



**Cadmus**

*Promoting Leadership in Thought that Leads to Action*

Volume 3, Issue 2 - May 2017

Available online at <http://cadmusjournal.org/>



## Globalisation Trapped

**João Caraça**

Director, Calouste Gulbenkian Foundation, France;  
Fellow, World Academy of Art & Science

### Abstract

*The promise of making society progress through the direct applications of science was finally fulfilled in the mid-20<sup>th</sup> century. Science progressed immensely, propelled by the effects of the two world wars. The first science-based technologies saw the daylight during the 1940s and their transformative power was such that neither the military, nor subsequently the markets, allowed science to return intact to its curiosity-driven nest. Technoscience was born then and (being progressively pulled away from curiosity-driven science) was able to grow enormously, erecting a formidable structure of networks of institutions that impacted decisively on the economy. It is a paradox, or maybe a trap, that the fulfillment of science's solemn promise of 'transforming nature' means seeing ourselves and our Western societies entangled in crises after crises with no clear outcome in view. A redistribution of geopolitical power is under way, along with the deployment of information and communication technologies, forcing dominant structures to oscillate, as knowledge about organization and methods, marketing, design, and software begins to challenge the role of technoscience as the main vector of economic growth and wealth accumulation. What ought to be done?*

The most eventful invention of the dawn of Modernity was that of the Florentine masters of the Quattrocento: a new representation of the natural world. Linear perspective was a new way of looking at reality, the first step to initiate its transformation. Linear perspective separated clearly the subject, the observer, from the object which was observed. The size of any object relative to those of other objects depicted in a context depends only on its distance to the observer, the subject that is representing reality. Previously, divinities were no longer larger than men: in fact, their apparent magnitude was a function solely of their remoteness from the observer. That these representations came to be accepted as “objective” stems certainly from the fact that they could be assimilated to those obtained through the use of an instrument—the “camera obscura”. It was this mental association that allowed conceptually the separation of light (a physical phenomenon) from vision (a physiological capacity).

### 1. From a Culture of Separation

The intellectual strength of modernity springs from the surprising capacity and robustness of “separation” as a method of analysis of natural phenomena. A new culture of critical tendency and experimental basis emerged, progressively validated by the flood of new discoveries pervading Europe—of new lands, new peoples, new skies and new stars. The old order was discredited and a new worldview took form. This worldview, of a “geometrical”

character, consisted in searching for symmetries in nature, which in themselves concealed principles of invariance that, in turn, led to the formulation of laws for the natural world. The laws are permanent, eternal and absolute, describing the behavior of bodies in the universe since time immemorial extending to infinity. They are formulated in mathematical language since Galileo declared that the Book of Nature was written in mathematical language, separating it from the other holy book, the Bible, which was written in the natural language. The objectivity of the laws of nature was assured by the use of instruments and their validity by the publication of observations and measurements.

---

*“Instead of the economy being embedded in social relations, as in the past, now it was social relations that became embedded in the economic system.”*

---

The legitimacy of this separation was granted by the sheer strength of the Reformation in the Protestant nations in which the new churches—separated from the secular forces that were building the State—were also in construction. The general climate of growing trade and business related to ocean navigation supported a further separation: that of a private sphere within what until then was the (public) domain of an agrarian society. Cities were the beacons of this spirit of modernity. And new Academies of Sciences were created to enshrine and nurture that spirit. The force of this geometrical worldview was still echoing loudly in the 19<sup>th</sup> century: Cézanne asserted conclusively that all forms of nature could be reverted to the sphere, the cone and the cylinder.

The triumph of modernity was the victory of this culture of trade, military power, navigation, finance, private appropriation and new knowledge. It came as no surprise that the first conflict in the disciplines of knowledge was the separation of philosophy from theology, as philosophers started to give priority to the empirical analysis of reality.

This was the first serious challenge to the millenarian affirmation of religious authorities who thought that they were the sole owners of the way to truth. Philosophers claimed that philosophical intuition was as legitimate a source of truth as divine revelation! The separation of mind from matter was then established, as expected.

A subsequent separation was that of natural philosophy (which adopted the designation of “science”) from philosophy. Scientists, pursuing a way of theorization based on induction, supported by empirical, replicable and verifiable observation, opposed metaphysical deduction as a speculation which could not contain elements of truth. This rift was not without consequences: separated from philosophy and the humanities, scientists developed an a-historical and cumulative conception of scientific knowledge and its progresses, which supported a claim of neutrality in social terms.

