can now begin to identify basic human needs as the goods, services, honors, and gratifications that people in society desire or need. Moreover, we can classify these desires/needs in terms of the basic values that the individual social participant acts to secure for himself and those dependent on him. Thus, we may emerge with a model of social process in which human beings pursue values through institutions based on resources. Now, this is a purely descriptive inquiry, but it is possible to observe that the needs/values and the institutions specialized to secure them are, generally speaking, identifiable. What are these values and what are the institutions specialized to secure them in any social process?

Table 3: The Human Perspective and Consciousness in the Evolution and Interdetermination of Values in the Human Social Process

Values	**Institutions**	**Situations**	**Outcomes**
Power	Governance-Political Parties	Arena	Decision
Enlightenment	Universities, WAAS	Forum	Knowledge
Wealth	Corporations	Market	Transaction
Well-Being	Hospitals, Clinics	Habitat	Vitality
Skill	Labor Unions, Professional Organization	Shop	Performance
Affection	Micro-social Units (Family) Macro-social Units (Loyalty)	Circle	Cordiality, Positive Sentiment, Patriotism
Respect	Social Class	Stage	Prestige
Rectitude	Churches, Temples	Court	Rightness
Aesthetics	Museums, Monuments, Culture	Creative Orientation	Symbols of Cultural Beauty and Aspiration

In this representation, values and institutions are represented descriptively in order to describe the system of community order as it is. It should, however, be understood that the social process of the community is a dynamic process in which there is an energy flow between the participators, the values, the institutions, and the results. Some of the results are generative of conflict. Other results are generative of the success of institutions functioning optimally. What is important is that social process is a generator of problems, and these problems are about the acquisition and distribution of values. This means that the dynamism of society requires a decision process that is frequently challenged to produce a solution to the problems of value conflict, value deprivation, or value over-indulgence. Thus, the community response to the problems that values pose for community order invariably must implicate a normative dimension about the optimal allocation of values in society. Indeed, some political scientists describe political science as concerned with the authoritative allocation of values in society. The intimate link between the politics of power and the political economy of wealth is this: power may serve as a base of power to get more power. It may serve as a base to get more of all the other values extant in social process. Even more importantly, every value may serve as a base of power to get and keep power. Wealth may serve as a base of power to acquire power and keep it. It may serve as a base to get more wealth. It may serve as a base to get a lion's share of all the values extant in social process. Thus, *homoeconomico-politicus* are an intimate association influencing the production and distribution of value needs in social process.

In reviewing the map of values and institutions of social process, it is important to keep in mind that it is the human perspective that gives meaning and life to the values and institutions in society. The human perspective comes with the perspective of identity, ego-demands, and the value ideals of expectation. These perspectives are driven by deep drives for self-actualization, self-realization, and psycho-social fulfillment. In this sense, the private motives of personality, even when displaced on public objects and rationalized in the public interests, still represent an underlying force that moves the personality in all social relations. This underlying force may be the force of self-affirmation for self-determination and is the most foundational energizer of the demand for human rights and dignity. The relationship between personality and value achievement may itself generate a sense of inner-fulfillment, which, in turn, becomes the driver of still greater levels of value creation and achievement.

6. Consciousness in the Identification and Allocation of Values in Society

The problem of the allocation of values implicates the idea that there may be different standards which justify one form of allocation over another. Historically, at least in law, there has been an assumption that legal interventions are meant to discriminate between the claims for values that are just and those that are unjust. It is this challenge that has given rise to the great traditions of jurisprudence and, most importantly, the jurisprudence of natural law. Natural law, however, could only generate procedures, not substantive rules, to facilitate the use of right reason in the resolution of value conflicts. Two of the most enduring of these natural law-based rules have survived and are essentially matters of procedural justice: *audi alteram partem* [the obligation to hear both sides] and *nemo judex in sua causa* [no one

should be a judge in his own cause]. However, we had to await the aftermath of the tragedy of the Second World War before we got a kind of official code of natural law in the form of the Universal Declaration of Human Rights. Although couched in the form of rights, the Declaration may be reduced to nine fundamental value-needs categories. The adoption of a code of moral priority, intended to bind all participants in the international system, limited the speculation about the role of values in the social process. Although most intellectual and scholastic speculation stresses the notion that values are somewhat opaque, difficult to distill, and even more difficult to clarify, the adoption of the United Nations Charter has served as a political impetus for the development and clarification of values. As a starting point, therefore, we may reduce the Charter [a legally binding instrument of global salience] into several comprehensible and clearly articulated keynote precepts. We list them as follows:

7. Global Values, the UN Charter: the Normative Value Guidance for Science and Society

1. The Charter's authority is rooted in the perspectives of all members of the global community, i.e. the peoples.* This is indicated by the words, '[w]e the peoples of the United Nations.' Thus, the authority for the international rule of law, and its power to review and supervise important global matters, is an authority not rooted in abstractions like 'sovereignty,' 'elite,' or 'ruling class' but in the actual perspectives of the people of the world community. This means that the peoples' goals, expressed through appropriate forum (including the United Nations, governments and public opinion), are critical indicators of the principle of international authority and the dictates of public conscience.

2. The Charter embraces the high purpose of saving succeeding generations from the scourge of war. When this precept is seen in the light of organized crime syndicates' involvement in the illicit shipment of arms, the possibility that they might have access to nuclear weapons technologies, and chemical and biological weapons, the reference to 'war' in this precept must be construed to enhance the principle of international security for all in the broadest sense.

3. The Charter references the 'dignity and worth of the human person'. The eradication of millions of human beings with a single nuclear weapon or policies or practices of ethnic cleansing, genocide and mass murder hardly values the dignity or worth of the human person. What is of cardinal legal, political, and moral import is the idea that international law based on the law of the charter be interpreted to enhance the dignity and worth of all peoples and individuals, rather than be complicit in the destruction of the core values of human dignity.

4. The Preamble is emphatically anti-imperialist. It holds that the equal rights of all nations must be respected. Principles such as non-intervention, respect for sovereignty, including political- independence and territorial integrity are also issues that remain under constant threat of penetration by alienated terrorists or organized crime cartels.

* For a full copy of the Charter see Charter of the United Nations | United Nations. (1945). http://www.un.org/en/charter-united-nations/

5. The Preamble refers to the obligation to respect international law (this effectually means the rule of law) based not only on treaty commitments but also on 'other sources of international law'. These other sources of law include values, which complement efforts to promote ethical precepts built into expectations of the universal ideals of morality.

6. The Preamble contains a deeply rooted expectation of progress, improved standards of living, and enhanced domains of freedom and equality for all human beings on the planet.

Based on the keynote precepts in the UN Charter, the world community also adopted an International Bill of Rights. The central challenge to a scholastic understanding of the International Bill of Rights is the need to clarify and distill its basic, underlying values. It may now be with confidence stated that we can distill at least nine functional values that underlie the entire international bill of rights. In a general sense, these rights, when considered collectively, represent the integrated, supreme universal value of human dignity. The central challenge then, is that those charged with decision-making responsibility must prescribe and apply a multitude of values in concrete instances and hope that their choices contribute to the enhancement of human dignity and do not, in fact, disparage it. At an abstract philosophical level, distinguished philosophers such as Sir Isaiah Berlin have maintained that it is futile to attempt to integrate these values with the abstract principle of human dignity because fundamentally, these values are incommensurable. Not everyone agrees with this. Specialists in decision and policy acknowledge that human dignity based on universal respect represents a cluster of complex values and value-processes. Therefore, the challenge requires that ostensibly conflicting values be subject to a deeper level of contextualized social insight and a complete sensitivity to inter-disciplinary knowledge, procedures, and insights. Thus, decisions in these contexts are challenged with the task of broader methods of cognition and a better understanding of abstract formulations of value judgments. Disciplined intellectual procedures have been developed to provide better guidance in particular instances of choice to approximate the application and integration of values in terms of the human dignity postulate. Does the ethic of universal respect and human dignity demand absolute, universal compliance at the expense of other universally accepted values? Ensuring that the values of respect, democratic entitlement, and humanitarian law standards are honored requires fine-tuned analysis and great subtlety in the structure and process of decisional interventions. Rules of construction and 'interpretation' are painfully worked out, which hold, for example, that even if a peremptory principle (*inscogens*) of international law embodies an obligation *ergaomnes*. It should be evaluated, appraised, and construed to enhance rather than disparage similar rights, which may also have to be accommodated. The currency behind the universal ethic of essential dignity and respect is that it provides practical decision-makers with goals, objectives, and working standards that permit the transformation of law and practice into a greater and more explicit approximation of the basic goals and standards built into the UN Charter system itself. This prescribes a public order committed to universal peace and dignity for the people of the entire earth-space community.

