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ERUDITIO

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

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Eruditio Vision

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

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In This Issue

This issue of *Eruditio* addresses themes as diverse as governance, economics, science and technology, history, international relations and psychology. Each depicts an important aspect of contemporary social reality from a different perspective. Together they depict an assembled jigsaw puzzle image of the world we live in and the interconnected goals we seek to attain. A valid understanding of humanity's current predicament is needed to transcend narrow disciplinary perspectives and embrace their common ground and the integrating principles that unravel them.

The discipline of Humanities is under threat: it has long striven to ape inappropriately and unsuccessfully the natural sciences. It is time to reverse what is no longer an option and seek the knowledge we desperately need from the Humanities which we cannot derive from any other source. The divorce between Science and the Humanities is a sign of the schizophrenia which divides the brittle outer mechanized, objective quantitative world of institutional society with the inner subjective world of values, human relations, insights about ourselves and intuitions about the meaning of life. This schism has been the source of grave problems, the consequences of which we are still trying to fathom, not yet to effectively address.

The degrees higher institutions award in the name of knowledge are a reflection of our fragmented and fractured view of reality and the world we live in. Thus, a new paradigm in education is essential for transforming social reality, for education is the most important instrument for conscious social evolution. The world needs new content and pedagogy which transcend all disciplinary boundaries and reunites the objective and subjective dimensions of reality to forge conscious leadership in thought that leads to action.

This need not take long. There are tangible goals for us to address in the form of SDGs. What makes them extraordinary is, humanity has planned out action items to accomplish by their own volition. Mankind has taken the route of conscious evolution even if it is not aware of it. In that sense, the articles in this issue reveal to us responsibility and accountability will no longer be luxuries but necessities.

Editors

Understanding Society: The Interplay of Reason and Emotion

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...the assumption behind [scientific] consensus is that science is a source of authority. Rather, it is a particularly effective approach to inquiry and analysis. Skepticism is essential to science; consensus is foreign. To expect agreement on all or many aspects of a multifaceted issue would be unreasonable. (Professor Richard Lindzen of the Massachusetts Institute of Technology)

Abstract

Understanding society requires incorporating all of its human dimensions, including both reason and emotion. Emotion has been underplayed because it complicates the study of society, making it difficult to build mathematical models, the emblem of a true science, at least as it has been interpreted over the past several hundred years. Humanistic portrayals of society have thus been marginalized, as also is art, generally, because they undermine rationality, the hallmark of authority in a science-based world. However, science, itself has come to be seen as somewhat emotional, as scholars examine its history, to say nothing of human beings, generally, who are emotional through and through. Other versions of scientific and scholarly research are explored to uncover these dimensions and their interconnections, including recent developments in biology, which focus on the possible importance of consciousness in nature.

1. Science on Trial

Reason was reintroduced into the intellectual discourse in the 12th Century, thanks largely to the Arab philosophers who had preserved as much as they could of the ancient Greek tradition before the introduction of monotheism in the Judeo-Christian tradition. During and following the Renaissance, reason brought a profound change in the human understanding of nature to the extent that we now have enormous power to intervene in nature, sometimes with unintended consequences that might threaten our existence as a species. Reason has also become the guiding inspiration for the understanding of society, to the extent that social science uses it as the basis for theorizing about society in the same way as it has inspired our understanding of nature. One question is: Why would reason not inspire us to alter our behavior so as to avoid any possible tragic consequences of our reason-based interventions in nature?

Indeed, there is a certain dissatisfaction with science today, both from without and from within science itself. There is a degree of irony to this dissatisfaction, resulting as it does

from some of the unanticipated consequences of science in the social world to which science itself belongs. Science in ancient Greece, where it was formalized, was seen as a branch of philosophy, the search for wisdom as the name implies, often with the purpose of dispelling superstition. With the rise of monotheism this connection was greatly diminished. Most of the ancient temples of learning and the written expression of this learning were destroyed and replaced with religious teachings that were to guide human behavior for the next 1500 years or so. Estimates are that only a small percentage of ancient wisdom has survived this evolutionary change:

The ancient world has come to us depressingly fragmented... But the most lamentable, is that this ancient inheritance has been given to us in a mutilated, misunderstood and distorted form by the generations that intervened (Theodorides 1954, p. 1)

During the Renaissance the ability to contemplate this knowledge was largely a product of the leisure time for the privileged class that was made possible by the economic surpluses provided by the rise of mercantilism in Europe, especially in what is now Italy. These surpluses were a product of the ability to “buy cheap and sell dear”, with the profits then employed to increase the number of ships and sailors used along with the products involved in the trade itself. This then stimulated the increased production of those goods and the ultimate rise of industrial capitalism in Europe (Pirenne 1925).

Science, especially physics, played a critical role in this process. The scientific revelation that the earth revolved around the Sun (as Aristarchus had also claimed some 2000 years earlier but in a more tolerant environment), along with other insights developed through reason, resulted in the burning at the stake of Giordano Bruno at the beginning of the 17th century in the Campo de' Fiori, the departure of Copernicus to his native Poland and the house imprisonment of Galileo. The issue then was probably more the questioning of the authority of the church than with anything having to do with an understanding of nature. But it did, however, cause a certain delay in the acceptance of science throughout Europe during that period, as well as for some people even today.

Nevertheless, science was here to stay, and in time would replace religion as the ultimate source of knowledge for the western world. The explanation for this was not only that science was empirically grounded but that it was to provide the information for the technologies that allowed mercantilism and industrialism to flourish and grow throughout Europe and ultimately in the rest of the world. These technologies allowed productivity to increase rapidly, encouraged and allowed the earth's resources to be exploited but, equally importantly, also helped create the military weapons that would allow the imperial European powers to exploit workers and their lands throughout the world to the fullest extent. This produced an increasing amount of surplus value that could then be invested in the continuous growth of this process. But it also created the illusion, especially in North America with its endless frontier, that this process could continue forever and that there were no limits in the universe to hinder its continuation (Potter, 1954). That we were consuming our earth's capital and treating it as if it were income was not considered by those who were creating the myth of endless development that rules our consciousness even today (Schumacher, 2010 [1973], Meadows, et al, 2004 [1972]). Also, of course, there would be no embarrassing questions

from a physics-inspired science about the moral implications of this world-wide exploitation of man and beast. Physics sought mechanistic mathematical laws; of what importance could morality be in such a deterministic world?

2. The Organization of Science

It might be well to recall how science itself is generally organized in this respect. Nineteenth century physics was and still is, by and large, the godfather of all science. Most scientists, natural and social, aspire for the deterministic certainty claimed by physics (notwithstanding subsequent uncertainties presented by quantum physics). When Newton was formulating his reductionist and mechanistic theories about order in the universe, he believed that he was merely uncovering a design formulated by God. Any moral judgements about this design would not seem logical in this respect. The subsequent indifference to this possible divine origin of the universe by current scientists has not changed significantly the belief in its deterministic character. Thus, emotional and moral considerations continue to be seen as extraneous to the project of science. Indeed, these critical elements of human existence have been seen as an impediment to objective research, where they are believed to have deleterious effects. This became true for research on both nature and society.

The purpose of scientific knowledge has been, first, to understand nature and, subsequently, through its implementation in engineering, to dominate and exploit it for human purposes (Leiss, 1974). Not that religious inspiration has been missing from this perspective:

And God blessed them, and God said unto them: be fruitful and multiply, and replenish the earth, and subdue it; and have dominion over the fish of the sea, and over the fowl of the air, and over every living creature that moveth upon the earth.
(*Genesis*, Chapter I, Verse 28).

The usefulness of this perspective to the evolution of mercantilism and industrial capitalism explains the symbiotic relationship that was developed between capitalism and science and further explains why so many resources continue to be devoted to science up to this day. This is especially true of the military applications of science that have made possible conquest and exploitation of the entire world by the imperial powers. Needless to say, all of this has been a male dominated enterprise from the very beginning, perhaps an extension of the hunter role of males throughout most of the previous evolutionary history of *Homo sapiens*.

The subsequent development of the other natural sciences, chemistry and biology, and more recently the social sciences based on this attachment to 19th century physics, has had important implications for society. Nineteenth century physics had certain ontological and epistemological presuppositions which guided its activity. We recall that presuppositions are not examined empirically; they are taken for granted and not subject to empirical examination.

One presupposition, as mentioned above, is that the natural world is governed by mechanistic and deterministic laws. At first, for Newton at least, these laws were thought to be the product of divine will: they were God's laws. Subsequently, most physicists dropped this divine origin and now, for the most part, believe that they are simply a fact of nature, born with the Big Bang or whatever origin the universe may have had. Second, these laws

were believed to be universal and infinite: they would exist for all times and all places, hence are deterministic Third, these laws were and are fundamentally mathematical: mathematical formulations can best express their true nature. Fourth, nature exists apart from the scientist; he (and now a certain number of “shes”) is simply a detached observer who is merely uncovering these laws. Fifth, these laws can be best examined by combining observations at the most microscopic level to form a picture of the whole; the whole being nothing more than the sum of these parts, combined mechanistically and expressed mathematically. Similar examples can be drawn from the other sciences, at least until recently, as will be discussed below.

3. Science and Human Society

The atomistic view of nature leads the other sciences to a similar approach, with the atomistic units, themselves, changing as befits the character of that science. In social science this has led to the ideology of individualism, that is, the idea that society is composed only of the individuals who constitute it and that the sum of their activities creates it. Therefore, the social whole is nothing more than the sum of these individuals’ activities and there are no other larger component parts.

Thus, following the inspiration of physics, the economy is seen as a deterministic mechanism composed of the actions of these atoms (rational individuals) which can best be expressed in mathematical laws. That there might be socio-organizational, including ideological principles, directing this process is not perceived in the atomistic framework of economics. An example of this limitation in perception is the belief by many economists (and businessmen) that an overall economy works best without government regulation, while at the same time ignoring the existence of significant forms of government regulation through tax laws, government subsidies etc., in society at large, as well as regulation *within* corporations, some of which are larger than most countries and their national economies. What corporate executive could imagine that his employees, acting in their own selfish interests, however rational, would produce the best corporate outcomes? In spite of this, many employees do logically behave in this way, inspired by our broader culture of possessive individualism, though always within the highly regulated corporate environment within which they work, of course (Macpherson 2011[1962]).

Needless to say, this is not a questioning of 19th century physics; it was perfectly adequate for its purposes at that time. Nor is it to belittle the enormous improvement in the material standard of living for those fortunate enough to have benefited from the free market system. It is rather more a questioning of the uncritical adoption of this model for explaining and understanding human society. Thus, one reaction to a physics-inspired science of social reality is the critique of science that many philosophers have been expressing for at least 200 years now.

One of the most vociferous of these critics was Friedrich Nietzsche. His early writings, especially, express a virulent questioning of the ability of science to provide an adequate view of social reality, especially in contrast to the view expressed by art. If social science were thought to be based on the idea of rational individuals, he would claim that most people have not either the time or the money or the education necessary to be rational in their

everyday lives. Most of their behavior is actually governed by emotions, emotions governed by the important myths of their time. His belief was that these myths were the most creative expression of human inventiveness. They have almost transcendental importance to human existence and should be an indispensable complement to science. (Megill, 1985, Ch. 2).

This insight had previously led an early 11th century Muslim philosopher, Abdul Ala al-Ma'arri, to claim:

They all err—Muslims, Jews, Christians and Zoroastrians: Humanity follows two world-wide sects: One, man intelligent without religion, The second, religious without intellect (Malik 2014, p. 135).

This is not just a minor inconvenience; it has also led to a major problem in the adoption of democracy as a system of governance: How can you have a democracy with a public that is generally ignorant of the complexities of modern society and that is, therefore, destined to vote on the basis of its emotions? This led the ancient Greeks and 18th Century Americans to establish a democracy in which only propertied men could vote, and for Plato to imagine a Republic governed by philosopher kings. All this, as if emotions were important only to sentimental women and that men were not governed by emotions as much as by intellect. War, based on the emotions of fear and anger, indeed, one of the most emotional of all human endeavors, is almost exclusively a male enterprise!

But, at the same time: How can you have a social science that ignores the importance of this dimension to human society? As an example, economics, the premier social science, ignores completely the most important of human emotional activities, the reproduction of the species, because it is carried on mostly by women and without any trace in the market system. Economists will claim, of course, that this is not their concern and that it is somebody else's problem. And in the fragmented and reductionist world of modern science this would appear to be true.

But, then, whose problem? Emotions are ruled out of science by definition. Yet, it is foolish to believe that emotions are inferior, or irrational, as the derogatory dichotomy of most discourse defines the non-rational or emotional. Human beings are both rational *and* emotional, usually in various combinations. This is why in ancient Greece rational philosophical thought was complemented by art, especially the theater, where these emotional and moral dilemmas could be explored in depth. It is also why theater in modern society is tightly controlled, as in the McCarthy witch hunt of the 1950s in the United States, when dozens of writers and directors were expelled from Hollywood because they were raising important issues about the society with an emotional impact on their audiences.

4. A Socially Constructed Society

Thus, perhaps one should take a somewhat more mundane and holistic view of myths: they may well be the product of inventive minds but in time become the habitualized view of reality as described by Berger and Luckman in their book, *The Social Construction of Reality* (1991). Human beings *construct* the social reality that they inhabit. They process information from their environment, including the behavior of those around them in order to develop a manageable understanding of their social and natural environment, which then allows

them to live together as a social unit. The assumption here is that human beings are social animals and that cooperation is indispensable to their survival. They are also individuals, of course, but individuals who are dependent upon each other and must be somehow *conscious* of this dependency in order to survive. This is something which cannot be captured by the mathematical laws of economics based upon the exclusive presupposition of individual rationality. Meanwhile, different societies have, over time, been organized in different ways, combining individual behavior and collective understanding of that behavior accordingly, as any anthropologist who studies culture well understands.

“Darwin’s theory has nothing to do with strength, as many have mistakenly interpreted it, but rather to do with the ability of a species to adjust genetically in order to survive.”

This is also to emphasize that science, itself, also *influences* human behavior, such that the atomistic ideology of individualism has, indeed, had a great deal of influence on the culture of modern society, especially in the developed world. The (a)moral values of the “free market system” continue to influence our behavior emotionally, and undoubtedly have caused much of the alienation recognized by most philosophers for the past 200 years or more. Indeed, this morality of “predatory individualism” has become an important “myth” for modern society, leading to anti-social behaviors that could very well threaten our very survival as a species (Gutenschwager, 2015).

The Role of Darwin

Adding to this 19th century physics-based view of social reality is the sizeable contribution of Charles Darwin to social theory. His views have sparked a great deal of opposition from religious perspectives because of the distasteful assumption that we have descended from apes. Much of this type of opposition is based upon a very superficial understanding and a general ignorance about what Darwin actually wrote. More thoughtful opposition relates to the subsequent transfer of Darwinian principles to social reality where it is used in a different sort of manner, especially in support of the ideology of competitive (predatory) individualism.

Darwin’s theory claims that mutations in the genes of a species or changes in its environment would result in genetic changes in that species that would allow it to survive those changes. If these genetic changes do not take place the species will simply disappear, hence the terminology “survival of the fittest”. This, of course, has nothing to do with strength, as many have mistakenly interpreted it, but rather to do with the ability of a species to adjust genetically in order to survive. Thus, survival of the fittest has to do with adaptability: if a species can adapt to the environment, if it can “fit in”, it will survive.

Meanwhile, changes in the environment can range from contacts with other organisms to major events such as earthquakes, meteorite bombardments, etc., to possible geological shifts, climate change, etc., that may derive in part from these major events. As far as the

various species are concerned, these events are random and must be adapted to, according to Darwin, if they are to survive. It is also well to keep in mind that for Darwin these genetic adjustments take place at an individual level; there is no conscious species-wide adjustment. Individual members of the species either adjust or they do not. If they do not, they disappear. If they do, they will likely become part of what then becomes a new species.

In addition to these major events, there is often competition among species whenever there is a scarcity of resources necessary for survival. Thus, some species change and/or disappear related to their ability to access these resources. This may go a long way to explaining the predatory behavior of *Homo sapiens*, as science and technology have increased our demand for and our ability to exploit the resources of nature and society, as well as our ability to compete with other humans for access to these resources.

In the vast history of evolution there has been built up a constantly changing and amazingly complex system of species, based on this process, and culminating in the human mind-body with its trillions of highly integrated cells. As discussed below, some scientists also believe that a world-wide human society would be the next level of complexity, once humans have figured out how to manage their potentially self-destructive conflicts.

5. The Symbolic Role of Science

This is not to say that there is some sort of scientific conspiracy involved here. Physicists enjoy their exalted status in society, their “symbolic capital” as Bourdieu called it, as do economists, of course, because of their emotional importance to society as it is currently structured. And this importance follows from their allegiance to the ontological and epistemological principles of physics. Nor does this mean that science has plotted to distort society in the ways described. The distortions are more likely the result of an inability to see the connections drawn above. We live in a compartmentalized world with connections among these compartments seen by some, but probably not by most, men (McClelland, 1975, Ch.3; Gungor, 2008). Thus, we have a science divided into compartments—physics, chemistry, biology in the natural sciences and economics, sociology, political science, anthropology, etc., in the social sciences; as well as a medical perspective which sees the human body as composed of separate organs and systems with specialists attending to each, sometimes with insufficient concern about the connections (especially with the mind) among them; etc.

This mental compartmentalization possibly began with the rise of urbanization. Communities much larger than those of the hunters and gatherers led to the specialization of skills and knowledge, especially among men, that characterizes urban society even today. Urban dwellers are no less dependent on each other than hunters and gatherers, but the cooperation among them may be hidden by the “unseen hand” of the marketplace, as Adam Smith would claim thousands of years later.

However, it is entirely possible that this unseen hand would not necessarily guarantee the perfect social solution, as many economists still assume today. But it may have encouraged the compartmentalization of thoughts and behaviors, making it more difficult to see connections among them in the social world. This may also over time have come to be reflected in the lower number of synapses in the male as compared to the female brain, making it easier for the male brain to focus on a single project but more difficult for most men to multi-task, for

example, or to discuss more than one subject at a time (McClelland, 1975, Ch. 3; Gungor, 2008, Ch. 5).

“It is one thing to use reason in the scientific search for knowledge and another to attribute rationality to all members of society to facilitate the creation of mathematical models, as the physics-inspired social scientists do.”

Thus, we must realize that the current social world studied by and in part created by a physics and Darwinian-inspired science is one result of the often unanticipated consequences produced by intentional rational behavior. To the extent that this is problematic, however, it should lead to a reassessment of our understanding of the social world, as well as of the intentions and the thoughts that prompt this understanding, especially in the scientific efforts to explain it.

For example, businessmen, as well as many common people, inspired by the myth of individualism, are now dissatisfied with a science that calls into question corporate behavior that threatens to alter the earth's environment in detrimental ways, ironically one of the unintended consequences of an atomistic and reductionist science itself! Climate change and environmental pollution, generally, are understood empirically by most scientists to be a serious problem for humanity. However, this claim is rejected by some citizens and ignored by most businessmen, because *it contradicts the belief prompted by the myth of our times that rational individual behavior will necessarily lead to the best collective outcome*. Indeed, many economists claim that this myth to be true, even if it can only be proven deductively and not empirically! This is not to say that rationality should be abandoned in the search for understanding nature and society. But it is one thing to use reason in the scientific search for knowledge and another to attribute rationality to all members of society to facilitate the creation of mathematical models, as the physics-inspired social scientists do.

6. The Role of Art in Society

The importance given to art by Nietzsche is also complemented by other critiques of the mechanistic and deterministic view of society. As theater is a form of art, society could also be seen as theater, as claimed by Kenneth Burke (Rueckert, 1969), which was true for most ancient Greeks. This is derived from Burke's claim that human beings are symbol-using animals. Thus, we, in essence, live in a world of symbols, rather than in a direct relationship with our environment. Language is our most basic symbol system, one developed to increase our understanding of our environment by allowing this understanding to be enhanced through its discussion with other human beings. Language is a system of symbols that represent elements of our environment, and as such is constantly evolving as our understanding evolves. Ancient languages were also thus more literal than modern ones. This can be seen with ancient Greek where words referred to specific elements of the environment, which then were elaborated into other metaphorical meanings with the passage of time, making translation into such a complex process it now is.

Mathematics is also one of these symbol systems, of special importance since the rise of science and of the technological society it has given birth to. Mathematics, however, also has symbolic, and often a mystical importance in today's social world, evoking important emotional responses which go well beyond its instrumental use to express meanings among the community of scholars who are studying nature and society. In other words, it has an artistic (sociodramatic) dimension sometimes understood explicitly or more often intuitively by its users: It can be used as a means of mystification, helping to establish the user as someone high up in the social "food chain". Religious symbols were and still are used to establish the same sort of status among its users and their audiences.

Art is the playground of this social evolutionary process because artists are given the freedom to experiment with meanings, not only by adding new meanings to words but by experimenting with other symbols, as well. Thus, sounds, colors, designs, movements, etc. add meanings that can be used to evoke emotional and intellectual responses in viewers and listeners. These metaphors are still very much in use today as any politician or advertiser or teacher or whoever can attest to. Burke (1968) and Duncan (1969) have elaborated an entire "science" of sociodrama to explain how people are motivated to think and act in various ways in society, according to the symbols that are used to influence their thoughts and, hence, behavior.

Other symbols, such as music, dance, hair and clothing styles, tattoos, etc., along with changes in language, can thus be used to support or undermine an existing social order, as the case may be. In the 1960s all sorts of symbols were used to criticize the existing social systems based on authoritarian and technocratic reason-based regimes found across the spectrum of political-ideological systems. All these regimes shared common anti-democratic propensities. These propensities were and are based on technological domination made possible by applications of modern science.

Indeed, the dream of some scientists and many engineers is to replace human beings with machines, using artificial intelligence to make human beings unnecessary and/or mere extensions of the machines that would control their lives. This would create a more productive and reliable "workforce", but the idea of work, itself, as an important element in the emotional life of human beings is mostly ignored in this vision. Not that technology is itself evil, of course; replacing repetitive, meaningless tasks such as the assembly line with automated technology is obviously a blessing. The problem is to recognize when technology is interfering with human creativity and emotional well-being to the detriment of those human beings whose tasks are being replaced (Cowles, 2019). But this would require a moral judgement, something missing, by definition, from most of modern science and engineering.

Thus, for many, if not most scientists and engineers the moral and emotional foundations of human society are invisible. Yet, human society is based on the ability of human beings to cooperate, which, in turn, as most of the scientists in the September 2018 issue of *Scientific American* agree, has been based on their ability to communicate and learn from each other. To communicate meanings and to cooperate requires an atmosphere of trust, which, in turn, depends upon an emotional and moral-based set of values that is referred to as culture. In order for this to occur, moral philosophy must be a part of everyone's "tool kit", including that of the scientist and engineer. But emotional and moral considerations are excluded,

as mentioned above, from the work of scientists and engineers, which has resulted in a worldwide technocratic culture that has become so alienating to today's human beings.

7. Countercultural Movements

All of this goes a long way towards explaining the countercultural movements that began in the 1960s throughout the world, irrespective of political-economic ideologies and systems. Because of the police repression imposed upon these young people at that time, these movements have gone “underground,” and continue today in a more clandestine manner. Ray and Anderson (2000) discovered this quite by chance during the research they carried out in the 1990s in the USA. They discovered groups of people that they labeled as “Cultural Creatives”, who were abandoning the modernist cultural values of competition, predation and materialism. Implicit in modernist culture is the worship of the “Money God”, as expressed most clearly in the social science of economics, which, in turn, aspires explicitly to the application of epistemological principles inspired by 19th century physics. Cultural creatives are trying to establish, wherever they might be, a new culture based on friendship, mutual trust and cooperation, much as Epicurus had done more than 2000 years earlier. Furthermore, these cultural creatives, found mainly in North America, Europe and Japan, are now estimated to include as many as 200 million adults, as reported on their web page.

*“History is
governed
by human
choices.”*

One of the ironies here is that while economic development is progressing rapidly in China and other East Asian countries, many cultural creatives have been looking to the East for inspiration on how to create a more meaningful spiritual and emotional life. As always, Aristotle's maxim that we must search for the proper “measure in all things”, is highly applicable, including his insight that we find the proper measure by exploring the extremes. Eastern religions sought inner peace in the greater or lesser absence of the satisfaction of material needs. Viewing the West, this absence is now leading to great enthusiasm among Asians for material goods and services. They will probably have to reach the extreme levels of materialism found in the West before they begin to review their lost spiritual heritage.

An outstanding article by Chinese scholars, for example, exposes a certain irony in the process whereby China was able to collapse the prolonged economic history of the West into a few short decades whereby they introduced rapid industrialization and financialization into their country. This they accomplished by suppressing the prices of agricultural products while increasing the prices of industrial products, and using the surpluses to industrialize their economy. This they did:

...in a much shorter time than it took the West to appropriate the wealth and slave labor from its colonies from four continents, which it used to enter the era of industrialization (Sit Tsui, et al, 2019, p. 31).

However, along the way they discovered that:

...the peasants, who had just benefited from land reform and resumed a highly diversified peasant economy, were comfortable in their modest, self-sufficient ways and did not have an incentive to increase their trade volume (p. 28).

So much for the notion that development is a historical necessity governed by deterministic laws! On the other hand, could China not modernize its economy, given its experience with British imperialism the previous two hundred years? History is governed by human choices at one location that have effects at other locations, intended or not by the authors of the original decisions, whatever mythological, religious or scientific symbols are used to legitimate those ideological decisions. Thus, the current massive migration of refugees into Europe is an inevitable result of the endless, often bloody, meddling of Europeans and their descendants in North America in the internal affairs of their countries of origin.

All of these symbol systems, including especially science, of course, have been and will be playing a highly significant role in the process of evolving to the next higher level of evolution by creating an integrated world society. The question is, what sort of society? Will it be a society based on shared human moral and emotional values or will it be a fully mechanized technocratic society based exclusively on the values of 19th century physics, along with certain distorted extensions of Darwin's theory of evolution? Finally, can there be a new science involved in this process that would incorporate ongoing 20th century revisions to these approaches?

8. The Emotional Need for Power

Meanwhile, there is an abiding human problem, irrespective of the particular mythology that has governed human societies over the past 2000 plus years. Whatever the ideology at the time, there have been some people, mostly men, though not only, who have used that ideology to satisfy an excessive, often pathological need for power. This is partly a result of the need that ordinary people have for a leader and their unwillingness to get involved, themselves, in the messy process of getting more or less egocentric individuals to cooperate in order to allow a large-scale society to operate at that level.

It is also a product of the fact that for most of our evolutionary history we have been prey, not predators, as many of the followers of Social Darwinism suppose us to have been (Sussman & Hart, 2005). Most of our ability to survive as prey has been the result of our ability to communicate and cooperate and thus outsmart the predators. Hence our need to live in groups. However, living in groups requires that rules be established so that everyone would know how to behave and be able to predict how others would behave in any given situation. Thus, moral systems were born along with cooperative group living, and these systems were deeply embedded emotionally, because survival depended upon everyone agreeing to abide by them. As we have moved to larger and larger scale societies, we felt the need to find a basis for designing moral systems to serve at these scales. Kenan Malik (2014) has traced these efforts in his book covering more than 2000 years and over most continents. He found that both reason and emotion have been involved in this effort, and concludes that the search has resulted in:

a polarization of the moral debate between those who insist that morality is nothing more than individual preference and those who desperately search for some external agent or realm in which to fix the objectivity of values, whether that be God or science, nature or transcendence. The real problem with contemporary morality, the reason it appears fractious and fractured, is, paradoxically, not moral but social (Malik, 2014, p. 343).

Of course, we can always return to the original reason for a moral system: survival. Insofar as we can estimate it, we can ask whether a given action would enhance or lessen our chances of survival, and assign a moral connotation according to this criterion. This would not be ultimately sufficient, but it would constitute a starting point.

In any case the question of morality does lie between the two extremes of the individual preference and the transcendental, as Malik concludes: it is a social problem. And the need would appear to be universal at that level. As most anthropologists would confirm, all societies need a moral system to guide the behavior of its members. This emotional need may be satisfied through the collective understanding and judgement of its members, the usual case in small scale societies, as well as in systems expressed in the idea of democracy. Or it can be satisfied through some sort of central leadership, tyrannical or otherwise. We are currently struggling with the question of how we can solve this problem in large scale societies.

But, currently, nothing seems to be working very well, neither the belief by some that science can resolve this either by ignoring morality altogether, as is often the case, or by substituting scientific law for moral code. Nor has religion been any more successful with its belief systems, which often include eliminating all those who do not share the beliefs of their given tribe. Nor have the specific recommendations by philosophers for any given standard been very successful in influencing the behavior of any given society. Indeed, the current scientific ideology of individualism embodied in economics hardly confronts this need at all.

Thus, unfortunately, we have yet to discover a social system with its concomitant ideology, at least in a large-scale urbanized world, that would relieve human beings of the uncertainty and anxiety that accompanies life in those systems. Gunther Stent (1978) finds inspiration in a possible innate or deep structure that might underlie the universal human need for a moral code. This would offer the hope that we will find a way, as this deep structure surfaces, to find meaning much as we do in forming specific languages, based on the deep cognitive structure that we all share biologically, as Chomsky suggests. This could also obviate the overwhelming emotional need for power in that small(?) number of individuals who seek to overcome anxiety by controlling the world and tyrannizing everyone else in the process.

The ancient Greeks averted this problem in part by believing that the community was the ultimate reference point for individual behavior. They separated life into the private, the “*idiotiki*” (ιδιωτική), and the public; the moment a person stepped out of his house he was automatically a citizen. A “*polis*” (πολίτης), from which derives so many of our common words from political to policy to police. Within the house he was an “*idiotis*” (ιδιώτης), from which derives our current word “*idiot*”, the person who lives in his own individualistic private world, even while he is out in public.

Meanwhile, the need for power is an example of the complexity of the emotional dimension of human existence. The need for power is in some ways a part of being human. Thus, it has had both normal and pathological expressions throughout history. Its pathological expressions can be very harmful both to individuals as well as to whole societies themselves. This has become more and more obvious over the past two hundred years or more, with the development of advanced technology and weaponry that has allowed power to be exercised ever more brutally.

McClelland (1975) has conducted major research on this problem. He traced the need for power through the stages of emotional development of the typical human being. He used the Freudian scheme, further developed by Erickson, of the oral, anal and genital developmental stages of the human being, which he then related to the need for power. Assuming that the need for power is present in everyone, he sought to explain how it might differ, both according to age as well as to the level of emotional development of the individual, irrespective of age. In the oral stage the need for power is realized through reliance on others, typically as a representation of the mother who provides sustenance and security, and in its pathological adult form as being “tied to apron strings of one’s mother”, or to any other provider of emotional sustenance. In the anal stage power is realized by the ability of the child to say “no”, thus recognizing his or her own power, which in its adult pathological form results in the person who constantly avoids making decisions or who collects prestigious possessions, such as expensive automobiles for men or shoes for women, etc., as an expression of one’s power. In the genital stage it is represented by the ability to actually control the behavior of other people, which in its adult pathological form leads to the tyrannical behavior characteristic of so many of history’s political, religious or business leaders. McClelland, as well as other researchers (Lee-Chai and Bargh, 2001), however, add a fourth stage, the use of power in an organizational setting to bring about changes in the social world, present in everything from the local community groups to the antiwar movements of the 1960s, or even radical religious movements. He suggests that the need for power can be seen as a normal part of the process of reaching emotional maturity, but also can take on pathological dimensions as described above, when maturity is not reached and it is used in excess, especially in stage 3.

It may also be that those with an excessive need for power and who often become tyrannical leaders, may be seeking power over others to respond to a feeling of inadequacy in their own psychology, mistaking fear expressed by others as a form of respect, or esteem as Maslow (2010) labeled it, in order to compensate for a lack of achievement in their own lives. This is not exactly a conclusion suggested by McClelland, but might be seen as a possible dimension that could be explored. This psychosocial problem is simply one more reason to broaden the study of society to include much more than reason (or even mythology and religion) as a means for explaining it.

Thus, emotion should not simply be dismissed as irrational and of no importance, as is so common in the age of science and engineering. Rather it should be explored and understood for its importance in everything from the operation of the “free” market system via advertising and marketing, to its use in the political arena to influence voting behavior, to its use in supporting an enormous worldwide military-industrial complex, about which President Eisenhower warned in 1960, and which has been so important to the capitalist system for at least 200 years. This major investment of public funds requires a viable enemy, something apparent in the emotionally charged McCarthy witch hunt of the 1950s in the USA and even to Thomas Paine in the late 18th century:

The English government presents, just now, a curious phenomenon. Seeing that the French and English nations are getting rid of the prejudices and false notions formerly entertained against each other, and which have cost them so much money, that government seems to be placarding itself for a foe; for unless it finds one

somewhere, no pretext exists for the enormous revenue and taxation now deemed necessary.

Therefore, it seeks in Russia the enemy it has lost in France, and appears to say to the universe, or to itself, 'If nobody will be so kind as to become my foe, I shall need no more fleets and armies, and I shall be forced to reduce my taxes... Unless I can make an enemy of Russia the harvest from wars will end [*Plus ça change...*!]. I was the first to incite Turk against Russian, and now I hope to reap a fresh crop of taxes. (1791, Preface to the French Edition of *The Rights of Man*)

9. A New View of Science

Thus, if we are to take this “outside” dissatisfaction with science seriously, we may also need to see if there is any “inside” dissatisfaction. Not that dissatisfaction within science is out of the ordinary, as noted above. With large scale efforts to test scientific hypotheses empirically there are bound to appear unanticipated outcomes. This is what Kuhn would label as anomalies, the accumulation of which would likely lead to a paradigm shift or scientific revolution, as he has described it. These shifts would require time to pass, as many scientists would, at first, object to the change because it threatened their emotional feeling of certainty. This is further complicated by the high degree of specialization that inhibits the ability to see connections among specific branches of science or, perhaps more importantly now, among the discoveries and applications of science and their effects on the individuals and societies that make up today's world.

Indeed, there are now many examples of dissatisfaction within science itself, a small part of which can be seen in a sample of the bibliography (Talbot, 1991; Harmon and Sahtouris, 1998; McTaggart, 2002; Gutenschwager, 2004; Lanza & Berman, 2009; Edwards, 2010; Lipton & Bhaerman 2011; Sheldrake, 2011 [1988]; Segerstrale, 2013, etc.). One way to investigate this dissatisfaction would be to ask if science might need a “godmother” to complement the “godfather” of science, something which, among other things, would likely move biology and anthropology from a secondary to a more primary status in science.

The authors above claim that what is missing in a physics-and social-Darwinist-inspired science are the ideas of consciousness and intentionality, characteristics which they believe are found throughout nature, as the ancient Mayans also appeared to believe (Jackson, 2019) and, even more obviously, in society, as the phenomenologists, existentialists and other humanists would claim. For them, the elements in nature are seen as consciously involved in creating and changing nature, and this is true from the tiniest prokaryotes to the most complex systems such as the human mind-body. Physics would appear to be indifferent to the possibility that the regularities expressible mathematically may in fact be governed by a nested hierarchy or holarchy of constructed structures or holons, as Ken Wilber (2017), following Arthur Koestler, would label them. This holarchy would start at the microscopic level of nature and end up in society with the human mind-body, the most complex holon working successfully in the living world.