Science started out as physics, and physics for Galileo was mechanics. The “mechanical” impetus of modernity through the advances in engineering, warfare and navigation was so strong that mathematics—which until the 16<sup>th</sup> century had been the way we dealt with nature

(through counting and numbers [arithmetic], forms and measurement [geometry], proportions and harmony [music], and positions and motions of heavenly bodies [astronomy])—was abstracted from nature to become only its language; physics (mechanics) became nature. This helped and enhanced the conception of mathematics as a symbolic language, enabling the separation of natural beings from natural rules, i.e., of objects from models, of ontology from epistemology. This scheme was met with an astonishing success—as overwhelming as the victories that modern European nations were experiencing in their expansion throughout the world. Who could doubt what one's eyes were seeing?

---

*“If we think that crises are terrible and destructive, we better be prepared for the next wave of structural change in the 2030s.”*

---

The new world of modernity—the terrestrial globe, not the territories around the Mediterranean Sea—was nurtured by the separation of space from time, and by the new concepts derived from the empire of the laws of nature. Space became appropriable till infinity and time became linear.

No wonder that the new social organizations that were able to fully interpret and conjugate these notions—the new companies or enterprises—provided the economic success of modernity. The new wealth they generated warranted their existence and proliferation. They became aware of the importance of technology in the mastering of time through the invention of machines. No wonder also that the Industrial Revolution was intrinsically a revolution in mechanical force and artifacts. The mastery of space was warranted by the development of market economies, through the incorporation and development of cities' economies (first at the national level and subsequently overseas).

Modernity allowed capitalism to flourish. Capitalism is a regime of societal power based on the rights to private ownership of the means of production (which have been dramatically extended to all domains of human life during the course of the last hundred years) and on the wealth generated by this appropriation. Its principle is the maximization of the accumulation of capital, which is limited solely by the “scarcity” of resources or by the “ignorance” of the knowledge that allows its further accumulation. Capitalism also needs an inter-state system that guarantees the legal property of accumulated capital—a fact that is sometimes forgotten. Modernity provided the adequate framework for the endeavor of capital: a powerful engine (the modern enterprise); a search for technological inventions to fuel the engine; a progressive de-materialization of money through financial innovations; and, an interstate system that progressively expanded in the world. Capital accumulation became indefinite.

The growth of economic activity and wealth associated with the industrial revolution had an enormous impact on society. A new vector of capital accumulation emerged and the control of economic system by the markets (i.e., the meeting places of long-distance exchanges) was established. The transformation of society was also deep and full of consequences. It brought about further separations in daily life. Industrial societies saw an inversion in the relation

between the economic and the social spheres: instead of the economy being embedded in social relations, as in the past, now it was social relations that became embedded in the economic system. The economy was separated from society and, further, home became separated from work. The concept of employment was born.

---

*“That a major crisis is developing in Western societies in the first decade of the 21<sup>st</sup> century is probably not a random coincidence. History does not repeat itself; it is rather human mistakes that tend to repeat themselves, over and over again, creating cycles, not of economic development but of human behaviour.”*

---

But the system was intrinsically prone to crises, namely crises of structural adjustment due to evolving production structures and infrastructures. Infrastructures are difficult to transform: they require voluminous investments and costly adaptations to the new basic conditions of economic activity. Every two generations, at least since the dawn of the industrial revolution, we have witnessed a crisis of this type. The technical infrastructure of production was transformed accordingly (through the 1830s) from water-powered mechanization to steam-powered mechanization, then through electrification (from the 1880s onwards) to full motorization (from the 1930s onwards) through cheap oil and mass production. The present situation, which can be described as a computerization of the entire economy, emerged in the 1980s. If we think that crises are terrible and destructive, we better be prepared for the next wave of structural change in the 2030s.