The most important thing to keep in mind here is that from a global perspective, politics and economics are intimately connected to the critical questions on the nature of global

governance. In short, they are critical to an understanding of the allocation of basic value needs in the planetary social process as it is and the challenges concerning the allocation of values for an improvement of the human prospect. This requires a challenge to scientific consciousness as well as a challenge to the consciousness of *homoeconomico-politicus*.

> *"Widespread human dignity flourishes when the dignity of the individual flourishes and reproduces values of exponential importance for the common interest of all."*

7.1. Consciousness, Values and Public Order

It is useful to approach the questions of value in terms of the nature of the public order that the rule of law system seeks to promote and defend. The system of public order secures the complex values that it is committed to defend by making an essential distinction between the minimum-order aspects and the optimum-order aspects of the system of public order.

7.2. Consciousness, Values and the Minimum Order

The problem of scientific responsibility, values and the prospect of at least realizing a system of minimum order in the global governance of humanity now represents a critical challenge for scientific consciousness. We may understand the relationship between community, minimum order, and values by imagining a society without an expectation that agreements and exchanges made in good faith and according to law will be honored; that wrongs (delicts) inflicted upon innocent parties will be compensated; that basic interests and expectations of entitlement [as in fundamental norms of right and wrong] shall be sanctioned by a collective community response; or that basic structures of governance and administration will respect the rules of natural justice such as *nemo judex in sua causa* or *audi alteram partem*, and will in general constrain the abuse of power and thus the prospect of caprice and arbitrariness in governance. The necessity of minimum order in a comparative, cross-cultural, historic reality is that human beings interact within and without community lines. In doing so, they commit wrongs intentionally or unintentionally, they require some security over their possessions and entitlements, and their systems of governance aspire invariably to constrain the impulse for abusing power. These are the minimum values of social coexistence. It is in this sense that law as minimum order confronts the idea of justice and potentiality. It is commonly thought that minimum order is a critical, but not absolute, condition of a more just, more decent, more optimistic human prospect. The rule of law precept is uncontroversial in the sense of minimum order and its 'boundaries'. Peace, security, and minimal standards of human rights are reflections of these values in international, constitutional, and municipal law. Fundamentally, the quest for the maintenance of a minimum order in society would appear to be an essential condition for the individual or aggregate of individuals to evolve toward a social process that maximizes value production and distribution. It is possible to see in this an evolutionary idea of progressive change relating to the production and distribution, optimally for all social participants. It is imperative that in the education of scientists and technology

innovators, their sense of social responsibility is at least minimally influenced by the global values of a minimum sustainable system of world order.

7.3. Consciousness, Values and the Optimum Order

This challenge to the public order raises the question of the production and the distribution of values beyond the minimum for social coexistence. This is an insight that is more challenging to the question of scientific responsibility and the values that ought to guide it. Clearly, a great deal of science will have an imprint that goes beyond minimum order and will be let loose in the domain of optimal possibilities and prospects. Here, it is critically important that value clarification be a component of the definition of scientific social responsibility. This is the challenge of the unequal distribution of opportunities or results. Human beings exist not only spatially, but also in terms of the duration of time and events. There is hopefully a tomorrow, a next week, next month, next year, and next century. Human beings, such as scientists, are also transformative agents who make things happen, and in doing so underline the question embedded in the nature of law and community that we can change things for better or worse, for the common good or the special interests, for the sense of expanding human dignity or the prospect of a negative utopia, the rule of human indignity. This is a critical challenge for scientific consciousness. The central challenge for values posed by the optimum order precept is the problem of the procedures and methods for producing values as well as the procedures, methods and normative ideas about the fair distribution of the values that are produced in society. At the back of the concern for human values is the belief in human capacity for the essential, energized generation of value at every level of the social process and the human resource as a producer of ideas, insights, and values of exponential salience. At the back of the human dignity idea is the belief that widespread human dignity flourishes when the dignity of the individual flourishes and reproduces values of exponential importance for the common interest of all. Fellows of the World Academy of Art and Science have suggested that the nine values embedded in the International Bill of Rights [power, wealth, respect, rectitude, enlightenment, skill, affection, health and wellbeing, and aesthetics] are the key to the notion of a public order of human dignity. They postulate that the maximal production and distribution of these values on a universal basis is the key to improving the human prospect and approximating a public order of human dignity. This means that the prescription, application, and enforcement of the fundamental values behind human rights remain a major professional challenge to *homoeconomico-politicus* and its focus on the importance of global governance remains afar off the global processes of governance charged with the defense of global public order. We may conclude that value needs are a condition and a consequence of focusing and directing the energy of the human perspective into concrete operations that establish institutions concentrated and specialized to value realization. In this sense, values and needs are incentives that generate a self-directed force, which ultimately evolves into institutions of effective power crucial to the allocation of values. It is possible to see these generalizations in the evolution of the sovereign authority of the nation-state and its own evolution from state absolutism to sovereignty routed in people's expectations. Another insight of this model is found in the notion that the power process itself is energized by human expectations, especially expectations of demand. Without demanding or claiming an

aspect of social power, society would be static. Thus, we see in the power process, the social activist. In the United States, Rosa Parks resented segregation in public transportation, so she staked a claim to repudiate racial discrimination in public transportation. Gandhi was thrown off a train in South Africa because he was not white. He initiated a claim to challenge the power of the state to impose unjust discriminatory laws. His challenges to the power process brought him to India as a leader of the Indian Independence Movement. Nelson Mandela challenged apartheid and indicated in open court that he was committed to human dignity and democracy and that these ideals were ones that he was prepared to die for. Therefore, it is important that we have a clear understanding of the process of effective power, and what the limits and strategies are for mobilizing bases of power, to effect meaningful social change. It is quite obvious that scientific consciousness, driven by a commitment to scientific social responsibility, will have to carry a significant level of commitment in utilizing social power so that the results of technology serve human purposes that are constructive and avoid those that are destructive. As Einstein suggested, the development of science and technology should be a blessing and not a curse on human kind.

"The problem with regulating science is the problem that it will be regulated by a politically ignorant constituency, who may seek to appropriate technology with selfish special interests."

From the perspective of an enlightened *homoeconomico-politicus*, concerned with science, consciousness and values, the following framework is provided as value-conditioned guidance for the technological innovators of our time and the immediate future.

8. Value Frameworks to Guide Scientific Consciousness and the Social Responsibility of *Homoeconomico-politicus*

1. *The value of life:* This is a centrally valued human subjectivity. It is referred to not in the "pro-life" sense (that a pregnant woman must bear a child), but in the Bill of Rights sense (that a person has the right to personhood and autonomy). The value of life, therefore, includes the respect and deference given to the individual in the global community.

2. *The status of the value of power and security:* Should it be narrowly or widely shared? Is the common interest of all honored in a system that seeks to secure the widest possible participation in all key areas of the power process? One of the central values identified in the Atlantic Charter was the freedom from fear. This concern for freedom has evolved so much that today no one denies that there is a critical interdependence between the concept of peace as a human right and all the other values in the UDHR. Peace and security might well be included under the functional category of power. However, peace is recognized as a complex peremptory component of the human rights value system. It is of value to again recognize that there are complex ways in which all human rights values have an influence on peace and security, recognizing as well that peace and security at

all levels are critical conditions for the effective mobilization of human rights values. A central aspect of the values of peace and security relates to the connection between the mobilizing force of strategy for the realization of human rights goals and the realization of these goals themselves. For example, is it appropriate to deploy violent strategies of action to achieve human rights objectives? Is it appropriate to disengage the value discourse involving strategy and struggle on the one hand and idealistic value objectives on the other hand? Gandhi, for one, insisted that the morality of struggle was even more important than the morality of distant idealistic objectives. Indeed, he also insisted that a disconnect between struggle, strategy, and goals was morally indefensible.

3. *The status and value of economic and wealth processes:* Is the common interest of all better secured by optimizing the capacity to produce and distribute wealth or the opposite?

4. *The status and value of respect and equalitarian values:* Should invidious discrimination be fully prohibited (covering all areas of race, gender, alienage, etc.)? Can equality be meaningful if it is only a formal, juridical idea without regard to the legacy of exploitation, repression, and discrimination? The repression of equal opportunity is also an invidious denial of liberty.