It is important to understand the difference between the word hierarchy and holarchy, in this sense. A hierarchy implies a center of control at the top of the hierarchy, the commands of which are simply carried out by the lower levels. Holarchy implies a system of holistic

structures or holons that are autonomous in themselves, though built up from smaller scale holons, also autonomous in themselves. Thus, it would not necessarily be the unregulated yet somehow mathematically expressible action of individual elements in nature, according to the atomistic viewpoint, but rather the ability of nature to organize itself at different levels in order to maintain its overall holistic structure.

As discussed above, the atomistic view of nature has led the other sciences to a similar approach. In the social world this has encouraged a mythology of individualism, as described above. In a more holistic natural science, it might appear as if social science were “humanizing” nature. This would reverse a long-term trend to mechanize humanity, both with efforts to see everything human as a mechanism, but also by attempting to replace human beings with machines and/or to make them mere extensions of those machines.

Thus, in order to give some apparent meaning to the mechanized human individuals’ activities, economics has had to presuppose certain deterministic characteristics of human behavior. It has assumed that all individuals are completely informed about the larger circumstances of their actions, that they can calculate the relations between their goals and the means that they choose to achieve them. They also assume that their economic goals can be completely expressed in terms of money—the only measure incorporated in the world view of most economists. As a corollary to the exclusive use of money is the presupposition that money is a measure of happiness and that there is a direct correlation between the amount of money one has and his happiness or her happiness, something not supported by most empirical research for money beyond a certain threshold (Kate4Kim, 2018). (The male pronoun is used because most of the presuppositions of economics as with the other sciences, at least until recently, have been products of the male brain.)

10. Biology and Society

In Darwin’s account of evolution there is no role in the alteration of the environment played by the species themselves. Now in the 20th century there appears the argument that the species themselves may play an important role in changing the conditions that would require genetic adaptation. This is the argument given by Levins and Lewontin in their book *The Dialectical Biologist*, and it adds an important dimension to the Social Darwinian argument embodied in the idea of predatory individualism.

Meanwhile, sociobiologists such as E.O. Wilson (1975) believe that human behavior can be reduced to biological terms and thus elaborated in the form of 19th century physics with a Darwinian twist: “Sociobiology is defined as the systematic study of the biological basis of all social behavior” (Appleman, 1979, p.446) and “If the decision is taken to mold cultures to fit the requirements of the ecological steady state. . .” (p.458). There is no reference here as to *who* is going to mold these cultures—could it be scientist-social engineers such as himself? Or, “If the planned society—the creation of which seems inevitable in the coming century...” (p.459). Again, there is no mention of who is to plan this future society, thus possibly betraying an anti-democratic mentality, something against which thousands of protests were launched in the 1960s and continue until today.

Others, such as Herbert Spencer and his Social Darwinist followers, believed that the highly competitive and predatory system that has marked the history of industrial capitalism

was compatible with Darwin's understanding of nature. The wealthy banker or businessman was nature's way of establishing who was the fittest and most justified to survive. This is unlike Mark Twain, who believed that "A banker is a man who loans you an umbrella when the sun is shining and demands it back the moment it looks like rain." Ironically, these are now the very people who, it could be argued, are driving humanity to possible extinction either through the rational exploitation and devastation of nature, or through climate change and/or through the possibility of a catastrophic nuclear war. *Their individual "genetic" survival is threatening the survival of the entire species of Homo sapiens.*

11. A New Biology and a New Science

This in no way contradicts the findings of Darwin but it does suggest that something more than Darwinism in its subsequent sociobiological interpretation is required to understand human behavior and to guide its possible evolution into a viable social form.

At least, this is what is proposed by Willis Harman and Elisabet Sahtouris (1998) in their book, *Biology Revisioned*. They argue that all things in nature have a form of consciousness, and that nature is evolving through the intentional actions of its very parts, ranging from the prokaryotes to cells, tissues, organs and organisms to societies and the earth as a whole (See also Matloff, 2016). The evolution of this hierarchy is seen in the development of structures or holons as Koestler calls them, to suggest that these structures are a product of conscious efforts on the part of those parts to create something new in nature which is not reducible to those parts. This same idea was put forward by Piaget (1970) who suggested that (holistic) structures are a product of assimilation and accommodation, so that for him the important thing to focus on was the process of structuring, in addition to the structures themselves. Thus, rather than claiming that brain structures necessary for language development are simply innate, as Chomsky had suggested, he claimed that they are constructed over time in the evolutionary process whereby *Homo sapiens* itself was constructed.

The appearance of these structures or holons as something more than the sum of their atomistic parts necessarily poses the question of how this process would take place if not as the result of some sort of consciousness and intention. Since these holons are universally present in nature and society, then consciousness and intention must also be present universally. This is the ontological claim of Harman and Sahtouris, and they supply multiple examples by numerous scientists to support their claim. This, of course goes against the prevailing doctrine of a physics-based biological science, and if Kuhn is correct this should lead to a lengthy battle between the two visions of biology.

Meanwhile, 20th century physics has produced a quantum view of physical reality, one which sees all the elements of nature as connected or in communication with each other. This is accompanied by the conviction that the viewing of reality by the scientists, themselves, actually changes that reality. What happens to these connections at a more macroscopic scale and to the claim for an outside "objective" view of nature is currently being struggled with (or put aside) within the science of physics itself. Adam Frank et al (2019) suggest that this has led to a "Blind Spot" in science. Thus, a revisioned view of science would lead to several changes:

In general terms, here's how the scientific method works. First, we set aside aspects of human experience on which we can't always agree, such as how things look or taste or feel. Second, using mathematics and logic, we construct abstract, formal models that we treat as stable objects of public consensus. Third, we intervene in the course of events by isolating and controlling things that we can perceive and manipulate. Fourth, we use these abstract models and concrete interventions to calculate future events. Fifth, we check these predicted events against our perceptions. An essential ingredient of this whole process is technology: machines—our equipment—that standardize these procedures, amplify our powers of perception, and allow us to control phenomena to our own ends.

The Blind Spot arises when we start to believe that this method gives us access to unvarnished reality. But experience is involved at every step. Scientific models must be pulled out from observations, often mediated by our complex scientific equipment. They are idealizations, not actual things in the world... all of these exist in the scientist's mind, not in nature. They are abstract mental representations, not mind independent entities...

So, the belief that scientific models correspond to how things truly are doesn't follow from the scientific method. Instead, it comes from an ancient impulse—one often found in monotheistic religions—to know the world as it is in itself, as God does. The contention that science reveals a perfectly objective 'reality' is more theological than scientific.

Therefore, the claim by a revisioned biology for consciousness in nature is given support by this new quantum physics. Indeed, there are at least two good reasons, among the many presented in the book by Harman and Sahtouris, to accept the hypothesis that there is consciousness throughout all of nature. One is the question of how there could be quantum connections throughout nature without some sort of consciousness to make these connections possible. Thus, quantum connections at the microscopic level cannot just disappear at the macroscopic level. These connections may well account for the fact that nature is organized, and that organization is somehow beneficial to the elements of nature; it allows nature to function and to give the appearance that it is governed by "natural laws". Sheldrake (2011) claims that these "laws" are a product of habitualized actions accumulating over time, exactly as claimed by phenomenologists for the appearance of order in society (Berger and Luckmann, 1991).

Meanwhile, these insights about wholeness were already apparent in biology in the 19th century. Skillings (2019) refers to Sir Kenelm Digby who

...thought of animals as intricate automata, and like a machine, the behavior of an animal could be caused only by the underlying order and actions of its parts. But what is it that unites the parts of a system into a living individual? . . . there must be something that turns a system into an independent and genuine whole [Holon?], rather than just a set of parts 'artificially tied together'. Digby's answer was to say that the wholeness comes from the system being functionally interdependent and integrated (author's emphasis). That is, the activities in one part of the system are

brought about by a cause external to the part where it occurs (interdependence); and the mutual workings of the parts account for the behavior of the system as a whole, making this activity internal to the entire system (integration).

And,

Evolution teaches us that no organism was ever cut from whole cloth or brought into being out of nowhere. At some point in history, independent cells must have changed so as to stick together and then evolve as a collective... This is what [Julian] Huxley called... the transformation of individuals into a higher-level individual [Holon?].

"We as human individuals must transform into a higher order 'individual', a new structure or holon, based on 'interdependence and integration', while preserving our ethnic, cultural and/or religious individualities."

But there is no explanation by either of these 19th century philosophers nor by Skillings, himself, about how and why these transformations take place. Harman and Sahtouris (1998) are suggesting that these transformations are a product of consciousness and intention. Yet, even today, according to Frank, et al (2019):

"...physical science—including biology and computational neuroscience—doesn't include an account of consciousness... On the other hand, if 'physical reality' means reality according to some future and complete physics, then the claim that there is nothing else but physical reality is empty, because we have no idea what such a future physics will look like, especially in relation to consciousness".

Thus, the claim that consciousness and intention are part and parcel of the entire universe is not unfounded. This must, in any case, be true for society and its human elements, something which is more or less ignored by an adherence to the model of 19th century physics in a good deal of social science, especially economics.

The question then arises as to whether a revisioned biological science might have important implications for the social world, a world that is troubled by so many apparently irresolvable problems, which range from the currently unworkable casino-like economic system to a highly alienated population trying to find the meaning of life while residing in that system. Indeed, a universe governed by consciousness would provide a model, a much-needed *vision* for helping us transcend our current social, economic and, indeed, philosophical impasse. It is in this sense that all human behavior is "voluntarist", since it is always intended and prompted by a conscious belief that what it intends will come true, with no margin for misunderstanding and the possibility of unintended consequences. We as human individuals must transform into a higher order "individual", a new structure or holon, based on "interdependence and integration", while preserving our ethnic, cultural and/or religious individualities, just as the parts of the human mind-body, do within its holistic totality. We

must transcend our (Darwinian) competitive stage and evolve into a new cooperative form. This is not fantasy. Indeed, we must move beyond the *Turning Point* (Capra 1982), using a *Biology Revisioned* (Harmon & Sahtouris 1998) and *Spontaneous Evolution* (Lipton & Bhaerman 2011), as well as the *Moral Molecule* (Zak 2012) and *Our Moral Minds* (Hauser 2006) to become *Super Cooperators* (Nowak 2011) and enter a holistic or even *Holographic Universe* (Talbot 1991).

Or we can just sit around and wait until we can no longer breathe, or until some emotionally unstable fanatic pushes the button and turns us all into radioactive dust, while cleaning out the stables until some new, more intelligent species replaces us in a future world yet to come.

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Physics and Cognition

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Abstract

Every physical object, celestial body or a living being, is characterized by the emission of physical quantities (or “grandeurs”) that we define as mass, energy, and “form” (physical order, or shape, or arrangement). The emission of form is usually called information. Mass and energy are physically equivalent. And energy is a conservative grandeur. On the other hand, form is perceived by an observer as “meaning”. But meaning is non-conservative. Hence there is difficulty in proposing a physical theory of information. One of the basic nineteenth-century assumptions about knowledge was “determinism”, i.e. the conservation of information in the evolution of physical systems. Modern science re-ordered reality through a search of invariances in natural phenomena that in turn corresponded to laws of nature. Its success in describing natural transformations supported and promoted a culture of separation of the basic components of daily life in every community (economy, society, culture, politics, ethics, state, religion...). The forces of finance and capital strived and prospered during the turbulences and changes, progresses and crises, of Western nations. However, the ends of the two most powerful physical theories today, General Relativity and Quantum Mechanics, do not meet at our scale. But everything seems connected. No longer can life be separated from the environment, nor can ontology be separated from epistemology. The attempts to describe reality seem hampered by the conspicuous absence of a conservative grandeur in the field of form. With such a concept, the measurement of the cognitive content of any society could become as dull and commonplace as the GDP.

1. The Rise of Intangible Investment: A New Paradigm

Whole industrial sectors based on information technologies have been created in the past few decades. The increasing importance of intangible or immaterial investment (R&D, software, education and training, organization, regulation, marketing, design) has shown that the nature of the basic processes of economic activity is being transformed. The reason being that an information transaction is not a pure “exchange” (e.g. as it happens for tangible things) but rather a “sharing” transaction.

The growing intensity of sharing transactions in a society reveals that the restrictions to the performance of modern economies reside essentially in the abilities of the operators themselves. Thus, endogenous (or accessible) knowledge potential, its form or organization, and the capacity to exploit it, are crucial elements of success and survival in the new economic environment. The effects of misunderstanding, of no apprehension of communicated information (which causes an inability to generate relevant meanings) can be devastating.

Two distinctive features characterize our times: the quantity of material change and the quantity of intangible activity.¹ They can be measured, respectively, by the rate of innovation and by the intensity of communication in our societies. Initially nurtured by (but also enhancing) globalisation mechanisms and procedures, innovation and communication stimulate modifications which display a plural conception of rationality, whose “plasticity” is well suggested through the nature and power of “sharing”, the basic regulator of information transactions.

The perspective of rationality as a field crossed by processes of rationalization tries to respond to that plurality—which can be designated, inspired by the ideas of Wittgenstein, by “rationality games”.² These processes are differentiated, heterogeneous, and conflictive, regulated by different matrices according to the fields of knowledge, the historical periods, or the research communities in which they emerge and develop.

The system of classification of knowledge we inherited from late positivism, a pyramid with science at the top, aimed not only at the consecration of science as the model of all other fields of knowledge but also at establishing a corresponding hierarchy, is no longer adequate. Novelty comes from the emergence of a new factor, the immaterial order, in the realm of a material paradigm of progress and prosperity.

Information and knowledge have to be subtracted from all the regimes of cumulative possession so well characterized by the empirical metaphor of the deposit. These regimes are substituted by the regimes of reception and audience. What this means is that knowledge can no longer be thought of as fluid, as in a mechanical framework, but has to be understood in terms of a new paradigm, enhancing its communicative, language-based features.

No classification of knowledge can be envisaged without a reference to the societal context in which it is generated. The present notion of “explosion” of information and of “fragmentation” of knowledge is probably the result of the powerful weakening and fragmenting effects that the forces of expanding markets provoke in the social order of our nations.

But this is not a singularity of our epoch.³ Fragmentation of prevailing social order has been experienced intensively in the past.

2. A New Organization of Knowledge

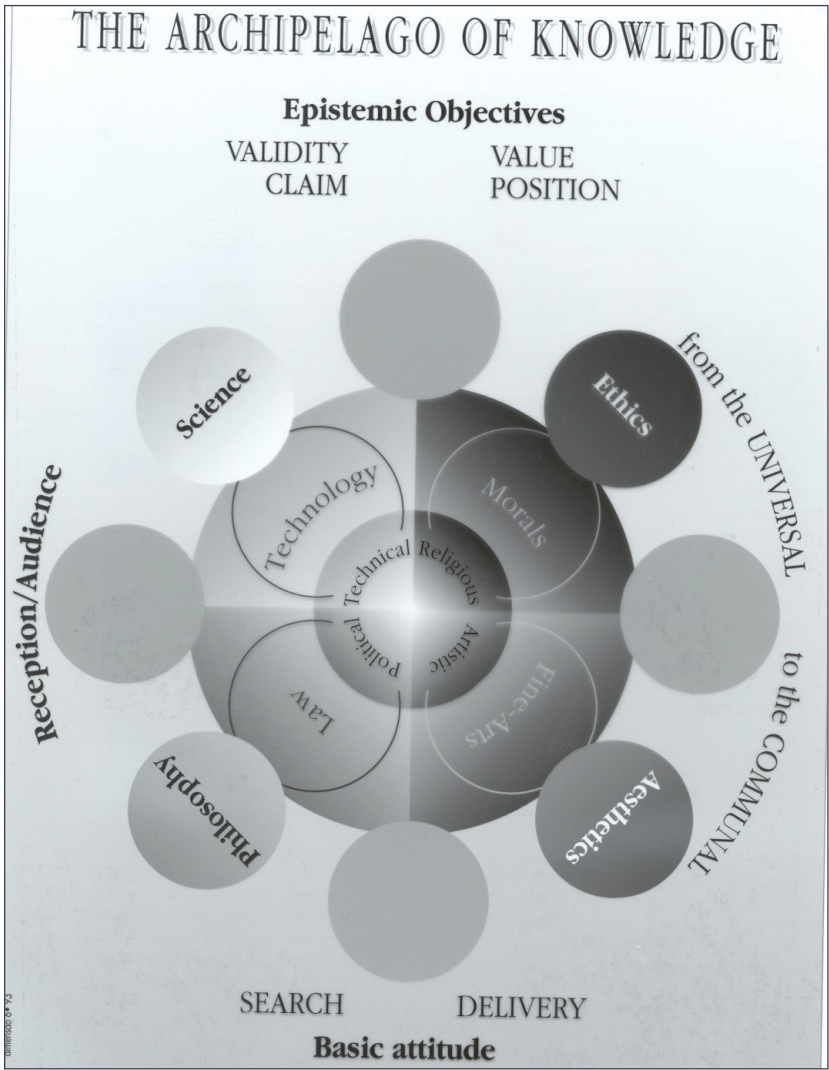
In medieval times, when the concept of central finite space prevailed (the Earth was seen as the center of the Universe), philosophy was posed at the center of knowledge, surrounded by the seven liberal arts: grammar, rhetoric, dialectic, music, arithmetic, geometry and astronomy. Later, with Enlightenment and the idea of the Encyclopedia, the strong and noble character of a highly advanced agricultural and commercial society envisaged knowledge as a tree, with the various fields developing as successive ramifications from a common stem: philosophy. Three main branches of the tree were assumed: the science of God, the science of Nature, and the science of Man.

In the 19th century, the success of the industrial society brought by the triumph of mechanics, railroads and iron, led to a new rationale, which culminated in the deployment of a new structure for knowledge classification, the positivist’s pyramid, with mathematics and

the other (hard) sciences in a descending order from the top, presiding over philosophy, the humanities and religion.

This was the organization of knowledge which was conveyed and taught to us and which reigned undisputed until the 1960s. However, from the standpoint of contemporary society, it is certainly difficult to maintain rigid distinctions between different fields of knowledge. One can easily understand this by noting the proliferation of disciplines which has greatly intensified since the middle of the 20th century and the increasing internal complexity and autonomy of various disciplines.

Figure 1: The Archipelago of Knowledge (Source: Reference 3)



To try to think of contemporary fields of knowledge on the basis of their classical divisions and hierarchy obviously involves risks, especially the risk that important segments of contemporary knowledge which are sometimes more innovative may be left out despite, or perhaps because of, the fact they are unclassifiable in the light of current criteria.

The issue is simple: criteria do not have any meaning outside strategies. This fact, together with the sense of a lack of global or objective point of view—a “god’s eye” which, it has to be remembered, has always been the classic ideal of philosophy and epistemology and also the argument that would allow to determine the place and status of other fields of knowledge—on one hand forbids one to speak of a system of fields of knowledge today, and on the other hand suggests a reappraisal rather than the dismissal of disciplinary references.

In this sense, the metaphor of an “archipelago of knowledge” may be useful and heuristically operative, particularly to the extent that it allows us to think, without any reductionism, of the articulation of criteria/strategies that guide the internal “thematization” of the main areas of relevance.⁴

In this perspective, “argumentativity” appears as a good criterion for the production of knowledge, thereby distinguishing science and philosophy from ethics and aesthetics; and the “audience” may be seen as another strong discriminating factor, from the point of view of knowledge reception, which distinguishes science and ethics from philosophy and aesthetics. Reception is supposed to be universal in the first case and communal in the second; this is undoubtedly a significant complementarity.

This approach leads to a new descriptive understanding of the realm of knowledge, as an archipelago, suggesting a reticular situation, i.e. a network, which does not postulate any common origin nor accept any “natural” or functional hierarchy. The loss of importance, if not of the aim itself, of arboreal or pyramidal conceptions of the fields of knowledge, is the most decisive effect of the emergence of the immaterial paradigm. Further, it is a scheme that allows and encompasses the creation of new disciplines.

To understand some of the main consequences of the proposed image of the contemporary situation in the fields of knowledge, it would be useful to remember that the traditional approach to science and knowledge has involved the use of two perspectives—an epistemological one, interested in the status of theories and laws and their relation to reality, and a sociological one, dealing mainly with the framework of scientific activity in a given society or environment.

These perspectives, which could also be described as internal and external, have been found to be most fruitful in the well-known works of Popper and Kuhn, respectively. It is doubtful, however, whether they are sufficient today. We have to take into account the profound changes which have marked the transformations occurring in economic activities, i.e. the increase in intellectual investment compared to physical investment, the growing role of complexity in the systemic framework (which until recently was particularly dominated by materialism), the emergence of sharing as the dominant form of communicating and circulating knowledge. Today we thus must consider knowledge from three different aspects: (i) the production of theories; (ii) the development of languages, and, (iii) the creation of communities; in other words, we see knowledge as a cognitive, rhetorical and communal device.

Thus, we can no longer discard the presence of tacit knowledge in any modern classification. And it is suggested that “codified” knowledge has to be subdivided into two regimes: those of “specialized information” and of “disciplinary knowledge”.

The tacit degree of man/world complex relationship corresponds to the regime of common knowledge, characterized by a diffusion mechanism of “exposure”. The explicit degree of the relationship between man and his world corresponds to the specialized information regime, with “teaching” as the communicative device. Finally, the disciplinary degree corresponds to disciplinary knowledge, to which “research” is associated.

We can thus assert that the activity of research is also the identifiable characteristic of the disciplinary fields of knowledge which appear by means of simultaneous “explicitation” and/or juxtaposed processes (for example, the social sciences).

Naturally, the practice of research will vary according to the “island of the archipelago” in question, that is, with the specific cognitive, rhetorical and communal strategies. To the criteria of science, based on the amplitude of empirical proof, the practices, or the method generally known as experimentation, correspond. But philosophy uses the method of analysis; ethics relies on the accomplishments of revelation; and aesthetics is characterized by a set of systematic procedures of construction/deconstruction. As if sharing was being tentatively “appropriated” by each grand domain of knowledge.

In the metaphor for knowledge, the central island of the archipelago corresponds to tacit knowledge, encompassing technical, political, religious and artistic areas.

Through the process of explicitation the network progressively extends and becomes more complex. Other islands appear: those of technology, law, morals, and fine arts. And then further away, through a more intensive thematization process, corresponding to the emergence of high precision languages, new islands of disciplines are seen.

3. Knowledge, Ignorance and Pseudo-knowledge

We may define true knowledge as that which lies inside the “boundary” of the archipelago; and ignorance as the “sea at large” that surrounds it. This sea can be conquered by constructing new islands, or by launching bridges to newly built offshore platforms or to other islands.

The archipelago is nowadays the locus of intense circulation of knowledge, in all directions, which reveals a real network character. Of course, pseudo-knowledge creeps up at every turn of the landscape, every time we want to swim (individually), or navigate (institutionally), in uncharted waters.

Pseudo-knowledge can be thought of as a group of sharks, or pirate submarines, that hunt along the shores or inside the canals of the archipelago, feeding on the discomfort of human souls. They try to disrupt the existing connections in order that their assertions cannot be verified. And only by using proper communicative strategies can they be overcome.

The archipelago is thus a heuristic metaphor, adapted to map knowledge in a situation of extended global activities characterized by intensive communication and networking processes.

But no classification is ever final. Maybe this was what prompted Leibnitz to deftly assert⁵ that “the whole body of the sciences may be considered as the ocean, which is entirely continuous and without interruption or separation, even if men like to conceive parts in it and give them names according to their own convenience.”

Knowledge and learning are the central resources and mechanisms of the new institutions, communities and organisations. So, the implications of the intensified circulation of knowledge will have to be recognized and fostered: disciplinary knowledge can only evolve in the context of a strong communicative framework which enables the attitude of sharing of meanings and values to realise its full potential. This is our fate and also our brightest opportunity.

On the other hand, our contemporary world is made of the networks which create, diffuse, finance, manage and support innovation, based on a group of formidable social, organizational and technological changes which were brought by the new process of producing technology from a science base. But these changes are societal, they are responses to the transformations experienced, involving all aspects of today’s reality, concerning all networks of intense and enlarged communication that support our activity. Sharing has become in the new paradigm, a fundamentally communicative-reticular process.

We must be aware, though, that the present view of the world based on “knowledge” does not coincide with the view of the world of modernity, which is based on science. The vision brought about by the new paradigm of knowledge and information also favors “governance” rather than “government”; it promotes “global” values over “universal” ones. Further, it propels the complexity of the “environment” to obscurity and veils the beauty of nature.

Science and universals correspond to the realm of nature. Nowadays, science is understood as a factor of economic growth and innovation: science has been transfigured into “technoscience”.

So we must not be surprised by the resurgence of ethics, now transformed into a theory of responsibility. Our moral world, made cohesive in medieval times by religion and, throughout modernity, by the idea of progress, now faces the tremendous challenge of reinventing a new cohesive “glue”. Otherwise, it risks dissolving into blocks, a sort of “moral apartheid”.

4. The Way We Experience the World

We live by interacting with what is external to our bodies, in a way that allows our survival. We can interpret, or represent “reality” through these interactive experiences and are also able to register them. As a result, the interpretations of past interactions can be stored in internal repositories, more or less organized according to the complexity of each individual. The “maps” of relations in which one has been involved along with their existence, as actual registers of past activity, operate as a guide to future interactions, or for the behavior to be exhibited in the course of activities we are engaged in the present.

Interactions with reality are a signal of our activity. This can basically take two forms. Physical alteration of the environment is a measure of the “action” of an individual (i.e.

the material, tangible activity). On the other hand, the alteration of the representation (or map) of reality is a measure of the “communication” (i.e. the intangible activity) engaged by the individual. So, any activity is in general a combination of tangible and intangible constituents. It is important to distinguish between them because there are cases where we deal with almost pure tangible activities like removing an obstacle, and others where almost pure intangible ones are involved like evaluating an alternative.

“We now know that observing or measuring is interacting, that a new theory needs to be developed to study and understand life.”

Physical action and communication are thus the two fundamental components of every activity. The consideration of both is essential to the understanding of nature, of the universe and of the life it supports. Every living creature or system is perceived through its interactions in terms of action and communication or, more commonly, by a combination of both. Action corresponds to emission of energy. Communication corresponds to emission of information. We can thus say that a system is characterized by the emission of energy and information.

This simultaneous simplification and complication emerged after the grand unification (the equivalence between mass and energy) revealed by special relativity. Energy is a conservative physical quantity and has therefore the property of being conserved in any closed system. Information, understood as physical order, or arrangement, or more generally as “form”, is not conservative. Furthermore, information is not totally captured by an observer, who only grasps what is relevant from it and discards the rest. This aspect—relevance to the subject—is associated with the notion of “meaning”. The repository of meanings is what is usually described as “knowledge”. By being non-conservative, meaning is at the origin of the difficulty experienced so far in inventing a physical theory of knowledge.

5. Information and Meaning

Each interaction with reality results in a meaning. These meanings constitute a representation of reality, a context in which new meanings are derived and made coherent. Highly social beings aggregate themselves in communities which evolve according to the composite influence of external factors (physical space and its climate) and internal factors (capacity of survival in their surroundings and cohesion of the group). These communities can be envisaged as open systems, exchanging continuously energy and information with the environment, their possibility for survival arising precisely from the capacity to sustain those exchanges. They exhibit the properties of self-organized systems. They behave as dissipative structures.

Therefore their cohesion and cognitive content are finite. They tend to align and organize their representations of reality in order to enhance their overall action and communication, with the aim of securing and eventually increasing the level of their collective cognitive potential. The effort to survive led to the emergence of “worldviews”, i.e. sets of explanations and precepts to guide the daily activities of the communities and their relations with the neighboring ones.⁶

A worldview is an essential ingredient of cohesion in a group evolving in time. Like the fitness of its members and the way they organize themselves. Clearly, we devise more easily indicators of physical action than assess and measure the value of communication.

“Everything is connected today. And this is precisely what complexity is about: the impossibility of separating the system from the context, the living being from the environment, the object from the measuring instrument, ontology from epistemology.”

This is due to the success with which for almost two centuries scientists experimented and theorized about the inner workings of nature. It required strenuous observations, designing new instruments, repeating and creating new experiments, invent and define new concepts, establish new relations.⁷ Finally, it was possible to differentiate and emancipate the concept of energy from the notions of force, of heat, of temperature and be able to measure the capacity to produce work in a rigorous manner.

But in the end it was chiefly the current acquaintance with machines using energy exchanges (such as engines) that led to the pervasiveness of the concept of energy in daily life. Similarly, today most common machines incorporate programs and pre-defined instructions to obtain definite effects and modes of operation. Computers and electronic networks are found everywhere and information processing, big data, mobile access and financial transactions are overwhelming. “One is now, perhaps for the first time, ready for a real theory of meaning (...) adapted to handle the most significant but difficult aspects of meaning, namely the influence of context.”⁸

Why was it not conceivable before? It is easy to trace where the trouble originated. The nineteenth century’s fundamental premises about knowledge were composed of determinism, reductionism and dualism. Dualism consists in the belief of observer independence, reductionism in the use of mathematical language and determinism in the conservation of information. These assumptions represented the triumph of science as the engine of modernity. It was the time when it seemed that the edifice of classical physics was only perturbed by two little clouds.

However, these clouds evolved into the major physical theories of the following century, which were the basis of contemporary technologies and critical infrastructures of the economy. We now know that observing or measuring is interacting, that a new theory needs to be developed to study and understand life, and that information and meaning are non-conservative. The problem is that deeply entrenched beliefs take time to leave the stage.

6. Coda: The Techno-scientific Transformation

We live in a world of uncertainty. But this is the way we have always lived! We had to invent mechanisms to reduce uncertainty by proposing order and classifying reality. But finally, everything that exists either adapts or disappears. But the crises we are enmeshed with in our times bring not only more uncertainty but they are also complex by nature. Everything

is connected today. And this is precisely what complexity is about: the impossibility of separating the system from the context, the living being from the environment, the object from the measuring instrument, ontology from epistemology.

The promise inscribed in the charts of all the Academies of Science since the 17th century, of “making society progress through the applications of science” was finally fulfilled by the mid-twentieth century. Science progressed immensely, propelled by the world wars’ efforts. The first science-based technologies saw the daylight during the 1940s to never leave our world.

Their transformative power was such that neither the military, nor subsequently the operation of the markets, allowed science to return intact to its curiosity-driven nest. Techno-science was born. Being progressively pulled away from curiosity-driven science, techno-science was able to grow enormously, erecting a formidable structure of networks of institutions that impacted the economy decisively.⁹

The “oil crises” of the 1970s set the stage to the deployment of the first socially selected products of techno-science: the information and communication technologies. A new period of techno-economic structural development was initiated, a period in which we are still living in, approaching the maturity of the solutions that those science-based technologies have provided for the time-span of two generations. New solutions will no doubt follow.

These solutions are naturally associated with a whole array of new issues. Information and communication at big distances seem to have exploded—a transformation that has profoundly changed our perception of life and how we live on our planet. Physical space has “shrunk” and information circulates the world at the speed of light. Further, images can now be digitalized for the first time in history, which constitutes a formidable revolution. Digitalization of images will impact society in a comparable manner to the invention of writing.

So, time is ripe to elaborate a new theory of information, capable of dealing with meaning and assessing the influence of context. The successes (and limitations) of Quantum Mechanics and the study of life rocked the foundations of classical physics. A new concept must be proposed for the dimensions of information, as universal as that of energy for the physical world of action. Maybe we will need to differentiate and emancipate the notion of meaning from the realm of natural language, information from uncertainty and probability, and to quantify relevance for the observer in a standard context.

Two decades ago, we tried to use entropic measures of information to describe the loss of cohesion of economic structures which corresponded to decisions to innovate.¹⁰ We took the data on world primary energy sources, means of transportation and the diffusion of hybrid corn in several states of the US, provided by Cesare Marchetti in an illuminating paper.¹¹ We observed that once the determinant factor in each case approached a definite fraction ($1/e$) of the total of possible deployments, a new structure emerged.

It was a promising beginning, but one which only scratched the surface of the problem. We searched for more data but also undertook a more formal path,¹² inviting a group of scholars in philosophy, arts and humanities, social sciences and natural sciences, to discuss the contours and content of the concept of “form” (the label for a possible conservative entity

in the field of information and communication). We were certainly approaching a fraction of 1/e (36%) of what we could possibly do when the cohesion of our group collapsed.

But we firmly believe in this endeavor, as Shannon and Weaver signaled earlier on. We must go back to the basics.

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The Philosophy of International Relations

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Abstract

The author attempts to examine philosophical components in the way of thinking and decision-making in the sphere of international relations by drawing links from the past and the present.

The present uncertain and insecure state of world affairs has led diplomats and scientists to significantly reconsider approaches and formats for global cooperation, thus extending the discussion to the philosophy of international relations.

The attempts to consider international relations in terms of a philosophical approach can be traced back to ancient times. Athenian historian and General Thucydides (460–411 B.C.E.), whose monuments one can see today at the entrance to the Bavarian State Library in Munich and in front of the Austrian Parliament Building in Vienna, has been called the Father of the international relations theory, which was dubbed later as “political realism”. It views the relations between states as ultimately mediated by and constructed upon the emotions of fear and self-interest. In the famous *History of the Peloponnesian War*, which is described as the only acknowledged classical text in international relations still inspiring theorists and scholars, a philosophical approach is clearly felt.

“Plato, Aristotle and Socrates in classical Greek philosophy and later Cicero in Rome felt dissatisfied with the world as they found it, trying to answer the eternal question of what ought to be in international politics and insisting that there should be some universal moral values on which political life could be based.”

International politics is seen as a competitive and conflictual field in which power and security become the main issues leaving quite a little place for morality and ethics. Constraints imposed on international relations are responsible for human beings’ conflict-based paradigm. Power therefore plays an overriding role in shaping interstate relations. According to Thucydides, “the independent states survive only when they are powerful” and not so much has changed since that time as far as the content of this statement is concerned, both practically and theoretically.

Generally, international relations contend various theories presenting their expectations and perspectives. There is a view of international relations that regards the field as states in their capacity of principal actors in the international arena amended today by many other participants: cities, local powers, transnational corporations, non-governmental organizations, political movements, unions of civil society. Political realism in international relations is often contrasted with idealism or liberalism which ostensibly tends to emphasize cooperation. When national interests are stressed these days, they are not as blunt any more, as per the Machiavellian doctrine “that anything is justified by reason of state”. The negative consequence of the emphasis on power is that a kind of skepticism is generated regarding the relevance of ethical and moral norms to the relations among states. However, the role of ethics in international relations could be hardly denied. It is an inseparable part of the contemporary philosophy of international relations, which reaffirms the importance of the possibility of moral judgment in international politics. It does not imply, of course, any abstract moral discourse that does not take into account political realities. A supreme value could be assigned to successful political action based on prudence, which means the ability to judge the rightness of a given action from among possible alternatives on the basis of its likely political consequences.

“Machiavellianism has become part of the present philosophy in international relations striving often for one-sided preferences at the cost of other participants, which has thus resulted in the loss of global balance.”

The ancient construct that “the decisions about justice are made in human discussions only when both sides are under equal compulsion, but when one side is stronger, it gets as much as it can, and the weak must accept that” has been ameliorated by means of international law and limited world governance by the UN and its system. At the same time enough space is still left to states pursuing elusive dreams of their superiority to claim the right of the stronger to dominate the weaker. A state bent on domination tends to explicitly equate right with might and to exclude considerations of justice from foreign affairs. In this respect, security of states acquires a central place. To attain security, states try to increase their power and engage in balancing power for the purpose of deterring potential aggressors.