A capitalist market economy lives always in an intimate arrangement with an interstate political system. It needs a strong interstate system to enforce the property laws that allow capital accumulation, as stated before. Capital, in turn, feeds its partner, allowing it to survive. This is why only hegemons and not empires are permitted in interstate systems. Capital is allergic to caps. And hegemons do not live as such forever. They are not able to set the rules of the game indefinitely. Every fourth generation we have witnessed crises (another type of crises) which degenerate into wars where the hegemons are replaced by other hegemonic nations. We observed this in the decades following 1610 (the Thirty Years' War), then in the 1710s (the war of the Spanish succession), in the 1810s (the Napoleonic wars) and after 1910 (the two World Wars). With the present expansion of the world-system encompassing almost the whole of our planet we cannot rule out the current “oil wars” as signaling the possible demise of the American hegemon. That a major crisis is developing in Western societies in the first decade of the 21<sup>st</sup> century is probably not a random coincidence. History does not repeat itself; it is rather human mistakes that tend to repeat themselves, over and over again, creating cycles, not of economic development but of human behaviour.

Modernity was fashioned by means of a culture of separation. The power of this way of dealing with reality brought enormous wealth and prosperity to modern nations. By the end of the 19<sup>th</sup> century four values summarized the preeminence of modern culture: nature (an

infinite resource that could be transformed by the knowledge of its laws); science (the legitimate way to discover truth); universality (the values and perceptions of European peoples were imposed on and accepted in all corners of the world); and, sovereignty (each state was like an atom, indivisible and acting as a legitimate component in the interstate system).

The 20<sup>th</sup> century pushed forward these concepts under the joyous leadership of the new hegemon across the Atlantic. Further separations ensued, mainly stemming from the overspecialization promoted by the education system, which by that time was reorganized to respond to objectives of the market economy such as fierce competition and higher technological levels. Science progressed immensely, propelled by the World Wars' effect.

It was following this path that science met its defining point of separation. The first science-based technologies saw the light during the 1940s to never leave our world again. Their transformative power was such that neither the military, nor subsequently the markets, let science return intact to its curiosity-driven realm. Technoscience was born with the atom bomb. Progressively pulled away from curiosity-driven science, technoscience grew enormously and impacted strongly on the economy. This was not without problems, of course. The neutrality of science (read technoscience) was definitively dead. "We lost our innocence," uttered Oppenheimer at Alamogordo. He understood then that the long-term and well-established value of science was being lost. But he could not yet foresee its consequences.

## **2. To a Separation of Cultures**

The world was transformed further in the 1950s under the Cold War regime. The "oil crises" of the 70s set the stage for the deployment of the first socially selected product of technoscience: the information and communication technologies. A new period of techno-economic structural development was initiated, a period in which we are living in, approaching the maturity of the solutions that those science-based technologies have provided for the time-span of one generation. But these solutions were naturally associated with a whole array of new issues. Information and communication exploded—a second revolution that has profoundly changed the perception of life in our planet. Terrestrial space has "shrunk" and knowledge travels around the world at the speed of light. Finance took increasing control of the economy and finally captured it, through further dematerialization of the monetarized system (another essential effect of the industrial revolution)—money is a convention. Finance has been the driving force since the initial stages of globalization: using the new technologies, finance extended the capacity of coordination at a distance (meaning: beyond political borders). The end of the Cold War further accelerated this tendency and, as a result, a multitude of new opportunities emerged and new networks were created to exploit them, challenging the existing mechanisms. Fierce competition between actors ensued and the expansion of market economies was fed by increasing inputs of new knowledge relevant for commercial operations: organization and methods, marketing, design, software, specialized training. New services and activities surged with high economic impact. And each of them developed its own culture.

Increasing growth and separation gave us much more than just two cultures (the transfer into the 20<sup>th</sup> century of the fierce debate of Enlightenment). We can now distinguish in our societies, besides the cultures of science and the humanities, a culture of social science (strengthened through the invention of post-modernism) and well-defined cultures in politics, business, media, military, religion, and education, as well as diverse cultures of risk, violence and individual autonomy.

---

*“Complexity is the impossibility of separating a system from its context, a living being from its environment, an object from its measuring instrument.”*

---

We evolved a full *macédoine* of cultures. But, worse, in this new Babel, the same individual person can switch from rationality (say, in politics) to the realms of the obscure, in just a click, making the resurgence of ignorance and mysticism seem a business like any other.

Therefore, the tremendous task placed on the shoulders of the coming generations is paradoxically very simple: strive for a new and novel integration of cultures. The reason is also very simple: modernity is exhausted. As argued below, modernity has been drained by financial capitalism; it was even led to transform the future (a founding value) into a mockery of itself, through short-sighted, sick and exclusive preoccupations centered on the present.