5. *The status and value of educational and enlightened values:* Should these values be widely produced and distributed or narrowly experienced? In the context of science, the critical value that secures scientific innovation and the liberation of scientific consciousness is the freedom of inquiry. The challenge posed by dramatic technological innovation is that further scientific consciousness will generate an internal process focused on scientific responsibility and a deeper sense of the value implications and consequences of technological innovation. The problem with regulating science is that it will be regulated by a politically ignorant constituency, who may seek to appropriate technology with selfish special interests. *Homoeconomico-politicus* has a critical role to play in the transmission of shared enlightenment.

6. *The status and value of skill and labor values:* The centrality of labor and skill values to the human condition indicates that these are central and fundamental values implicated in the rights and expectations of those who seek to create and sustain these rights and labor values. Should these rights and expectations be widely shared or narrowly shared? The global crisis of massive unemployment would seem to impose a special responsibility on *homoeconomico-politicus*.

7. *The status and value of health and well-being values:* The delivery of reasonably formulated and accessible healthcare and social services to all is now widely regarded as a crucial entitlement, if the most basic standards of decency in politics and society are valued. Today, unemployment aid, social security, Medicare, and other social services are considered crucial to a society that cares for its people.

8. *The status and value of the family and other affective values:* Because the family is the basis of collective existence and is central to the human rights of children, the public

policies of a society that destroys family (and other affective ties) pose a problem for the wide generation of affective values including the loyalty values of patriotic deference.

9. *The status and value of moral experience and rectitude:* A system that endorses the centrality of moral experience to the legal and political culture and seeks to maximize the spiritual freedom of all is yet another of the central themes of human rights. Rectitude should never be a foundation for sectarian and ethnic conflict.

10. *The status and value of cultural and aesthetic experience:* The term 'cultural' includes the concept of the aesthetic. In fact, the word "cultural" could encompass all the value preferences that we might extract from the UDHR. There is, however, a narrower meaning that the term culture might carry. That meaning ties in with the notion of human rights as also emblematic of the diversity of human experience, experience that reflects the cultural richness of humanity as a global community. There is great controversy about the issue of culture and tradition, culture and creativity of the present, culture and the elaboration of the aesthetic, which may capture and nurture the cultural narrative of creativity and beauty which may in fact be the critical psychological view of how the glue of social solidarity promotes creativity. The boundaries of this discourse are controversial. Sensitive matters of sexual regulation which may differ widely may be justified by culture and yet here the culture of tradition may not be compatible with the culture and creativity of the present or the future in human rights terms. For example, female genital mutilation justified by cultural tradition is not justified by either religion or by the science of human sexuality. Human rights thus provide a process by which these boundaries may be appropriately protected and expanded according to the normative challenges of human dignity. The current discourse often suggests that universality trumps cultural relativity or vice versa. This is not necessarily helpful unless one sees these ideas as only the starting point for value clarification and application from a human rights perspective. Aesthetics should never be a foundation for demonizing vast sectors of humanity.

11. *The status and value of the eco-system:* Today, we recognize a complex right to a viable eco-system on what theorists have seen as Spaceship Earth. The values embedded in the protection and promotion of a healthy eco-system are, like many other values, issues of complex inter-dependence and inter-determination. However, implicit at least in the concern for the integrity of the eco-system is clearly the notion that there are no human rights if there is no environment in which human beings can survive and possibly even improve the human prospect. But this insight suggests an even higher level of moral consciousness in the sense that the eco-system (with its plant life and animals, wild and domesticated) is part of a complex cycle, in which human beings are both custodians and also utterly dependent as individuals and as society. This means that we now see in nature not something irresponsibly exploited and destroyed but central to our identity as a sentient species. To take a simple example, for all the vaunted technology of human progress and human egotism, no one has seen a dog or a cat or a rat or indeed the most elemental of recognizable life forms outside of this lonely and unremarkable planet called Earth. Thus, as humanity, we now look at life even in its most humble forms as

not only indispensable to the interconnected chain of life on this planet but we see in it something new and utterly connected to the very consciousness of being human and being alive. In short, we know that our dogs identify with us. We may now know those ordinary pets in terms of how they and all other living forms have shaped our identity both psychologically and physiologically. The integrity of the ecosystem requires a form of identification from *homoeconomico-politicus* that is sufficiently comprehensive to cover the entire Earth Space System.

9. *Homopolitico-economicus* and the Challenge of a Green Economy as a Critical Eco-System Value

In this paper we seek to clarify the salience of *homoeconomico-politicus* and the challenge of climate change. Climate Change is a good tool to better understand the idea of *homoeconomico-politicus,*[*] consciousness and social responsibility for values. Climate change floundered at the Copenhagen conference because of the determined efforts of the climate change deniers lobby.

The Fossil fuel industry is in effect responsible for the overwhelming contribution of greenhouse gases to the looming crisis of climate change.

The concern for the development of a global mandate on climate change through the good offices of the UN had to confront a longstanding global problem: the division of the world community of states between the rich and the impoverished. Since a lion's share of the carbon emissions in the atmosphere was generated by the rich industrialized countries, there was a lingering concern about the price and distribution of the price for reducing carbon emissions in the world community. Since the poor states made a negligible contribution to greenhouse gases in the atmosphere a question of justice and fairness seemed to emerge. Why should they share in the cost of the reduction of greenhouse gases when they are not responsible for the crisis? More than that, the predictions of the crisis could spell catastrophe for poor states.

Perhaps these states should be the beneficiaries of financial assistance from large states to convert themselves to green economies, and to compensate for the damages they suffer. Clearly, in attempting to move forward there needed to be some formula for allocating responsibility as fairly and as universally as possible. Perhaps the most important outcome of the Paris accord is that every country is a stakeholder in the problem and must commit itself to a constructive role in reducing greenhouse gases in the future. Most countries were persuaded to come up with plans as to how the economy would respond to cutting carbon emissions through 2025-2030.[†] In this context, every state is required to come up with a plan without a specification of the extent to which individual countries would cut emissions.

The agreement is not in the form of a treaty.[‡] It will only become technically and legally binding as an international treaty when at least 55 states which together represent 55 percent

* The best studies on the role of the political and economic personality types can be found in Lasswell, H. D., & McDougal, M. S. (1991). Jurisprudence for a free society: Studies in law, science, and policy (Vol. 1). Dordrecht, Netherlands: M. Nijhoff. Pages 399-472, 473-507,509-523,525-555 and 591-630.

† European Commission. (2015, December). Paris Agreement. http://ec.europa.eu/clima/policies/international/negotiations/future/index_en.htm

‡ For a full discussion of contemporary theories of international law-making, including the emergence of international economic soft law, see Nagan, W. (2007). Communications Theory and World Public Order. Virginia Journal of International Law,47(3), 760-774.

of global greenhouse emissions adopt the agreement within their own legal systems as a form of treaty ratification. Even assuming that this happens, the question would still remain as to what the legal responsibilities are of the other approximately 100 states. We would contend that the agreement as it now exists is not without an element of a juridical *imprimatur*. In effect, the agreement contains in terms of its background, the core elements of the creation of a form of international soft law, and this would appear to have an approximation to the development of a form of customary international law. The reasoning is as follows.

This agreement depends upon the good faith obligation that international law imposes on states, which establish public declarations of the nature and scope of their duties. The good faith obligation implies that these will be legally binding on the states. Thus, the binding effect of the agreement is not in the agreement itself but a matter of the customary international law dealing with the rights and duties of states. The agreement contains a legal expectation that states are required to reconvene in good faith every five years starting in 2020 indicating in good faith their updated plans to strengthen their emissions cuts. States were also required to reconvene every five years starting in 2023 to publicly report how they are achieving their emissions cuts, compared with their stated plans. Moreover, the agreement requires states in good faith to monitor and report the state of their emissions levels and reductions using a universally accepted counting system. This approach was achieved largely because the Obama administration did not want an agreement specifying specific levels of emissions reductions. Of course, such an agreement would in effect resemble the form of a treaty and the U.S. administration would have to submit it to the senate of its advice and consent.