A variety of approaches within the scope of what is called political realism in international relations is claimed to be replaced today by neorealism, which is presented as an attempt to establish more science-based attitudes to politics on the world arena. Judgments proceeding from realist and neorealist views and conceptions are being criticized by theorists representing ideal, liberal, critical and post-modern perspectives and vice versa.

A system of views that is called idealism can claim to have a long tradition in international relations too. The representatives of it such as Plato, Aristotle and Socrates in classical Greek philosophy and later Cicero in Rome felt dissatisfied with the world as they found it, trying to answer the eternal question of what ought to be in international politics and insisting that there should be some universal moral values on which political life could be based. Building

on the work of his predecessors, Cicero developed the concept of a natural moral law that was applicable to both domestic and international politics. The idea that politics, including the relations among states, should be virtuous, and that the methods of warfare, which for ages used to be the most applied form of international relations, should remain subordinated to ethical standards, was gaining ground.

“The United Nations founded in 1945 as a real universal organization, the first of its kind in the history of the world, basically changed the philosophy of international relations by introducing a new format for states’ interaction and interdependence.”

Contrary to that, a Florentine Renaissance diplomat, historian and philosopher Niccolò Machiavelli (1469-1527) introduced in the 15th century the concept of admissibility of immoral actions in politics. It is a doctrine which denies the relevance of morality in politics and claims that all moral and immoral means are justified to achieve certain political ends. Although Machiavelli never uses the expression “ragion di stato” in his native Italian, or its more widely known French equivalent “raison d’état”, what ultimately counts for him is precisely whatever is good for the state, not any ethical scruples or norms. This type of political thinking is called “Machiavellianism” and is associated with unscrupulous behavior, dishonesty and betrayal considered to be normal and acceptable in the pursuit of what is understood as goals of the actor. Though no one uses the term “Machiavellianism” now in a positive sense which has a clear negative connotation, it has become part of the present philosophy in international relations striving often for one-sided preferences at the cost of other participants, which has thus resulted in the loss of global balance after the end of the bipolar era. If there was an end to the “Cold War” and an ensuing victory, it should be considered definitely a Pyrrhic victory, since the world has not become more safe or predictable than before. On the contrary, today multiplying conflicts are witnessed everywhere around the globe and refugees are invading and making states suffer.

Thomas Hobbes (1588–1679) saw the relations among states as based on the quest and struggle for power. The same would be true later for the model of international relations developed by Hans Morgenthau who was deeply influenced by Hobbes and adopted the same view of human nature driven by “a perpetual and restless desire of power after power that ceases only in death.”

German philosopher Georg Hegel asserted in the 19th century that “the state has no higher duty than maintaining itself”, and gave a kind of an ethical sanction to the promotion by a state for its own interest and advantage against other states, thus defying traditional morality. The good of the state was interpreted as the highest moral value with the extension of power of nations regarded as its right and duty. During the same period, German historian Heinrich von Treitschke declared that the state was power and that the supreme moral duty of the state was to foster this power. He considered international agreements to be binding only insofar as they were expedient for the state. The idea of an autonomous ethics of state behavior and the concept of what was called “Realpolitik” were thus introduced. Traditional ethics was denied

and power politics was associated with a “higher” type of morality. These notions, along with the belief in the superiority of German culture and nationhood, remained till the end of the Second World War as instruments to justify policies of conquest and extermination. The concept of a double ethics, private and public, that created further damage to traditional, customary ethics, was invented. The doctrine of “raison d’état” has led as its final consequence to the politics of “Lebensraum”, two world wars, and the Holocaust.

“The philosophy of international relations is not just an intellectual enterprise. It has practical consequences and largely influences the way of thinking and decision-making in world politics.”

After the horror of the First World War, the philosophy of international relations was dominated by the desire for peacekeeping to prevent another global catastrophe. This was accomplished by establishing a system of international law to be promoted by a universal organization. The League of Nations created in 1920 and the Briand-Kellogg Pact of 1928 which outlawed war contributed to cherished hopes for a peaceful solution to aggravating problems in the relations among states. In the illusory philosophy of international relations of that period the origin of war was seen in rather bad social conditions and wrong political arrangements which could be improved. The League of Nations did not become a truly universal organization due to its obvious dependence on France and Great Britain which stopped the United States from fully endorsing it. At a certain stage, the outbreak of the Second World War became inevitable.

The United Nations founded in 1945 as a real universal organization, the first of its kind in the history of the world, basically changed the philosophy of international relations by introducing a new format for states’ interaction and interdependence, thus paving the way for global governance with elements like the Security Council which gave veto right to its permanent members and made resolutions obligatory for member-states.

Among the recent philosophers in international relations, it should be mentioned that Edward Carr contributed in the 20th century largely to the concept of conflict of interests which is fundamental to emerging challenges and wars. He showed that the language of justice could be used just to achieve the particular interests of a state, or to create negative images of other countries to justify acts of aggression. Morally discrediting a potential enemy or morally justifying one’s own position shows, in his opinion, that moral values are derived from actual policies. Policies are not created on some universal norms independent of the interests of the parties involved.

The philosophy of International relations propounded by a prominent post-War scientist Hans Morgenthau placed human qualities such as selfishness and lust for power at the center of the vision of the contemporary world. This insatiable lust for power, timeless and universal, which Morgenthau identifies as “animus dominandi”, the desire to dominate, is for him the main cause of conflicts. His concept of power implies the assumption that political leaders “think and act in terms of interest defined as power.” It appears as a universally valid category

and an essential element of politics, since various things can be associated with interest or power at different times and in different circumstances. Its content and the manner of its use are determined by the political and cultural environment.

“It is useless to define the actions of states by the exclusive reference to power, security or national interest. International politics cannot be studied independently of the wider historical and cultural context.”

However, the philosophy of international relations is not just an intellectual enterprise. It has practical consequences and largely influences the way of thinking and decision-making in world politics. As Raymond Aron and other scholars have emphasized, power, the fundamental concept of Morgenthau’s theory, is ambiguous. It can be either a means or an end in politics. But if power is only a means for gaining something else, it does not define the nature of international politics in the way Morgenthau claims. It does not allow us to understand the actions of states independent of the motives and ideological preferences of their political identity. Accordingly, it is useless to define the actions of states by the exclusive reference to power, security or national interest. International politics cannot be studied independently of the wider historical and cultural context.

At the same time, a new vision of international relations and their philosophy has been developed, reflecting changes in the world. Following the détente of the 1970s, the growing importance of international and non-governmental organizations, as well as of transnational corporations and new formats of multilateral cooperation, was witnessed. This development led to the consolidation of thinking which became known as neo-liberalist or pluralist thinking. The leading pluralists Robert Keohane and Joseph Nye have proposed the concept of “complex interdependence” to describe their more sophisticated picture of global politics. They argued that there can be progress in international relations and that the future does not need to look like the past.

Kenneth Waltz, another scientist, made an effort to amend the philosophical discussion about human nature with his theory of international politics, which is analogous to microeconomics. He argued that states in the international system are like firms in a domestic economy and have the same fundamental interest to survive.

As a practical expression of international society, international organizations could be seen as upholding the rule of law in international relations, especially the UN. Their philosophy, as well as the philosophy of existing G7 and new formats of international cooperation of states like G20 and BRICS at the global level, and Shanghai Organization for Cooperation and others on the regional level, is subject to future studies and assessments which challenge scientists with an important and responsible task to be accomplished.

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A Slightly Contrarian Perspective on a Nuclear-Free World

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Abstract

This analytic piece penetrates into ironic implications of nuclear weaponry and nuclear disarmament efforts, including those embodied in the renowned START treaty. Some of these implications seem to undermine international security and the framework of world order, and some actually appear to threaten global and human survival. Again, irony will indeed be seen to permeate the unconventional conclusions adduced.

1. Introduction

Since their invention over seven decades ago, nuclear weapons have been the obvious and unrelenting bane of mankind. Because of their mega-destructive power and grisly lethality, the instruments have cast a pall of dread over the world for the entire memory span of most people alive today (actually about 97% of living humans, per the world population age distribution). Many also can recall the Cold War period when much of humanity lived every day of their lives in constant, conscious, and justified fear of instant mass annihilation. The more senior American and Russian readers would have experienced “civil defense” nuclear attack drills during their formative school years, literally involving crouching under classroom desks—as if that would have done very much good for anyone in the event. As J. Robert Oppenheimer of the Manhattan Project famously said in 1965 to capture the gravity and mood, “I am become death, the destroyer of worlds.” As many of us said in the ’60s and ’70s, “Nukes are bad for kids and other living things.”

“Abolishing nuclear weapons does not also delete the widespread knowledge of how to make those things, unfortunately. The apparent inability of peace advocates to grasp this reality, along with its strategic implications, is one of the most vexing frustrations for the peace movement’s sympathizers and fellow travelers.”

Surely this assessment is one of the few generalizations that all can accept. Maybe all except those Neanderthal, Luddite, war-mongering, right-wing reactionaries, that is! To the contrary, if only it were that simple. Rightly, we would also have to add the governments of North Korea and Iran to the roster of dissenters, so afflicted are they with “missile envy” and megaton lust that they race to develop or enhance nascent nuclear weapons capability.

But then what of the governments of the extant major nuclear powers, holders of thousands of thermonuclear devices and delivery systems presently despite much public clamor for disarmament?

In the interest of balance, arguments supporting the societal utility and moral worth of nuclear weapons can be noted for the record: (1) In their only wartime use, two of them drastically shortened the deadliest war in human history—although at considerable cost to about 150,000 Japanese civilians who perished. (2) If not for the mutual nuclear arsenals numbering in the tens of thousands, how many conventional world wars would the United States and Soviet Union have fought with each other and their allies during the 45-year Cold War era? It is plausible that the deterrent effect of the specter of uncontrollable planetary devastation indeed worked to prevent the worst war of all, the World War III that never happened. Or not. (3) If nuclear weapons were, in fact, totally eliminated from the face of the earth, how long would it take for any rogue state (e.g., North Korea, Iran, Russia, or name your favorite) to reconstitute its nuke-dedicated arsenal—thereby establishing a hyper-military monopoly against which the rest of the world would be defenseless? Is that a sanguine prospect, or is it more sanguinary? Would the consequences be benign? Abolishing nuclear weapons does not also delete the widespread knowledge of how to make those things, unfortunately. The apparent inability of peace advocates to grasp this reality, along with its strategic implications, is one of the most vexing frustrations for the peace movement's sympathizers and fellow travelers. What about abolition followed by international enforcement? Attempted enforcement of weaponry restrictions on outlaw regimes is as quixotic and chimerical as expecting common criminals to abide by strict gun laws, as recent history demonstrates at both ends of the weapons spectrum.

Regardless, water under the bridge or idle speculation as of now, it may appear, yet historical or hypothetical diagnosis may still be of value insofar as yielding lessons pertinent to contemporary crises. Looming nuclear proliferation in the Middle East tinder box as an ironic artifact of inept U.S. and U.N. efforts to prevent that very outcome would be one of those crises. Could escalating the potential consequences of war help to forestall mortal military conflict—again? Or will it all depend on the type of society that controls the nuclear weapons, perhaps vis-à-vis its cultural, religious, and/or moral orientation? Alternatively, might Iran or Israel draw the lesson that a nuclear first strike can be its salvation or Holy Grail, so to speak? Time will tell, and time seems to be running out.

So much for the garden variety nuclear landscape. More exotic dimensions may be gathering in the offing.

2. The Global Defense Issue

If not enough on the world's nuclear plate already, the worst may be yet to come. And this time, the conventional pacifistic zeitgeist concerning weaponry morality could itself prove massively fatal. Shifting gears to mere policy blundering, charitably assuming honorable motives, the situation is even graver than before with a quantum jump in potentially catastrophic effects. While the reader may have been distracted by mass murder, worldwide terrorism, economic meltdown, global warming, and a pending U.S. national election with major implications for international war and peace, America and the world have been recklessly endangered in a new and ironic way: A nuclear weapons treaty between the United

States and Russia has been approved and then put into effect as of the early part of President Obama's second term. Moreover, Mr. Obama himself declared a national policy commitment to completely eradicate the world's supply of nuclear weapons. Is there a problem with this auspicious progress? Brace for something very different.

One non-traditional aspect of this new, ersatz START agreement (Strategic Arms Reduction Treaty) and environment, in particular, does not seem to have registered cognitively with some important international leaders, the relevant media, or the world public. Has everyone forgotten about the contingency plans for defense against near-earth asteroids? Yes, it is now about asteroids. Really.

Granted, we know that attacking an incoming asteroid or comet with a barrage of nuclear weapons blasts is not necessarily the optimal approach. Science has established that such a method is completely ineffectual given some physical conditions—but also the most viable chance in others, especially as a last resort against genuine doomsday. (See *Near-Earth Object Survey and Deflection Analysis of Alternatives*; NASA 2007.) NASA, in fact, along with the U.S. National Research Council (2010), has endorsed nuclear explosives for planetary defense against near-earth objects in certain circumstances. So, the former Obama administration's fetish for reducing U.S. and Russian nuclear stockpiles toward zero, a desire also held more broadly, of course, would cripple that essential alternative capability. Might the policy stance do more good than harm, or vice versa?

The grimmest eventuality suddenly is more tangible and urgent, with scientists at the Russian Space Agency now forecasting higher than normal likelihood of a major asteroid impact around the year 2030 (ICN 2010). The private B612 Foundation estimates a 30% probability of catastrophic asteroid collision within this century (Lu and Rees 2013). Due to population expansion and mass urbanization, a reproduction of the 1908 Tunguska impact (projected to occur about every 300 years; Su 2015) would likely produce a substantial body count of casualties. Although the most recent species-extinction asteroid collision with earth was tens of millions of years ago, since the 2013 Chelyabinsk airborne meteor explosion that injured 1200, it is no longer possible to claim no mass casualties (at least of the injury type) from such objects in human history. In other words, we may need the world's nuclear arsenals for species survival someday fairly soon. Thanks to President Barack Obama and his like-minded national security apparatus, those vital assets may not be available when needed most. And Mr. Obama's eight-year suppression of the U.S. manned space program could also be recalled very unfavorably by doomed earthlings about 10 (or 80) years hence.

Apart from political disagreement, widespread domestic misgivings in some quarters about Barack Obama's own experience and readiness for office now seem to have been ratified, reified, and even understated, if anything. The completely non-melodramatic expression of this unfolding epiphany is that some of the world's most powerful leaders have put that world in considerable jeopardy, literally. The ominous is being realized. In particular, in the view of critics, the Obama administration's rare combination of scientific ignorance, strategic irresponsibility, and preternatural arrogance could not only become the undoing of its own country but could even bring about the destruction of humanity and the earth itself! (Other than that, how was the play, Mrs. Lincoln?) At least the American president meant well. But can we expect the scientifically illiterate Donald Trump to do any better?

Or is all this not to be taken seriously? If it were not serious, however, the U.S. and other leading techno-powers would not have devoted serious resources to a terrestrial defense project known as the Near-Earth Object Program (NASA, 2007). The threat is recognized by experts as deadly serious. Until recently, it was by the U.S. government also. In fact, the field of planetary science concurs that it is only a matter of time before the inevitable threat materializes, and we should not be defenseless against it (Schweickart 2009). In the political realm, the U.N. General Assembly and its Scientific and Technical Subcommittee have formally endorsed development of an international asteroid warning network (IAWN). Nuclear disarmament by the superpower(s) does leave the world naked against at least one variety of the asteroid threat. Even depleting, if not erasing, the world's supply of thermonuclear devices leaves us with an emaciated capacity against the bigger space rocks, the ones that matter in terms of total extinction. (Ironically, the pro-ballistic position now may be seen to have some merit at the high end of the weaponry spectrum. Most readers may hope that lower-end weapons advocates such as the NRA do not notice that analog.)

The unfortunate and unforeseen moral of the story is that the world's nukes may not have been an unalloyed evil after all. Food for thought; the author actually hopes to receive an effective rebuttal. And some say that Barack Obama's critics have been too severe. It turns out that the critics may have been wrong after all, but by unduly moderating their criticism. When Mr. Obama said he would restore science to its rightful place, we did not expect this outcome.

3. The International Security Issue

Back to earth, the only good news, at least in this regard, is that the Russians probably will not be eliminating their nuclear weapons at all (while the U.S. side destroys its own) because the latest START treaty is ultimately unverifiable on the Russian end. The successful regimen of the 1991 START agreement is to be abandoned in the new bilateral contract, with inspections reduced from 40 to 18 per year (U.S. Department of State 2013). Why should we believe that the Russians will choose to violate an arms treaty? That is what their general historical pattern of behavior has been, across the full range of weapons of mass destruction categories (Leitenberg and Zilinskas, 2012; Siegel, 2013).

Other weaknesses of the revised START treaty are adequately covered elsewhere (see Arms Control Association 2012; Kyl 2010), but the verification lacuna is the most salient one, terrestrially if not celestially, as America and the world may come to learn. So, improbably, there is an ambivalent trade-off between international and interplanetary security. "There are more things in heaven and earth..." as the prescient Shakespeare wrote.

By the way, if the U.S. and Russia are restricted to about 1500 warheads each, as they are under new START, what will be the combined total for Russia, China, North Korea, Iran, Pakistan—and even Israel and France, for good measure—relative to the United States' 1500 (down from its former and indomitable 25,000 or so)? Does the prospective answer really make you feel safer, whether you are an American or not? Do you really feel that world peace is enhanced when aggressive outlaw states such as some of those listed will collectively be more powerful strategically than the U.S.—the nation that saved the world from tyranny at least twice, generously rebuilt post-war Western Europe including a former

enemy, maintained the balance of peace during the Cold War period, fed most of the world, developed and shared unparalleled medical science for humanity's common welfare, and has exercised its power more temperately overall than any superpower in world history (yes, including the atomic bombing to end World War II, which is estimated to have saved hundreds of thousands of lives, net)? And the objectivity of the last proposition is confirmed as one futilely seeks a counterexample. If readers had not thought about it this way, maybe some in strategic leadership positions should have. Pleasant dreams, comrades.

4. Conclusion: Primary Culpability

Now the main subtext and unifying theme of this note become clear. The present confluence of events emerges as the suitable occasion for an omnibus treatment, given social, national, world, and even *celestial* circumstances. It is timely to bring together some under-the-radar issues that an audience dedicated to the peace of the world should be alerted to and sensitive about. Underscore "under the radar."

From domestic and international machinations to celestial mechanics, of all things, when real vision, wisdom, and statesmanship are needed, even for an issue of supreme (forgive me, *cosmic*) magnitude for the planet, it is sometimes amateur hour at the White House, with the world's most consequential public officials strategically and technologically myopic. Perhaps they are too focused on prosaic politics. No inescapably amateur conclusion about the quantitative level of asteroid impact danger is offered here, in this non-technical document, obviously. Rather, it is the contrast between the expert community's seriousness and the former Obama administration's frivolous unpreparedness, still uncorrected to this day by a subsequent U.S. administration, that is cited as conspicuously imprudent. Even non-technicians with a modicum of reason are capable of that discernment.

Ridding the world of nuclear weapons is a noble ambition indeed, yet could also be a specious one until a new form of terrestrial defense is invented. One can only hope that the next advance in global defensive technology will not also have the familiar offensive corollary effect that atom-splitting has.

For better or worse, civilization depends on energy for development and even survival. In a remarkable irony, we happen to be at a juncture when the unique energy signature of one particular nuclear power variant could become a literally vital component of that successful formula. Unfortunately, a curious form of political short-sightedness impedes such basic understanding.

This concern connects full circle in a poignant way: If an American president is capable of the worst possible decision-making error—if that is what it is—with the stakes no less than the survival of mankind, what credibility can there be on more mundane issues such as war and peace? It is past time for such a question to be raised. (Or is it heresy to challenge the infallibility of one who was bestowed a Nobel Peace Prize, although "on the come"?)

Barack Obama's critics, partisan or otherwise, like to ask sardonically, "How's the hope and change working out?" Those humans still alive to ponder the question in the wake of a future asteroid collision, if any are, will know the answer—and may have strong opinions

about the peculiar politics-science intersection of our era. If any members of the Norwegian Nobel Committee survive, perhaps they will reconsider that 2009 Peace award.*

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Future Possible Scenarios of World Governance: A Discussion on Keith Suter's Ideas

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Abstract

In this paper, Suter's scenarios of world governance are discussed and re-evaluated in the light of today's world. For that purpose, two general models of governing the world are posited, centred on the global/non-global governance dichotomy; then, in turn, each of these models are divided into two possible future scenarios, thus merging Suter's scenarios as follows: (a.1) global governance and global government: world state, (a.2) global governance but no global government: Earth Inc., (b.1) neither global governance nor global government: steady-state; (b.2) neither global governance nor global government: wild state. Finally, the possibility of an anarchist society after the struggle of the wild state is added to the last scenario, a society ruled by people's own capacity to persevere and help each other without a centralising institution of power. The paper concludes suggesting which of the possible futures seems to be closer to the present.

1. Introduction

Keith Suter has recently written about the future of the nation-state in an era of globalization,¹ providing four scenarios of future governance:

1. **Steady State:** This scenario argues that the basic nation-state structure will remain in spite of all the discussions about global governance. Nation-states, which came into existence only since the Treaty of Westphalia in the 17th century, will make their way through the 21st century, for they cared for the national interests and avoided the potential tyranny of transnational superpowers: the least of the two evils. For the purpose of this article, this possibility is to be referred to as “No global governance—No Global Government: Strong National States”.
2. **World State:** This scenario suggests that there are no national solutions to transnational problems, so governments have to implement some working collaboration to solve common problems; although Suter does not contemplate here the possibility of a global hegemonic state after a war, some other authors, especially those from world-system theory, also examine that possible scenario. Thus global government could take place in several forms: from strong global dictatorship (would not be a peaceful solution) to a global federal government or some government composed of functional agencies ruling the world. For the purpose of this article, this possibility is to be referred to as “Global Governance—Global Government: Several Types of Governments”.
3. **Earth Inc.:** It refers to a scenario in which the nation-states have not been able to solve the common problems that make them lose control over their population, thus

transnational corporations are the only international organizations that can bring to a peaceful transition the governance of the states while joining “the world together into one market as they fill the governmental vacuum”.² For the purpose of this article, this possibility is to be referred to as “Global Governance—No Global Government: The World in the hands of Transnational Corporations”.

4. **Wild State:** It suggests that after the states have lost control over their countries, there is no transnational organization capable of filling the vacuum which thus results in increasing chaos. As Suter puts it, “this is the ‘nightmare’ scenario, in which nation-states fall apart, there is an increase in ‘failed states’, mass movements of peoples and increasing environmental and health problems”.³ This scenario is a pessimistic one but also can be foreseen as a positive one within the decline of nation-states, for this chaos envisaged by Suter is the reverse of the social order imposed by a Hobbesian state: the anarchist society as described by Kropotkin (and libertarians such as Nozick) and endorsed by Chomsky or Graeber in modern times represents this positive vision. For the purpose of this article, this possibility is to be referred to as “No Global Governance—No Global Government: Anarchist Society”.

2. Models of World Governance and the Future of Humanity

2.1. Global Governance—Global Government: World State (a.1)

This is Suter’s second scenario. Global governance is not a mere desire but a matter of fact, for the world is already ruled globally, the point, according to Frankman, is what is the governance that we want for the interests of humanity and then what are the alterations we have to make. The alterations referred to are embedded in his belief that the current global system is an oligarchy with a hierarchical and authoritative structure, far from democracy. The reasoning of the author goes from national welfare states to a worldwide welfare state to prevent capitalism from its excesses (in the same way as what happened at national levels during the first half of the century), which are, for the author, mainly the increase in inequality of wealth and income as well as the suppression of democratic values and participation. This prevention of capitalist global excesses is left to a welfare state to make the world safe for people to live in and for the ecosystem to endure.

If we are to survive as a civilization, Chase-Dunn more recently wrote about the five crises of contemporary world (including those mentioned by Frankman previously) that need to be solved when the U.S. hegemony is in decline:

- a. **Crisis in Global Governance:** It concerns the difficulties of dealing with troubles in the contemporary world, where troubles cannot be dealt without conflicts of interest between the powers of the interstates system that has been gradually established in the decline of US hegemony: “The long-term trend toward large-scale political integration and centralization will eventually result in the emergence of a world state, but this is an unlikely development for the next few decades”.⁴ He thinks that a world state will come up in the long run, that is, the global governance would be managed by a united and unique state of states (a confederation, perhaps).
- b. **Crisis in Inequality and Democracy:** The inequality between South and North is still big and the problem is that the inequality is justified by the impossibility (disastrous) of

getting for every human in the world the same living conditions than those in the North hemisphere: “If the people of the global South eat as many eggs and drive as many cars as the people of the global North the biosphere will fry. This is a problem”.⁵ And democracy is poor in quality because after World War II those who won, and especially the US, distributed and controlled the power of the globe.

- c. **Crisis in the Biosphere:** Global warming and pollution are characteristics of the geological epoch we live in, called Anthropocene by the geologists, and defined as the modifications and fast devastation of the ecosystem by human causation. This crisis has been “exacerbated by the unwillingness of the powers that have to make serious efforts at reaching solutions”.⁶ Nowadays we can include in this section the latest move of the president of the US, who, by drawing his country away from the Paris Climate Agreement (The White House’s report, 2017), undermines once more common efforts to solve this global crisis.
- d. **Crisis in the Global Capitalist System:** Here, Chase-Dunn recalls Wallerstein’s ideas, and suggests that capitalism is in crisis because of the long-term rise of wages, cost of material and taxes, which means that it will be very difficult to maximize the profit. Capitalism then will fall by the contradictions within it: “The falling rate of profit means that capitalism as a logic of accumulation will face an irreconcilable structural crisis during the next 50 years, and some other system will emerge. Wallerstein calls the next five decades ‘The Age of Transition’.”⁷
- e. **Crisis in the New Global Left:** The crisis of the global left refers both to the weakness of people’s claiming and the lack of unity at global level against the abuses of structural power (the sort of resistance that power benefits from; see Wallerstein, 2014). He envisages a future in which “a global united front that combines labour with horizontalists is possible, but may not happen until global Robocop and 21st century fascism get stronger”.⁸ A global movement of people seems only plausible when the pressure from the top becomes extreme. Horizontalists are activist populist movements that reach some sort of state recognition and are associated with syndicalism towards the same goal. The term “global Robocop” refers to the total digital surveillance of private life; Robocop is also associated within the UN to the autonomous weapons like drones that can enter the battlefield and target people without the need for actual soldiers that can be compromised.

As the reasons for a change in global politic orientation have been laid down, the next question has to do with the sort of world governance that is best for the interests of people. Frankman remarks the need for a welfare global state to care for the social. This must be in a form of an actual government, not any supranational organization or corporation: “A welfare state, whether national or global, requires a structure of government to shape the programs, to finance them, and to respond to changed circumstances”.⁹ This is linked to what Chase-Dunn said about the military force that a superpower needs to own to implement global governance and intervene when challenges to authority come. And it seems that governments, better than any other instances of power, can fulfil this responsibility to constrain and exercise legitimate violence. Without that, we wonder, is there any possibility of governance? It seems the answer is negative, for ruling is to enforce behaviours, thoughts and beliefs as well as the

use of violence upon those who do not follow the lead; but it seems plausible to think that there are other ways of social organization (in a nongovernmental approach): one which does not apply the rules of a few over the many; in the fourth scenario I will discuss, for instance, Kropotkin's suggestion of anarcho-communist society based on mutual cooperation.

However, according to Frankman, the purported global government presents difficulties to be implemented such as 1) limitations imposed by major powers 2) The misconception of believing that it is enough to solve national problems 3) The acceptance of functional globalism: most of the global problems are technical, so we must leave the experts to solve it. Nevertheless, giving the need to solve the world crises mentioned above and considering the plausibility of a global government to solve them, we must examine the sort of governments that would be feasible. I will follow the distinctions made by Suter while extending with a critical eye the evidence in favour of each of the types of governments:

- a. **Federalist.** It is defined as the decision of national governments to transfer certain powers (for instance, military power) to a global government (while retaining the power to make laws on local properties).

In a brief history of the proposal of global federal government in Western culture, Kant must be the first name to be mentioned; he understood that only a state of states could guarantee the cessation of warfare and the endorsement of a "perpetual peace";¹⁰ in the XIX century, probably it is K. Ch. F. Krause who has to be mentioned in relation to the idea of a global federal government.¹¹ He was an enthusiastic admirer of Napoleon in his initial victorious moments, for attempting to unify Europe, and the World, under a unique regime, believed to be the expansion of the democratic ideas of French Revolution. Krause held that in the same way that a nation-state must provide the conditions of living within the national community, there must be other institutions at higher levels to care for the conditions of living and promoting peace and unity between the states of different totalities such as Europe, Asia, Africa and America.¹² This logic was that of a gradual integration of sovereign nations of Europe into a federation of European states, the nations of Asia into a federation of Asian states and so on, to ultimately achieve a confederation of all the nation-states from around the globe in what he calls the League of Humanity, where all people had to be represented (each state represented in its continental confederation and each continental in the global confederation) and unified under a common destiny: the ideal of humanity.¹³

In the XX century, the global democratic federalism was around for a while; for example, as early as 1925, Harold Laski was arguing that the world government was part of the modern conditions and that federalism was its most appropriate form to prevent war and secure economic justice for people;¹⁴ besides, after the World War II, on the front page of *The New York Times* (1945) was reported a conference in Dublin calling for global democratic federalism, and the periodical in Canada entitled *World Federalism* was active from 1955 to 1974.¹⁵

Nowadays, this global government's option is discussed probably more than ever; there are a number of NGOs and international organizations that are pro-federal world governance. The most active one is the World Federalist Movement—Institute for Global Policy. Between its claims can be found the formation of a United Nations

Parliamentary Assembly (UNPA), which would bring about an improvement in global governance “by adding a democratic and independent complement to the UN system”.¹⁶ This organization works to transform the UN into a strong, democratic federation while keeping the US within to cooperate and support it.

In general, the idea of global government has received criticism on the basis of democratic escapism; this remark posits people’s disregard for the democratic process on the account of the huge number of actors involved.

The difference made by each vote seems so insignificant in comparison to the world population that this might diminish democratic participation and the actual meaning of participating.

“The new world citizen is likely to be a product of globalization from below rather than from above.”

- b. **Functionalist.** It is defined as a network of global agencies that handles particular functions such as health, telecommunications, etc.; they are also called “epistemic communities”.

Here the risks of a non-national growth are presented, in which states lose control of global issues that affect them. They need the expertise of those who work for many governments to the point that the stability and growth of the global economy may depend to a large extent on them. These agencies constitute the era of the technocracy as has been called. Epistemic communities are then the groups of experts that inform the governments about technical solutions to complex issues: “The ‘epistemic community’ approach describes the roles played by networks of experts in international decision-making: how they agree upon and articulate causal linkages within complex issue spaces; how they frame issues and define salient discourse; how they define and limit potential solutions or outcomes; and how they define state interests within the issue space”.¹⁷ The epistemic communities consist of experts who are to be accountable from several governments who otherwise would be at a loss in those particular issues. They represent the formation of a knowledge-based power network on a global scale. Brown understood that a globally identified conglomeration of a technocratic network would be required for the functioning of an institutionalized global mode of regulation.

- c. **Populist.** The creation of a grass-roots movement to establish a democratic world government.

With the U.S. hegemony in decline, populist revolutions and social movements have increased, claiming, as new Global Left, a change in world politics’ orientation, a position well represented by the contributions made by Negri and Hardt (2000, 2004, 2009). For Frankman, the democratic deficit has been caused by the nationalist education; he means that the type of person we are and the way we behave have been nurtured through national elites, and seems to claim for a more global human being, with rights and responsibilities at large scale: “Our myopia, cynicism, withdrawal, avoidance of collective responsibility, and deference to authority and technical experts have been carefully nurtured by an educational system in the service of nationalism”.¹⁸ Therefore, the way out to this situation in which people have been drawn away from their

responsibility but at the same time from their right to participate and make differences is the formation of a government solidly founded on a populist movement. He defends that the new world citizen is likely to be a product of globalization from below rather than from above. Both are at stake, however, there are reasons not to be that optimistic, for it is from above as we have been changing (he wrote it above) through the education system, political decisions and social encouragement.

The scenario of the global federal government is the preferred choice for many analysts, especially for those who see the threat of a nuclear war as a major problem to keep in consideration. In line with the Enlightenment tradition, a global government would be the only solution for a “perpetual peace” and, in particular, for the warfare between nuclear-armed states. The question is if a global government could really be the solution to all wars, for the constrictions and the use of power necessarily will have a response, mainly as a resistance, from the governed in many different fashions, whenever the actions of power are not seen legitimate and the freedom and possibilities of living are undermined. There may not be warfare between states, yet revolts and even war would be over between the government and the people of the world; Negri and Hardt have envisaged in our times a “violent” (not necessarily a bloodshed) revolt of the multitude against Empire, symbolic of the purported network of contemporary global governance.¹⁹

Suter encounters that the problem in discussing global governments, in general, is that there is not yet a global community (union of all people), so to national communities, a global government sounds like Big Brother: “We cannot discuss world government because we have no world community to support it [...] The way to promote world community is to have world government [...]”;²⁰ and, after presenting this circular argument (the hen and the eggs dilemma), he opens a hope for the future precisely based on the awareness that global discussion can bring about and the effect that might have on uniting world community.

2.2. Global Governance—No Global Government: Earth Inc. (a.2)

In a way that resembles Negri and Hardt’s description of Empire, Frankman (1997) states that the world is governed not by a single government or institution yet by many of them in a sort of multipolar world conceived of as a nebulous term introduced with this specific meaning by Robert Cox: “There is, in effect, no explicit political or authority structure for the global economy. There is, nevertheless, something there that remains to be deciphered, something that could be described by the French word *nebuleuse* or by the notion of governance without government”.²¹ The vision that Negri and Hardt offer us of Empire, as the current political and economic global system also has to do with a sort of global governance without a unique government: “Empire establishes no territorial centre of power and does not rely on fix boundaries or barriers. It is a *decentered* and *detritorializing* apparatus of rule that progressively incorporates the entire global realm within its open, expanding frontiers. Empire manages hybrid identities, flexible hierarchies and plural exchanges through modulating networks of command. The distinct national colours of the imperialist map of the world have merged and blended in the imperial global rainbow”.²²

This concept of Empire will serve us to explore briefly the mode of governing that has been denominated global governance/no global government. Here are some of its main features:

- a. It has no territorial boundaries. It has no limits, rules over the entire “civilized” world and it combines national governments with other international organizations and corporations; the latter “tend to make nation-states merely instruments to record the flows of the commodities, monies, and population that they set in motion”.²³
- b. It has no temporal boundaries; it presents itself as the end of history. Not as a result of a process but as the only way of being, and the way it will always be.
- c. Empire rules over human interactions and over human nature itself, it rules over the entire social life and thus it presents the paradigmatic form of biopower. Industrial and financial power produces not only commodities but also subjectivities (which produce needs, social relations, bodies and minds...). The imperial machine (Empire) “produces and reproduces master narratives in order to validate and celebrate its power”.²⁴
- d. Although the practices of Empire are violent and fierce, “the concept of Empire is always dedicated to peace—a perpetual and universal peace out of history”.²⁵

Negri, however, envisages a government of the multitude (populist government as seen above) against that nebulous center of power that he denominates ‘Empire’. Empire thus has a counter-Empire. That counter-Empire is not limited to any geographical region. It is now in configuration throughout the resistant movements and desires and struggles of the multitude.