We live in a world of uncertainty. But we have never lived in an uncertain world! We were able in the past to generate mechanisms to reduce uncertainty by proposing order and classifying reality. But finally, all institutions evolve, i.e., adapt or disappear. Let us take three examples. First, the medieval Church. The church controlled ignorance through the invention of sin and repentance. Their method was based on confession. But religion is prone to fundamentalism and, so, is averse to diversity. The disregard of modernity towards the past and its ancestors quenched and sank the power of the Church of Rome. Second, the nation state. The control of ignorance was accomplished via the introduction of an education system and the creation of degrees. This system, which stimulated critical thinking and taught us how to judge the credibility of the sources of knowledge, was implemented together with a powerful method of examination. But the state is also prone to conflicts of interest, and globalization has been actively promoting its weakness, by destroying its timid impulses to resist financial discipline. Finally, the markets: market economies control ignorance through the emergence of a vigorous industry of consultants. The method of consultancy firms is based on the free use of advertising to achieve their objectives. But markets are intrinsically prone to crises: there goes confidence down the drain. Nobody is perfect!

We are living through a deep crisis that originated in a conjugation of different processes: geopolitical, techno-economic, cognitive. The separation of cultures has led us here, and we have let these crises entangle with one another like schoolchildren. Everything is connected today. We live in a complex world. We are surrounded by complexity. We know today that we are the products of complexity. This is what is new.

All the grand challenges we face today, from climate change to sustainable living, from innovation to the management of cities, are complex by nature. But what is complexity? Very simply, complexity is the impossibility of separating a system from its context, a living being from its environment, an object from its measuring instrument. Exit separation!

We can say that we live in (and are thermodynamically) open systems. The intellectual apparatus devised by the end of the 19<sup>th</sup> century, composed of determinism (i.e., information conservation), reductionism (i.e. the use of mathematical language) and dualism (i.e. the independence of the observer), is severely flawed with regard to the representation of reality. We know that the progressive substitution of human labour by machines—at first mechanical, and now communication-driven—has dramatically changed the condition of work and employment and the social structures in which they were in turn embedded. The effectiveness of advanced economies derives from their capacity for operating science-based innovation systems, but what matters most in their performance is the quality of their governance. But how do we understand the whole, especially in the absence of a culture of integration? Maybe we will have to define a new epistemic objective, different from that of “progress through the transformation of nature”, the aim of modernity.

But before that, we have to understand how values have changed, to assess where and how a new culture is desperately needed.

We may discern four cognitive crises unfolding before our eyes (each corresponding to a well-established value of modernity): a crisis of nature; a crisis of science; a crisis of the universal; and, a crisis of sovereignty. In each of these crises, a new concept has emerged to perturb and displace the characteristic word of the culture of modernity (nature, science, universality, sovereignty)—respectively: the environment; knowledge (as in the “knowledge-economy”); the global; and, governance.

The notion of environment today has the relevance we attributed in the past to nature. But we then understood nature as a scenario—eternal—where phenomena were taking place. We could attempt at controlling or transforming nature, but nature would always be there, unharmed. Now, with the concept of environment, a big change occurs: the environment is no longer the permanent scenario, but the stage where the actors perform (in fact there is no scenario). And there is no author, nor a plot; the actors create their own narrative as they play and they are responsible for the outcomes, inclusively for the deterioration of the stage. An evil power is creeping in: it declares the future as worse than today, so the motto is: let us recentre our efforts on the present—the opposite of modernity. A feeling of anguish with respect to the future is being instilled.

The word ‘knowledge’ is being redefined so as to signify the set of fields (law, organization, marketing, design, software, training) that together with technoscience feed the success of the new services and the new economy in the globalised world. It has displaced science in all policy-oriented documents written after 1990. But science was not just a mere instrument of the economy, a straightforward source of new technologies. Science was for three centuries the main element of support of the worldview of modernity and the most important criterion in the search of truth. Its culture signified the constructive role of error and of objection,

one of the most important elements for establishing the concept of citizenship. Science aimed at eternity, offered a vision for the long-term.

The new word knowledge is a vassal of the markets and their daily operations. Markets welcome change but ignore the long-term effects. Their frenetic search for (economic) value makes them myopic. Consequently, knowledge is suffering from short-sightedness nowadays. The feeling of short-termism is rampant.