In short, the standard of emissions set in good faith by states is voluntary but there is a legal requirement that they publically monitor, verify, and report on their progress. This model seems to work on the principle of transparency as a foundation for global peer pressure on states. States therefore will not want to be embarrassed by falling short of their own commitments. It is by no means clear that these steps are both necessary and sufficient to avert continued disasters triggered by the climate change process. In the Unites States itself, various states have experienced massive floods, including the states of major climate change deniers. To get the poorest countries onboard, the preamble of the agreement indicates that $100 billion dollars is promised to help the poor countries adapt to a desirable green economy and to mitigate some of the damages of climate change.

The principal feature of the climate change agreement is the target of holding the average global temperature to a figure below 2 degrees Celsius above pre-industrial levels. In practical terms this means that, the temperature increase on the planet should not increase above 1.5 degrees Celsius above pre-industrial levels. The idea of limiting the global temperature to 1.5 degrees above pre-industrial levels means that there is a concrete goal to stay well below 2 degrees. Scientists believe that this would likely ward off the worst effects of climate change.[6] No one is exactly sure what the triggering point is that would melt the entire Greenland ice sheet as well as the West Antarctic ice sheet. It is possible that staying below 2 degrees Celsius would trigger such catastrophe. However, the odds are much better if we stay 1.5 degrees Celsius. It is not necessarily clear that the 1.5 target will be achieved by pure reliance on voluntary state action. Even if it is achieved, it is only a scientific guess that this will be

sufficient to overt the worst consequences of climate change. The position of this economic forum is that the target of 1.5 is a bare minimum to be attained and if it could be improved upon, it would secure a greater safety net for humanity. Additionally, the fact that the agreement is not a treaty of hard law does not mean that it has no juridical effect whatsoever.

"Green growth can be achieved by the recognition of human capital's basic resource, human creativity."

In this regard to this target, the target temperature aspiration is not mandated as a matter of international treaty law. It therefore does not have the status of hard international law would require advocacy from the XII International Colloquium and its allies that the agreement is still binding as a matter of law. However, it does have important juridical characteristics, sometimes defined as international soft law. The idea of soft law means that the binding character of the agreement is a matter reinforced by indirect methods designed to give the agreement the force of international obligation. First, the agreement comes with a consensus of 150+ states. The agreement comes with strong support from the international scientific community as well as important scepters of learned societies of the international social process. The agreement comes with a strong support of a multitude of organizations constituting the civil society of the planet committed to environmental integrity. The agreement is supported not only by states, but also by civil society, learned societies in the arts and sciences, specialist communities in the sciences, and those committed to environmental integrity.

Additionally, the agreement comes with the institutional support of the foundations of authority of the United Nations system itself as well as other organizations of nation states at different levels of global society. Specialist aspects of civil society concerned with human rights and humanitarian values are also lined up in support of this agreement. This adds up to considerable strength in the foundations of the authority component, which is a critical part of the dynamics of international law making. The other important component of international law making is the component loosely described as the controlling intention designed to give prescriptive force to the obligation. Here the controlling intention is reflected in part in the good faith expression of intent to abide by the agreement of at least 190 sovereign states. In general, the good faith expression by a sovereign state that it intends to respect a prescription it has openly supported or advocated is enough to secure the notion that the agreement has sufficient controlling intention, which along with the authority signal gives it the force of law. Additionally, the agreement requires a public commitment to the scope of the obligation with regard to emissions reductions that the states openly subscribe to. This public commitment includes a threshold publication of the state's plan of action in the future, and a reporting of the results of its action, which requires global transparency. This provides an additional lever to support the seriousness of the controlling intention of the sovereign states' commitment to emissions reductions. The active monitoring of the process by the United Nations itself, as well as a vast constituency of members of civil society including specialists in local politics, environmental advocacy, scientific expert knowledge, human rights organizations, and highly respected learned societies, reinforces the controlling intension of states.

Finally, international law making does require clarity in the expression of the specific prescriptive expectations that the agreement entails.[7] Since the states have stated what the prescriptive expectations are, this provides a degree of clarity in terms of the prescriptive expectations that a state is obliged to honor. Thus it would seem that at least in the context of the specific objectives of state action in reducing carbon emissions there is without a doubt a binding obligation on the part of states and their subjects to respect their agreements that the states have agreed to having the force of binding international soft law.

The most important aspect of giving the human efficacy is the recognition that within states major corporate and industrial enterprises are largely responsible for greenhouse gases.[8] This puts the controlling intention of the state against the self-interest of the corporate and industrial sector within a state. This is a challenge that has to be confronted. The most significant cause of pollution lies with the fossil fuel industry. Modern society owes progress to energy. To change this confronts not only corporate interests, but also the interest of workers dependent on the fossil fuel industry. There has to be an alternative and that alternative would depend in part upon radical new thinking, envisioned in the new economic thinking of this economic forum, as well as the economic thinking behind the policy and progress of the global sustainability movement. The fundamental challenge lies in the shift on a global basis from the total dependence on the fossil fuel process to an alternative approach to meeting global energy needs as well as producing energy that eliminates the flow of greenhouse gases into the atmosphere. Experts maintain that the fundamental challenge of stabilizing the global climate via green economic growth is a matter of fundamental policy choices.[9] Those policy choices have to be made on the basis of new economic thinking which makes as its fundamental postulate, the vital importance of human capital. Green growth can be achieved by the recognition of human capital's basic resource, human creativity.[10] We must therefore creatively take stock of how to make buildings, transportation systems, and industrial processes, energy efficient. This would have to extend to offices, homes, residences, cooking equipment, automobiles, and public transportation.

The recognition of human creativity must be sustained by a commitment to major investments in clean and renewable energy. This includes solar, wind, geo-thermal, and various scales of hydroelectric power. If we are willing to recognize the genius of human creativity in creating a carbon neutral environment, experts estimate that an investment of 1.5 percent of the global GDP will generate effective and alternative energy policies for all countries at any level of development. Such large-scale investment in clean energy would help raise efficiency standards in buildings, expand public transportation, and replace fossil fuels with clean and renewable energy. It is further estimated that such investments will pay for themselves in 3-5 years. These investments will have to come from both the public and private sectors. The attractiveness of green energy would mean that energy costs would be reduced for all. If a carbon tax is placed on fossil fuels, then the price of fossil fuels will be far more expensive than green energy. A policy commitment to green energy would enormously expand job opportunities. It is estimated that if the U.S. spent 200 billion a year on the green energy economy, it would drop U.S. emissions by 40 percent in 20 years and

create a net increase of 2.7 million jobs. If India spent 1.5 percent of GDP on the economy, a 20-year program with these investments would create more than 10 million jobs a year. Other illustrations are equally impressive.

> *"Scientific leadership must be more articulate in the defense of the values that sustain a creative, dynamic, and responsible scientific, economic and political culture as an indispensable foundation for an improved world order based on human rights and human dignity."*

The real losers will be the fossil fuel industry and the mega-corporate giants that own it. It is estimated that they stand to lose $3 trillion in values over the next 20 years. Clearly, the petroleum industry will not take this lying down. Hence, the real problem is with green energy and greed energy. The losses of the fossil fuel sector may be somewhat tolerable if the losses are averaged out over 20 years coming to about 150 billion a year. One major issue that the mega-giants of the fossil fuel industry must consider is that the holdings of the largest 200 corporations in the fossil fuel sector hold assets, which indicate that 60 percent of those assets are unburnable. This is an important issue for investors and already some 456 institutions investing some 2.6 trillion dollars have committed themselves to this investment, or to reinvestment in clean energy.[11] Others have already looked at diversification of their investments. For example, Warren Buffet, a famous corporate investor, doubled his holdings in solar and green energy companies in the amount of some 50 billion dollars. It is important that this economic forum use its good offices to illustrate to the major players in the fossil fuel industry, the importance of their diversifying their energy enterprise in the direction of green clean energy. The XIII International Colloquium should emerge with a declaration in support of universal clean green energy.

10. Conclusion

This paper has sought to clarify the salience of the difficult concept of scientific consciousness, and its implications for *homoeconomico-politicus,* and the importance of cultivating that consciousness not only in creative ways but in ways that are morally and ethically compelling. This means that consciousness should be alert to the dynamics of positive and negative sentiment in the shaping of the technological paradigm of the future. Even more importantly, it is crucial for scientific consciousness to self-regulate itself by being better informed about the values it seeks to promote and defend. Successful self-regulation of science avoids the danger of control and regulation by forces completely ignorant of the implications of science and technology. This means that scientific leadership must be more articulate in the defense of the values that sustain a creative, dynamic, and responsible scientific, economic and political culture as an indispensable foundation for an improved

world order based on human rights and human dignity. This issue is made practically relevant by the challenges demanded for economics and politics equal to the challenge of climate change for the earth-space community.