This scenario (Suter’s Earth Inc.) is presented as an evolution of a trend already in motion at least since the publication of Adam Smith’s *The Wealth of Nations*. The public good is achieved by pursuing individual interests in a world that is a free market. Suter emphasizes the risks of leaving to corporations and marketing the governance of the world and the people, for they are to place the commercial logic at a global level over the moral component and national interests: “People are principally consumers or aspiring consumers. Politics and patriotism are not as pleasurable as the latest fashion in clothes, music or technology. They are consumers rather than citizens. This helps explain the reduction in armed conflicts since 1950—they are consumers and not warriors [...] Transnational corporations have eroded the notion of a national economy; there is now only a global one”.²⁶

Vaidhyanathan has recently written to explain (2018) how Facebook as well as the Silicon Valley, as corporations blinded by the efficacy of their algorithms, threaten global democracy and society. He holds that the problems with these corporations are twofold: how they are designed and how their system is being used by people. Regarding the first question, he asserts that these global systems work exactly how they were expected to work, and that is precisely its flaw, for it “allows every user to post content indiscriminately, develops algorithms that favour highly charged content, and is dependent on a self-service advertising system that precisely targets ads using massive surveillance and elaborate personal dossiers”;²⁷ Facebook, in particular, which links 2.2 billion people across hundreds of countries, obtains its revenue by monetizing the data trails of its users. It stores users’ profiles and sells them to make more accurate targeted advertising; the more engaged users are, the better configured their profiles are. This results in a commercial imperative to raise levels of engagement by virtually “allowing” engaging contents that usually are more provocative. Concerning the second problem, Vaidhyanathan considers that these corporations have created a *Frankenstein* and they are losing control of it; the power of global connectivity that these

firms advocate is so powerful that it cannot be constrained for the better, yet many extremist ideologies and pernicious content, as well as false news, have found their way to influence great amounts of people through these social media. Vaidhyanathan asks rhetorically: “So how did the greatest Silicon Valley success story end up hosting radicals, nationalist, anti-Enlightenment movements that revolt against civic institutions and cosmopolitans? How did such an enlightened firm become complicit in the rise of nationalists such as Donald Trump, Marine Le Pen, Narendra Modi, Rodrigo Duterte, and ISIS?”²⁸ For the purpose of this article, it must be retained how these corporations’ inherent logic can make us walk towards a possible future scenario in which global democratic societies are ripped apart within this surveillance capitalist model.

2.3. No Global Governance—No Global Government: Steady State (b.1)

This corresponds to Suter’s first scenario. It finds its logic in the concept of national sovereignty. Nation-states are not willing to surrender their sovereignty. International relations and cooperation have been mostly carried out in a partisan standard of behaviour and the interest at stake is how a government can maximize its own gain. Here the recent law that defines Israel the nation-state of the Jewish people must be mentioned, with Hebrew as its sole official language, in order to reinforce, thus, national identity against Palestinian claims and within its own borders by building a sort of apartheid: “The State of Israel is the national home of the Jewish people, in which it fulfils its natural, cultural, religious and historical right to self-determination”.²⁹ This basic principle 1b of the new law (2018) reinforces the plausibility of the steady-state scenario and puts forth a legitimate doubt on the constitution of a global government (as the union of the people) other than a minimal protection agency (international force).

Suter provides some pieces of evidence for this scenario:

- a. Politics is local. There are a number of facts that make this scenario probable, for nowadays nation-states are still the core of political and military power, although overwhelmed by economic corporations’ growth. Some evidence of the national nature of politics is, for instance, the fact that foreigners are not allowed to vote in national elections. And in spite of supranational organizations such as the UN or EU, nationals can only vote for their national representatives, not for European or UN’s representatives, which is one of the initiatives currently proposed by WFM-IGP (2013): the creation of a United Nations Parliamentary Assembly.
- b. National boundaries. While there are extremely wealthy countries and extremely poor countries due to the international economy, those boundaries will restrict the movement of people. The recent migrant crisis in the Mediterranean Sea has been the result of the refusal by a few governments (Italy and Malta) to let immigrants enter their territory within their national borders, where the number of refugees exponentially increased in the last two years (UNHCR, 2018).
- c. National sovereignty is not only a core countries’ concern, developing countries also have a strong determination to maintain their sovereignty, gained after their independence from colonial masters. The fear of a new form of imperialism would make these countries not to give away their sovereignty. This is one of the biggest concerns

in proposing any sort of global governance, especially that of a global government. According to this scenario, the fear of having their national sovereignty and the right to determine their own future undermined by a global power dissuades nation-states from embracing any project of governance at a global level. The tyranny is a thread; it is a democratic process through which any sort of global government can be constituted together with its persistence. Global decisions to what rules, laws and conditions of life must be implemented undermined the sovereignty of a nation-state that opposes them in the democratic process (being the minority); its right to refuse it as a sovereign state is, in this case, annulled, for what can a global government do with those states that do not want or cannot follow their demands? In the EU, states such as those mentioned are condemned to pay back compensations and/or eventually to the exit of the union. Would a global government, which is the totality of the people of the globe, declare a sovereign nation out of the global jurisdiction? Those problems are to be taken into account if we attempt to combine national sovereignty with a global government, which will be forced to work out the type of sovereignty it might possess.

2.4. No Global Governance—No Global Government: Wild State/Anarchist Society (b.2)

This is Suter's fourth scenario. It is the result of weak nation-states and weak international social cohesion. Both national and international governance have failed. It is called "the nightmare" scenario and the "wild state", a denomination that proves (as I mentioned above) that the conception of the state is that of the Hobbesian *Leviathan*, a state that is legitimated to use force and violence for the sake of people's security. A state that, as a sovereign nation, constitutes the civic society: a social organization in which the rights and freedom of citizens emerge as such. Without the state or any type of institution replacing its function, the human society can only be thought of as chaos and annihilation, "every man against every man": the state of nature described by Hobbes.³⁰

Suter presents some facts that can be considered as increasing the chances for this scenario in the near future:

- a. The nature of the corporations. The previous scenarios are too optimistic and there are many forces that bring disorder. Suter thinks that corporations are not moral and do not have loyalties to anyone, for they are built with the only purpose of the returned capital: "transnational corporations are not a force for good. They are motivated only by money. They are out to make money for their owners/stockholders and they are not out to improve the world. They are not really accountable to anyone".³¹ In this case, a situation of chaos can be predicted because corporations can cause disasters on land and in societies as long as they can benefit from them. The supposed governance of corporations that would replace governments in the international arena would paradoxically lead to the eradication of governance at all levels.
- b. The number of failed states. In addition to the danger of a world ruled by corporations' interests, there is an increasing number of "failed states" around the globe. Some examples of them are Somalia, Afghanistan, Yemen and, to some extent, Syria (a government that does not control the entire extension of its country's territory and the fate of its people).

Suter concludes from this scenario that “the nation-state system is less than 400 years old. There is no law of the universe to say that it should always exist. The 21st century way will see its slide into chaos”.³² Chomsky, recognizing that the concept of “failed state” is “frustratingly imprecise”, attempts to give a definition of it by pointing out some basic characteristics: “One is their inability or unwillingness to protect their citizens from violence and perhaps from destruction. Another is their tendency to regard themselves as beyond the reach of domestic or international law, and hence free to carry out aggression and violence. And if they have democratic forms, they suffer from a serious ‘democratic deficit’ that deprives their formal democratic institutions of real substance”.³³

“Failed states” are thus states driven into chaos, broken apart by the claims and interests of several national and international parties. The question is if the chaos is precisely caused by the lack of government or by the imposition of illegitimate governments upon people. A world that has been devastated by corporations’ economic strategies and by failed states might find a way to endure in a society that reduces its governance to a minimal state or to a plurality of communities linked by mutual aid. In the first case, I recall Nozick’s concept of the minimal state. According to him, states are coercive organizations that have, for a given territory, an effective monopoly on the use of force. That is, states are characterized by being the only legitimate entities that can make use of violence.³⁴ Thus, Nozick argues that nothing more than a night-watchman state can be legitimate. Every “failed state” is from this point of view the effect of an illegitimate centralised imposition upon a social community. And it expresses the view that social organization cannot only be the result of the emergence of an authoritative state; people will cooperate whenever they feel free to do it, without the constraints of governments and ruling elites.

A different description of an anarchist society can be read in the work of Kropotkin, who emphasises the two principles of the so-called anarchist communism: 1) The abolition of individual property which becomes the common property of society and 2) the reduction of government to a minimum in which “the individual recovers his full liberty of initiative and action for satisfying, by means of free groups and federations freely constituted, all the infinitely varied needs of the human being”.³⁵ The anarchist society rejects the state; therefore, only by mutual aid and support a sort of social organization, led by the only purpose of helping each other, can grow: a society not regulated by policy and elite’s interests, for, as Graeber put it, the notion of “policy is by definition something concocted by some form of elite, which presumes it knows better than others how their affairs are to be conducted”³⁶ (2004: 10). A definition that is opposite to the political life in which the people decide what is best for them, a democratic life in its purest sense: mutual support instead of imposition. This mutual aid tendency as part of the survival of the species is very active in extreme situations such as the “wild state” (although not exclusively in them), situations that endanger individual and social life as put forth by Kropotkin: “but when even the greatest calamities befell men—when whole countries were laid waste by wars, and whole populations were decimated by misery, or groaned under the yoke of tyranny—the same tendency continued to live in the villages and among the poorer classes in the towns; it still kept them together”.³⁷ The anarchist society must be held as a third legitimate option within the possibility of no global governance/no global government. In fact, it must be considered as the positive side of the coin whose negative side has been called by Suter “wild state”. Because, anarchism, as a

form of stateless, self-managed social organization and through direct participation in small communities, has not only been the goal of social utopias carried out temporarily in practice as was the case of the commune of Paris (1848) and the Mondragón project (ecosystem of companies with self-management and cooperation in the north of Spain), the years of Spanish civil war in which the republics self-managed facing Franco's army, once the republican government had exiled (1939) or the Zapatista revolution in Mexico (1994) but, as Graeber³⁸ states, anthropology gives us dozens of examples of non-Western communities in that the direct participation and cooperation between its members and the absence of state are essential features.

3. Conclusion

Throughout this article, a review has been made of the different possible forms of global governance supported by the classification provided by Suter. This type of studies, I claim, has a greater interest perhaps in current times than ever before in other periods of history due to pressing uncertainty regarding the survival of the human being as a species on earth in the case of not finding the appropriate mode of government for all; because more than ever, a joint solution is required to face a progressive increase in the deterioration of the quality of life of citizens, the exacerbation of social and economic inequalities, the increase in suicides due to work stress in big firms combined paradoxically (or not) with high levels of unemployment, economic pressure and general dissatisfaction, global warming, irreversible damage to the ecosystem, and the health of citizens and, above all, the possible breaking of American peace together with the terror of nuclear war.

The objective seems clear, not so much the means to achieve it. The different types of government that have been proposed as future alternatives with their advantages and disadvantages do not fail to reflect this difficulty in matching the appropriate model. But the truth is that some of these types of governance are or seem to be closer than others to the present times. Throughout the critical review (albeit brief) that this article has carried out, evidence has been obtained that in the contemporary world there is a reactive tendency of states to reaffirm their sovereignty to the detriment of international organizations and global action. And, although the transnational organizations maintain their symbolic role as that of the UN, and have even seen in recent years a certain movement demanding a global government to be incarnated precisely by a parliamentary assembly of the UN, it does not have the expected political, economic and social relevance. This movement for global government is understood rather as an effort to resist (with a certain notion of justice from a bureaucratic point of view) a greater trend of globalization carried out by cooperatives and expert agencies, true objectives of state support in this neoliberal capitalism of authoritarian nature that seems to be the true face of the times and of the future mode of governing: a strong, authoritarian state, with ties and interests at the global level, exercising its influence and power, through the growth of its affiliated companies and agencies; a protectionist state with hegemonic economic ambitions in pursuit of the capitalist monopoly and its derivative political and social influence.

Finally, it is necessary to emphasize that although this type of plutocratic governments that seem to dominate the international scene could lead to a warlike confrontation by economic or geopolitical interests, the scenario of a set of failed states at the global level

due to demonstrations or popular revolts and the inability to control the state by government seems highly improbable, and the same, therefore, could be said of a type of anarchist organization, which, although for some authors it is possible to function in contemporary Western societies, since these are organizations whose foundation is precisely the absence of a central organizing power, is unthinkable if previously the state has not succumbed to becoming some kind of failed state.

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On the Limits to Development in Technology & Knowledge

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Abstract

The possible development of the world must be considered first from the viewpoint of information about Nature and possible limits to human capability. The main question is whether there are limits to those notions or not. Despite the efforts of philosophers, we do not know the answers although we know the constants of Nature which dictate our existence. Secondly, in structural terms it is possible to distinguish the level of civilizations. Following J.D. Barrow's thought, there are several types of civilizations according to their ability to control larger or smaller entities. Such a classification starts from the size of everyday objects, then goes on to genes, molecules, atoms and to elementary particles, later ending up manipulating the basic structure of space and time. Presently, we are at the stage of controlling atoms but not all possibilities are yet known. We should ask if technological progress is inevitable or not; if it is, values and human side of the progress should be taken into account. If technological progress starts to hamper values, then the world could face critical situations and instabilities. Our present knowledge confirms that understanding the complexity of the world as a whole could also help to build up scenarios for future development. In this context, the activities of WAAS are analysed. However, we can be certain that everything is uncertain in the future not because we are wrong or there is some special situation right now but because we live in a complex world where interactions between the constituents may create new, unexpected and unpredictable qualities.

Prediction is very difficult, especially about future.

– Niels Bohr

It is still possible to arrive at a credible forecast for the next 40 years.

– Jørgen Randers, 2013

1. Introduction

We all agree that the World is changing fast—new technologies, the growing information flows, uneven developments of countries, energy shortages and pollution, just to name a few problems. And probably the most important question is how mankind can cope with all the changes and wishes. It has always been a challenge to predict the future. Ancients tried to use oracles like ancient Greeks did by asking advice from Pythia, the oracle of Delphi. The Chinese have used cracked bones for making predictions. Nostradamus, who lived in the 16th century, tried to forecast future events and his predictions are still studied. Nowadays,

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mankind has much more knowledge about Nature, possesses powerful computing facilities and understands the threats that the world faces. It is quite obvious that eternal questions about the future are asked again and again. In what follows, a short overview on possibilities (and impossibilities) to forecast the future is given from a viewpoint of a physicist. First, in Section 2, some philosophical ideas are described. Section 3 is devoted to actions which characterize the present activities in communities. In Section 4, some recent results of modelling the future are described. Finally, some conclusions are drawn in Section 5.

“We may regard the present state of the universe as the effect of its past and the cause of its future.”

2. Philosophical Ideas

The first question one should ask about predictions is: are there certain limits? John Barrow (1998) asks this question and builds up a certain framework for understanding the possible edges of knowledge. Some remarks from history of thought are needed in order to understand contemporary ideas better. In the Judaeo-Christian tradition it is understood that with God all things are possible and this understanding has been in practice for a long time. Leaving aside many influential thinkers, let us mention Laplace’s demon. This is an idea from the 19th century about causal determinism. Laplace said (cited from the English translation of the book in 1951):

“We may regard the present state of the universe as the effect of its past and the cause of its future. An intellect which at a certain moment would know all forces that set nature in motion, and all positions of all items of which nature is composed, if this intellect were also vast enough to submit these data to analysis, it would embrace in a single formula the movements of the greatest bodies of the universe and those of the tiniest atom; for such an intellect nothing would be uncertain and the future just like the past would be present before its eyes.”

However, Laplace’s demon does not take into account the irreversibility concept and the ideas of thermodynamics and quantum mechanics. Today, this statement is considered interesting from the viewpoint of the history of science.

From the vast cornucopia of interpretation of processes in Nature, it is worthwhile to mention the seven world riddles formulated by du Bois-Reymond (1874). He indicated four difficult but potentially soluble problems: the origin of life, the origin of language, the origin of human reason and the evolutionary adaptiveness of organisms (listed after Barrow, 1998). The three insoluble problems in his list were the following: the origin of natural forces and the nature of matter; the origin and nature of consciousness and sensation; the problem of free will. Although nowadays we know much more compared to what passed as knowledge in the 19th century, one has not found full answers to these problems.

The present understanding about the complexity of Nature with underlying simplicity allows us to envisage possible constraints and to classify the possible levels of future technological civilizations (Barrow, 1998). Four possible distinct futures are possible:

- i. Nature unlimited and human capability unlimited;

- ii. Nature unlimited and human capability limited;
- iii. Nature limited and human capability unlimited;
- iv. Nature limited and human capability limited.

“One of the most highly developed skills in contemporary Western civilization is dissection: the split-up of problems into their smallest possible components. We are good at it. So good, we often forget to put the pieces back together again.” – Alvin Toffler

There are pros and cons for all these possibilities and the discussion is still going on. In the near future, one can be sure that knowledge is growing but whether the process of acquiring knowledge at the large (cosmic) scale will go on or there are limits, is a question. If such distinct futures give rise mostly to philosophical discussions, then the knowledge about the possible technological levels is clearly related to available energy resources and every forecast must be based on energy production, transmission and storage (Christophorou, 2018). The possible civilization types following Barrow (1998) may be characterized by their ability to manipulate the large-scale world around them:

- Type I is capable of manipulating objects over the scale of themselves like building structures, mining, etc.;
- Type II is capable of manipulating genes and altering the development of living things;
- Type III is capable of manipulating molecules and molecular bonds;
- Type IV is capable of manipulating individual atoms, creating nanotechnologies and artificial life;
- Type V is capable of manipulating the atomic nucleus;
- Type VI is capable of manipulating the most elementary particles of matter;
- Type Ω is capable of manipulating the basic structure of space and time.

Leaving aside these types, one should note that such a classification deals with the physical world. However, this is just one side of the coin because the other side is related to human values and social systems (see Section 4).

The ideas described briefly above are just a general framework of our understanding and one should analyse further the structural properties of natural and social processes before coming up with possible forecasts.

3. Complexity and Dynamic Mechanisms

The World around us is complex, which in a nutshell means that it cannot be understood only by analyzing its constituents (whatever they are), physical entities or living organisms. The notion “*complexus*” itself means what is woven together and this togetherness makes the world not only richer but much more interesting. By ‘complex’ we characterize the processes, phenomena, etc. which involve also many parts or constituents and because of

their interaction with each other, new qualities may emerge which often are unpredictable. This means that the full system cannot be characterized by summing up the behaviours of its constituents.

Classical research aims to split general problems into their simpler components and then to study them as deeply as possible. An extremely impressive explanation is given by Alvin Toffler (1984): “*One of the most highly developed skills in contemporary Western civilization is dissection: the split-up of problems into their smallest possible components. We are good at it. So good, we often forget to put the pieces back together again.*”

Complexity theory is characterized by holistic view, i.e. the pieces are put together as a whole. Put very briefly, the properties of complex systems are (Weiler and Engelbrecht, 2013):

- i. non-additivity and nonlinear interactions;
- ii. deterministic unpredictability;
- iii. sensitivity to initial conditions;
- iv. there are several typical phenomena characterizing the behaviour of nonlinear systems (bifurcation, emergence of new patterns, multiple equilibria, coherent states, chaotic regimes, adaptability, self-organization, etc.);
- v. despite the variety of phenomena and motions, there are several rules which govern the processes in complex systems.

The main structural cornerstones of complex world and processes are *fractals*, *networks*, and *hierarchies* (see Scott, 2005; Barabasi, Frangos, 2014, etc.) Structures and phenomena together constitute the basis in the analysis of complex systems. However, the complex physical and social systems are different because in social systems one should also take values into account (Engelbrecht, 2016). Whatever happens in the world, human behaviour is strongly influenced by values. In general terms, the basic values accepted by society according to T. Ash (2007) are: freedom, peace, justice, prosperity, diversity, and solidarity. But the values are space-dependent and environment-dependent, they are related to the cultural and personal values of people which may not entirely coincide with the general norms in societies. And certainly the societies are different when we speak about values. Inglehart and Welzel (2004) have constructed a cultural map of the world, where survival values and self-expression values are depicted against traditional values and secular-rational values. This map clearly shows the groupings of English speaking countries and Latin America, catholic Europe, protestant Europe and Confucian countries, ex-communist countries and Africa.

Society as a complex social system can be modelled using networks and clusters, communities and alliances and is spatially and temporarily differentiated. Society is able to function not only because of its structures but also by the behaviour of its members (constituents in the physical sense) and the links (interactions in physical sense) between them play the most important role. Turning to complexity of physical systems, the interactions between the constituents are described by physical laws and can be measured at least with certain accuracy. In complex social systems the situation is much more complicated because the links are based on accepted rules (laws), traditions, language, and governance, on economic and environmental conditions and certainly on values.

It is important to understand the possible constraints or limits of complex systems. Engelbrecht (2016) has stated that in *physical complex systems* constraints (often *thermodynamical considerations*) exist in order to limit or guide the processes, and in *social systems* it looks like *values are the leading and guiding factors*.

The modelling of social systems is a cornerstone of all future studies. For example, the Conference on Complexity and the Policy Studies 2019 (www.caps-conference.org) was set up with the aim to advance social goods in a complex world. The basic understanding from complex systems is declared as basic: (i) social systems are complex adaptive systems; (ii) social systems are embedded in specific socio-ecological environments; (iii) socio-ecological environments are the result of long, historic processes; (iv) invisible system variables such as values and beliefs strongly affect outcomes; (v) change in social systems results from ongoing interactions between multiple variables; (vi) interactions between system variables are mostly non-linear; (vii) straight causal relations are not sufficient to understand social change as effects are non-linear and largely unpredictable.

Another important question is, how to behave in complex systems? There are several issues that must be understood. The first is, causality as mentioned above. Granger is widely accepted (Granger, 2003): (i) the cause occurs before the effect; (ii) the cause contains information about the effect that is unique, and is in no other variable. However, it is not always possible to use Granger causality principles. Paluš et al. (2018) have shown that coupled chaotic dynamical systems violate the first principle of Granger causality. This is a problem in mathematical models but cannot occur in Nature. In this context, the forces in social systems must be studied. For example, Bednar et al (2006) have found that forces for consistency and conformity slow convergence in a model of cultural formation and they have also noted the non-linear additivity in such processes.

Finally, there are two important notions: synergy and stigmergy that are useful in the actions in complex systems.

Synergy, as it is understood nowadays, comes from the Greek ‘*synergos*,’ meaning working together. This notion was accepted in psychology in the 19th century but more widely used in many fields of science after the groundbreaking studies of Fuller (1975) and Haken (1977) on synergetics. This is meant as an interdisciplinary field of studies, which explains the self-organization of patterns and structures in thermodynamically open systems. One can say that synergy is related to the famous saying of Aristotle—the whole is more than the simple sum of its parts. Clearly, this is also the characteristic of social systems.

Stigmergy comes from the Greek words ‘*stigma*’, mark or sign, and ‘*ergon*’, work or action. Originally, it was used in biology to describe termite behaviour (Grassé, 1959), but nowadays it is understood as a mechanism of indirect coordination through the environment (Theraulaz, Bonabeau, 1999). Heylighen (2015) gives the following definition: “*stigmergy is an indirect, mediated mechanism of coordination between actions, in which the trace of an action left on the medium stimulates the performance of a subsequent action.*” So stigmergy is not only related to the behaviour of social insects but also to the behaviour of crowds, division of labor and cooperation in general (Miller, 2010). It stresses the importance of feedback, markers and cognition.

Equipped with the knowledge about complex systems, values, limits, causality, synergy and stigmergy, one could make possible (or impossible) predictions.

4. Modelling of Future

4.1 Some General Ideas

Scientific modelling simulates processes or phenomena for better understanding, quantifying and predicting the outcome. In this context, the conceptual models help to understand the links and causality, while mathematical models help to quantify and predict the values of variables in time. Future studies have been in focus for ages and nowadays many special institutions and research centres are into this field. It is impossible to present a systematic overview on studies about the future in one paper but some ideas are briefly analysed in the following sections. As explained in Section 3, the world is complex and the mathematical models for the forecast should take into account the properties of complex systems, regardless of their physical or social character.

In constructing the models, one should be aware of paradigms which mean distinct sets of thought patterns. The word comes from the Greek *'paradeigma'*—that is 'pattern, example, sample.' Already, Plato has used the word *'paradeigma'* for a model or pattern used by God to create the cosmos. The contemporary understanding of paradigms in science goes along the ideas of the American philosopher of science Thomas Kuhn (1962). According to him, the normal evolution of science is based on a widely accepted framework of certain understandings using well-known experiments and theories. This framework may be described as a paradigm. The revolutionary idea of Kuhn was to propose that such continuities in science were interrupted by periods called paradigm shifts. During these shifts new basic concepts are formulated and existing theories and understandings are reformulated. The history of science knows many such paradigm shifts: from Ptolemaic cosmology to the model of Copernicus; from Phlogiston theory to Lavoisier's theory of chemical reactions; blood circulation by William Harvey; from Newtonian mechanics to the theory of relativity etc. Certainly, the old ideas are not left aside voluntarily and the understandings engraved on stone tablets seem to last forever. The quote attributed to Lord Kelvin in 1900, for example, states: "There is nothing new to be discovered in physics now. All that remains is more and more precise measurement." Sometimes the process of paradigm shift is called 'paradigm war'. Indeed, it is not always easy to accept fresh ideas, simply considering the reason that we have always done so! Some changes are easy to accept, some need a lot of proofs. It is certainly not only in science, it also holds true in social life, management, economy, etc. In modelling the future, one should carefully consider existing paradigms because the future might need completely different ideas compared with existing principles.

Once the mathematical models are constructed then there are other issues which need attention. These are singularities and catastrophes. The concept of singularity was introduced by J. von Neumann in 1950 and nowadays, in the field of technology, the definition given by Kurzweil (2006) is used: technological singularity is "... a future period during which the pace of technological change will be so rapid, its impact so deep, that human life will be irreversibly transformed. Although neither utopian nor dystopian, this epoch will transform the concepts that we rely on to give meaning to our life, from our business models to the cycle of human life, including death itself."

In mathematics, ‘singularity’ means discontinuous change. Such problems are dealt by the so-called catastrophe theory derived by Thom (1968) and Zeeman (1976). A ‘catastrophe’ means that in a nonlinear system the equilibria can appear or disappear due to small changes in some leading parameter. Geometrically such catastrophes are classified according to Thom as fold, cusp, swallowtail, butterfly, etc. depending on the shape of the potential function called control surface which describes the process. In physics, catastrophe theory can be used for describing the phase transitions and gravitational lensing (detecting of black holes). In physiology, the human behavioural patterns including nervous disorders can be described by using the concept of a control surface. Catastrophe theory has been used for describing the behaviour of stock markets: jumping from bull market (index rising) to bear market (index falling) which causes a crash. The geometry of control surfaces, however, shows that beside jumps there also exist smooth paths from one equilibrium regime to another. Such processes need careful changes in control parameters or in other words, deep understanding of processes. For example, it has been shown that large-scale social processes like war-peace can also be described using the catastrophe theory. In this case when public opinion is divided between “hawks” and “doves”, the negotiation may move the process of the war threat to peaceful solutions. Similar description could be used in the analysis of riots.

4.2 Modelling Scenarios

Coming to predictions about the possible future, this has been a growing trend during the last half a century and several models have been proposed. In principle, a model describes the changes in general variables like population, industrial output, food supply. There are many think-tanks, professional networks and foresight organizations all over the world devoted to futures studies. A ground-breaking model was proposed by Meadows et al. (1972) in the famous book *The Limits to Growth* commissioned by the Club of Rome. Three scenarios were proposed: the standard run, comprehensive technology, and stabilized world. Only the latter avoided the collapse that was estimated to happen before the year 2100. Note that in this context growth means quantitative increase in physical dimensions.

Since 1972, much has changed in technology (progress in IT and nanotechnology, genetics, etc.), nature (sea level rising, agricultural land degradation, pollution growing, etc.), community (the widening gap between the rich and poor, GDP per capita declining in many countries, etc.), decrease in non-renewable resources etc. It is of great interest to analyse what has happened in the world and compare the data with the proposed model and predictions made about 40 years ago. Turner (2012) has used the UN data about the world economy and population and came to the conclusion that “the standard run scenario compared well with the global data for the majority of variables.” The conclusion of this study is that a collapse could occur within a decade or might even be underway. It is stressed that the issue of resource constraints is a greater problem than climate change. This is explicitly explained by Brown et al. (2011) by the analysis of energy constraints on economic growth, ecological impact, etc. Their conclusion is that higher rates of energy consumption are needed to sustain developed economies. The fundamental question is how to proceed further.

One could always argue about the assumptions of a model or criticize the methods used for calculation. One way or another, the official data used by Turner (2012) demonstrate clearly the tendencies of changes close to the standard run. Randers (2013) has proposed his model

with predictions up to 2052. He starts by asking how the human ecological footprint will evolve towards the middle of the 21st century. Altogether his model has 11 variables starting from the global population, GDP, productivity, consumption, etc. up to ecological footprint. Randers uses a mix of models and tries to improve them with several feedbacks. As a result, growth in world population and GDP will slow down over the next generation, there will be more episodes of extreme weather and there will be huge regional variations in economy.

One way or another, the perspective is not glorious. However, one might always ask whether variables in a model are really important or whether they are too specific or too general, etc. For example, GDP alone does not characterize reality well but the values related to the GDP give more information about the welfare of countries (Caldarelli et al., 2012), which is a sign of economic complexity. It seems that contemporary understanding of future studies should also include social and ethical dimensions.

Returning to the ideas briefly described in Sections 2 and 3, it seems that there is no need to be afraid of technological limits. Technology predictions are certainly based on present knowledge and include many possible changes on earth and also extraterrestrial activities. However, the appearance of new materials or breakthroughs in the IT or medicine fields cannot be predicted in the long run. This also concerns the changes in value chains, consumption patterns and social upgrading (Lee and Gereffi, 2015). The emerging technologies also include the risks in economy, environment, society etc. (WEF Report, 2017) and disruptive impact. There is a need for better governance in order to avoid negative consequences.

Considering technological inventions, especially for scenarios, one cannot forget Amara's law on the effect of technology (named after Roy Amara, past President of the Institute for the Future, Palo Alto): "We tend to overestimate the effect of a technology in the short run and underestimate the effect in the long run." This is an example of a hype cycle as explained by the IT company Gartner: a peak of inflated expectations is followed by a trough of disillusionment, after which the process slowly tends to reach a plateau of productivity at a much lower level than the expected peak. This law is certainly not based on strict analysis but must be considered more like a warning. Such a tendency calls for a careful planning of all scenarios.

In the context of modelling (cf Meadows et al., 1972; Turner, 2012; Randers, 2013, etc.) it seems that the next step is to apply the knowledge about the dynamics of complex systems. Indeed, it is difficult to find such global models where the possibility of chaotic regimes is taken into account, or where the sensibility of initial conditions and the existence of multiple equilibria are analysed. Contrary to that, the curves demonstrated by Turner (2012) or Randers (2013) are smooth with maxima and minima or showing exponential growth. Quantified variables are extremely important to account for values. In complex societies values play the role of possible constraints, like the physical systems are governed by thermodynamical conditions (Engelbrecht, 2016). The possible changes in existing paradigms make all the predictions questionable. The coupling of variables into the complex network (see Randers, 2013) is to be specified with care, especially with a special analysis of causality. It is not enough to follow classical rules of Leonardo da Vinci (cited after Truesdell, 1968):

1. Observe the phenomenon and list quantities having numerical magnitude that seems to influence it.

2. Set up linear relations among pairs of these quantities as they are not obviously contradicted by experience.

Quite probably, the coupling is of nonlinear character and will have a significant influence on the process, especially in the long run. This brings us to phenomena which are known in complex systems (see above). Another aspect to be taken into account is related to values or “soft” constraints. Daly (1987) has distinguished two general classes of limits to growth: biophysical limits on the Earth and ethicosocial limits. The first class of limits involves resources, ecological connections etc., resulting in changes in economic subsystems, explicitly shown in *The Limits to Growth*. The second class involves (i) cost imposed on future generations; (ii) extinction of a number of sub-human species; (iii) effects of welfare; (iv) corrosive effects on moral standards. And besides GDP and material goods, there are intermediate goods (Hirsch, 1977) and public goods (Puu, 2006). Among the intermediate goods is education, which facilitates professional and social advance (Hirsch, 1977). Intriguing questions have been formulated by Puu (2006): is culture needed for developing the economy or is the economy needed for developing culture? In other words, this is a question about the values of material goods vs public goods. In our contemporary technological world, these questions must be answered in order to build the future, where communications and connectivity play an important role.

To sum up, one cannot be too optimistic about making predictions in the long run. The predictions formulated up till now serve as warnings but cannot be used for predicting advances. Surely these predictions explain what could be the consequences of doing nothing. Clearly not only the material values but also soft values need to be taken into account in all discussions about the future. Voros (2001) has formulated “The three ‘Laws’ of futures”: (i) the future is not predetermined; (ii) the future is not predictable; (iii) future outcomes can be influenced by our choices in the present. It seems that the ‘worldview’ analysis as stated by Aerts et al. (2005) and permanent risk analysis (WEF Report, 2017) permit us to construct the global image of the world. It needs permanent orientation in the world (collective conceptualisation of the nature of the physical, the social and the ethical world), followed by evaluation and action models. One cannot forget that the social world is changing rapidly and even the deviance (the behaviour that goes against the norms and values) may offer recalibration of societal norms (Thorlindsson and Bernburg, 2004).

5. Final Remarks

Models like “The Limits to Growth” (Meadows et al., 1972) or “2052” (Randers, 2013) certainly have warned the world about the consequences of growing consumption in the conditions of limited resources. In order to avoid that, changes in policy are needed, much like Voros’ (2001) third law—future outcomes can be influenced by our choices in the present. However, as stated by Bengtson (2018), future is fast and the actions should also be fast. Although the changes can be slow, one should be aware of the Seneca effect (known also as Seneca cliff or Seneca collapse). The Seneca effect can briefly be characterized by the slow growth of a phenomenon but the fast collapse under certain conditions. Lucius Annus Seneca, the ancient Roman philosopher, has written in his letters (about 62 AD) that fortune is of sluggish growth, but ruin is rapid. Using the theory of complex systems, Bardi (2017) has analysed many examples starting from the collapse of Rome to physical phenomena

like fracture or avalanches and the collapses of social systems like financial crises and overexploitations. He showed explicitly that such changes are not the results of mistakes but embedded properties, and instead of fighting the changes, one should embrace the changes. Following the ideas of the catastrophe theory, the proper choice of control parameters may avoid the singularities (collapses) and follow a smooth path of changes. The risk analysis of actions in policy, economy and society (WEF Report, 2017) keeps the world on track to development that is stable.

The World Academy of Art and Science (WAAS) has embraced actions to address many global issues. These concern human-centered economic theory, new paradigm for global human development, transdisciplinary social science, global higher education, etc. *All these activities leave traces*. It means that following the principles of *stigmergy* (see Section 3), the influence of WAAS will be spread in the world helping to be better equipped for the year 20??, following the motto: promoting leadership in thought that leads to action.

Finally some monographs must be mentioned where the authors have analysed the future prospects of the world in more detail: Djurovic (2017), Christophorou (2018) and Šlais (2019).

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Information Asymmetry and the Coase Theorem Fallacy

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Abstract

The paper deals with the problem of externalities caused by environmental pollution. A theoretical contribution made by Ronald Coase, in 1960, presented a paradigm shift in externality policy, offering the possibility of bargaining between parties as an efficient way of solving problems without government interference or judicial intervention. Coase claimed that the efficient outcome will be attained irrespective of the property rights distribution among the parties. In spite of the broad popularity among free-market economists, the so-called Coase theorem appears to be a fallacy. Waves of criticism came from various directions, from Behavioral Economists to Transaction Cost Economists. The paper gives four reasons why the Coase theorem should be given more consideration in practical life, as an exception than as a rule. Most of the pollution problems concern numerous affected parties with a significantly different bargaining power. Information asymmetry is the most important obstacle to efficient bargaining. Therefore, asymmetric information has to be included as a fundamental tool in non-equilibrium market analysis.

Environmental pollution is considered as a typical example of negative externality. In economic theory externalities are defined as unintended and uncompensated effects of one agent's activities on another agent's utility (Ayres and Kneese, 1969). The effects may be either positive or negative, so we may speak about positive and negative externalities. Positive externalities generally create no problem and are useful, even desirable. Positive externalities usually are not subject to economic analysis; however negative externalities in most cases are. Construction of an airport close to a densely populated residential area, functioning of a nickel smelter in the vineyard region are just two of many negative externality cases. Public goods and externalities are considered two basic types of market failure (Browning and Browning, 1987).

In dealing with market failures, government intervention was envisaged a long time ago. In most cases, courts of justice were aimed at solving negative externality problems. However, after an article appeared (Ronald Coase, 1960) externality policy has been altered. In the essence of Coase's work is the possibility of bargaining between private agents. If property rights are well-defined and protected, and if transaction costs of bargaining are non-existent or negligible, bargaining between affected parties will result in an efficient outcome. In this way, negative externality problems will be solved efficiently without government interference or judicial intervention. Even more, Coase claimed that the same efficient outcome will be attained irrespective of the distribution of property rights among the parties. This seemingly revolutionary perspective attracted high attention in the economics

profession and many respected theorists have accepted it, calling it the Coase theorem. Many economists dealing with the issue should be mentioned; among them are Armand Alchian, Douglas North, Oliver Williamson, Harold Demsetz, etc. Richard Posner (1993) has formulated the theorem as follows: “If transaction costs are zero, the initial assignment of property rights—for example, whether to the polluter or to the victim of pollution—will not affect the efficiency with which resources are allocated.”

“In economic theory there has never been a formal proof of the Coase theorem.”

1. The Coase Theorem Appears to be a Fallacy

No matter how logical and convincing the Coase theorem seems to be, after half a century, it appears to be a fallacy. In spite of the fact that many free-market economists would strongly disagree with the previous assumption, there is no answer to the rising tide of questions about its validity. Waves of criticism came from various angles. In a seminal article by Kahneman, Knetsch and Thaler (1990), the question of so-called “endowment effect” has been raised. Contrary to theoretical expectations, several experiments conducted by the authors proved that the Coase theorem appears to be wrong. According to the theorem, allocation of resources to the individuals who can bargain and transact at no cost should be independent of the initial allocation of property rights. However, the experiments proved that the observed marginal rate of substitution between transacted goods is affected by the initial distribution of property, or by the endowment. In fact, the person who is assigned property rights on a certain good is more likely to retain it, not to transact it. The conclusion made by Kahneman et al. gives a good explanation for a frequently observed paradox in contingent valuation studies, when willingness to accept (WTA) compensation for lost environmental goods is always higher than willingness to pay (WTP) for the same good to be obtained.

Another set of problems with the Coase theorem is related to a totally unrealistic assumption about nonexistent or negligible transaction costs. In fact, such costs always exist and are part of normal market functioning. Information gathering, processing and dissemination of information, negotiation, monitoring, risk-management, and protection of institutional order are always costly, and cannot be avoided or neglected. Ronald Coase was aware of this fact. In one of his later papers, Coase (1992) describes the theorem as a provocative result that was meant to show how unrealistic the world would be without transaction costs.

In a detailed paper, Anderlini and Felli (2000) analyzed the presence of ex-ante transaction costs that may lead to failures of the Coase theorem. The so-called basic “hold-up problem” arises whenever the bargaining parties have to pay some ex-ante costs before the negotiations take place. The authors concluded that under such circumstances a Coasian solution to the externality problem is not available. Instead, a recurrent “hold-up problem” emerges.

2. The Coase Theorem is a Tautology

One of the hardest criticisms of the theorem was given by Dan Usher (1998). He concluded that the Coase theorem is instructive but misnamed as a theorem. In fact, it is a tautology, and even when bargaining is costless, the theorem may be considered either incoherent or wrong.

How is it possible that after such a hard criticism the Coase theorem is still part of Economics and can be found in many textbooks? The answer may be that the “theorem was used to justify a hands-off approach to big business on the part of politicians, regulatory agencies, and judges, leaving pollution and other economic problems to the corrective powers of free market.” (Cassidy 2013) In other words, the theorem is just an ideological construction, suitable for offering a seemingly scientific foundation to the neo-liberal political thinking. The fact is that in economic theory there has never been a formal proof of the Coase theorem. Formally speaking, a theorem without proof is not a theorem. Even Ronald Coase in his Nobel Prize lecture, given in 1991, tried to clarify the issue saying, “I tend to regard the Coase theorem as a stepping stone on the way to an analysis of an economy with positive transaction costs.”

“In Microeconomics textbooks, one of the basic preconditions for Pareto-optimal solutions in competitive markets is the assumption of perfect information.”

If his words are to be properly understood, the next steps in the development of economics will be focused on transaction costs, not on the imposition of the theorem itself, as a ready-made solution for dealing with negative externalities. Practical use of the Coase theorem should be limited just to a narrow set of situations, in which only two equally endowed private agents are in a position to negotiate, both with equally negligible transaction costs. In all other cases, certain ways of internalizing externalities are to be utilized, including government intervention through legal procedures or taxation. In other words, the Coase theorem should be considered more as an exception than as a rule. In real life such exceptions are very rare, even impossible.

3. The Coase Theorem should be properly understood, more as an exception than as a rule

There are limitations that reduce the validity of bargaining solutions, and the applicability of Coase theorem.

1. Most of the pollution problems concern numerous affected parties, not a single person. Whenever there are a number of damaged agents (i.e. environmental pollution with a factory polluting a broad area with many inhabitants), transaction costs of gathering and organizing the damaged side will be prohibitive for an efficient solution. In such a situation the polluter is often in a better position, paying damages just to a few.
2. The Coase theorem claims that the manner in which property rights are initially distributed has no effect on the outcome. In other words, the initial distribution of property has no effect on the real allocation of resources, and the same efficient outcome would emerge via bargaining, irrespective of the property allocation. However, this is far from being the case. In reality, it is clear that the outcome of bargaining process is always dependent on bargaining powers. The outcomes of bargaining are always influenced by initial

allocation of property between parties. Evidence can be seen in many cases when rich and powerful polluters managed to “compensate” poor victims of pollution. Many times outcomes of negotiations are tailored by the powerful, unrelated to any notion of efficiency.

3. Even more striking are the cases with unequally informed parties. Typical examples are pollution accidents, particularly with long-lasting pollution, when only one side has complete information about the consequences (Bhopal disaster, 1984, India). Sometimes even no one has full and complete information about the consequences, for example of radiation pollution (Fukushima disaster, 2011, Japan; Chernobyl disaster, 1986, USSR). Under such circumstances, characterized by information asymmetry, there is no efficient bargaining. It is surprising that in Microeconomics textbooks, one of the basic preconditions for Pareto-optimal solutions in competitive markets is the assumption of perfect information. Even after a broad discussion raised by George Akerlof’s article about the market for “lemons” (1970), a perfect information assumption is still part of standard Market Competition Theory. In real life, there is a permanent information asymmetry, in nearly all of the markets, no matter how organized they are.

“The Coase theorem should be properly understood, as Coase himself stated in his Nobel lecture.”

Nearly always some of the demand-side or supply-side agents have better information about the objects of transaction. Sometimes much better information, like participants in the sophisticated markets (e.g. participants on antique markets or art markets, food markets, vine markets, chemicals markets, high-tech markets etc.). The more complex (technically, socially, psychologically) the object of transaction is, the higher information asymmetry appears to be. Only in market transactions with simple or standard quality commodities (e.g. ores and minerals, metals traded on commodity markets), it may be expected that all participants have same, or nearly the same, information. However, such simple commodities are less and less present in the contemporary markets. In all other transactions, a certain level of information asymmetry exists. Sometimes, the asymmetry is very high, providing one of the transaction agents with unbeatable advantage, and leaving others with an unsurmountable disadvantage. Therefore, a new approach to the market analysis must start with an assumption that some of the market participants are better informed per se than the others. In other words, all transaction parties should be informed about the market, but some are in a position to be more informed than the others. Consequently, chances for monopolistic advantages based on information asymmetry always exist. If one party possesses better information, there is no efficient solution for environmental externalities provided by bargaining.

4. Particularly complicated are the situations with inter-generational bargaining between current and future generations (e.g. negotiations about climate change). In such cases, one of the bargaining parties is actually missing (still unborn), and all the attempts of the current generation to act in the interest, or in favor, of future generations are unjustified and irrational. Many environmental externalities have trans-generation effects. Current generation’s behavior will definitely have significant effects on future generations. However, there is no bargaining with the unknown future.

Therefore, it may be concluded that the only rationale would be to keep the bargaining procedure as an extremely specific and seldom a solution for the externality problems. Some other ways are to be implemented, including the existing legal procedures, via judicial system, and through Pigouvian taxation. The Coase theorem should be properly understood, as Coase himself stated in his Nobel lecture. Finally, an asymmetric information approach should be included as a fundamental tool in non-equilibrium market analysis.

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A Note Reconsidering ‘A Theory of Wealth Distribution & Accumulation’: Perspective on Uncertainty

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Abstract

Growth and Distribution have become one of the main instruments for achieving a better standard of living. Fundamental issues of Political Economy can be defined as a conscious effort of the society to follow the economically developed in order to promote rapid and fundamental change. Such a concept is fairly broad as it seeks to promote not only a fast growth-rate but also significant structural socio-economic changes. Within a Post-Keynesian approach, the present note extends the model of overlapping generations considering uncertainty. Anxiety and uncertainty with regard to the outlook and outcome for the future are fundamental characteristics of human condition and society, as highlighted by Jacobs (2019). In this paper, we emphasize such concepts, given that the distribution of wealth between generations requires leadership leading to action and acceptance of risk and uncertainty.

1. Introduction

The purpose of this article is to explore the behavior of wealth accumulation in a more general form like Baranzini (1991) did in “A Theory of Wealth Distribution and Accumulation,” We provide a more general framework for the macroeconomic theory of income distribution and wealth accumulation, especially by focusing on structural dynamics of classes, saving and accumulation in the presence of uncertainty and portfolio choice. In order to expand our knowledge in this field, we consider the role of market imperfections in the generation of different socio-economic classes.

We expect this article might strengthen the sharing of new ideas of common interest in economic science and political economy, both belonging to orthodox and heterodox schools. As Morishima (1977, p. 61) has pointed out, “International friendship among economists of different schools of thought is more important than that of the same school, especially in such a difficult period of history when political and economic interests are giving rise to so many conflicts.”

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We are living through one of those periods of history when the degree of uncertainty about the future goes beyond the limits of tolerance, as was argued by Inglehart and Norris (2016). They consider that the economic insecurity perspective makes the mass support populism, putting social cohesion at risk and making the task of governing particularly difficult. We are mainly concerned with the present and future of a more democratic society and showing that the instability can give rise to hybrid types of regimes, introducing authoritarianism in institutions.*

As we know, a democracy that is not accompanied by social and economic betterments for the population-at-large is putting its survival at risk. Increasing discontent could lead to social and political unrest allowing significant room for anti-democratic forces.

There is growing evidence that the increasing complexity of relations between the most advanced capitalist economies has already produced a structure with a certain degree of autonomy, the embryo of a possible economic system of greater reach than the one currently in existence. But this development has not been accompanied by an advancement at the institutional level. This explains the inadequate way in which regulation, namely coordination and control, is being exercised within the framework of the new structure. The resulting tension can only be absorbed if there is an effective advancement at the institutional level, or if there is a turn-around in the whole process to restore the autonomy of decision to the national power centre.

Bagchi and Svejnar (2015) present a new vision about the impact of wealth concentration affecting income distribution and show the negative relationship between concentration and economic growth, which is an example of power concentration. Ghatak (1978) concludes about these kinds of models that it is necessary to test the model systematically, considering all available information, to provide economic planning for obtaining an optimal solution.

Sugahara et al. (2016) presented an extension of Teixeira, Sugahara, and Baranzini (2002) considering heterogeneous agents and governments, leading capitalists and workers to keep a positive intergenerational stock and presenting the existence of both classes in the equilibrium. Following the article published in 2002, Góes and Teixeira (2020) presented an extension of Baranzini's Theory, with a mathematical formalization, concerning technical progress, leading to a Structural Change approach, and introduced behavioral differences between rentiers and workers.

However, in their approach, they did not consider uncertainty, which is an important issue when a real economy is analyzed. The definition of uncertainty is complex. Keynes (1921) defines this concept as the variation in a situation of complete knowledge to complete ignorance. Shackle (1972) defines this concept as a binary, where a decision can be certain or uncertain. The post-Keynesians used Shackle's definition but named it Fundamental Uncertainty.†

The present contribution deals with a broader understanding of the link between these theories and this assumption. Our note is structured into three sections: first, the introduction; the second section develops a new vision of Góes and Teixeira (2020) considering uncertainty and the third section features concluding remarks.

* Carothers (2018) analysed this concept in 35 countries, but we are sure that it has a broader validity.

† Dequech (2004) says, "[...] different conceptions of probability underpin the different ways in which uncertainty has been expressed."

2. Structural Dynamics of Classes, Saving and Accumulation in the Presence of Uncertainty and Portfolio Choice

The Post-Keynesian theory can be supported by an orthodox microeconomic foundation, which was presented by Baranzini (1991). He dealt with the adaptation of the Samuelson-Diamond overlapping generation model and linked both Kaldor-Pasinetti models with some neo-classical microeconomic issues. Teixeira, Sugahara, and Baranzini (2002) dealt with an extension of this model considering taxation in their hypothesis and showed that the essential nature of the “Cambridge Equation” is preserved in Baranzini’s approach.

In this vein, Góes and Teixeira (2020) expanded their view considering technological progress, which is an important issue to construct a Structural Change vision, which led the authors to analyze different behaviors between rentiers and workers. However, they did not consider uncertainty in their assumptions. This is the main focus of the present note: linking uncertainty with economics and political institutions.

Let us now broaden the scope of our analysis by introducing a stochastic element, as done by Baranzini (1991). Uncertainty, in finance and economics and in numerous cases, generates a two-class society. This is important since, at least to a certain extent, even in economics one could argue that the persistence of the classes in the system, either in a static or in a non-explosive dynamic context,* depends critically on the way in which the population is divided into sub-groups.

We may say, rephrasing ecological scientists like Ilkka Hanski (2012, 2014) and Dennis Chitty (1960), that even though any single sub-group may be vulnerable to extinction, the population as a whole persists as a result of movement between sub-groups. In economic terms, this would mean that the economic and social system would be able to reproduce itself year after year without the risk of collapsing.

The micro-economic foundations of a two- or more-class model may be used to study the issue of the dynamics of dynasties in a stochastic world. The focus is on:

1. the dynamics of capital accumulation in a stochastic world where individuals, families or dynasties have the choice between consumption or saving over a given time-horizon;
2. the choice of individuals or families with respect to the kind of financial investment chosen, i.e. safe and/or assets. The *U.S. Surveys of Consumer Finances* of the 1980s show that the proportion of households desiring no financial risk for their savings is about 69% for the lowest quintile of income earners and only 6% for the top 1%. Not surprisingly, the holding of stocks, either directly or through mutual funds, increases with income, from about 5% for the lowest quintile to about 78% for the top 1%;
3. the conditions under which uncertainty, *via* a portfolio choice, may give rise to class differences, thus reinforcing the hypothesis of a society characterized by the presence of different socio-economic classes as in the case of the classical, post-Keynesian model, and also some neoclassical models of growth, income distribution and wealth accumulation.

* For instance, in a steady-state model, the system expands, but the relationships among variables remain constant.

The analysis has a double purpose:

- First, to expand the analysis of the micro-foundations of the economic behaviour of individuals, families or dynasties, with particular focus on their behaviour concerning long-term saving and consumption-patterns, we may add that individuals make up families, families make up dynasties, and dynasties make up classes with a homogeneous economic behaviour.
- Second, to bring closer the ‘real’ and ‘monetary’ research lines of the post-Keynesian research programme: the former with particular reference to growth, income distribution, and capital accumulation; the latter with emphasis on the integration of money and uncertainty with the post-Keynesian framework.

This is just the first step in this direction, and more effort will have to be made to formulate an exhaustive macro-economic framework including all elements of the two separate research lines. The uncertainty structure (relative to the rate of return on the risky assets) that one may introduce here is the so-called Markowitz-Merton-Flemming continuous-time optimal portfolio approach where investment opportunities are stationary and consumption preferences are iso-elastic. This assumption, as John Stanton Flemming (1974, p. 137) points out, ‘enormously simplifies the arguments—and the results.’

Merton (1969, 1971) considers a continuous-time consumption portfolio problem for an individual whose income is generated by capital gains on investment in assets with prices assumed to satisfy the geometric Brownian motion hypothesis and where the stationary nature of the problem leads to (a) a policy of consuming at a rate proportional to wealth; and (b) an optimality of a constant portfolio composition. In this way Merton’s analysis (which has the merit of considering a finite time-horizon) yields explicit solutions for optimal consumption and portfolio composition. Flemming’s analysis (1974) was motivated by the desire to ‘present Merton’s continuous-time portfolio analysis in a form more accessible to those who, like the author, are intimidated by the terminology of stochastic processes and integrals.’ By assuming an infinite time-horizon, Flemming arrives at the same results as those obtained by Merton. Our analysis is based on the Merton-Flemming approach. However, here the focus is on the consumption and mean accumulation rates of the family or dynasty. The influence of variance and risk-aversion on all variables is also considered in detail, deriving some results that have so far passed unnoticed in the literature.

The analysis shows that the variance of the risky rate of return has a negative effect on the optimum accumulation of wealth, while at least for reasonable values of the parameters, risk-aversion has a negative effect on the rate of growth of mean wealth. Looking at the results obtained from a historical point of view in order to throw some light on the different patterns of accumulation of capital, it may be shown that (under the realistic assumption of decreasing risk-aversion with the amount of wealth) in the case of a double capital market, uncertainty may contribute to generating a two-class society. In fact, all other things being equal, one class should end up with a very high capital stock per capita, while the other would register an accumulation rate that decreases continuously with time (see Baranzini, 1991, pp. 190-9).

Uncertainty also tends to generate (or to perpetuate) a two-class society in a model that considers only risky assets like stocks (and not riskless assets like cash, savings accounts,

money markets funds, CDs and bonds). However, while here one class ends up with quite a large amount of financial wealth per capita, the other class with an initial average or high risk-aversion reaches a constant mean accumulation rate (equal to the rate of growth of population), thus endowing their children with a fixed and limited amount of marketable wealth. Even in the quite unlikely case of increasing risk-aversion with the amount of wealth, uncertainty is bound to generate or perpetuate a two- or multi-class society. In this specific case, uncertainty tends to lead to less ambiguous results than in the case of a number of stochastic models, and the conclusions yield additional insights into the long-term process of wealth accumulation (or dispersion). One may therefore conclude by emphasizing that the process of wealth accumulation, including human capital in a more comprehensive model, may be studied in the context of assigning to different groups a specific rate of growth of population or specific investment opportunities.

“The individual and society will have to accept risk, moving from poverty to abundance and embrace uncertainty along the way.”

A number of similarities seem to emerge from a comparison of the behaviour of a number of species recently studied by biologists and ecologists, the behaviour of past agricultural alpine communities, as well as that of today's households that may choose between safe and risky assets for the accumulation of their savings.

- In general, there seems to be a sort of ‘invisible hand’ that governs the systems, and which ensures the survival of the species, both animal and human.
- In particular, the existence of different classes or sub-classes of insects and other animal species according to the research of Hanski and others, and the existence of socio-economic classes with different behaviours, might ensure a ‘general stable equilibrium’ of the community or of the system. In the case of socio-economic classes, deviations at the (sub-) group levels seem to be absorbed and neutralized at the macro-level.

We are well aware that these results should be interpreted with great care. But we are certain that animal and human species do share common behaviours and mechanisms that ensure their survival and prosperity. Herlyn and Radermacher (2019, pp. 75) claim that “a further problem is added today, namely the partial undermining of democracy by globalization and thus the undermining of its ability to correct such imbalance, which results in a starting position that is unfavourable for more equalisation and makes it difficult to correct conditions (the so-called ‘trilemma of globalization’)”.

3. Concluding Remarks

This article considers that when uncertainty is introduced in scientific models, they do not matter if the object analysed is human or an animal. Their propensities have a common behaviour which reinforces the method, using other sciences to prove some similarities with economics, as shown by Stanley et al. (2001), who linked physics and social science. In the

animal world, we characterize species, which live in different communities and share common behaviour, especially when uncertainty is involved. Note that uncertainty sweeps the world today not in any historically unprecedented ways, but reflecting a basic human condition that has been holding true to this concept at least until the Industrial Revolution. According to Jacobs (2019), “the visible uncertainties of the past also review unseen opportunities unleashed by unseen forces which were long overlooked due to humanity’s preoccupations with visibly looming threats.”

“There has clearly been a historical evolution of socio-economic structures from being based on the conception of growth for growth’s sake towards the wellbeing of all citizens and society.”

For humans, the capital and wealth accumulation certainly depends on their inherent natures, which characterize the overlapping generation, considering that day after day we decide to save or consume and at the end of our lives share our own wealth with the next generation. Wealth concentration by the richest people (almost 1% of the population in the world) is 78% of current wealth, meaning that the next 1% of the next generation will earn this amount not by hard work but by inheritance.

To change this reality, the individual and society will have to accept risk, moving from poverty to abundance and embrace uncertainty along the way. However, they do not know what the value of risk-aversion is; an economy can maintain at least two classes in the society. In this vein, the present situation will be considered. Quite centrally, implementing desirable decisions will lead to changes and the present unequal concentration of wealth will not continue to persist. There has clearly been a historical evolution of socio-economic structures from being based on the conception of growth for growth’s sake towards the wellbeing of all citizens and society.

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Economy and Employment: Trends to 2040

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Abstract

In this paper we focus on three major factors that will affect the economy and employment globally through to 2040. First, although there will be economic growth globally, it will be uneven; mature economies with older populations slowing and economies with young population growing, with a booming middle class in Asia. Second, trends in capital and labour culminating in a connected world—the internet and mobile phones—mean that knowledge can cross boundaries and local labour adds less value, leading to more inequality between the labour force and the wealthy within countries. Third, artificial intelligence (AI) will displace many jobs, leading to growth without employment. This raises the question of how to prepare Millennials, who will be decision makers in 2040?

1. Introduction

This article is based on the work developed through assignments with many leading organisations to develop their responses to the changes over the next twenty years, and previously published in *Megatrends* and *How to Survive Them: Preparing for 2032*.¹

After defining “a trend” we start by reviewing the current trends in the economy and employment, considering both underlying structural factors and the nature of employment. We then explore where these might take us by 2040. We discuss what could deflect the trends and conclude with some thoughts about how to prepare Millennials for 2040.

2. What is a Trend?

A trend is a way of describing one aspect of possible futures (and of course the past). It is not a forecast—it is a direction of travel. We contrast a forecast—a single point in the future—with the realistic approach of exploring the direction of travel of a trend—noting that both timing and direction cover a range of possible futures.

Sometimes it is hard to spot major changes as they unfold. However, major trends in the economy and employment are happening now and have effects both now and in the longer term. In this paper we focus on the economy and employment. These are, of course, correlated with other trends such as demographics, urbanisation and technology adoption, and so we briefly explore these before examining the impact on employment.

Figure 1 Trends are not forecasts

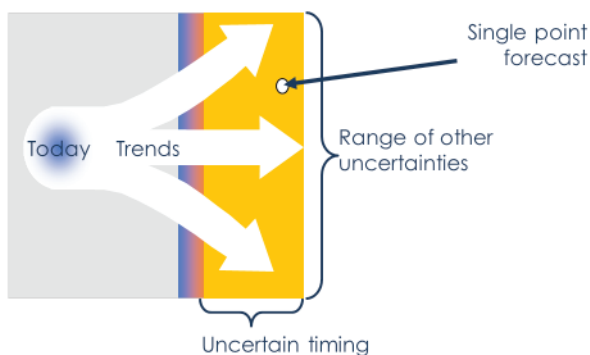


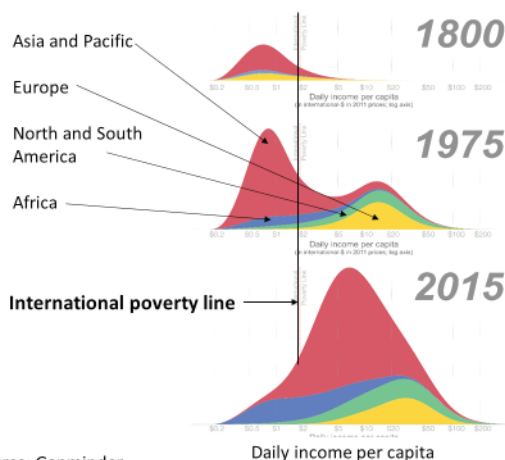
Diagram © Ringland, Sparrow & Lusting, Beyond Crisis John Wiley 2020

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3. Current Trends

First, just to recap on progress to date—since 1975 the world has become a wealthier place. While poverty remains a global issue, large number of people in Asia are no longer living below the international poverty line. We should not lose sight of this improvement in discussions of the economy and employment.

Figure 2 Income distribution



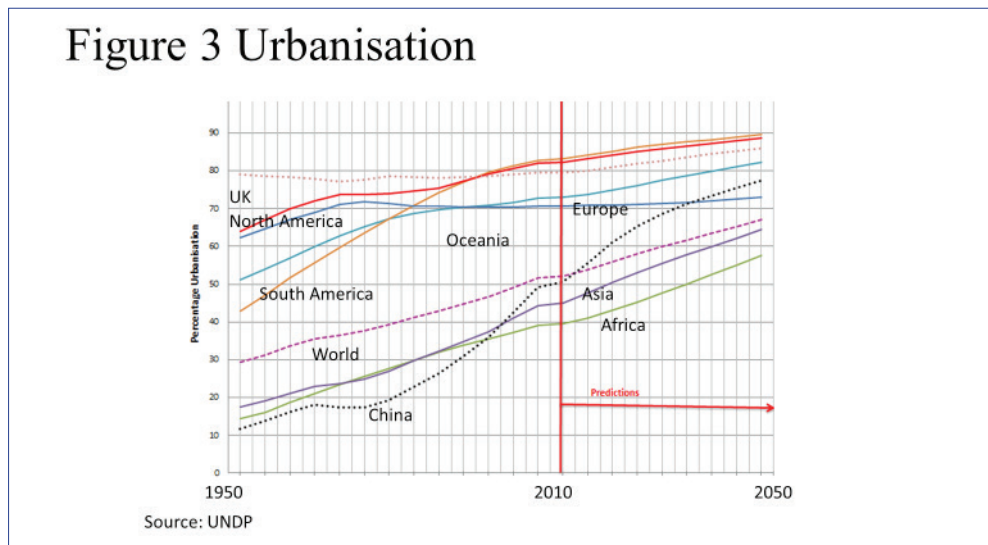
3.1. The Economy: Underlying Structural Factors

3.1.1. Dependency Ratios

The structural factor often discussed as the key contributor to the post World War II growth phase was the benign dependency ratio.² In Europe, East Asia and the Americas the current trend is for the number of workers to fall in relation to the number of dependents as the population ages.* In South Asia and Africa today, young and growing populations provide a benign dependency ratio.

3.1.2. Urban Migration

Productivity is higher in the cities than in rural areas, and so the proportion of people living in urban rather than rural areas is important for the economy.[†] Migration and urbanisation are currently high, caused in some places by disruptions due to conflict, and in general by the economic ambitions of migrants. The figure below shows the rate of urbanisation anticipated through to 2050, by region.[‡]



3.2. Capital and Labour (this section is based on discussion with WAAS Fellow Dr. Robert Hoffman)

Economist and social scientist Kenneth Boulding made the point that “The classical economic taxonomy of factors of production into land, labour and capital is too heterogeneous to be useful; know-how, energy and materials are a much more useful taxonomy in understanding productive processes.”³ Over the past decades, each of these has seen a substitution.

* <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3412045/>

† <http://personal.lse.ac.uk/YoungA/InequalityOJE.pdf>

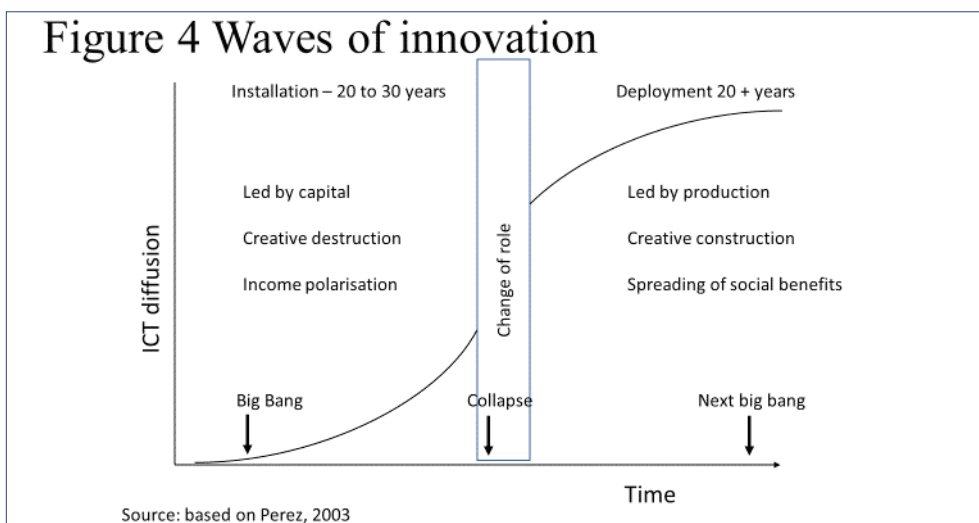
‡ <https://www.statista.com/statistics/672054/change-in-urbanization-worldwide-by-region/>

Non-human sources of energy have largely replaced manual effort, automated control systems replaced humans as a source of process control, and the embodiment of knowledge and know-how in process plant, and equipment for knowledge and know-how has replaced that embodied in production labour. Second, almost every production process requires process control. Increasingly automated control systems are displacing humans as a source of process control, for example driverless vehicles. This substitution will continue to play out over the next few decades. Third, almost every production process is informed by knowledge and know-how. Originally, the humans who did the work and provided process control, also provided the knowledge and know-how needed for production. Increasingly, the knowledge and know-how are embodied in the plant and equipment. The generation of knowledge and know-how is highly specialised and is easily replicated.

Together these substitutions have deeper implications for human societies. As humans play a smaller and smaller role in production, payments for labour will not be enough to pay for the goods and services that can be produced. Most of the value created in production will go to the owners of the process who are then able to buy more, that, in turn, generates even more income. The result is that we are seeing increasing concentrations of wealth globally. While the expansion of the middle classes in Asia is a dominant force for change in our timescale, the underlying structural factors mean that inequality of wealth and the nature and role of work represents an ongoing challenge for society.

3.3. Industrial Development and New Industries

In thinking about the effect of industrial development, and which new industries will emerge, we follow the thinking of Carlotta Perez, from *Technological Revolutions and Financial Capital*.⁴ In looking at the effects of technology on society, the shape of waves of innovation (see the figure below) suggests that we are at a transition point in the exploitation of ICT infrastructure and the next technological revolution. This means that creative destruction gives way to creative construction.



- Technological innovation will spur growth through AI and robotics, and through ICT infrastructure;
- A continuing convergence of emerging market economies with the developed regions as adoption of innovation drives growth;
- An increasing share of services based on adoption of innovation;
- Globalisation of services provision based on economies of scale of ICT platforms;
- Waves of innovation in biotechnology may well start to impact economic growth in the next decade.

3.4. The Connected World: Cross Border Flows

Globalisation constrains the ability of national governments to collect tax revenues. Supply chains over many firms and countries can mean revenue is recognised in low tax locations. Mobile flows of people and money across borders compare with nations based in a geographical location. In *Moneyland*, Oliver Bullough illustrates how international money flows make it really difficult for national governments to enforce a fair regulatory environment.⁵

While people have been moving funds across borders for ever, the use of the internet and mobile phones means that in many parts of the world, the banking system is being bypassed by providers of transaction services.

For instance, cross-border transactions from one currency to another are important in many countries with a large diaspora—systems like TransferWise, based on a low-cost platform and easy to use interface, transfer money efficiently for a low fee and a good exchange rate. And in Africa, M-Pesa has revolutionised access to finance using mobile phones. It allows users to store money on their phones. If you want to pay a bill, or send money to a friend, you text it and the recipient can convert it into cash at their local M-Pesa office. It means that millions of Africans who do not have a bank account can still manage their finances.

4. The Nature of Employment

4.1. The Informal Economy

The relationship between employer and employee has changed. Even in family firms, the gig economy and the informal economy are widely present.

The informal or shadow economy is the diversified set of economic activities, enterprises, jobs, and workers that are not regulated or protected by the state. The concept originally applied to self-employment in small unregistered enterprises. So domestic help—working a few hours per week for a neighbour and paid in cash or kind—is the way this has worked in the past. The informal economy does not contribute to tax revenues.

The gig economy often refers to jobs paid by the piece as in taxi journeys or pizza deliveries or document translation. Commissioners of gig economy workers are usually organisations that pay company taxes.

The informal economy comprises more than half of the global labour force and more than 90% of Micro and Small Enterprises (MSEs) worldwide.* Informality is an important

* <http://www.ilo.org/employment/units/emp-invest/informal-economy/lang--en/index.htm>

characteristic of labour markets in the world with millions of economic units operating and hundreds of millions of workers pursuing their livelihoods in conditions of informality. In both the gig economy and the informal economy, the responsibility for support in sickness or old age rests with the individual or their family. The state may be able to provide some welfare payments, but this is often linked to tax payments and revenues. Over the past decade, the informal economy is said to account for more than half of the newly created jobs in Latin America. In Africa it accounts for around 80%. In Europe, official estimates are that this represents less than 10% of GDP.

4.2. *Employment in Large Companies*

The nature of employment is changing due to the impact of globalisation and earlier waves of the introduction of ICT. These waves have a structural impact on the nature of employment. Entry level job roles are still needed, as are decision making roles: but layers of middle management have been removed. Their tasks were two-fold: supervisory or mentoring to junior roles and providing information that flow upwards. Information that flow upwards has been automated but a number of management thinkers* believe that the weakening of the mentoring role has been damaging to the functioning of many organisations.