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Socioeconomic Challenges and Crises:
Brazilian Illustration and the Search for a New Paradigm*

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Abstract

Economic Neoliberalism in its most perverse form has been recapturing the imagination of policy makers worldwide. It emerged in the context of a prolonged crisis, increasing unemployment and unsustainability in the public sector. Growth slowdown reflects several factors, including domestic errors of economic policies, lower commodity prices and structural bottlenecks. To overcome these problems, most of the dominant governmental proposals, reminiscent of questionable austerity strategies, reflect the Washington Consensus' vision. Such a framework—mainly enforced by the financial elite and stimulated by the supporters of fictitious capital—underestimates the intricacy of fragile economies and does not answer some fundamental questions regarding their policies. Neoclassical-economics-based dominant austerity actions are not a proper scheme to deal with the vast challenges faced by some nations. Actually, we need a careful construction of a new multidisciplinary—socioeconomic, political, environmental—theory and programme to deal with the roots of our problems. This article sheds insights into the much needed new paradigm for those concerned about the required top-down reforms worldwide.

"We need a new comprehensive and multidisciplinary socioeconomic theory that markedly differs from the present situation and in this vein makes a positive contribution in setting the ground for a new framework."

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1. Introduction

It is easy to identify periods in which countries want to fully integrate themselves into the international market, counterbalanced by frequent calls for self-sufficiency and the need to strengthen State control over important sectors of the economy. Most actions taken by several governments have barely been internally consistent with fair economic development

in the sense of tackling, simultaneously, the targets of sustainable growth, reasonable income (and wealth) distribution, as well as monetary stability. Most governmental policies tend to work like a frictional pendulum, dominated by confronting experiments and obstacles. Some countries are on the verge of socioeconomic collapse. The conflict between the need to avoid several fragilities and the powerful opposition from those privileged and corrupted by the current state of affairs is quite obvious.

As pointed out by Teixeira & Ferreira (2015), in most of the countries, the economic system is more and more deeply in the hands of domestic and international finance, and the value of capital is to a large extent fictitious, bearing only a very remote relation to assets that it actually represents. It means that we are in the world of "financialization". The present power of fictitious capital dominates a significant part of the relationship between debtors and creditors. The debtors have difficulties in meeting their financial obligations since the creditors set severe conditions that the debtors have to meet. Such hegemony violates fundamental values and principles on which a democratic and fair society must be based. We need a new comprehensive and multidisciplinary socioeconomic theory that markedly differs from the present situation and in this vein makes a positive contribution in setting the ground for a new framework. The search for a new vision involves burning political and socioeconomic issues. Without a profound humanistic theory, which can produce significant actions, we are risking increasing uncertainties about democratic civilization. Contemporary financial system exerts a devastating power over the majority of society with the implementation of targets mostly linked to their non-humanistic preferences and magnitude of their perverse influence.

Some of the social implications of the neoliberal economic view over humanity are too obvious, including the negative impact of rising levels of inequality on overall welfare and the recurring economic crisis. Besides, in many ways, such a paradigm stimulates conflicting rather than co-operative behaviour; no single economic policy fits all states and regions. In most countries we have enormous regional and socioeconomic disparities. Opportunist economists and politicians, to a large extent financed by the banking system and multinational organizations, simply reiterate the need to follow the path of orthodox stabilisation, standard monetary and fiscal adjustments—"la Nave Va," as Fellini called it.

In this vein, alienation, corruption and fragile institutional arrangements lead to considerable problems. When wrongdoing involves ignoring lamentable political stress and persisting in sticking to treatments that are not working, we cannot excuse the heavy State apparatus from the roots of such affairs. On the other hand, it is rather suspicious to suggest that the market is prepared to guide its proper role, without fair controlling mechanisms by society and desirable institutions. The reasons are straightforward: i) one has to be very careful in making 'naïve' neoclassical analyses a success or a failure in the short and long terms in economic strategies generally; ii) it is necessary to understand the complex institutional conditions of each country; iii) the 2008 international economic crisis generated broad skepticism among serious decision makers worldwide, but the impact of such disturbance was not enough to stimulate innovative ways to engage policy makers in a solid shared new vision to correct the dominant approach.

As it is well known, historically, most economies have been involved in profound forms of financial manipulation, creating unheard-of profits and manipulating interest rates for both domestic and foreign speculators. Furthermore, money switches quickly from a once highly valued sector to another, in the same way it moves from country to country, despite some domestic attempts to bring up a "favourable climate" for investors. Schumpeterian innovations are scarce, but the financial and political retribution to the "fictitious entrepreneurs" is almost unbounded.

It is necessary to make a clear distinction between desirable investments and speculative ones. It happens that in this epoch of fierce globalisation and prevailing vision based on the extreme form of neoliberalism, international finance follows two paths that often cross each other. One is that of multinational corporations engaged in acquiring and creating enterprises, extending their influence but rarely expanding towards fair competition. The other is the international funds, channelled to many economies in search, essentially, for fast and non-risky returns on investments. This "financialization" plays a pivotal role in contemporary capitalism. As pointed out by Saad-Filho (2011, p. 244), it *"... facilitates the concentration of income and wealth and supports the political hegemony of neoliberalism through continuing threats of capital flight"*.

In virtually all major industrial nations, an important component of wealth and income inequality is the prevailing increase of revenue at the top of the income pyramid as pointed out by Piketty (2013). The same phenomenon occurs in the emerging countries. For instance, in the case of Brazil, despite the relative economic success, mainly in the first decade of this century, regarding policies to reduce poverty and actions to increase minimum wage, personal and functional income and wealth distribution are so unequal that Brazil still ranks the first amongst the most unequal countries in Latin America. In recent years, the "*dispute settlement system"* changed again, intensifying and widening the gap between the very poor and the very rich. The socioeconomic elite, to a large extent associated with the financial system, have been getting rich faster due to well-known adopted measures, including corruption. Rapidly rising expectations from the past are being substituted with frustration and tension nowadays. De-industrialization, increasing rate of inflation and unemployment accompanied by declining real wages are becoming dramatic. This also occurs in many other nations.

In 2015, the neoliberal economic policies which the authorities tried to impose on Brazilians have perplexing components concerning the nation's fragile socioeconomic reality, elevating the portfolio of a "social strata" whose profile is easy to identify. Naturally, the country needs a modern infrastructure, reduction of the bureaucratic process, to pay attention to fiscal policy, to take action with regard to high pensions and super rents in the public sector, to punish corruption, etc. It is required to make the country adapt fair integration into the global economic system and changes in social aims and technology. It is necessary to improve education, public health, financial stability, basic investment in infrastructural sectors, etc. Such actions involve the forces of the market, but the state must play an acceptable role regarding the promotion and protection of the less fortunate in society. This means to seek development with human dignity, as pointed out by Bhaduri (2005).

"The hardest task is to change deeply held attitudes."

In Brazil, as in many countries, capitalists love state financial support, but hate to take proper risk and embrace fair competition. Actually, governmental disputes and political parties are dominated by big enterprises and politicians financed by large-scale business. Financial control, fair labour relations, adequate industrial organization, necessary regulation and many other jargons, mainly emerge domestically in the form of an illusion. Unfortunately, it is often taken for granted that economic reforms of the kind suggested by different versions of the proponents of the Washington Consensus are a proper doctrine to use in similar situations [see Stiglitz (1998) for the opposite view on perverse monetarist approach, including the deepening of the mighty "financial market"].

This article is just a necessary step towards a deeper criticism in search for another order. The new order necessitates building up of a more humanistic theory and desirable policies to correct mistakes, including environmental ones, without penalizing the poor and an equal and fair distribution of wealth in all nations. Now that the disillusionment with the current state of socioeconomic and political affairs seems to be creating considerable distress, the need for a new vision may well get a fair hearing at last. The hardest task is to change deeply held attitudes. Jacobs & Šlaus (2013) summarize key elements for an alternative paradigm.

In section II, we will summarise and criticize the dominant literature and then pay attention to a scheme of growth, distribution and accumulation for an open economy in which finance and active government as a whole are essential. The environment is also a *leitmotif* but needs to be given more emphasis. Section III, as an illustration, is concerned with the performance of the Brazilian economy in the light of the current scene of potential diving into the quicksand of socioeconomic damage. We also criticise the prevailing version of the Washington Consensus as a framework to deal with the nation's socioeconomic and political troubles. Section IV emphasizes the importance of fundamental questions not properly answered by the orthodoxy. Section V has our concluding remarks.