One of the biggest changes affecting economic activity may well be the nature and expectations of the workforce. Family sizes are decreasing globally as women move to urban areas, become educated and are exposed to images of life and work with fewer children.⁶ This means that family structures which have supported working women in the past are less available, leading to the need for more flexible work. And Millennials globally share many similarities. For example, the number one reason Millennials leave organisations is due to lack of personal career opportunities within their parameters of work/life balance and job satisfaction. Millennials are exhibiting a shift from consumerism to shared experience: tourism, leisure and sport. There is also an increasing acceptance, in many regions, of sexual diversity. And a desire to “do good in the world.”⁷

4.3. *AI – The Effect on Jobs and Skills*

A discussion on the current technology for AI systems compared with that for “superintelligence” is outside the scope of this paper. Here we focus on current applications and trends to 2040.

A two-year study from McKinsey Global Institute† suggests that by 2030, intelligent agents and robots could eliminate as much as 30 percent of the world’s human labour, displacing the jobs of as many as 800 million people. These will mainly be blue- and white-collar jobs—not entry level or those requiring higher education levels. However, AI is already augmenting jobs, from surgery to truck driving. Medical and security applications involve scanning and interpreting data for progressing cases through departments of organisations, and in robots to augment human care or cleaning services. Swathes of white-collar jobs have already been partially automated.

* <https://www.estherderby.com/what-do-middle-managers-do/>

† <https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet>

AI is emerging as a battle ground between China and the USA.* Adoption of AI is slower in Europe.†

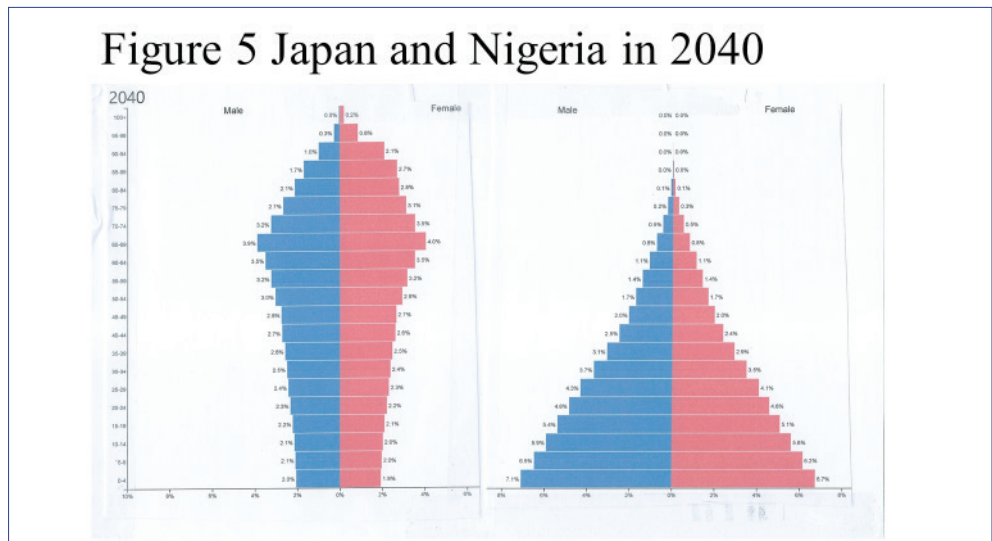
5. Where the Current Trends could take us by 2040

5.1. The Economy: Underlying Structural Factors

5.1.1. Dependency Ratios

The economies of Africa, South Asia and the Middle East are likely to benefit from new entrants to the workforce. The age structures of Nigeria and Japan in the figure below illustrate the difference between the number of people in the labour force in 2040.‡

Over the next few decades, a major challenge for organisations and governments in mature economies is likely to be the increasing number of older people. Older people buy less, so the economy is likely to shrink. Organisations are likely to struggle to pay out pension obligations, and governments are likely to be faced with welfare obligations to older people, to the disabled, and to those displaced by the next technology revolution. These problems could hinder economic growth.



5.1.2. Urban Migration

The United Nations has projected that nearly all global population growth from now up to 2030 will be in the cities, with over a billion new urban inhabitants over the next 10 years.§ Based on population growth models, the Global Cities Institute at the University of Toronto

* <https://www.ft.com/content/3f934028-4724-11e9-a965-23d669740bfb>

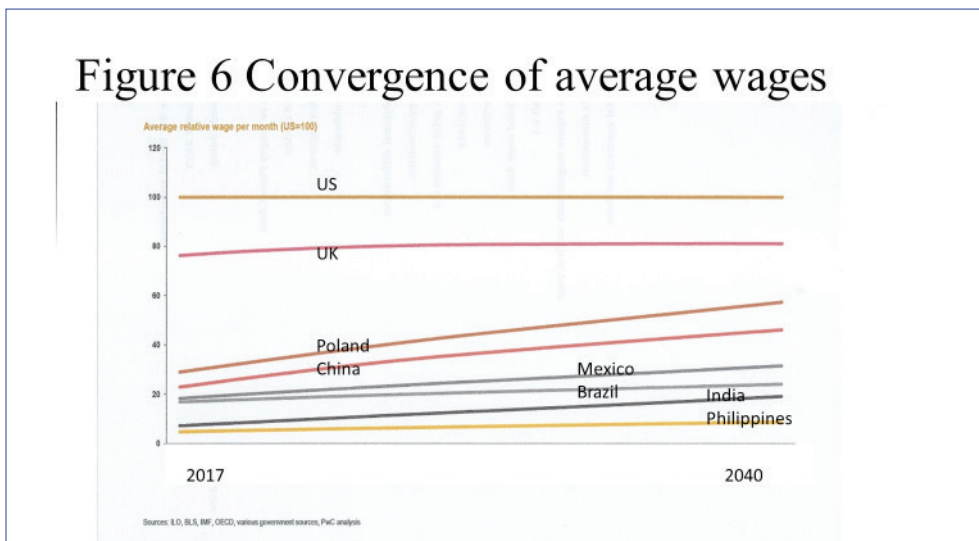
† <https://www.mckinsey.com/-/media/McKinsey/Featured%20Insights/Artificial%20Intelligence/Tackling%20Europes%20gap%20in%20digital%20and%20AI/MGI-Tackling-Europes-gap-in-digital-and-AI-Feb-2019-vF.ashx>

‡ <https://www.populationpyramid.net/world/2040/>

§ <https://www.undp.org/content/undp/en/home/presscenter/pressreleases/2016/10/17/sustainable-development-in-cities-is-critical-to-achieving-most-of-the-2030-agenda-.html>

projects that the 10 biggest cities in 2050 will be (in order) Mumbai, Delhi, Dhaka, Kinshasa, Kolkata, Lagos, Tokyo, Karachi, New York, Mexico City.*

5.2. Capital and Labour



The figure above shows the relative convergence of some national average wage rates to the rate in the USA, to 2040.[†] This reflects the globalisation of knowledge and its encapsulation in electronic platforms.

5.3. Industrial Development and New Industries

Many of the new industries are likely to combine the use of technology with social innovation in service industries such as health, social care, leisure and entertainment, education and government. Investment in new industries are likely to be less from governments, and more from individuals—using ICT platforms—as investors or through family firms.[‡]

The global financial system is unlikely to survive in its current form, due to the increasing mobility of money and the large percentage of wealth in private hands at the expense of governments. This has advantages, as one of the contributory factors to the 2008 financial crash was the connected nature and homogeneity of the world's financial system.[§]

5.4. The Connected World: Cross Border Flows

Average wages are converging across geographies, and at the same time the ability of people and organisations to transfer funds is increasing. This not only concerns remittances—

* <https://www.globalcitiesinstitute.org/>

† <https://www.pwc.com/gx/en/world-2050/assets/pwc-the-world-in-2050-full-report-feb-2017.pdf>

‡ <https://www.longfinance.net/news/pamphleteers/power-choice-and-economic-models/>

§ http://www.cs.cmu.edu/~softagents/papers/icmas98_heterogeneity.pdf

estimated to be US \$700 billion in 2019 globally*—but transfers by companies, and by individuals seeking a safe haven or low tax regime. These are estimated at several times total world GDP and are likely to only increase as the importance of non-bank institutions increases.

“Unless we change the economic rules—perhaps with something like a Universal Basic Income—broad-based prosperity is likely to remain elusive.”

6. The Nature of Employment

6.1. The Informal and Gig Economies

The informal economy is likely to continue to be important in the fast-growing urban areas of Asia and Africa, as family firms and corporate structures find it hard to engage. The gig economy is in many ways compatible with the ambitions of Millennials and is likely to flourish. New alliances of workers could become their safety net.

6.2. Employment

In developed countries, the personal aims and ambitions of those joining the workforce, or becoming decision makers by 2040, could challenge the current assumptions of many organisations. These are often tied to the experience of senior managers, gained in a different age. This may lead to new approaches to work/life balance at different stages of a person’s life.

Societal questions are posed as we (again) consider a future in which many of the activities involved in “work” are done by machines. A Harvard Business Review article “Economic Growth isn’t Over, But it Doesn’t Create Jobs Like it Used to”† suggests that information technology (and specifically Artificial Intelligence) is going to intertwine with innovations that occur in the future, making them less labour-intensive. Unless we change the economic rules—perhaps with something like a Universal Basic Income—broad-based prosperity is likely to remain elusive. The innovations may come, but the people at the top of the income distribution pyramid will continue to capture nearly all of the gains.

6.3. AI – The Effect on Jobs and Skills

Two questions loom large—how many jobs? And what skills will be needed? A study by the Millennium Group‡ proposed three scenarios for an economy of 9 billion people as AI becomes more powerful by 2050:

- It’s Complicated: A Mixed Bag
- Political/Economic Turmoil: Future Despair
- If Humans Were Free: The Self-Actualization Economy.

* <https://www.migrationpolicy.org/research/impact-remittances-economic-growth-and-poverty-reduction>

† <http://www.millennium-project.org/future-work-technology-2050-global-scenarios/>

‡ <https://hbr.org/2016/03/economic-growth-isnt-over-but-it-doesnt-create-jobs-like-it-used-to>

Each of these stresses the disruption, and need for political and social measures, as well as technology.

A recent report by Nesta on “The Future of Skills”^{*} found that around one-tenth of the workforce are in occupations that are likely to grow as a percentage of the workforce, and around one-fifth are in occupations that will likely shrink. Education, healthcare, and wider public sector occupations are likely to grow while some low-skilled jobs—in fields like construction and agriculture—are less likely to suffer poor labour market outcomes than has been assumed in the past. The report highlights the skills that are likely to be in greater demand in the future, which include interpersonal skills, higher-order cognitive skills, and systems skills. The future workforce will need broad-based knowledge in addition to the more specialised skills that are needed for specific occupations.

7. Possible Deflections

7.1. Underlying Structural Factors

7.1.1. Corruption

Many nation states are also struggling to tackle corruption. The World Bank points out that the roots of corruption lie deep in bureaucratic and political institutions, and its effect on development varies with national conditions. But while costs may vary, and systemic corruption may coexist with strong economic performance, as in many parts of Asia, the World Bank’s experience suggests that corruption is, in general, bad for growth.[†]

We can distinguish between two forms of corruption:

- Direct (and often illegal) corruption: measured in international league tables published by organisations like Transparency International.
- Use of legal, national or international loopholes covering aspects such as tax or wages. These become even more important in the connected world.

7.1.2. Ethical Industries

There is increasing concern about the scandals and frauds in firms, and in government. Recent examples include the opioid crisis, where unethical pressure on consumers has led to many deaths;[‡] the energy companies continue to be attacked as a source of CO₂;[§] at a recent event to launch a report on corporate governance, the top three firms judged to have the best processes were also noted to have had scandals in the newspaper headlines in the previous week.[¶]

The attitudes of Millennials will be crucial in disrupting current trends and creating ethical industries.⁸

^{*} <https://www.nesta.org.uk/report/the-future-of-skills-employment-in-2030/>

[†] <http://www.worldbank.org/en/topic/governance/brief/anti-corruption>

[‡] <https://eu.usatoday.com/story/news/2018/11/02/dea-drug-deaths-opioids-heroin-fentanyl/1857591002/>

[§] <http://www.ipsnews.net/2019/04/global-energy-consumption-emissions/>

[¶] <https://www.iod.com/news-campaigns/good-governance-debate/>

8. Conclusion: How to prepare people for 2040?

8.1. Who needs to be prepared?

Alvin Toffler in *Future Shock*⁹ spoke of the post-industrial society and how the pace of change was accelerating—he emphasised how threatening people find change. He coined the term ‘future shock’ to describe the shattering stress and disorientation that we induce in individuals by subjecting them to too much change in too short a time.

Since that time, change has accelerated, with technology having a reach barely imaginable then. It is perfectly reasonable for existing governing structures to feel threatened—on the whole, older people are more likely to feel threatened by change. People who did not grow up with technology may find it hard to adapt.

However, Millennials and Generation Z—born after 1980—have grown up with the idea of continuous change, and technology, and use it to connect, often to the despair of parents and teachers. This gives them the power of the network for global reach. So, we suggest that Millennials and Generation Z, who will be decision makers by 2040, are the groups that need to get prepared for 2040.

8.2. How can this be done?

Generation Z are famous for their assumption that technology can fix all problems. As part of the Ethics in Schools programme at Ethical Reading, we use a number of routes to explore why technology may not be enough. We use case studies based on real life, for the students to discuss in groups and then report back; and let them analyse why different groups have come to different conclusions.* We also use games such as Terra Nova,[†] which engage children and adults in exploring current trends.

The best guide to toolkits for gaining views of the future to 2040, currently in use in many organisations, is *Strategic Foresight*.¹⁰ This can be used in conjunction with *Megatrends* which provides the evidence for the trends, to inform the discussion.

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* www.ethicalreading.org.uk

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Heart of Darkness for Mind, Thinking and Creativity Conference

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Abstract

This article focuses on the ubiquity of depravity in society and the promise of public conscience. Public conscience is the foundation of a culture based on the rule of law. The problem of depravity implicates the evolution of the contest between science and morality. This article draws attention to one of the historical outcomes of this contestation, which suggested that the only way to look at law is from the point of view of the “bad man’s” economic interest. This discourse deeply influenced modern economic neoliberalism. Still, public conscience prevailed in holding the most depraved perpetrators to the rule of the law in the Nuremberg Trials. Public conscience additionally gave rise to the UN Charter as well as the International Bill of Rights. However, the fragility of human institutions has reflected the notion of a “heart of darkness.” This remains a constant challenge to a world which seeks to promote the universal dignity of man.

“Heart of Darkness raises an important question about the vital importance of the evolution of public conscience strengthened by public values and reinforced by jurisprudence and legal culture.”

In 1899, Joseph Conrad published one of the most famous novels in English literature: “*Heart of Darkness*”. The narrator, Marlowe, is part of a party traveling up the Congo River to meet with Kurtz, an idealistic messenger of Western civilization. During the voyage up the Congo, Marlowe notices that many of the colonial officials who they meet represent an almost excessive form of Western style and mannerism. As they venture deeper into the Congo, it appears that these elements of Western punctiliousness appear to disintegrate. Finally, they reach the headquarters of Kurtz. Kurtz represents the most appalling disintegration of Western civility and civilization. In fact, he appears to have been overtaken by his own heart of darkness. What happened to Kurtz? And what happened to the fellow travelers with Marlowe, who seemed to experience a level of deterioration of personality and civilization? In Kurtz’s diary, there are references to his deterioration, which is expressed as “Exterminate all the brutes!” Later, on his death bed, he says to Marlowe, “The horror! The horror!” When Marlowe returns to Europe, he has a new appreciation of the fragility of the human person and his social relations. If there is one element of hope, it is that Kurtz still had the capacity

and conscience to pass judgement on himself. As Marlowe experiences his return to Western civilization, he remains concerned that the fabric of civilization is fragile, and that the capacity for self-judgement is limited. Yet, this is a truth that could not be understood within the cultural and legal frameworks as they have evolved.

“How are we to tell one form of reason from another? This, it seems, requires more than the simple elaboration of a rule of reason. It requires the cultivation of a disciplined form of creativity with a capacity to project itself as a creative force for the evolution of society.”

Heart of Darkness raises an important question about the vital importance of the evolution of public conscience strengthened by public values and reinforced by jurisprudence and legal culture. What is obvious to Marlowe is that without these somewhat frail rules that connect the web of social organization, the possibility of Kurtz-like failures is essentially close to the surface. In this sense, we can consider that the rule of law, as it has evolved over time, has been a critical factor in the movement of progressive society from status to freedom. However, the story of the fight for the supremacy of law is far from done.

Fifty years or more after Conrad wrote this novel, several versions of Kurtz emerged in the context of the twentieth century. In Russia, the Stalinist state emerged with a complete repudiation of the rule of law, and that state became noted for its mass murders. In China, the totalitarian state emerged under Mao Zedong, and that state also became acknowledged for its rolling mass murder. The rise of Hitler by fascism in Nazi Germany led to the mass extinction of human beings in the form of industrialized human slaughter. These are three notorious examples of the states that had evolved with sophisticated laws and cultural practices, and yet the revolutionary impulse to destroy left a vacuum which could not be filled by law, religion, or cultural practice.

Some background to legal theory and legal culture: the emergence of rule-of-law governed society in Europe owes a great debt to Roman legal culture. The Romans classified law according to *jus civile* (the law of the state), *jus gentium* (the law of nations), and *jus naturale* (the law of nature). The latter two categories often influenced the law of the state in directions that were flexible and more responsive to human needs. On the other hand, *jus civile* stressed the principle of the stability of legal and social relations.

During the Middle Ages, the influence of the Church reflected the influence of the Christian-inspired principles of natural law. These natural principles focused on the need to fully deploy human reason in the defense and promotion of human justice. This meant that the precise boundaries of natural law were undetermined. However, the United States Supreme Court, in the famous case *Marbury v. Madison*, adopted the principle of judicial review, which essentially was supported by the natural law idea that jurists bring active reason to legal affairs. This perspective has remained a cornerstone of American jurisprudence. It

is a matter that is still controverted; for example, it is said that judges exercise too much discretion in the discharge of their roles.

“Thinking creatively is an indispensable tool for the improvement of human possibility.”

By the middle of the nineteenth century, science began to dominate, arriving in the form of analytical positivism. Here, the principal objective was to ensure that all legal rules were scientifically objective and valid. This could only be achieved by the recognition that all states are sovereign, and what the sovereign orders is the law. Recourse to natural law reproduced too much subjectivity and ambiguity in a field that required objectivity and certitude. The central point of the sovereignty-as-law principle was that we could not clearly separate what law objectively is from the subjectivity of moral-and-value discourse.

The influence of positivism was reflected in the infamous *Dred Scott case*, which literally read the Constitution as denying African Americans any civil and political rights whatsoever. Later, in the case of *Plessy v. Ferguson*, they read the principle of equality narrowly, to justify the principle “separate but equal”.

In 1899, Oliver Wendell Holmes delivered a famous lecture at Boston University titled “The Path of the Law”. This was a revolutionary expression of a scientific approach to legal theory. Holmes pointed out that the life of the law was not logic but experience. He stressed elsewhere that logic created the illusion of certitude. In fact, he indicated that as a judge, he could give any conclusion a logical form. What, then, was the law? Holmes presented a shocking idea to distinguish law from moral sentiment and value. Holmes said that to look at law realistically, we must look at it from the point of view of the bad man. The bad man consults his lawyer, because he wants his lawyer to represent his interests, and not the vaguer interest of morality and values.

This positivistic approach was in many ways brilliant, because it limited the illusion of logical certitude and stressed the importance of looking at law from the point of view of its most important consumer, the bad man. What it also did was to cement into the fabric of law and economics the idea that the only interest that counted from this point of view was the self-interest of the bad man consumer. In an indirect way, the bad man became the cornerstone of modern neo-liberalism in economics. It still remains a great challenge to determine the circumstances under which the corporate form of generating wealth may be constrained not only by objective law but also by principles of legal and ethical morality.

While this matter remains a challenge to both law and economics, the heart of darkness that fell on Nazi Germany and resulted in millions of murders provoked the challenge of public conscience. This resulted in the Nuremberg Trials, in which individuals were criminally tried for acts so egregious that they defiled the public conscience. Subsequent to Nuremberg, we had the development of a new form of constitutional order which sought to restrain the heart of darkness, reposing in the antechamber of all sovereign states. Along with the new form of global constitutionalism, there emerged an International Bill of Rights. This Bill of Rights was supported by governments and non-governmental players in the evolving public

conscience to sustain human rights norms and to ensure that all global power is subject to the human rights-conditioned rule of law.

The central problem posed by the insight into human subjectivity that it carries the seed of a “heart of darkness,” raises the question of how it can produce legal and cultural institutions that cultivate and respect human subjectivity, constrain its destructive impulses, and focus on the challenges of the future evolution of society. The two elements of law that stand out are the ideas that scientifically law must be a matter of logic and from a moral point of view, there is the perspective from the natural law tradition that all law has limitations as does logic. This requires the cultivation of reason, thought, and elaboration. This natural law tradition says that all human relations must be constrained by a natural-law based rule of reason. How are we to tell one form of reason from another? This, it seems, requires more than the simple elaboration of a rule of reason. It requires the cultivation of a disciplined form of creativity with a capacity to project itself as a creative force for the evolution of society. This requires a number of intellectual forms of experimentation, including the capacity to forecast and to differentiate between destructive and constructive futures. The capacity to creatively instill a more promising future probably lies in the skill to mobilize the mental capacity of free fantasy and to consider the creativity of fantasy in terms of constructive future possibilities. In this sense, thinking creatively is an indispensable tool for the improvement of human possibility.

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The Fourth Industrial Revolution: Challenges, Risks and Opportunities

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Abstract

Modern challenges, risks and opportunities of a new technological paradigm of human development—the so-called fourth industrial revolution—are covered in this article. Their social costs and consequences are discussed in detail. The impact of the fourth industrial revolution on business development is analyzed. Development of information platforms of supply and demand is presented as the creation of new business models. When considering the impact of the fourth industrial revolution on the state, it is concluded that the state has increased control over society, while changing the mechanisms of interaction between the state and civil society, the development of competition and decentralization of power. It is pointed out that the ability of state structures and authorities to adapt to the conditions of the fourth industrial revolution will determine their survival in the new conditions. If they are able to face the world of revolutionary change openly, the ability to change their state structures, make them transparent and the effectiveness will allow the state to maintain its competitive advantages and withstand the tests of a new technological paradigm of human development. Artificial intelligence is considered in detail as the main driver of the fourth industrial revolution.

The world is at the very precipice of a new technological revolution that will fundamentally change our way of being, life, work and ways of interaction with each other. In its scale, scope and complexity, the transformation/changes will differ considerably from anything experienced by humanity so far. We still have no idea how it will evolve, but one thing becomes apparent: our response should be universal and comprehensive, including all active participants in world politics, from the public-private sectors to the intellectual and civil society. Klaus Schwab, the founder and Executive Chairman of the World Economic Forum in Davos, describes these technological transformations/changes as the fourth industrial revolution.

During the first industrial revolution water and steam power were used to substitute manual work for machine work and develop industrial production, during the second electricity was used to expand and enhance the scale of mass production, during the third electronics and information technology were used to automate production. And right now, the third industrial revolution is being replaced by the fourth, a digital revolution that has emerged and evolved since the middle of the last century. This has been mainly characterized by technology blending, which blurs the traditional borders between the material, digital and biological worlds.

Since 1784, steam power, water, and equipment for mechanization of production marked the first industrial revolution. Since 1870, the division of labor, electricity, and mass production shaped the character of the second. Since 1969, electronics, information technology and automation of production have become the basic features of the third. Can we identify the primary and main features of the next revolution?

There are three markers, which show that the present changes do not represent a follow-up to the third industrial revolution, but demonstrate the beginning of the fourth. These are the speed, scale of changes and their effects on the whole system. The speed of occurrence of new discoveries and technological breakthroughs has never been observed before. In contrast to the previous revolutions, the pace of development of the fourth revolution is exponential rather than linear. Furthermore, almost all industrial sectors in nearly every country are being reformatted, and the breadth and depth of changes foreshadow transformation of the whole production, administration and management systems.

The possibilities of billions of people, connected by mobile devices with powerful computing capacity, large amounts of information storage and access to knowledge, are endless. And these possibilities will be increased with the discovery of new technologies in various areas, such as artificial intelligence, robotics, autonomous means of transport, the Internet of Things, 3D printing, nano-biotechnology, materials science, energy technology and quantum computing.

1. Challenges and Opportunities

The fourth industrial revolution, as the previous three revolutions, has the capacity to increase global income and improve quality of life for peoples of the world. Consumers with material possibilities and access to the digital world are those who already enjoy its fruits/benefits; through its technologies, new products and services which increase efficiency and comfort for everyone. Taxi request, booking of flight tickets, marketing, making payment, listening to music, film screening or computer games—we have remote access to all of them.

In the future, technological innovations will give rise to significant changes in the industrial procurement, with long-term efficiency gains and productivity in this area. Transport and communication costs will be reduced, logistics and global supply chains will be made more efficient, trade margins will be decreased, all this will lead to the opening of new markets and economic growth.

At the same time, the revolution could bring increasing inequality as a result of changes in the labour market. Either automation, which replaces manual labour, or direct replacement of a worker for a machine, could cause an increase in the gap between the income of capital and the income of employees. However, it is possible that such replacement of workers will in the future provide a net increase in safe and top-paying occupations and jobs.

This shift has never proceeded smoothly without great social expenses. Moreover, most of them took place in the countries that made this shift too late. Thus, the first industrial revolution led to deindustrialization in India (in the 18th century, India produced up to 25% of world GDP, by the mid-twentieth century the share fell to 2%), and there was a serious lack of technology in Russia and Turkey. The second industrial revolution caused the Great

Depression, which resulted in major social shocks not only in the United States, Germany, Argentina, but also mass famine in the colonies (at the expense of which the metropolis was getting out of the crisis).

We have not yet generalized data on the consequences of the third industrial revolution. However, the most preliminary estimates show that deindustrialization of the post-Soviet space, series of crises in Latin America are the consequences of such a shift, in which these countries have lagged behind. Alternative examples are China and Korea, which integrated technology through competent industrial policy and managed to emerge as world leaders after the third technological revolution.

The most preliminary estimates show that at least 20% of jobs have been cut. And globalization has led to extremely uneven job cuts in different countries. The imposition of overproduction during the transition of the global crisis did not allow occupying the released labor force on a global scale through the growth of production. And the economic growth around the world of 3-4% per year does not solve any of its problems.

So far, it is difficult to foresee the likelihood of developing one scenario or another, but there are historical prerequisites demonstrating that the result will be a mixture of both versions. However, it is obvious that talent, rather than capital, will be a crucial factor in the production function during the fourth industrial revolution. It will result in the division of labour market into two main segments: “low-skilled labour/low salary” and “high-skilled labour/high salary”, a result of which will be an increase in social tension.

Apart from its crucial economic impact, disparity will also have a significant social aspect in the context of the fourth industrial revolution. The greatest beneficiaries will be those who provide intellectual and material capital—savers and investors—which explains the widening gap between groups dependent on capital and wage labour. Therefore, technology is one of the main factors of stagnation, as well as declining incomes, even in countries with high levels of income: the demand for high-skilled labour is growing, but it is dropping for medium-skilled labour. As a result, the labour market will be characterized by high demand for highly skilled and unskilled labor, with little demand for the middle segment.

Resentment could also be strengthened by the spread of digital technologies and the dynamics of social media in information dissemination. Today more than 30% of the world's population use social media platforms for communication, education and information dissemination. In an ideal world, these relationships could provide opportunities for building bridges among diverse cultures and, as a result, for unity and cohesion. Nevertheless, these relationships also could create and promote unrealistic and utopian views of the success of an individual or group, as well as suggest and disseminate extreme (extremist) ideas and ideologies.

The invention of the XXI century was the emergence and quick wins of the information space by social media, which in many respects replaced the traditional media. Thus, according to studies of the international marketing management system HootSuite, as of January 2018 in Belarus more than 49% of the population (4.67 million) are active users of social media. 3.85 million Belarusians use social platforms on smartphones. But the most curious fact is that Belarus ranks first in the world in terms of the percentage of women on Facebook (58%).

It should be acknowledged that only 8.6% of Belarusian business pages on Facebook use advertising tools (this is almost 3 times less than the average).

What can be connected with such changes? Firstly, social media is a more mobile way of transmitting and receiving information. It expands access to the social network, and today in Belarus only 3.25 million use the fixed internet, with a constantly increasing speed of access to the network, which makes social networks more competitive.

Thirdly, there is a deepening democratization of the information space. Earlier information could be provided only by centralized news agencies, now we see how social networks allow any registered account to become a kind of center for the transmission and dissemination of information. Therefore, today the media community is faced with an entirely new phenomenon—bloggers. Bloggers, in contrast with journalists, are not bound by mass media legislation, act as private individuals and are not responsible for the credibility in the transfer of information. The same can be said about social media, which leads to consequences in the area of quality of transmitted and reported information, as well as public security.

Sometimes the anonymity of social media leads to greater risks. Anonymity of accounts provides a broad range of instruments to manipulate the information space. Attempts to organize “revolutions through social networks” and as the distressing consequences of the Arab Spring, rumblings of which we still observe in Syria and Yemen, show, social media requires the development of a legal framework that could regulate this sphere. In this regard, in the Republic of Belarus in 2010 in the National security concept, and in 2016 in the adopted New military doctrine provisions on the features of the threat of “hybrid wars” were introduced, namely in the part related to information and psychological methods of destabilization of the situation in the world.

On the one hand, it is necessary to develop legal support for freedom of speech in social media. On the other hand, participants in social networks should feel safe both in terms of access to accurate information and in terms of moral and psychological protection. The latter factors are important. Over recent years, there has been a great number of cases of so-called “haterism”, mentally incorrect behavior in social media, which sometimes causes deplorable and tragic consequences. Anonymity and legally undefined aspects of these media create loopholes, including illegitimate and illegal actions. Many social media networks, due to their anonymity, in particular the telegram channel, are used by destructive forces for communication by representatives of criminal and terrorist groups. Therefore, this resource has been recognized as hazard and blocked on the territory of the Russian Federation. Attempts of numerous information junk shot, misinformation and manipulation of interpretations of already existing information are also recorded. All these possess a hybrid threat, which is recognized by experts at the world level.

In the next thirty years, the role of the internet and social media will only gain more significance. Audience coverage will expand through generational change, increasing access to the internet in new regions and speed of data transmission. Moreover, in some countries social networks are already trying to integrate with e-governments, banking systems and Agency resources. There is an integration of information, management and payment systems, the process of digitalization, which expands the functions of social networks and requires

more detailed elaboration of security and the establishment of a qualitatively new framework of legal support for social media functioning.

2. Impact on the Business

Nowadays significant challenges remain in thinking or anticipating the speeding up of innovation progress and increasing the pace of change, and these factors are the source of constant surprises even for the most skillful and informed participants. Anyways it has been clearly demonstrated in all sectors of economy, that the technology marking the beginning of the fourth industrial revolution has a decisive impact on business. The fourth industrial revolution is already happening, it is now picking up and the development of robotics will further digitalize the economy and automate production and services, and expand the use of little-used technologies.

In supply and logistics of many industries, we can notice the introduction of new technologies, enabling totally new ways of servicing for existing procurement needs, and, consequently, greatly competing with established production and value chains. A similar effect comes from the initiatives of innovative competitors, who due to worldwide digital platforms for research, development, marketing, sales and distribution, can quickly displace long and well-standing market participants, by improving quality, speed or cost of providing goods for consumption.

In addition, significant changes on the demand side are arising, as the increasing availability of information, constant involvement of the consumer and new patterns of consumer behavior (mainly as a result of access to mobile networks and information) make companies adapt ways of development, marketing and delivery of products or services.

Development of information platforms is a core trend. Such platforms combine supply and demand and undermine existing production structures, and as examples we can see new business models in the contemporary “sharing” economy and “on-demand” economy. These platforms (“Uber”, “Airbnb”, “Alibaba” etc.), easily used on smartphones, bring people, assets and data together, thus creating entirely new ways and means of consuming goods and services. In addition, they make easier achieving “wealth” for businesses and individuals easier, changing the personal and professional sphere of employed. These new business models are rapidly spreading as a large number of new services are booming, from laundry to shopping, from housekeeping to parking, from massage to transportation.

In general, there are four main effects of the fourth industrial revolution on business—the impact on consumer expectations, on product improvements, on collaborative innovation, and on forms of organization. Tangible products and services can be enhanced by means of digital opportunities that make them more valuable. New technologies make assets more sustainable and flexible, while data and analytics are changing the way they are being maintained. The world of individual consumer experience, widely available information services and efficient use of assets requires new forms of cooperation, especially considering the speed with which changes are going on. And the emergence of global platforms and other new business models, as a result, means, that individual capabilities, culture of society and organizational forms should be revalued.

3. Impact on the State

As material, biological and digital worlds continue to merge, new technology and platform will provide expanding opportunities for citizens to interact with government agencies, to express their views, coordinate their efforts, and even to avoid authorities' supervision. Concurrently, government agencies will receive new technological options to strengthen control over society, based on more complex and upgraded monitoring systems of digital infrastructure. However, the authorities will be under pressure to reconsider their approaches to interaction with civil society and pursue policies, as their central role in the latter will go down with the birth of new sources of competition, redistribution and decentralization of power arising from new technologies.

"The fourth industrial revolution will change not just what we do, but also who we are."

Ultimately, the adaptability of government structures and authorities will determine their survival. If they are able to accept the world of revolutionary changes, to modify their structures, to make them transparent and efficient enough to maintain their competitive advantages, then they will address new challenges. Otherwise, they may face difficult problems to solve.

This will become especially evident in the field of management. When the time of the second industrial revolution coincided with the then existing public policy and decision-making systems, decision makers had time to consider particular issues and formulate necessary solutions or appropriate regulatory frameworks. The entire process was linear, mechanical, with a strict top-down approach.

Such an approach is not suitable for our time. Given the rapid pace and scale of the impact of the fourth industrial revolution, legislators and regulators have faced unprecedented challenges and, mostly, found themselves somewhat helpless.

For example, how could they protect the interests of consumers and the society in a broad sense while continuing to foster innovation and technological progress? With the introduction of "flexible" public administration, the private sector has implemented appropriate measures to develop software and business models on a larger scale. It means that regulators should adapt to a new, ever-changing environment, evolving to fully understand what they regulate. For that purpose, the authorities and regulatory agencies should work closely with business and civil society.

4. Impact on Humanity

The fourth industrial revolution will change not just what we do, but also who we are. It will influence our identity and all related aspects: our perception of privacy, understanding of property, consumer habits, time that we devote to work and leisure, career development, a set of skills and competence, and personal relationships. At the core of this question is the permanent use of smartphones that may cause the loss of one of the most important aspects of our existence: to make a pause, to think and to start having meaningful conversations.

Privacy is one of the greatest personal challenges posed by new information technologies. We reflexively realise how important it is for everyone, though we are aware tracking and sharing information about ourselves is a crucial aspect of the new information interaction. The fundamental issues of the impact of the loss of control over our information on our private life in the near future will be only discussed more actively. In addition to breakthroughs in biotechnology and AI that redefine the concept of the human being on the whole and push back the boundaries of life expectancy, cognition and human capabilities will make us review our moral and ethical norms.

5. Artificial Intelligence (AI) as one of the main drivers of the Fourth Industrial Revolution

Artificial intelligence already exists in our lives, from self-driving cars and drones to virtual assistants who can translate or invest. By virtue of the exponential growth of computing power and the huge amount of accumulated data, the progress in the field of AI has been impressive in recent years. AI is widely used in creating new types of medicine and developing algorithms which can predict our future cultural preferences. At the same time, digital production technologies interact with the biological world. Engineers, designers, architects combine computer-aided design systems, additive manufacturing, materials science, and synthetic biology for breakouts in the discovery of symbiosis between microorganisms, our bodies, the substances we consume, and even the houses we live in.

Artificial intelligence will become the central driver of change according to the polling of 800 leaders of technological companies which was conducted specially for the 46th World Economic Forum in Davos in 2016. 45% of respondents believe that in 2025, artificial intelligence may be present on the boards of directors of large companies.

Artificial intelligence used to exist only in science fiction, but now it is one of the most promising and rapidly developing technologies. Limited or “weak” AI technologies are already widely used in various spheres: from mobile phones and household electronics to military products. The development of “strong” artificial intelligence, which can make informed management decisions, is on the agenda today. Experts say that the prospect of creating such a technology, questions not only the current system of global labor division, but also the world order and international security system.

Discussions at the conference organized by the China Institute of Contemporary International Relations (CICIR) with the participation of the Stockholm Peace Research Institute (SIPRI) in September 2018 in Beijing showed that AI technologies will be used by nuclear powers in the near future to modernize their strategic weapons. The usage of “weak” artificial intelligence (sharpened to solve a specific task) for early warning of the launch of enemy missiles, as well as for estimating the possibility of such a launch, can give the military command of a nuclear power additional time to decide on the backlash and its scale. New technologies can also upgrade the accuracy of nuclear weapons and the effectiveness of missile defense, improve the protection of nuclear facilities, and provide better data.

At the same time, the acceleration of the decision-making process of one of the parties will inevitably push its potential enemies to search for opportunities for faster delivery of nuclear weapons. Such a race between nuclear powers potentially has a serious threat to

world stability, since it will leave less and less time to estimate the threat of a missile attack and the expediency of response. Ultimately, it cannot be excluded that the countries will be forced to automatize decisions about a retaliatory strike, which can lead to unpredictable consequences. At the same time, weaker nuclear powers, feeling vulnerable, in the nearest future may implement an automatic nuclear retaliatory strike system (by analogy with the Soviet “Perimeter” system and the American “Operation Looking Glass”).

As part of the discussion, it was noted that even machine learning experts do not always fully understand how it works. Despite the rapid development of AI technologies, the “black box” problem, when decision-making algorithms remain hidden from developers, remains prevalent. Thus, before trusting artificial intelligence solutions related to the use of lethal weapons, it is necessary to significantly increase their transparency. However, there is inevitably a contradiction arising from the need to combine the transparency of machine learning mechanisms with their protection from the enemy, since the data used by neural networks can be “poisoned” by intentional manipulations (data poisoning). It is also important to note that military forces due to their work specifics have a fundamentally smaller amount of data for machine learning than civilian companies engaged in AI.

However, it is already obvious that in the medium term, AI will make production, transportation and trade more efficient, improve crop yields, open up many new opportunities for technology development, restructure labor markets and consolidate new approaches to national security and modern military system. One of the tendencies can be particularly shocking: eventually, it is impossible to exclude the possibility that countries will have to automatize decisions about a retaliatory strike, which can lead to unpredictable consequences. Also the situation is complicated by the fact that autonomous weapons and artificial intelligence are still in the “gray zone” of international law.

It means that countries which are able to develop and use innovations in the field of AI will have good prospects for economic growth and for enhancing national security. In contrast, countries that maintain an excessive dependence on outdated infrastructure and economic models will find it difficult to ensure competitiveness.

The United States is a global leader in AI. Companies such as Google, Amazon, Facebook, IBM and hundreds of start-ups conduct extensive research focused on developments in this area. In September 2018, a 2 billion dollar campaign was started in the United States to develop the next wave of AI technologies with the goal of “turning computers from specialized tools into problem-solving partners”.

At the same time, China is striving to become a world leader in AI by 2030. In October 2019, China allocated USD 1.6 billion for development in this area, and in 2017 investments amounted to USD 4.9 billion, which was the world’s largest investment in this sphere.

Although the USA and China are the largest players, the development of AI is global. In Israel and the UK, the sector is developing at a high level. Earlier this year, the French government announced a major public investment in this area. The promotion of innovation in the field of AI is also a key focus of governments in Japan, South Korea and Russia.

In September 2017, Vladimir Putin said that “artificial intelligence is the future not only for Russia, it is the future of all mankind. The one who becomes the leader in this sphere will

be the ruler of the world.” In Russia, in 2017 the capacity of the AI market was less than USD 12 million, and by the end of 2020 it is expected to grow to USD 460 million. The AI market capacity in the industrial sector by 2021 will be USD 380 million.

“Highly automated production does not involve the automation of physical actions and repetitive operations alone, but also the automation of human intellectual activity with its ability to solve non-standard tasks and formulate deep strategic goals.”

Former Google CEO Eric Schmidt believes that both Russian and Chinese leaders realized the importance of this area, not only from the commercial point of view, but also for military developments. In May 2018, at a meeting on military construction, Vladimir Putin stated that the production of weapons should focus on the implementation of AI and robotics.

In recent years the AI market in Belarus has grown several times. The High-Tech Park (HTP), which was established in 2005, has about 400 residents now. In 2018, more than 70 companies are engaged in AI, of which the most famous are MSQRD, AI Matter, Viber and EPAM. The number of specialists in the field of AI reaches 1,700 people.

The Decree of the President of the Republic of Belarus Alexander Lukashenko “On the Development of the Digital Economy”, signed at the end of 2017, served as an impulse for the active development of technologies by IT companies. The main developments in Belarus on AI are applied in the fields of car industry, health care, agriculture, industrial production, finance, transport and environmental protection. Solutions are being developed for automated vehicles, speech recognition, search technology, computer vision, increasing the effectiveness of the use of acreage, yield forecasting, etc.

Highly automated production, changing the configuration of socio-economic and administrative relationships, does not involve the automation of physical actions and repetitive operations alone, but also the automation of human intellectual activity with its ability to solve non-standard tasks and formulate deep strategic goals. Despite the presence of advanced systems that automate certain aspects of human intellectual activity, it is extremely difficult to realize the ability to solve non-standard tasks and formulate deep strategic goals at a high quality level. At the same time, it is necessary to understand that the technology of machine learning in practice proved the possibility of formalization and subsequent implementation throughout computer technologies of non-algorithmizable processes and subject areas. So we can conclude that high quality in this area is possible.

Now the main thing that is necessary is to understand how safe such an impulse will be for humanity, the established system of norms and institutions.

Despite the fact that artificial intelligence, as a scientific area, is the source of a great diversity of principles and paradigms, methods of data processing, semantic methods and technologies are currently the most advanced and promising. In particular, algorithmic methods for creating intelligent systems based on formal-logical models, in a general sense, represent the way to create syntactic structures that do not carry information about the

content and meaning of data, and therefore systems based on these models can hardly be called intelligent.

Today, the efforts of all professionals to create intelligent expert systems are aimed at the formal expression of such objects as “inference”, “meaning”, “knowledge” and, based on the practical awareness of the limitations of classical methods, experts increasingly come to understand that without semantic methods and technologies further progress in the field of artificial intelligence will be impossible. One way or another, it became clear that without these methods, intelligent systems would be just a game of imitation of communication, argumentation, understanding and purposeful action. Moreover, the limits of this imitation have already been achieved. A good example is the “intelligent” chatbot, which for the first time managed to pass the Turing test “at the tests, organized in 2014 by the University of Reading (United Kingdom). At the same time, in order to hide the semantic errors associated with the patterned nature of the system, based on statistical methods of syntactic information processing models, the developers came up with a legend according to which the program is a 13 year old boy from Odessa who does not speak English well.”

Despite the fact that the first Eliza bot was written in 1966, we still cannot talk about tremendous progress in this direction. In particular, the bot still works by certain instructions and relies on pre-formed keywords “understood” by the bot. Each command must be written by the programmer separately using regular expressions or other forms of string analysis. If the user does not use keywords, the bot responds with messages like “sorry, I did not understand.” At the same time, despite limited functionality, such bots sometimes can be effective. It often concerns electronic legal systems and electronic lawyer systems, since the dialogue between users is served by much greater standardization and formalization.

In addition to bots, search, engineering, economic, medical and military systems with elements of artificial intelligence, intriguing enough, especially for scientists, is the creation of automated systems for identifying and prioritizing research projects in terms of socio-economic development. In particular, according to academician Igor Sokolov, the director of the Research Center “Informatics and Management” of the Russian Academy of Sciences, separate fragments of this system are already used by the Russian Foundation for Basic Research and some industrial enterprises.

The main benefits of the implementation of AI should be noted:

- automation and widespread cost reduction;
- the emergence of autonomous transport and robotization;
- optimization of logistics processes and supply chains;
- optimization of energy and transport networks;
- development of sensor networks and monitoring of agriculture;
- development of information services and a distributed economy;
- development of personalized medicine, clinical practices and infrastructure for distributed and secure access to medical data;
- the emergence of personal educational trajectories and the development of social engineering;
- creation of autonomous weapons systems.

Of course, large-scale technological development within these areas and the introduction of relevant results in various aspects of socio-economic practice without proper scientific and economic expertise brings some potential risks.

“A positive trend in the development of society is possible, provided that the state authorities are able to adapt to the new conditions of the information society.”

So, according to many forecasts, AI will already surpass the human intellect by 2035-2050. However, as we noted at the beginning of the article, the current results, despite the seemingly impressive character, are more likely to be in the area of imitating of intellectual activity or performing easy algorithmic tasks. Therefore, in our opinion, these dates can be significantly postponed.

Recently, there is an opinion in the expert community that AI systems will deprive people of work. In this case, the restructuring of the labor market, the withdrawal of professions related to the same type of processes and standardized physical manipulations, and the reduction of the working day are obvious. But, despite this development of AI systems, undoubtedly, new, creative and highly skilled professions will arise. Thus, the thesis about increasing social inequality in connection with the introduction of AI seems to be incorrect, since the emergence of such professions (provided timely and efficiently organized retraining of personnel and equitable distribution of large additional funds raised from productivity growth and cost reduction) will help to overcome the era of alienated, mechanistic labour and to make the work of interacting with AI systems less complicated and more fascinating.

The speed, scale and impact of change on the entire systems of the fourth industrial revolution are unprecedented in human history. The challenges and risks of the modern technological paradigm of human development, its social costs, consequences and contradictions are also great. Creation of new business models on the basis of information platforms of demand and supply, strengthening of control over society and personality by the state, radical change of mechanisms of interaction of the state with civil society, development of competition and decentralization of power, creation of artificial intelligence—all these can lead to significant progress in the development of society and its degradation. A positive trend in the development of society is possible, provided that the state authorities are able to adapt to the new conditions of the information society.

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Our Endangered World Needs a New Paradigm

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Abstract

Our world is confronted with formidable challenges, even endangering the continuity of human existence. Most of these dangers are manmade, the outcome of a misplaced attitude towards man, matter and nature. This is rooted in a false paradigm based on the autonomy of man ignoring Transcendence. There is an urgent need for a new paradigm along the lines of Albert Einstein's vision that man is a part of the Whole. Urgently needed, therefore, is a spiritual awakening, in a highly diversified world with many conflicting interests. A common platform for dialogue and cooperation could be founded on four keywords. This paper offers a perspective on a peaceful, just and sustainable world. It pays particular attention to two key areas: peace and security in the nuclear age, and an economic model that is, at a global scale, just and sustainable. Notwithstanding the great problems confronting us, it is carried by hope.

1. Our Endangered World Needs a New Paradigm

Our world is under threat of major challenges. Some of these have natural causes; the most ominous are, however, manmade. The instruments created by science and technology risk annihilating life on this planet: huge power rests in frail human hands!

The distorted view of economics has not only not contributed to the wellbeing of many people, but also led to the progressive destruction of our natural habitat. Our culture is out of balance. The equilibrium between matter and spirit is lost. Of crucial importance for the survival of mankind is the development of a new paradigm. Narrow nationalism should give way to global cooperation. The Corona Crisis offers a unique opportunity to reflect upon the current policies towards collective disaster.

This paper will focus on:

- the key challenges to humanity
- a new paradigm – spiritual awakening
- the search for a common platform in a highly diversified world
- two key areas: peace and security in the nuclear age and a new economic model which is just and sustainable
- signs of hope

2. Key Challenges to Humanity

- **Prevention of the annihilation of mankind. The current policies are a sure course for disaster. Our world is engaged in a massive preparation for war.**

Military expenditures have reached outrageous proportions (exceeding \$1800 billion, i.e. more than double the top year spending during the Cold War), whilst other major areas affecting human security are severely underfunded. Great concern is justified due to the resumption of the arms race. There are now more than 15,000 nuclear weapons. Steps are being taken to increase this number in the coming years. Do we realise that about 100 nuclear weapons are sufficient to put an end to human civilisation? We should increasingly be concerned about the effective management and control of the nuclear weapon systems. These are subject to misinformation, misjudgement, human and technical failure. Even more so given the envisaged delegation of human control of the deployment of nuclear weapons to artificial intelligent systems. This Doomsday Machine, together with new arms technologies, the lowering of the nuclear threshold, developments in cyber warfare and the weaponization of space, is preparing a sure road towards Armageddon.

*“Radical change
in our attitude
towards man,
matter and nature
is required.”*

- **To set course towards a world with a just and sustainable economy**

This is of particular relevance in view of the close link between the actual untenable economic model and the ecological crisis.

- **To stop the progressive destruction of the world’s natural habitat**

Current attempts to address immediate ecological issues are inadequate. Thus far we have failed to live up to global commitments. New ideas about a sustainable economic model are urgently needed, restoring the balance with nature. This includes addressing the issue of consumerism.

- **To reverse growing inequalities**

Inequalities are a major cause of conflicts, mass migration etc. Initiatives are needed which lead to:

- New development strategies for regions most affected (Africa, Middle East, Latin America)
- Improved transparency of the financial sector (transactions, just fiscal policies)

- **To reduce the causes of mass migration**

Special efforts to address the causes of massive migration, notably inequality and the destruction of natural habitat should be made.

- **To control the immense force resulting from progress in science and technology**

- Preventing developments that are harmful to humans
- Proper handling and use of artificial intelligence
- Genetic engineering

- Global data processing vs. human dignity and privacy
- Human beings should not be reduced to a bundle of algorithms

- **To manage the corona crisis and future pandemics**

The unparalleled series of asymmetric shocks these challenges impose can only be effectively addressed by concerted, coordinated multilateral action by and on behalf of all nations in the world community and our international agencies for global governance. Unfortunately narrow nationalism stands in the way of a constructive approach. This blindness for the state of affairs can only be overcome by a new paradigm.

Technology and pragmatism alone will not meet the above challenges. For an effective response more is needed, in particular, radical change in our attitude towards man, matter and nature is required. This demands a new vision of man as part of the Whole. In our present culture economics is the dominating force. The equilibrium between matter and spirit is lost. A widely spread spiritual renewal is needed.

“Man is not an autonomous human being, but part of the Whole.”

3. A New Paradigm – Spiritual Awakening

We are living in an insane world, indeed! Looking at the way major challenges to humanity are handled, one cannot avoid the impression that our intellect is engaged in a process of self-destruction, instead of promoting human well-being. Could it be that our deepest motivation is fundamentally flawed? We have lost awareness of the direct relation to the basic ground of human existence. Man is not an autonomous human being, but part of the Whole. The new paradigm demands nothing less than a recapturing of the sense for the Transcendent.

The essence of the new paradigm is eloquently expressed by Albert Einstein:

“A human being is a part of the Whole, called by us ‘Universe’, a part limited in time and space. He experiences himself, his thoughts and feelings as something separated from the rest, a kind of optical delusion of his consciousness. This delusion is a kind of prison for us, restricting us to our personal desires and to affection for a few persons nearest to us. Our task must be to free ourselves from this prison by widening our circle of compassion to embrace all living creatures and the whole of nature in its beauty.”

These words are of decisive significance in the actual confrontation with formidable challenges to our human existence. The guiding principle in life is indeed love for humankind and nature. When we grasp the full significance of these words it will help us to overcome the blatant individualism and narrow nationalism, opening our eyes to solidarity and peacefulness.

3.1. Spirituality: The Key to a Fundamental Change in Attitude

One of the hopeful developments in the past decades is the resurgence of spirituality in a materialistic world. This remarkable development occurs while the economic juggernaut rolls on with irresistible force, crushing everything obstructing its path. Yet new life is budding in an arid landscape. Spirituality is now—after many years of obscurity—one of

the most popular words. Numerous initiatives are receiving a widespread response, both from religious and non-religious people. Apparently, a reaction is setting in against the present technocratic, materialistic culture, which tends to reduce human beings to grabbing zombies. This growing interest in spirituality reflects the rebellion of the soul against an ever more oppressive modern world. It is a passionate *No* to the reduction of life to crude materialism and sexism, a revulsion against the overwhelming trend to triviality and instant-fulfilment. Fortunately, not all people are numbed by the filth and rubbish daily poured out by a commercially driven entertainment industry. We are indeed living in a time of transition in which new thinking is engaged in a fierce struggle to replace inadequate—even highly dangerous—patterns of thought.

This upsurge of interest in spirituality is not surprising for mainly two reasons. The first one is related to a deep concern about the staggering problems of modern society and the ineffectiveness of old recipes. Indeed, the present political scene does not inspire much confidence. Jockeying for position seems to be a more popular pastime than practising statecraft. Vision and moral courage are rare commodities among politicians who take pride to have freed themselves of any ideological or transcendental ballast. The notion that ‘something is fundamentally wrong’ is, however, spreading fast. The second reason has to do with a growing sense of dissatisfaction about life in general. With the evaporation of the awareness of the basic ground for our human existence our sense of orientation also vanished. The compass needle lost its bearings. For many, life has become pointless. Boredom and lack of purpose prevail, even among those who have ample means of access to an abundance of consumer goods. In this uninspiring setting, more and more people are awakening from the deep slumber of ‘horizontalism’ (ignoring Transcendence). They have a hunch that there must be more in life, something of a higher power, which could open up a new perspective on a fuller, more humane life. Rich sources of inspiration can be found in religions and other sources of wisdom.

3.2. Spirituality – An Invisible But Real Force

Spirituality is an invisible but very potent force in real life. It cannot be grasped, as it lacks material substance. Still it gets a hold on people, transforming them by a new outlook on life. It is even capable of changing a society whenever a critical mass of people is reached. It is the crucial factor in meeting our key challenges.

- Spirituality escapes any effort of quantification. It has no price and cannot be bought. Although invaluable, it is freely available to everyone with an open heart. For young and old, for sick and poor, for the healthy and wealthy.
- Spirituality is essential for establishing a creative relationship with the origin of our existence. Opening our hearts to the source of life will help us to discover our true identity.
- Spirituality addresses the whole person, not just one aspect of our personality. It provides an integrating magnetic force, capable of healing inner fragmentation, thus enabling us to live a meaningful life, free from the enslavement of materialism and hedonism.

- Spirituality provides also the sustaining force to those who are suffering or have to cope with endless frustrations in life and work. In opening up the access to an endless source of inspiration, we receive the courage to continue to act even when the case looks hopeless.
- Spirituality is not just another quality of the human person like intelligence, character or personal charm. It is the central force in life, determining our deepest motivation, a matter of the heart, centre of all decisions. From here the answer is given to the fundamental question: *where do you stand with your possibilities, at this crucial moment in history?* In essence, this is the basic question for every human being: *where are you?* Do we take our place in responsibility for the creation entrusted to us?

The essence of spirituality cannot be captured in words; it always looks for embodiment in acts. The emphasis is not so much on *talking* about the essence, but on trying *to live it*. The only language therefore that can be used is that of love. This is what mystics of all times have tried to convey. A beautiful expression of this experience is to be found in the Song of Songs, where human and divine love is united.

Whether humanity will follow the long line of extinct species depends first and foremost on our flexibility to change old models of thinking. Human decisions, not blind fate, steered us into the present quagmire. The key to our future rests in our hands. Whether this key will be used, depends on the rediscovery of the paramount importance of the spiritual force in life. This is certainly a tall order under present circumstances dominated by crude materialism. But it can be met, if much more attention is given to spiritual renewal than is presently the case.

4. A Common Platform in a Highly Diversified World

Who would dispute that a spiritual renewal of our culture is long overdue? The contribution of science and technology to a substantial improvement and betterment of our quality of life is indisputable. The age of Enlightenment paved the road for ‘responsible man’, freed from abuse of power by church and monarchs. But has this ‘autonomous man’ not overestimated himself by closing his eyes to the greater Reality from which we are inseparable?

Would it not be possible, in a world with so many conflicting interests between states and such a colourful diversity of philosophies of life, to rally support for a shared creative vision that leads to a reorientation of our culture?

Can we find common ground to set course for a sustainable, more liveable society? I believe that we can, as the sources for this shared vision are indeed present in science, religion and other convictions in life. Let me make an attempt to identify the source for a common approach.

How can we find a common platform in a highly diversified world? The starting point is an experience of reality that we can all identify with, regardless of differences in belief. We all live in a world under threat, humanists, agnostics and believers alike. We must chart a new course together. The ingredients for that joint reflection are present in four keywords that everyone can relate to.

4.1. Keywords

- Interconnectedness
- Vulnerability
- Urge to live
- Awe

The first two, *Interconnectedness* and *Vulnerability* are based on hard facts. *The urge to live* is vital for a human being. The fourth word, *Awe*, reflects a fundamental experience that is repressed in our culture, but potentially present in every human being.

It goes without saying that these keywords may be differently rooted in a humanist or agnostic than in a monotheist framework. The values these keywords inspire, however, are shared by all. Some of these are: responsibility, respect for life, peace, justice, solidarity, and moderation.

4.1.1. Interconnectedness

Science in particular has deepened our understanding of the fundamental *interconnectedness* of all ecosystems. Many religions too have propagated this for centuries. This insight is crucial, both for the individual and for society as a whole. It can contribute to the replacement of the sterile egocentric *culture of individualism* by a *culture of connectedness*, based on relating, caring and sharing. The global *Campaign of Compassion* works towards this end. This inspires values like justice, solidarity and the pursuit of peace. In political terms, it means caring for the poor and weak in society, social and just taxation, a humane immigration policy, etc. This notion of interconnectedness is also of particular relevance in our globalizing world. Growing awareness of connectedness can promote the development of international agreements (e.g. for raw materials, for water) that take into account the legitimate interests of all countries, including the weaker partners. The increased interdependence among nations demands a progressive international dialogue and cooperation.

4.1.2. Vulnerability

Is it still necessary to elaborate on the vulnerability of our ecosystem after the impressive documentary *Planet Earth*. Do the facts outlined in the reports of United Nations' experts and the Climate Change Conferences in Paris not speak loudly enough? We are headed for an ecological catastrophe within the next few decades. The current ecological crisis is largely caused by the unsustainable pattern of production and consumption of about one fifth of the world population. Three fifths of the world is now following this globally untenable model of development at an accelerated pace. How could we close our eyes to the severity of the situation, given that the problem is further compounded by explosive population growth?

In order to repel ultimate global catastrophe, cooperation between science, religion and other views of life is required. Only then can the colossal forces that have been developed in recent decades be controlled. Science can contribute predominantly in the field of technology. Our view of life can inspire the necessary behavioural change. This partnership is also essential for a sustainable economy on a global scale, an economy that respects the boundaries dictated by nature.

4.1.3. Urge to live

The urge to live is inherent to all forms of life. For human beings this implies another aspect, namely the longing to live well, in a world where living is good. A world in which peace and justice are not just empty words. A world which provides future generations with the opportunity to enjoy the beauty and diversity of Mother Nature. The current deterioration of the necessary conditions for life thwarts the realization of this deepest desire. This has stirred the primordial instinct, the will to live. A force that manifests itself in the surge of creative initiatives to promote sustainability in business and other sectors, and also in numerous groups, movements and NGOs. We are in this battle for the long haul, and the courage to persist despite adversity is crucial. That is why access to a fountain of hope is indispensable. Hope springs eternal!

The necessity for a more responsible way of relating to man, matter and nature is greater than ever, hence the urgency of a thorough reconsideration of the premises of our culture of greed. This is where religions, other philosophies, and science—each in their own way—share a joint responsibility. That applies equally to all who bear responsibility in politics, economy, business, the media, and culture. They are the ones who shape the process of change.

Many religions preach a resounding call to change our way of life, to leave this misguided path. Science provides indispensable analyses and suggestions for creative new directions. Politicians and managers are faced with the challenge of paving those ways!

4.1.4. Awe

A single word that so aptly captures the sense of rapture we experience when faced with the wonder of that which transcends us, the miracle of life in the boundless Universe. It is a word that evokes a fundamental attitude of profound respect and reverence for the source of all being. For the religious man, it is rooted in his relation to God. The Holy Books bear witness to this living relationship. The Psalms beautifully sing its praise. But the non-believer too can identify with this fundamental principle. In the international Pugwash Movement, I have met many leading scientists who—being agnostic—were filled with awe in their contemplation of the structure and interconnectedness of the micro- and macro cosmos. The advancing scientific understanding of the precision of the laws that enable life on earth adds to the sense of awe for the origin of all being. Indeed, progress in scientific discovery can lead to a greater sense of awe.

This fundamental principle also emerged during the installation of the major European telescope on the Spanish island of La Palma in 1985, in the presence of several European heads of state. A famous astronomer pointed out that this telescope allows us to penetrate even further into the secrets of the Universe, “but that everything we do here is nothing more than reflecting on the great miracle that it exists”. The sense of *Awe* is fuelled by wonder and contemplation of all being; by the primal force of nature, as well as her beauty and elegance.

In our Western culture, the vision and feeling for what transcends us are often lacking. In ‘flatland’, the horizon remains limited; there is no depth dimension. This is where banality and greed thrive, while humanity and integrity languish. For many, this sense of Awe is an unknown experience. The Self, elevated on a pedestal, is mainly governed by the horizontal dimensions of counting and measuring. A hurried and hectic existence leaves little

time for reflection on fundamental questions of life. Moreover—thanks to science—many commodities have become a given. When we come to understand a trifle of the process of life, we tend to believe that we therefore have a handle on it. That the principle of life in itself is a great miracle too often escapes attention. And precisely that insight might help us gain perspective on man's place in the *Ultimate Reality*.

4.2. A Vision of Interdependence

Nobody can ignore these four keywords, because they determine the *human condition*. Each of them in turn has the power to inspire change, but a cultural reorientation at this critical stage requires a clear vision of their interdependence. Only then, the indispensable synergy will be engaged. This vision of intimate interdependence is currently lacking. This is a serious shortcoming, because the very fusion of all four key words can shift the balance in favour of the change that is now underway. To clarify the above, I mention the mind-set of some leading ecological scientists who expect total salvation based on a pragmatic approach. But precisely this blind spot for the deeper spiritual underpinnings of the ecological crisis (the fourth key word) hinders the progress of sustainability.

On the other hand, there is a form of religiosity, which leads to resignation and passivity, rather than the required engagement. Single-minded fixation on the fourth key word—and the consequent attitude of *awe*—can sometimes lead to a failure to take a stance based on the factual *Interconnectedness* and *Vulnerability*.

Each of these four words is an important signpost. But the decisive impetus for cultural change comes from a clear view of the cohesion between these keywords. Together they provide a basis for a joint reflection on the continued existence of humanity in a humane, sustainable society.

4.3. A Common Platform

The much-needed reorientation of our culture would benefit greatly from cooperation beyond perceived differences. The vision of the cohesion between the key words provides a starting point for people of different views of life to come together and set a new, common course.

Would that be possible for science and religion, too?

Certainly, the relationship between them has historically been tense. Especially when each exceeded the boundaries of their own competence by taking a stance on matters which belong in the domain of the other. Essentially there is no need for contradiction, because each has its own domain, with its own methodology and a different objective. Science focuses on analysis, the explanation of phenomena and the study of regularities. Religion and philosophy focus on giving meaning, and identifying a code of life that makes a society liveable. They focus on insights that provide structure and cohesion to life, and promote personal development that combines freedom and responsibility.

In the important book—*The Great Partnership*—renowned British Chief Rabbi Jonathan Sacks provides a powerful argument for cooperation between science and religion. Both are aimed at promoting human well-being. And precisely that is what is now threatened by the irresponsible way of relating to man, matter, and nature. The disturbing perversion

of the essence of religion by fanaticism, extremism, and violence does not need to deter us from collaborating with the vast majority of moderates. A radical minority might distort our perception of the essence of a religion, but can never strip off its original meaning. The famous Swiss theologian Hans Küng rightly distinguishes between true and false religiosity. His criterion is whether the well-being of man is served. In this context, the importance of dialogue within religious denominations is further emphasized. Like the cooperation between religions and other views of life, it deserves more attention from spiritual and political leaders.

The fundamental *Interconnectedness* and *Vulnerability* demand that we take effective action in the short term. It is imperative as it flows from the urge to live, hence the urgency of joint reflection of believers and nonbelievers, science and religion, the cultural sector, economy, and politics. Our collective survival under humane living conditions is at stake.

“Science without religion is lame, but religion without science is blind”

– Einstein

4.4. Love – The Keystone

The preceding discussion avoided the use of the word ‘Love’. This is due to the widespread misconception that a ‘soft power’ is irrelevant in a formal discussion of cultural change. Mistakenly so, because Love is one of the most powerful forces known to man. It can bring the mighty to their knees, and move people to act in favour of a fellow human in need, even at the expense of personal sacrifice.

It is also Love that gives a powerful impetus to our awareness of the four key words. Certainly, reason forces us all to do so, but without love we end up in a cold, harsh society.

Love is universal, we are steeped in it in the womb and it is transmitted to future generations. Love is the keystone in the dome created by the four key words. It is the unifying force, and has left its mark on each of them.

*It is the highest form of connectedness
the most sensitive and fragile
fulfils our deepest yearning
and deepens the sense of awe.*

Love is central to many religions. The inner knowing that nothing—neither might nor powers, in life or death—can separate us from that love, is a constant source of inspiration, strength, independence and courage to persevere.

In our formalized society, a rediscovery of the rejuvenating power of love is essential. Not merely for the individual, but for all of us. It is about more than sustainability: ultimately, it is love that makes society liveable.

4.5. Discussing a Viable Route Together

For meeting the key challenges to humanity, and for a new inspiration of our culture, a realistic assessment of the critical situation, in which we find ourselves, is required. I will focus against the backdrop of the relationship between the four key words on two major questions: peace and security in the nuclear age and a just and sustainable economic model.

Finally: whether we will succeed to achieve the required fundamental cultural reorientation in time depends on whether a tipping point can be reached, where enough people are willing to promote it. Hence the importance of a well-founded view of life, which determines the way of relating to man, matter and nature. The decisive factor may be the answer to the ultimate question posed to each of us: What have I done in my lifetime, with my abilities, in this critical phase of humanity? Was this a 'self-centred' existence, focused on money and blind to the distress of the world? Or did I try—in a spirit of empathy—to promote a more peaceful, humane, and sustainable society?

"The bitter irony is that the spectacular increase in military power has not brought us greater security, but a much greater human insecurity."

To this question, Herman van Rompuy, the former president of the European Council, offers a profound and guiding answer in a Haiku of a few words:

*God, goodness and love
both received and given
give meaning to life*

5. A New Approach in Two Key Areas

We are living in a deeply divided world full of conflicts and diversity of opinions in life. Yet we share one paramount interest: to overcome the major challenges to humanity, ensuring the continuity of life on this planet. The road to a liveable world is full of obstacles. We need a series of steps. Two key areas are of particular importance:

- To secure peace and security, preventing our total annihilation as a result of a major military conflict,
- To stop the progressive degeneration of our natural habitat.

5.1. Peace and Security in a Nuclear Age

If there is one area in urgent need of new thinking and acting, it is in the field of Peace and Security. We are living in an absurd world, wasting huge, scarce resources on weaponry that can never be used without risking the lives of the greater part of humanity. At the same time, there is no real willingness to deal adequately with the major challenges we face. Immense suffering could be prevented if only a small fraction of the enormous military expenditures were made available for these other concerns. The bitter irony is that the spectacular increase in military power has not brought us greater security, but a much greater human insecurity.

We are actually living in the presence of a military arsenal with a destructive potential that could end the human venture at short notice. We are sleeping on a volcano, oblivious to its rumblings. The magnitude of this is widely underestimated.

The current ominous reality and developments are founded on an outdated security concept. In the 21st century governments still act on the basis of the old Roman adagio: if you want peace, prepare for war. This is sheer folly! Largely fuelled by the military-industrial-scientific complex. In the nuclear age we are forced to adapt our security concept to the new reality created by science and technology. We need therefore a fundamental reappraisal in our thinking about peace and security. The new paradigm should lead us to a new security concept: if you want peace, prepare actively for peace.

This implies among others addressing major causes of conflict. Diplomacy and development of poor countries are more effective instruments for promoting peace and security than military force.

5.1.1. From MAD to MAS

In our present security policies the concept of Mutual Assured Destruction plays a predominant role. This concept, however, has become obsolete, not simply because the two original competing superpowers have been replaced by a total of nine nuclear states, but also because of the destabilizing effect of the dynamic pursuit of Research and Development, including the development of new weapon systems.

Human and technological failure of the present hugely pre-programmed destructive capacity cannot be excluded. Among experts there is a growing concern in this respect. The immeasurable potential consequences of such failure are an additional argument against the credibility of nuclear deterrence as a security concept.

At present mutual fear and distrust largely drive military expenditures worldwide. We have to realize, however, that true security cannot be obtained at the expense of the other. This means: 'I am secure, if you do not feel threatened by me'.

International peace and security first and foremost requires that the major powers actively work together to overcome this so-called Security Dilemma. It refers to the fact that measures taken by one state to increase its own security prompt other states to reciprocate in kind, fuelling a vicious cycle of armaments that results in the overall deterioration of the security of all. But War is not destiny. There is in fact a way out of this Security Dilemma. It does necessitate a concerted effort on behalf of political leaders, especially of the major powers, to reduce international tensions. International peace and security, after all, do not come about in a vacuum. This can only be brought about by awareness on the part of these political leaders of the severe risks posed by a global armed conflagration to their own societies—before a 21st century version of the Cuban Missile Crisis spirals out of control. It fundamentally depends on their acknowledgement that cooperation instead of confrontation is the only way out of this dilemma. Awareness and acknowledgement should be followed by a series of confidence building measures which can then provide the foundation for a new architecture of arms control and arms reduction regimes.

This leads to a radical departure from the prevailing concept of Mutual Assured Destruction (MAD). We need to move towards a concept of Mutual Assured Security (MAS), a Copernican turn in our thinking about security.