We hope some of the issues discussed here will alert us on the necessity of a fundamental revision of the dominant economic theory and instruments to tackle the crisis and paradoxes which sustain the current socioeconomic policy. We need an alternative and a multidisciplinary paradigm to provide an alternative way to solve fundamental problems, not just for Brazil but for all countries.

2. Aggregated Economy and Extensions

2.1. Dominant Approach

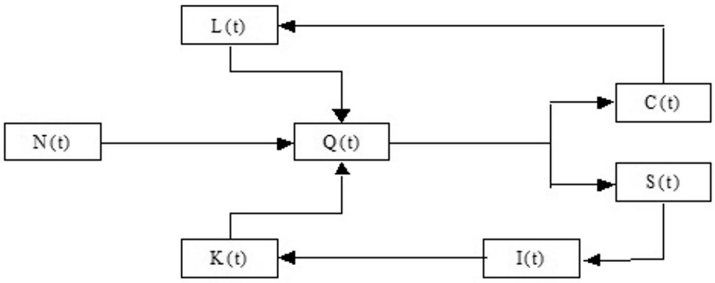
The basic neoclassical model of the capitalist process of growth and distribution is expressed basically in the form of a single good in a closed economy where the government plays an insignificant role. Such a scheme has a very simple feature and its deficiencies are very serious. It tends to evade fundamental questions on the role of money and investment. As a result, the dominant model fails to clarify the relationships among several issues which should be considered in the process of economic development. The degree of complexity in this

matter can be better appreciated if we argue that the basic neoclassical growth model, besides the deficiencies already mentioned, does not take into account money and international trade. Also, the environment and waste are not included.

Let N be the environment (land), L the homogeneous labour force and K the single capital stock. They are inputs to the flow of output, Q, leading to consumption, C, and savings, S. According to a very simplistic version of this neoclassical standpoint, the single good is both a production good and a consumer good. S has precedence over investment which is completely invested, expanding the stock of capital. Uncertainty is completely ignored.

Before moving to figure 1, it is necessary to indicate that this simplified formulation of the neoclassical approach is supposed to conform with the "Occam's Razor Principle" in the sense that models are not expected to provide full explanations. They are abstract and deal only with a selected number of relationships. The conclusions follow from the premises that models should contain as few components as possible. Surely, this is a methodological oversimplification; after all, we are dealing with social science. Furthermore, when conclusions follow from oversimplified premises, we are in the midst of a self-reinforcing circular argument, not a scientific truth or a model of the real socioeconomic and political world.

Fig. 1: A Simplified Scheme of Growth and Distribution



Notice that the scheme above does not involve finance, and theoretically it is mainly concerned with production and expenditure of a single good, corn for instance. This is a simple starting point, an accepted preliminary construction, a barter economy, which will eventually be extended to include the monetary economy. Another interpretation would indicate that money is neutral. Some economists would also argue that in a modern credit economy the money supply is endogenous. It accommodates itself to the needs of trade, so that there is a reversal of direction of causality between money and expenditure as well as between savings and investment, but this is not the conventional view.

A typical orthodox neoclassical interpretation of the simple scheme assumes the existence of a simple commodity and technological framework relating capital and labour. Land is neglected. Consumers maximise utility, given the budget constraints. Producers maximise

profits, given the flexible relationship among inputs. Assuming perfect competition, the economic system would fully utilize capital and labour since they are supposed to be payable according to their marginal contribution (utility). The structure underlying such oversimplified vision tends to be perverse since, for instance, the prices of the environment/ exhaustible resources are not taken into account.

In such a decentralised institutional framework, involving pure competition, the behaviour of the agents is perceived, essentially, in subjective terms and "Say's Law" thus applies. Actually, this approach does not provide a reasonable explanation for most of the troubles of any real economy even when we expand the output from a single commodity to multiple commodities, not to mention the role of corporations and the distorting power they exert over the theory and practice of modern capitalist economy.

The limitations of the above approach are very obvious. Is mainstream economics prepared sufficiently to welcome open-minded discussion and in this vein to reduce the magnitude of its influence both in academia and economic affairs? Theoretically, what role should government play to counter or offset the distorting influence of the rising levels of corporate power, wealth and income inequality on markets? No doubt, the impact of rising levels of inequality on overall socioeconomic welfare and wellbeing merits careful attention. As pointed out by Teixeira et al (2015, p.148), *"The common position on efficient allocation of resources remains founded on self-interest and Pareto optimality and is inadequate for treating the complexity of the real world"*.

Such premise is obviously irrelevant in a world in which egocentrism instead of cooperation is considered as the most important value to curb socioeconomic and environmental disturbances. Furthermore, the investment activity that is financed leads to variation in effective demand but we always need to pay attention to significant differences in the social and human value of speculative and fictitious investment versus investment in the real economy.

For instance, what is *"Capital"*? To Marx (1983) it was a social, political and legal category. According to him, *"capital"* could well be money and machines, could also be fictitious capital, but the essence of it was neither physical nor financial. It was considered the power that gives capitalists the authority to make decisions and to extract surplus labor from workers. In the neoclassical theory, resource utilisation assumed the dominance of a market clearing process involving either full employment or a natural rate of unemployment, and in the long term, balanced growth. These outcomes require a *"happy"* financial market. The focus of such analysis is the promotion of competition. Neoclassical economists tend to believe that such a mechanism will lead to stable equilibrium and maximal utilisation of disposable resources. This standpoint tends to ignore the special problems posed by the necessary transformation of demand for future resources into demand for resources now.

2.2. Socioeconomic Accounting System, Distribution and Sustainability

Neoclassical apparatus is mainly concerned with resource utilisation but the real problem in modern capitalism is with resource creation and the distribution of income and wealth. In

other words, how to expand investment (thus, accumulation, growth and employment) and how this process is financed. From a simple accounting standing point, as indicated by Keynes (1937; 248), *"'Finance' and 'commitments to finance' are mere credit and debit book entries, which allow entrepreneurs to go ahead with assurance".* The existence of a satisfactory combination of these components may well be necessary, but not a sufficient condition to attain a high rate of economic growth, sustainability and simultaneous distribution. Thirlwall (1994) argues that the effective constraint for long-term steady growth, at a high rate, is the long-run rate of growth of exports, combined with the long-run elasticity of demand for imports in relation to the national income (output). Kaldor (1971), who dealt with conflicts in national economic objective, was one of the outstanding economists and policy makers of his generation to question the traditional foundations of the fiscal and monetary approaches, theories and policies.

There are some relevant structural components missing in figure 1. On a number of fundamental issues on this theme, see Nagan (2015). He mostly writes about causes of the current challenges and opportunities so as to formulate an integrated and comprehensive strategy towards the promotion of an adequate change needed for well-being of a nation. Mollo & Teixeira (2008) argue that production, investment, finance, technological change, distribution of income, and institutional considerations depend on macroeconomic conditions that have to be built. For this, a fair and active State is necessary. Dynamic configurations cannot be ignored, since they provide the boundary conditions allowing firms and consumers to function. A profound appreciation of the environment is also fundamental from the point of view of a long-term perspective. Such a complex process cannot be conducted without proper State participation. Adequate regulation is still more important under the condition of significant inequality of wealth, income and political power.

Financial conditions are responsible for the pace of investment and innovation. Long-run interest rates have to be higher than short-run rates, warranting a liquidity premium to savers who choose to lend to long-term investors. But, at the same time, long-term interest rates cannot be higher than the return on capital, or they will inhibit investment. To tackle properly such difficulty requires a low short-run interest rate of public bonds in the market of liquid assets. This denotes appropriate conditions of finance to stimulate innovation and investment, thus increasing income and production. Even if part of the investment and innovation can be financed out of profits, they can be augmented if sound conditions of credit are improved and regulated to inhibit speculation.

In general, persistent budget deficits can cause problems and there are attempts by policy makers to force some fiscal discipline forbidding the government from running excessive budget deficits. Sometimes, the legislation includes rigid rules setting an upper limit on deficits as a proportion of the tax revenue. When the government runs a persistent budget deficit it ends up with substantial debt. A widely used indicator of fiscal health is the debt-GDP ratio. A country with rising GDP can have a stable or falling debt-GDP ratio even if it runs budget deficits over time, provided that the GDP is growing faster than the debt. But this is a hard task since implicit liabilities occur in the form of pensions, social security, medical care and a number of other social expenditures over time.