5.1.2. The new paradigm brings us to the following recommendations

- To convene a UN High level panel of leading personalities and experts on the key challenges to peace and security in the nuclear age. Guidance can be given by similar initiatives in the past, a.o. UN high-level panel on key challenges (2004), Report Brundtland Commission and the Palme Report on common security.
- Stop the resumption of the arms race, including the weaponization of space and preparations for cyber warfare.
- Opening negotiations on the reduction of weapons systems.
- Dismantling the Doomsday Machine step by step under effective control mechanisms. To begin with the strategic weapons on hair trigger alert, the concept of first use and pre-emptive strike.
- Set in motion a process of drastic reduction of the budget on military expenditures.
- Re-allocate vast resources on Research and Development of new weapons systems to activities serving human development.
- At present the outlook for international cooperation in the field of peace and security looks grim. Of crucial importance therefore is to increase pressure on those holding responsible political positions. This demands a worldwide action aimed at increased public awareness about the imminent threat to human existence.

5.2. A Global Economic Order, which is Just and Sustainable

Our world is in the firm grip of economics. The dominance of economics is one of the striking features in modern society. Practically no sector is immune to its onslaught. Basic humanitarian values, like respect for life, justice, solidarity, moderation and decency are under great pressure in a society in the grip of money, profits, competition and extreme efficiency. This imbalance between the spiritual and material aspects seriously impairs the quality of life, making it more and more difficult to achieve real fulfilment. The present economic model is neither just nor sustainable at a global level. The social situation in most modern states gives rise to serious concern because of the widening gap between rich and poor, not only within nations, but also between countries. As the famous Oxford scholar professor Kate Raworth has put it in her news-breaking economic paper ‘Doughnut Economics’: “Humanities’ pressure on Earth’s life-giving system is in dangerous overshoot... The global economy stands face to face with the carrying capacity of the Earth.”

5.2.1. The Driving Forces Behind the Economic Mechanism

The orchestrated movement behind the dance around the golden calf looks solid; its tempo will not be easily changed because it is guided by three closely interrelated myths:

- Unlimited material needs of human beings, leading to worldwide consumerism with its large-scale harmful consequences. Big efforts are made to ensure an ever-rising consumer demand. People are constantly indoctrinated through television and other media with vain promises of a better life, whenever a particular product is bought.

- Necessity of permanent growth. The growth ideology is linked to the so-called ‘endless needs’.
- Idolatry of a free market without any restrictions.

These stubborn myths are the poisonous fruits of a misconception about economics, which ignore the fact that:

- Man is not a voracious animal with insatiable needs. As a responsible human being he is in a position to moderate his longing for ever more goods and services.
- Endless growth is impossible given the limited carrying capacity of the Earth.

Permanent material growth is considered indispensable for employment and prosperity. They also assume that only growth could provide the financial means for ecological and social policies.

Indeed, economic growth for the Low-Income and Middle-Income countries is an essential condition for the improvement of the living conditions of millions of people. But the same cannot be said for the rich countries. Here a different type of non-material growth should be envisaged. It is about time that the prosperous countries freed themselves from the obsession that one has to go all-out for getting more and more in order to achieve fulfilment. Real fulfilment in life does not depend on material factors but on our inner disposition, our own spirituality!

- The idolatry of an absolute free market without any regulations. This has put us back into the law of the jungle: the winner takes all, symbolized by multinationals! There is no such thing as a ‘mechanical equilibrium’; the economy is dynamic and requires stewardship.

The new paradigm should free us from the dominance of economics. Quality in life is more important than quantity.

Between the three myths analysed above, there exists a common link: *hubris*. This denial of Transcendence, this so-called ‘liberation of man’ has led to a narrowing down of human possibilities, instead of a better development of his faculties. The ‘death of God’ left an empty space that was soon occupied by newly self-created gods such as: unlimited material needs, permanent growth and idolatry of the market.

The strong belief, founded in the conditions of the nineteenth century, that economic growth is a necessity to end human deprivation, has become self-destructive, particularly in the High-Income countries.

Clearing the way toward a just and sustainable economic order demands a new look at economics. This new perspective can be opened, when we see economics as an instrument to serve the common good, instead of a goal in itself. This will be, however, hard to achieve without a spiritual renewal. Decisive, therefore, will be the rediscovery of our responsibility towards the source of our existence and fellow man, and a full consciousness of the planetary

*“The economy
is only part of
a larger reality
and not an
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absolute laws.”*

boundaries. From here will sprout a new relation to man, material goods and nature, thus to economics!

“The current Corona crisis offers a unique opportunity for the emergence of a new, sustainability-oriented economy. This requires innovative policy, not a return to the past.”

5.2.2. Economics – A Goal in Itself or an Instrument to Serve Mankind?

The new paradigm should provide valuable guidance for a new approach to economics. It should be clear that the economy is only part of a larger reality and not an autonomous entity ruled by absolute laws. It requires wise stewardship. There can be no doubt about the impressive contribution of economics to the phenomenal improvement in living conditions, during past centuries. However, man has been overshooting the mark: our economic models and our consumption pattern stand face to face with the carrying capacity of Earth. Economics is degraded to a set of rules and concepts on ‘gains’, ‘rate of return’ and ‘maximizing profits’, instead of being a means serving the wellbeing of humanity.

The question about the purpose of economics is therefore of great relevance. There is a real need to develop a clear view of the *essence* of economics. This could be defined as follows:

The purpose of economics is the responsible use of the limited means at man's disposal in order to promote the common and individual well being of present and future generations. Production, distribution and consumption of goods must be oriented towards a just and sustainable society in which the planetary boundaries are strictly respected.

Indeed, the essence of economics is to *serve man and society* in such a way that all people can lead a decent existence, *within the limits imposed by the natural environment*.

The above given definition holds consequences, which will not be easily accepted in a post-enlightenment society, in the grip of materialism and hedonism; and certainly not in a spiritual climate in which basic values like solidarity, compassion and respect for life are undermined. Economic theory and practice is nowadays built on a very narrow basis, leaving little room for the basic teachings of religion. It is precisely this loss of vision on man's place in Ultimate Reality which is at the root of the unjust and unsustainable economic model: man's (political and social) addiction to wealth accumulation and never-ending consumption.

The forces resisting any change in the present situation are formidable. This makes it difficult to realize the urgently needed transformation in production, distribution and consumption patterns. Commercial interests, as well as a large number of citizens, will resist any attempt to initiate a more sober lifestyle. Material sacrifices are not popular in a secularized society, which gives priority to eager acquisition and immediate satisfaction of desires. These reservations, however, should not withhold us from advocating some fundamental changes in human behaviour and in the present economic order.

- Rebalancing the role of the market, the State and Society, with emphasis on the State and Society, aimed at investing in the sources of wealth: natural, human, social, cultural, and clean energy, with the help of transformational public investments;
- Design circular, regenerative and distributive economies by redistributing wealth, i.e. land, enterprise, technology, knowledge etc., with the participation of all humans;
- Get away from the dominant economic concepts like ‘gain’, ‘rate of return’ and ‘efficiency of the market’: use money as a means of exchange for regenerative investments by fully respecting the planetary boundaries, instead of consumption, thereby replacing ‘gain’ by ‘maintaining value’;
- Human behaviour: get away from the self-interested and dominant-over-nature man to the social, interdependent and dependent-upon-the-living-world man.

A new paradigm should lead to:

- Re-framing our inner motivation, giving more emphasis to serving the common good and sharing, instead of amassing private wealth.
- A more sober and responsible lifestyle, putting an end to consumerism. Quality of life is more important than quantity in goods. This will reduce the ecological footprint of the prosperous states.
- A more sustainable world order, safeguarding the natural habitat.
- Full transparency and strong regulations of financial and capital markets.
- A decrease in the gap between rich and poor: eliminating exclusion and poverty. Global regulation (moderation) of top salaries and related payments, equitable tax systems, eliminating and preventing tax evasion and tax havens.
- Globalisation fully respecting the 2015 UN Sustainable Development Goals and the whole of the planetary boundaries.
- A fully democratic and transparent management of international institutions such as the World Bank and the International Monetary Fund, which should abandon their ‘in defense of growth paradigm’.

Together we can overcome the present obstacles and take the necessary steps for a new world order. The current Corona crisis offers a unique opportunity for the emergence of a new, sustainability-oriented economy. This requires innovative policy, not a return to the past.

6. Why do we have hope?

The present situation looks grim, but we should never lose hope. The Corona crisis is mobilising creative energy and a great upsurge of true human solidarity. Signs of hope are:

- Growing awareness that we are living in a spent culture in urgent need of new inspiration.
- Numerous initiatives pointing towards spiritual renewal and responsible management aiming at the common good.

- The impressive commitment of many aimed at a peaceful, just and sustainable world.
- The irresistible urge to live life in its fullness and to pass this on to future generations:
Love of Life!

Acknowledgement

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The Space Between Us: An Approach to Collaborative Innovation

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Abstract

We live in extraordinary times. Every generation has thought so, but in fact, ours is the first to be confronted with existential crises of such a magnitude that we might consider humanity to be on the endangered species list. In our past history on this planet we have always succeeded in dealing with critical challenges through innovation produced by flashes of insight. And now more than ever exactly that is what is needed. Through experience and observation we know that collaboration does inspire and support innovation, but we do not really know exactly why or how. We do have familiar aphorisms that point to the phenomenon, such as “two heads are better than one;” but while we accept this as true, it does not account for the phenomenon itself. In this article I will propose an approach towards explaining it, as well as several key questions underlying that approach.

1. The Story Telling Animal

Human being is often referred as the story telling animal. Not only did we once tell stories to the other members of the clan gathered around the fire, we still tell stories about the Universe, about the God or Goddess we believe created it and also about ourselves. And sometimes we get so lost in our own stories that we no longer know they are stories. We then relate it to each other and to ourselves as characters in that narrative and to the narrative itself as if it is described as an independently existing fixed reality. When that happens we become captives of the story and feel more like the victims of a world apparently out of control than the inventors of that world. In fact, some observers have even expressed the belief that we are already past the point of no return. It is not just the decline of the West that Oswald Spengler prophesied, but conceivably the potential end of life as we know it is for all of us.

Innovation requires the ability to question the prevailing reality, which in turn requires that we are able to recognize ourselves as the source of the narrative underlying it, or at the very least as the source of the agreement that keeps it in place. In other words, innovation implies, first of all, that we are able to distinguish reality as a story and ourselves as the storytellers. This is just as true whether one lives in a scientific materialistic society or in an indigenous animistic one. If innovation requires the ability to question the prevailing reality, then the competence to engage in that kind of questioning requires the ability to collaborate. Yes, it is true that there always have been a few geniuses who seemed able to manage it alone in the solitude of their library or laboratory, but the questioning now needed is far too large and complex for a purely individual effort. Moreover, even these apparent lone geniuses did not actually act alone. They were in contact with the work of contemporaries through

reading their publications or through correspondence as well as sometimes even through direct conversations. None of them operated in a total vacuum.

In the last few decades there has been quite a bit of inquiry into the nature of insight. For example, in a study done by brain researchers Edward Bowden, Mark Jung-Beeman and their team, the results of which were published in July 2005 in "Trends in Cognitive Sciences", the classic "aha" moment of insight was discovered to be associated with a surge of activity in the right hemisphere of the brain. However, closer examination showed that this surge was actually caused by a reduction in the left hemisphere activity, which normally would inhibit right hemisphere functioning. Why is this important or even relevant? Because it is the left hemisphere that tells us who we are, which is to say, that continually reminds us of our identity and of its place in the story. It is the right hemisphere, which operates more intuitively and holistically, that produces the moment of insight by being freed up to make connections that are otherwise not obvious. Thus, not only is the facticity of the prevailing reality anchored in the activity of the brain, but so also is the ability to question that reality. This theme is developed further by Iain McGilchrist in his brilliant book, "The Master and His Emissary: The Divided Brain and the Making of the Western World." McGilchrist explores how the two hemispheres interact with each other to shape our experience of reality. The central point of the book is that there has been a palace coup, so to speak; the left hemisphere, which ought to be operating in the service of the right hemisphere, has instead taken over. The emissary has become the master. As a result, to a large degree the left brain's logic and rationality inhibit the right brain's natural and inherent capacity for connection and insight. In other words, the prevailing reality is maintained in existence because the left brain prevents the right brain from effectively questioning it. Here is how McGilchrist puts it: "Insight is...a perception of the previous incongruity of one's assumptions, which links it to the right hemisphere's capacity for detecting an anomaly." And because of this brain activity that suppresses insight, we humans often are blinded to our role in maintaining our perception of reality and are simultaneously in denial of our blindness. This would certainly explain the fact that we can see and understand our perilous situation as a species but seem largely unable to take effective action with regard to it.

It has often been noted by cognitive development experts that very young children do not play so much with each other as that they play next to each other. That is to say, they are not yet capable of collaboration. It takes a significant leap in cognitive development for that ability to be available and clearly many humans, regardless of their age, are not very good at it. That is, adults mostly do not work together so much as they work next to each other. When two or more people are genuinely collaborating there is a diminishment in their attachment to their own identity, which is to say, to the story they are telling themselves about themselves and about their world. In fact, it is not unusual for people to report that during particularly creative occasions they "forgot themselves" or "lost track of time." In other words, there appears to be a direct correlation between successful collaborative innovation and a period of looser attachment to one's identity. There is a shift from being focused on my point-of-view as it interacts with your point-of-view to being attentive instead to the space between us. While I still may have a point-of-view I am no longer so fixated on it and am more open to new and unpredictable input from the surrounding environment. This will, of course, include another man's point-of-view but also may go beyond it. Suddenly, I can access not only

my collaborator's thinking, but can also see connections between things I may have learned or thought about in the past and what people sometimes refer to as the "Zeitgeist" or simply "ideas in the air." Freed from a tight connection to my identity, the space between us rather than my own mind becomes the workbench where collaboration actually occurs.

"The 18th century, and particularly the second half of it, was the highpoint in the development of individuality."

2. The Age of Enlightenment

Let me take this a step further by first taking a step back. At the present time in our human history, particularly in the West, we have come to know ourselves primarily as individuals. In fact, we pride ourselves on this as a sign of our progress as a species. It was not always so. In earlier periods of history people knew themselves primarily by virtue of their place in a social hierarchy and as members of a tribe or extended family or a social class or a craft guild or as belonging to an estate ruled by a nobleman. Individuality existed, of course, but as a secondary or ancillary attribute.

Most historians locate the start (or at least the flowering) of this development in the enlightenment period of the 18th Century, although there are certainly traces of a burgeoning individuality as early as the late Middle Ages. In his well-known letter describing his ascent of Mount Ventoux, which was written about 1350, the Italian poet Francesco Petrarca (1304-1374) described his ecstatic experience of reaching the summit, gazing at the landscape spread out before him and discovering three-dimensional space. This may sound bizarre to anyone living in the 21st Century for whom it might seem that three-dimensionality has always been a feature of reality. But consider that medieval paintings do not portray three-dimensionality; they depict a flat, two-dimensional world. Petrarch's account presents the discovery of perspective, and inherent in perspective is the existence of two points in space: a "vanishing point" on the horizon and a point-of-view located in the observer. Later René Descartes (1596-1650) declared the observer's point of view to be separate from his body and gave it a name—the "res cogitans" (the thinking thing). Still later, John Locke (1632-1704) made self-awareness (or thinking about oneself) the defining feature of human identity and thus reified even further the self as an object of thought located at a point somewhere in mental space. This not only made human identity more objectively real, but in doing so, it also enhanced the possibility of greater human agency through the prospect of reasoned thinking to control both the inner and the outer worlds. Immanuel Kant's (1724-1804) "categorical imperative" then accorded this objectified self a dignity as well as autonomy by making the following maxim the basis of all moral action: "So act as to treat humanity, whether in your own person or in another, always as an end, and never as only a means." And building on all of this, the framers of the American Republic, who had read and were very much influenced by the Enlightenment philosophers, granted each individual person "certain unalienable rights," which were enshrined in 1776 in the Declaration of Independence. "Life, liberty and the pursuit of happiness" became not only self-evident truths, but also human birthrights. In 1789, inspired in part by the American example, the French made their own revolution and produced the Declaration of the Rights of Man and of the Citizen. Individuality now not only had an objective existence in reality, its existence and even its right to flourish were protected by social contract.

I think it is fair to say that the 18th Century, and particularly the second half of it, was the highpoint in the development of individuality. It was a time of remarkable ferment and creativity and blossomed into a celebration not only of individuality but also of the individual's power to reason. However, I believe it is also fair to say that the bright light of reason, which shone so brilliantly during this period, began to lose its luster over the following centuries. Today at the start of the 21st century the shadow side of the Enlightenment period has shown itself. The glorious autonomy of individuality has devolved into a depressing isolation and estrangement. The light of reason, which the Enlightenment philosophers were so sure would lead to universal peace, freedom and happiness has been eclipsed by the dark of reason, which has led, among other misfortunes, to the development of nuclear weapons, the prospect of environmental collapse and, perhaps most debilitating of all, the sense of anomie at being cut off from any kind of meaningful relationship to our world. In our zeal for freedom and autonomy we have lost our connectedness not only to each other but also to nature and to life itself. Splendid individuality has become "The Loneliness of the Long Distance Runner" and the buried fear and rage of reclusive teenagers depicted in "Bowling for Columbine". In fact, in a book published last year entitled "Loneliness—the Unrecognized Sickness," Manfred Spitzer, a leading psychiatrist and neuroscientist, claims that loneliness is actually now the leading cause of death in the West, though this is hidden because loneliness kills indirectly by making people much more susceptible to cancer, heart attack, stroke, depression and even dementia.

"In our zeal for freedom and autonomy we have lost our connectedness not only to each other but also to nature and to life itself."

However, to be clear, I am not suggesting that we throw out the remarkable achievements of the Enlightenment. Having a looser relationship to one's own identity should in no way be understood as a denial of individuality. On the contrary, it should be seen as an enhancement and a further development of the original intentions of those 18th century philosophers. Their dream was of a free thinking human being capable of being guided by reason towards ethical action. To the extent that one can have a point-of-view rather than be trapped in it, one is autonomous and free even from one's own inherited and in part socially constructed opinions.

On the other hand, to be caught up in one's point-of-view is, of course, the essence of an identity; it is to be trapped in one's own history and condemned to live out one's life as a character in a story limited by the plotline of his or her autobiography. And what is true at the level of individual is also true at every larger level of human social structure: relationship, family, organization, community and society.

The fact is we need collaborative innovation at each of these levels if we are to meet the current challenges of being human. As a fall out of these challenges, so far mostly in the West but increasingly everywhere, people at every level have become so polarized that genuine and productive dialogue has become increasingly strained if not impossible.

Certainly, we remain quite good at innovation with regard to our technology and our business models, but hardly at all with regard to how we conceive of ourselves. In fact, we seem to have lost interest in the oldest and most productive questions of our species: "Who are we?" and "Why are we here?"

3. Beyond Identity

Jean Gebser (1905-1973), one of the greatest almost unknown geniuses of the 20th century, saw in the scientific, philosophical and artistic breakthroughs of his time the birth of a new consciousness, which he described as “a-rational” and “a-perspectival.” By this he meant a consciousness unattached to any point-of-view. As examples: while the consciousness of the Enlightenment period was based on a clear Newtonian/Cartesian separation between the inner and outer world-spaces, the findings of Quantum Physics call that separation into question; Picasso drew the human figure in “Les Demoiselles D’Avignon” from so many points-of-view that the concept of point-of-view itself is no longer applicable; Rainer Maria Rilke’s poetry transcended the subject/object basis of language to create a luminous world appearing unattached to any point-of-view; and Akira Kurosawa made the film, “Roshomon,” staging the same event from so many different points-of-view that the notion of point-of-view itself becomes the main character of the story. Moreover, modern neuroscience and Post-Modern philosophy have so meticulously deconstructed

the myth of an objective individuality that all that remains of it is a superstition on a par with the belief our ancestors once had in the Divine Right of Kings. In short, believing in the objective existence of a “me” with a point-of-view just because there are thoughts, feelings and body sensations is like believing in a thunder god just because there are loud noises during a storm. Perhaps without realizing or understanding the full consequences of it, we are now in the midst of outgrowing our fixation with our own identity and with it the familiar ways of connecting to one another and to our world. This is both good news and bad. It is bad because it leaves us feeling unmoored in an unrecognizable world beyond the conventional understanding of identity. It is, however, also good news in that only by entering such a profound field of not knowing can we find the necessary power of innovation, which by definition lies beyond what we thought we knew.

What actually happens in a moment of successful collaborative innovation, which I have alluded to throughout this article, is a letting go of one’s attachment to one’s sense of self as an object with a point-of-view long enough to interact with one or more people who are doing the same. This allows for a leap from defensive debate to cooperative exploration, which often can lead to insight. It seems to me that we are now entering a time in our history when it is once again essential to ask the newest variations of the oldest questions: If I am not an identity, then what am I? If I am not the main character of a story, then who am I? If I am not located in a point-of-view, then where am I?

“It is once again essential to ask the newest variations of the oldest questions: If I am not an identity, then what am I? If I am not the main character of a story, then who am I? If I am not located in a point-of-view, then where am I?”

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The Art and Science of Collaborative Innovation: A General Theory*

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Abstract

This article shares our research, the aim of which is to cure the critical lack of Collaborative Innovation in business, government, politics, military, and personal relationships. The article proposes that Collaborative Innovation comes from 'Continuous Curiosity' with the effect of rotating leadership, and recombination processes in symbiotic (flowing) relationships. (1) Our intent is to certify candidates in a coherent structure for identifying fundamental elements of Collaborative Innovation, turning it into practices based on one simple theory, and producing breakthroughs; ultimately, to have many people practicing on their deepest concerns and the most important problems in the world. Our mission is to encourage "deep dives" into what lies at the bottom of the iceberg of Collaborative Innovation in human affairs, and to reveal what really matters in transforming that base metal into gold.

1. Common Challenges in Achieving Collaborative Innovation have been:

- Willingness to change structure and authority relationships, at least temporarily, to enable Collaborative Innovation.
- Creating shared commitment to a singular collective Strategic Intent.
- Fear of not getting agreement from others.
- The intent to integrate intention and flow.
- Inability to see two/multiple realities at the same time and serially, i.e., the reality of the quality of relationships and the reality of measurement and physical performance.
- Willingness to speak from the heart.
- Ability to pay attention to one's confusion before one's certainty.
- Acceptance that Relationship (how people are being with each other) is the foundation of accomplishment in Collaborative Innovation.
- The ability to Connect and Move On, respecting what you get, and not being stuck with it.
- The ability to Integrate madness and accuracy in real time.
- The character of leaders often shapes what's possible or forbidden in Collaborative Innovation, i.e. courage, competence, forgiveness, persistence, caring, patience,

* This paper is the outcome of conversations with fellow members of The Institute for Collaborative Freedom.

capacity for silence, ability to accept or embrace paradox and contradiction, imagination, discipline, generous listening, contemplation, concrete action, and committed speaking. These are observable in aspiration, committed action, behavior, practice, allowable feedback, and the experience of others.

“Breaking Free turns energy into form.”

2. PREMISE: “Systems with the most available energy will prevail. Good ideas, products, organization and the force of will are not enough.”*

– Victor Sanchez

As Sanchez points out, the pull of the existing culture’s gravity always wins without the Energetic Awareness that enables Escape Velocity and the ability to see, address, and overcome cultural and personality barriers. This requires personally paying attention and addressing it directly when we see that energy is low or missing. It means directing energy where we want it to increase, (i.e., it is always our job to enliven a boring meeting and move things forward). This energy expansion is always a momentary event allowing us to Break Free of the gravity of the current circumstances. In the next moment another set of gravitational forces will need to be contended with—gravity never goes away.

In physics, an energy field is a Force Field, a vector field, that describes a non-contact force acting on a particle at various positions in space. Our research, and practical application in business, government and human relationships over the past 50 years suggest that similarly, there are a number of such ‘fields’ or ‘contexts’ within which human energy expands within individuals and groups.

Strategy and action soundly rooted in these ‘energy fields’ have consistently produced ‘breakthroughs’ in performance, relationships, and culture.

3. The Smith Energy Fields

Human Mutuality is the way people are connected, to themselves, to others, and to the physical and natural world. It is the way we are *being* with each other, and the structure or nature of our connections.

The Overview Effect: Upon breaking free of Earth’s gravity and going to space, some astronauts experienced a surprising change in their perspective of life on Earth. Author Frank White[†] named this phenomenon “The Overview Effect;” a deep, personal, profound experience that radically alters one’s world view and the nature of reality. Astronauts who experienced this were witness to a message about how to be, with the planet and with each other. This message about being “in the same boat” together points to an opportunity for many of us to break free of “the way it is” and create moments of transcendence that go beyond identity, individually and collectively. It is about shifting our point of view to see that what needs attention in our companies, communities, and relationships is always greater than the sum of the parts.

* See <http://eruditio.worldacademy.org/volume-2/issue-1/article/breaking-free-bringing-overview-effect-life-and-work>

Contemplative Action comes from codes, education, practices and leadership that promote special virtues of character: compassion, honesty, forbearance, humility, strength, perseverance, courage, courtesy, extreme care in details, self-reliance.

Breaking Free turns energy into form. It is physical action that produces a demonstrable result. Breaking Free requires energy to loosen the grip of gravity (whether going to space or gaining freedom from past beliefs and culture, past relationships, etc.). A portal/ gateway to ‘choice’ where none existed before, it is entirely an energetic phenomenon that requires the power and intention to achieve Escape Velocity and at least temporarily reach Zero Gravity—where free choice exists.

Islands of Sanity are an experience of coherence, safety, boundaries conversational or spiritual. They can be found/created in a sanctuary, a relationship, a place, a project, a mission...

Harmony through Conflict requires the intent to come to, or return to, alignment/ shared commitment. It calls for a background intent to create an experience of ‘us’—being in something together. This is impossible to define, as opposites must be included. It requires full self-expression and a willingness to fight/engage to get another’s attention, and the capacity/skill to not automatically react to differences. It is not risk-averse, but includes a willingness to forgive and forbear. It is not soft, but built on an insistence for honesty and truth about one’s actual experience. It is a search for metaphor that respects and embraces everyone involved, heals, and avoids right-wrong language.

The Merlin Factor indicates that the principal impediment to changing an organization’s strategic direction is its existing culture, (that is, people’s current beliefs about the limits of what is possible). Changing people’s beliefs about the future can produce extraordinary improvements in quality management, technical innovation, customer service and profitability. This culture-changing process of leadership through a radical strategic vision follows a pattern the author calls, ‘The Merlin Factor’, (based on the legendary magician who ‘lived backward in time’).

Committed Speaking is to honor your word as yourself.

Evidence Consists of different Types of Speaking:

- **Conversations from the Future**

Examples: Declaration—speaking that is not true or false, but valid or invalid. The authority comes simply from the fact that “you said so.”

I declare. . .

I say that. . . This will be. . .

- **Conversations from the Present**

The facts are,

I think that,

My opinion is,

My analysis is,

I agree/don’t agree

Examples: Conversations for Action—speaking which evokes commitment to act within a certain time with specific conditions of satisfaction.

I request
I promise
Will you?
I decline
I counteroffer
I commit to commit later

- **Conversations from the Past**

Examples: Descriptions, Explanations and Assessments—they offer to provide evidence or argument.

4. Theory: Definition of Terms

ENERGY is the strength and vitality required for sustained physical or mental activity. Synonyms: vitality, vigor, life, liveliness, animation, vivacity, spiritedness, verve, enthusiasm, zest, vibrancy, spark, sparkle, effervescence, ebullience, exuberance, buoyancy, sprightliness.

MUTUALITY: The density of the Space between people varies from completely clear/transparent/open/empty to completely dense/closed/blocked/full. Mutuality is a continuous area that is relatively free, available, or unoccupied with the quality or state of being mutual. Attitudes, values, principles, beliefs, thoughts, fears, emotions, ideas, preconceptions, orientations, cultures and identities can occupy the space. Mutuality reduces the density of the space between people. Mutuality makes Space between people less dense by introducing: Breathing alone or together, Present Awareness, Overview Consciousness, Ability to shift mindset from victim to cause in the matter, Intense presence of nature, questions that create new possibilities, Embracing Paradox, Promising what you cannot predict, Meditation, Absence of Force, Absence of Explanation, Absence of Transaction, Generous Listening,, Speaking from the Heart, Committed Speaking, Eliminating Noise, Contemplation, The intent to “Inter-Be,” Beginner’s Mind, Zero Gravity, Not being a Noodle in Someone Else’s Soup.

CURIOSITY is the urge to know more about something. The state of being curious includes inquisitive interest in others’ concerns, wondering, ready to poke around and figure something out. In mathematics, a square is the result of multiplying a number by itself, e.g. two times two. In Curiosity among individuals or groups, squaring is the acceleration of the experience of mutual wonder such that “I” becomes “Us.” Accelerating Curiosity is an energetic phenomenon. Its nature is neither linear nor conceptual.

5. A General Theory of Collaborative Innovation

“There is nothing as practical as a good theory”. – Albert Einstein

ENERGY (E) = equals MUTUALITY (M) x CURIOSITY SQUARED (C²)

“In the presence of wonder, awe, inspiration, love, vibrational energy, mystery, and inexplicable wholeness, anything becomes possible.” – Charlie Smith

Making A Dent in The World: Breaking New Ground – Steve Jobs’ Advice

- **Do Something Different to Anything that has been done.** Collaborative Innovation is everything. A business, government, economic and relational system that is successful, sustainable and consistent with how human beings really are.
- **Ally with Kindred Spirits.** Others with shared values that often see things differently from others.
- **A few Key Products:** Put the ‘A-Team’ on each product. What are you saying ‘no’ to? “It’s so simple, a 2-year-old can use it.” Our audience does not care about our product. They care about themselves, their hopes, their ambitions. If you help them reach their dreams, we win them over. Be different because instead of just pragmatic benefits, the experience would talk and what are you doing to enrich the lives of your audience.
- **Master the Message.** Be a great storyteller. Instead of simply delivering a presentation like most people do, inform, educate, inspire and entertain, all in a presentation.

6. Applications and Experimental Programs

- **Campbell Soup of Canada** was sure to lose much of its Canadian manufacturing to the United States without radical cuts in cost. Leaders and workers feared one another. The culture was uncooperative. All but two manufacturing plants were saved and remained in Canada.
- **Cunard Ellerman** shipping lines was a merger of two shipping companies, one large, one small, and both desiring to expand business, cut costs and create a singular harmonious and communicative culture.

It became a harmonious single culture with financial savings, and having had a graceful transition.

- **IBM.** In a service division, poor performance and cooperation led to a crisis need to reduce 500 products produced in five different countries to one computer screen, the need to simplify processes, save as many jobs as possible, maintain identity and self image in each country, not become servants of the United States, and resolve serious conflict within the leadership group in the United States and between countries
- **The Rouse Company** operated 70 shopping centers around the US and Canada. Many shopping center managements were dysfunctional. Communication was unreliable and dishonest between centers and headquarters. There was an industry-wide recession not seen in many years. The executive vice president said that he would no longer work in a place where people did not tell the truth, were not open and honest in their communication, and would not commit to breakthrough goals with each other and independently. He promised to take this on with commitment and vigor or leave. His division had the best few years in history and innovated many new ways of working.
- **The US Air Force** was mandated with other companies and agencies to design and fly an airplane from a runway to fly 17,500 miles an hour; an impossible goal never before

achieved. Ten thousand people across the U.S. were involved. Breakthrough thinking and uncharacteristic actions were required. Significant progress was achieved before Congress removed funding and shifted the money to the military and private companies.

- **The president of a large energy company** wanted to become CEO and the existing CEO did not want to leave for five years. The challenge was to make this happen politically and with grace. If it did not happen, he intended to leave the company in eight months. After creative and effective strategy, the existing CEO committed himself to leave in one year and did so.
- **An Admiral in the Ministry of Defence in the British Navy** was in charge of a large agency responsible for all military pay and insurance programs. He had a dysfunctional and misaligned senior team and knew that shared intention and increased harmony were absolutely necessary in the future they wanted. There was no alternative and he was not confident that he knew what to do that would really work. With Collaborative Innovation, they achieved previously impossible alignment and brought coherence to the system and themselves.
- **The head of a Canadian division of a global pharmaceutical company** had been judged as middle grade performer in another country and transferred to Canada to prove himself. He was determined to take radical action and do whatever was necessary to have Canada become a leader in the entire corporate world. In the next year, they came to be number three in the global companies in most of the world and were recognized for the quality of their culture and employee engagement scores.
- **The leader of a Proctor and Gamble manufacturing plant in the north of England** wanted a dramatic increase in performance and a collaborative culture. In a short period of time, they were tripling their machine efficiencies and employees were so excited about now appreciating the new way of working, they independently and unilaterally went to other manufacturing plants in the United Kingdom to help other employees take advantage of what had been learned.
- **A global consulting company in England** in their government affairs division went through an intensive individual coaching of the leader who aspired to bring his personal values for performance and human culture into the company and really meant it. Financial growth, creativity, and people seeking work there increased dramatically over a number of years.
- **The National Industrial Distribution Association** in the United States was shrinking in size every year. Gross margins kept going down. Many were going out of business. Small companies were absorbed into large companies at a rapid rate. A lot of people lost their jobs. It was bleak. When I first met with the Association leaders, they felt helpless as a group, and as individuals. Almost as if grasping at straws, they began a Strategic Visioning Program, in sets of meetings, they created a number of moonshots, breakthrough projects, new ways of working with one another, and convincing media. It soon became clear that some companies were doing well while most others, except the very large ones, were doing poorly. It also got clear that what made the difference was their speed, imagination, boldness, and willingness to collaborate with themselves

and their clients. At the end of a year many were moving forward innovatively and collaboratively at the same time as people and as companies.

- **The National Peace Academy Campaign** was the vision of a man named Bryant Wedge. The dream was to create a national academy at the level of West Point, Annapolis, and the U.S. Air Force which was devoted to research, practice and action in the areas of nonviolent dispute resolution in the United States and around the world. The idea was to create a national ethic of waging peace with equal conviction to the capacity for violence and war. There were critical challenges in managing volunteers, relating to and negotiating with members of Congress, lack of money, and continuing resistance from the Defence Departments, Schools of Foreign Service, Arms Manufacturers, certain media, and many members of Congress. On one hand, it seemed like Don Quixote tilting at windmills and on the other hand a noble, while and committed purpose with leaders who really meant it.

The original mission was to have the U.S. Congress create a Commission to study the viability and merits of such an effort. The National Peace Academy Campaign was a low-budget, largely volunteer, effort to enable this. My role was to help build teams, coach and counsel leaders in breakthrough thinking and creative ways to engage in constructive conflict resolution. Our deeper role was to act as a “conscience” for all of them to bring together the ethics of their values and the powerful politics and opposition that would naturally come from the Defense Department schools of foreign service, media, and certain members of the Congress.

In fact, the commission bill was passed with a \$500,000 grant and after a year of negotiation, forward movement and sacrifice of some of the original principles Congress passed a bill to create the National Institute of Peace which is now a beautiful building with extensive world conflict resolution research and facilitation located on the Washington Mall. We did not accomplish the vision and it was a strong step in the right direction.

All of this personal and business energy expansion led to countless life altering and leadership development experiences for individuals. These activities also lead to positive transformations in marriages, contributions to communities, churches, and individual’s sense of well-being and purpose in their lives. Another consistent result was in break through leadership training for individuals of great benefit to the companies and careers.

7. Innovative Collaboration

Four Quartets – 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.*

*A condition of complete simplicity
Costing not less than everything*

*And all shall be well and
All manner of thing shall be well
When the tongues of flames are in-folded
Into the crowned knot of fire
And the fire and the rose are one*

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