Seeking profits through investment and controlling the accumulation of capital and the process of sustainable economic development are subject to negotiations between the financial system, businessmen and the government. A profit-flows-based analysis of a real world economy requires that the scheme include money and banking from the very beginning. This is a fundamental requirement in a capitalist economy and one of the most difficult analytical and practical problems to be solved.

Table 1: Profit Flows Analysis of a Real World Economy

C – capitalists L – workers A – reserve labour resources K – capital RD – research and development fund N – natural resources	Cw – workers' consumption Cc – capitalists' consumption Cg – governments' current expenditure W - wages
Ie – investment expenditure Id – Intended Investment Ifd – foreign direct investment F – financial market Fi – internal finance	TF – taxation on with-profits funds Tw – taxation on workers' income Tc – taxation on capitalists' income
E – rentier Y – national product Yw – workers' income Yc – capitalists' income Yg – governments' income	X-M – trade balance S – total savings Sd – domestic savings Sw – workers' savings Sc – capitalists' savings Sg – governments' savings Sf – foreign savings
P – total profits Pi – internal fund of investment Pw – profits accruing to workers	Pg – profit of the public sector Pc – profit accruing to capitalists

History has shown that unconstrained market forces often lead to disaster. On the other hand, unlimited government centrality of economic decisions has promised more benefits than it can currently afford. It is obvious that any analysis that emphasises resource creation has to focus on investment. Actually, it is impossible to consider effective demand in capitalist societies without examining demand for investment. That is, how demand becomes effective and the way investment is financed. This being the case, if aggregate income and output are growing, normally, investment demand in the aggregate requires external financing. As pointed out by Minsky (1983, p.47), *"An implication of this requirement is that under modern conditions money, as the liability of the banking or financing systems, is a product of the investment process. It is not possible to analyse the determinants of effective demand without considering the behaviour of those institutions in an economy that select and finance investment, and in the process that determines the price level of existing capital assets"*.

From 2008, the governments, in most of the economies, did not succeed in maintaining macroeconomic sustainability at acceptable levels of growth and employment. On the contrary, as the socioeconomic crisis erupted, human costs mounted and became an increasing threat posed to stability in most nations. The case of Brazil was, apparently, less explosive till 2014, but the level of the GDP obtained in that year was nearly the same as the value in January 2011. This and the recent crisis will be explained in the next section.

3. Brazilian Economy from a Recent Perspective

Traditionally, the presence of persistent high inflation in Brazil is due to the diverse use of formal and informal backward-looking indexation mechanisms to protect financial assets and personal wealth. Such financial mechanisms tend to protect the upper and middle classes and, historically, have played their part in increasing the concentration of income and wealth. Governments did have difficulties to reduce distribution of income, price distortions, and structural bottlenecks to attain stability and sustainable growth. Troubles with public debt and lack of international competitiveness have been the actual norm of the economy till the late XX century. In period of crises, and in conformity with the *"orthodox wisdom"* established by the Washington Consensus, the Brazilian government, quite frequently supported by the IMF, set in motion unsuccessful stabilization processes. As rightly pointed out by Bhaduri & Nayyar (1996, p.31), *"The principal instruments for achieving IMF-style stabilization are fiscal policy of the government (taxation and expenditure in the budget) and the monetary policy of the central bank (interest rates and credit controls)."*

Both instruments were applied as brakes to reduce the purchasing power under the presumption that it causes monetary expansion and excessive aggregate demand, thus accelerating inflation. In 1992, due to the effort of President Itamar Franco and a group of experts, the Real Plan, a Brazilian singular model to combat inflation, was successfully established and implemented. From 1993 the next president, Fernando Henrique Cardoso, was able to reduce inflation, but the cost of stabilization did not prevent the financial crisis of 1997 and 1998, in his second mandate. To tackle the issue, a number of institutional reforms were required to enable the country to seek broader goals of development. President Cardoso was committed to bringing down inflation and budget deficits, to liberalizing trade, privatizing state-owned enterprises, etc. Those having been done, he believed development would simply come true.

However, such an approach, which emphasizes getting governments out was not successful from a historical perspective.* President Cardoso seems to consider that competition between public and private investment is not desirable, considering the former's capacity to crowd out the latter. This theme is rather controversial. Most of the Brazilian population did not appreciate many aspects of his policy and his party's candidate was defeated in the 2002 election.

During the presidential administration of Luiz Inácio Lula da Silva (2003-06) and (2007-2010), redistribution of income via the expansion of minimum real wages, progressive social

*As pointed out by Bruton (1998, p.926), "The view that an effective market mechanism would appear if government simply removes itself from the economy was implicit in many formulations even though evidence to support the view was rarely offered."

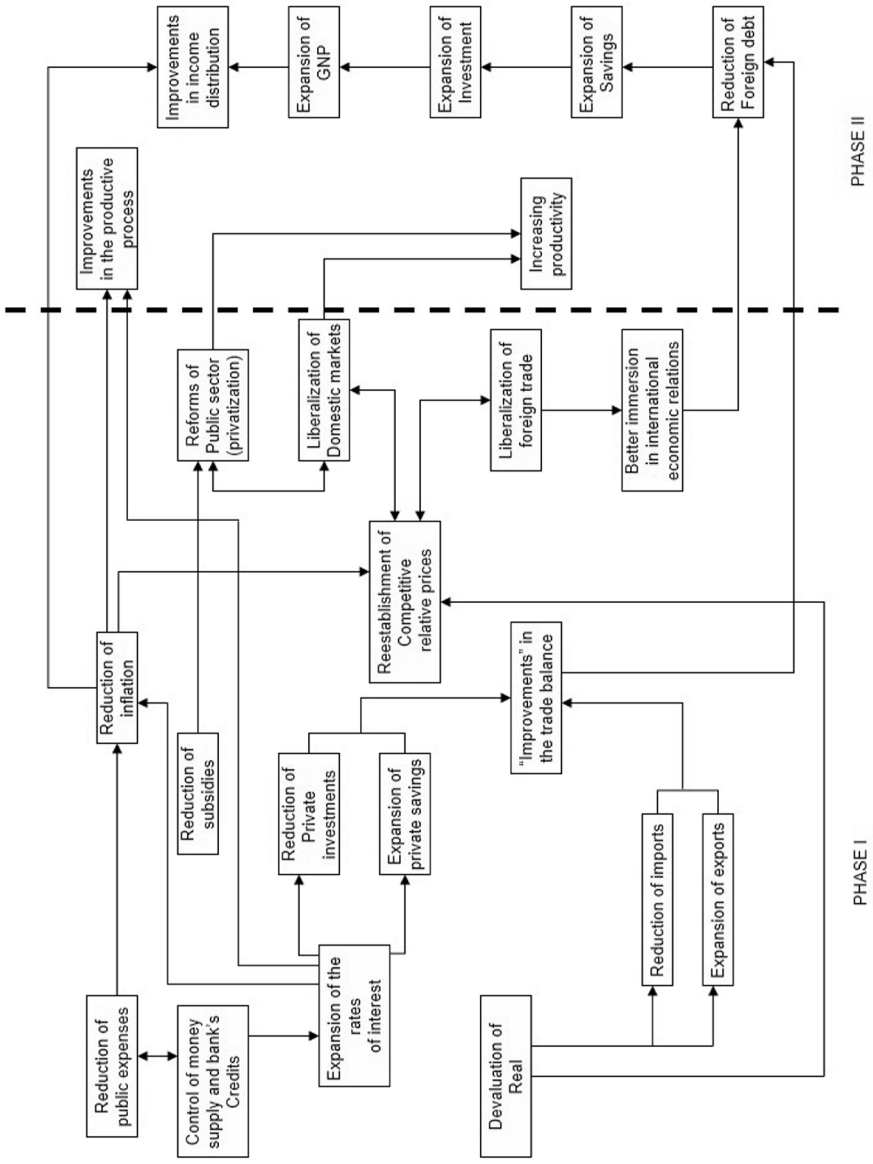
programmes and some control of the exchange rates allowed an expansion of the middle class, household borrowing and the creation of new jobs. Large formalization of the working force was also attained. In its efforts to reduce the impact of the 2008 international crisis, and to not make the mistake of creating too limited anti-crisis policies like Europe did, the Brazilian government may have exaggerated its anti-crisis actions.

The neoliberal press praised President Lula da Silva, arguing that social gains were sustained and market credibility was kept through a combination of policies based on i) inflation target and some central bank independence; ii) almost free floating exchange rates; iii) relative tight fiscal policy. Most of the population and the owners of the fictitious capital were happy. The former President's relative success was also due to the increasing demand, at excellent prices, for Brazilian commodities in China. During that period, Congress was dominated by a coalition of various forces, most of which supported such strategies involving semi-redistributive economic policies. However, the deindustrialization of the country, which started in the 1980s, continued. Lula did not take advantage of the positive economic results to do some essential structural changes. It was necessary to tackle the problems of infrastructural investment instead of protecting fictitious capital, to stimulate competitive technological advancement and to consider a number of institutional reforms.

This optimistic epoch was followed by the period in which Dilma Rousseff (2011-2014) turned out to be the President of the country. Her administration continued to deliver some gains to the working class in terms of employment and social equity. But her strategy was hampered by a number of strategic economic mistakes. She did not understand that the economy was not in good shape any more. Her programme included badly guided actions to support selected industrial sectors, which proved counterproductive, relegating to the sidelines the importance of various features of the Brazilian economy. As time went by, her macroeconomic policies became even more unbalanced. Her main strategy was to continue the strategy towards increasing domestic consumption, despite the well-known criticism of wage-led growth. Kaldor (1971) was highly critical of consumption-led growth policies that neglected the foreign trade sector.

During the presidential political campaign in 2014, Mrs. Rousseff was very unrealistic regarding the real situation of the country, despite obvious problems she was encountering, from the beginning of her mandate in the conduction of her economic policy. Notice that the presidential election of October 2014 was much mistrusted, involving disgraceful disputes among candidates, mistaking financial support to the parties and the ample corruption involving the links between the public and private enterprises became too obvious. During the political campaign, she was very critical of the relevance of alternative economic proposals. But, as soon as she won the election she was compelled, due to the political circumstance, to follow, to a large extent, the opposition counterpart, which had only a limited and conservative alternative macroeconomic programme. Indeed, the political support she got from the Congress and society was very less. Actually, she got lost in political and judiciary troubles. Nobody knows if she will complete her mandate. By the way, the average labor income of workers which increased till 2014, started to drop by the end of that year.

Fig 2: Brazilian Perspective of the Washington Consensus



To resolve the mentioned deepening damages, her government placed, at the end of 2014, a typical neoliberal economist from Chicago in the Ministry of Finance (Joaquim Levy). Unable to implement his simplistic and non-popular austerity initiatives, in December 2015, she replaced him by Nelson Barbosa, an economist who conformed more with her view. The new minister's main mission is to match the surplus of tax revenue in 2016 with the "*Hope Speech*" message to get the economy back on track in 2017. This is a hard task. During her first mandate, too many mistakes were committed such as easy credit boosting demand for consumption goods and insufficient care for supply, backed by her limited understanding of Keynes (1936) and post-Keynesian economists. In this circumstance, power scattered among groups of politicians, big businesses and the profit seeking *rentiers*.

According to our understanding of Kalecki (1943), even higher profits for such group or class do not, necessarily, change their views and opposition since the government-intensive and efficient action (which is not normally the case) would imply an undesirable change in the balance of power. Is Brazil an interesting country for private investors nowadays? Actually, they prefer to take advantage of the fictitious capital. After all, the domestic financial system is very profitable but bankers do not want to get embroiled in a political debate where their customers have divergent views. Fig. 2 shows a scheme with phases I and II of the Brazilian version of the Washington Consensus as the dominant economic engine, where credit and fictitious capital play the central role. In section IV we will deal with some fundamental questions.

4. Some Fundamental Questions

At this point some questions come to our mind: i) Why do sympathizers of the Washington Consensus deliver the same medicine to each ailing developing country? ii) Is it the case that the proposed policies are only introduced if they are in the interests of the domestic oligarchy who will retain wealth and privilege whatever its socioeconomic impact on the people of a nation? iii)Why do orthodox packages of austerity adjustment systematically bring about recession, unemployment and further polarization of income and wealth in countries with basically no social safety nets to protect ordinary people? iv) Why is it that the financial system is so fiercely protected in its speculative operations around the world? v) Are conventional policies implemented because it is believed they really overcome crises in developing countries or are they mainly designed to benefit financial interest in the domestic and advanced capitalist world? vi) Why, in theory, do financial authorities support democratic institutions when, in practice, they undermine the democratic process by imposing imprudent policies that hurt ordinary people and lead to social turmoil and democratic setbacks? vii) Why is the adjustment crusade for internal balance (fiscal responsibility) and external balance (current account equilibrium) always pushing for the reduction of real wages? vii) Last but not least, what should be a fair fiscal and monetary stance of developing countries in the face of recession or economic downturn?

These are some fundamental questions that require a convincing reply. Unfortunately, the proponents of Washington Consensus prefer to apply their approach without answering relevant questions. The country needs sounder socioeconomic policies to guarantee the

necessary conditions for stability, equilibrium, growth and distribution. The required fundamentals may involve a new set of components: i) adequate real rate of interest; ii) inflation rates similar to those of the main international partners; iii) stable and sustainable budget adjustment to achieve long-run equilibrium; iv) competitive and predictable exchange rate; v) creation of working posts; vi) improved distribution of income and reduction of public discontentment; and vii) creation of safety nets to protect the common citizen.

The points above raise further important considerations. For instance, what do we mean by competitive exchange rate? What is the real exchange rate in equilibrium? This ratio depends on the nominal exchange rate and of the prices of non-tradable goods and services. Naturally, it is difficult to have control on the prices of international tradable goods. In the long-run, the real rate of exchange is an endogenous variable. It should be compatible with fairness and sustainable development, and not have its head in the clouds.

"The potential fruitful scientific cooperation among economists and other social scientists needs to be strongly emphasised if society as a whole is to successfully face the multi-dimensional challenges posed by an expanding range of issues."

5. Concluding Thoughts

Scholars of different schools of thought must be invited to take great care of structural changes, the dynamics of prices, production, employment, productivity, human dignity, socioeconomic fairness, environmental sustainability, safeguards for our collective well-being as well as effective governance. Macroeconomic policy should be based on the benefits coming from proper investments in health, education, ecological infrastructures within a democratic political system. Actually, although conventional thinking still tends to believe that crises stem mostly from uncertainty, exogenous and unexpected events, they occur not at random but through the dissociation between fictitious and the real capital, the circulation, production process and injustices which result in further consequences.

Most prominent economic models associated with orthodox adjustment programmes have not brought fairness and income distribution to the centre stage. The typical policy packages to promote structural adjustment have been mostly addressed to meet the demands of fictitious capital. We need a broad and serious alternative analytical framework that takes into account the peculiarities of many nations. This involves a serious change in the socioeconomic theory which must have human dignity and sustainable development as its goal.

It must be said that many difficulties remain to be solved. Their solutions acquire renewed urgency which certainly will raise deeper questions about the wisdom of further acceptance of the accounting system encouraged by the dominant paradigm. Last but not least, the development path characterized by sustainable and high values for increasing the rate of

growth is a very improbable target for a capitalist economy to pursue, with the possible exception of short bursts of Schumpeterian optimism on the part of a subset of entrepreneurs. As pointed out by Dobb (1960. p. 74),*"The reason for this improbability is that such a development-path implies, 'par excellence', an investment in increased productive capacity in the capital goods industries 'in advance' of any foreseeable expansion in the market for them."*

Nowadays, we tend to appreciate more and more fairness in wealth and income distribution and the need to preserve our environment. A straightforward conclusion of our article is that the potential fruitful scientific cooperation among economists and other social scientists needs to be strongly emphasised if society as a whole is to successfully face the multi-dimensional challenges posed by an expanding range of issues. This task requires a profound rethinking of the conventional accounting system, where fictitious capital plays a damaged role. We consider the basic argument that the neoclassical model does not even approximate the real world as very important in order to understand what is happening in the planet. It raises several fundamental theoretical and empirical questions related to markets, money, and institutional power which we hope will stimulate the search for an influential alternative human-centric approach. Our article pinpoints the unsatisfactory state of socioeconomic and political affairs. Perhaps, anxiously, or ambitiously, we have tried to locate steps to a multidisciplinary, humanistic and meaningful theory. The implications of our prospective vision are far-reaching, as the growing number of people and institutions may realize.

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