---

*“The world today is a computerized jungle.”*

---

The notion of globalization has displaced that of universality. For two centuries we enjoyed the rule of the universal. We had permanent, sacred and eternal rights just because of the fact that we were born. These rights were introduced to protect the citizen from the powers of the state and to allow the free exercise of citizenship. Of course, the process of exercising one’s rights has not been easy, nor linear. Social progress and welfare were the culmination of a lengthy fight, punctuated by eventful battles. But globalization has introduced a wicked twist in this framework. In the realm of globalization there are no acquired rights, but just contracts, where rights have to be negotiated and re-negotiated continuously. The place of the individual citizens has to be conquered in the markets, their performance optimized, their utility demonstrated. A systematic process of negotiation, profitability, competition is at work. People are dispensable, their importance resides in their function—as producers or as consumers—they were transformed, actually, into resources: human resources! They have to be recyclable (through life-long learning!), or otherwise they represent no value to the markets. They become a nuisance and can be eliminated if they are of no economic utility. The world today is a computerized jungle. There is a kind of hush all over the world. Oppression is back in town.

Governance has swiftly substituted sovereignty. For centuries, the states (and the balance of force) have been the cornerstones of the order that was established by Westphalia, which contributed to the political stabilization of Europe. The notion of the nation-state was tentatively exported to different continents of our planet with mitigated success. Governments have been recognized as legitimate representatives of nations and morally responsible for their internal security and welfare, and as the interlocutors in foreign affairs.

But the globalization of markets, with a rhetoric anchored in liberalization, deregulation and privatization, provoked national governments to recede progressively from the economic sphere. This recession motivated the surge in the national political spheres, of new actors (at a distance) with considerable (economic and political) power. Who governs now? Where are important decisions being taken? Who is accountable? Have we voted for them? Governance is now a popular word, pervading all fields of activity in advanced countries. No wonder people and institutions feel insecure.

The decline of strong values such as those of nature, science, universality and sovereignty has unfolded mixed senses of anguish, short-termism, oppression and insecurity. Tomorrow will be worse than today. And the markets make sure that today is the day. To consume immediately is the only certainty that is allowed. Marketing propaganda forces us to make instant decisions. The preeminence of financial capital—due to its intangibility and therefore infinite possibility of accumulation—accelerated this trend to a point of no return. The final

act has been the (self-) separation of finance from the economy, in the vain attempt of gaining full control over the accumulation processes. In trying to fly too high and unattended, finance lets its wings melt down. And the result has been the spiraling down of the assumptions regarding the future knowledge economy into a deep crisis that may unfold a new order. But whose? For the first time in centuries (except during the period of wars), we do not see the light at the end of the tunnel. We have become afraid of the future. This means, finally, that capitalism has killed modernity. For what purpose, we do not yet know: we can only recognize this as a tragic Oedipian moment of Western cultural evolution. Our states, heirs of the medieval tradition of divine power and omnipotence, no longer own the future. They are turning their eyes and actions away from it, concentrating on immediate solutions. The future has been privatized too. We are trapped.

---

*“The way forward is therefore clear. We have to invent a new future.”*

---

### 3. Trapped?

The U.S. is drifting further away from Europe. The Internet has freed the Americans from their European birth complex. Will the U.S. be able to maintain its hegemonic status in the 21<sup>st</sup> century by forging new networks? Will the global 21<sup>st</sup> century look similar to the 18<sup>th</sup> century multipolar Europe? Nobody knows.

The Europe of Christendom was doomed by its local nature, for being unable to open up to new arrangements. It closed down. The way forward is therefore clear. We have to invent a new future.

We will have to nurture curiosity over and over again. And we will have to borrow from António Vieira his extraordinary vision—as valid and effective today as it was three hundred years ago, when he brightly stated that “to assess hope we have to measure the future”.

*Author contact information:*

*Email: [jcaraca@gulbenkian.pt](mailto:jcaraca@gulbenkian.pt)*

### References

1. Caraça, J., “Science et communication”, Presses Univ. de France, Paris 1999.
2. Cippola, C., “Clocks and Culture”, W.W. Norton & Co., New York 1978.
3. Freeman, C., “The Economics of Technical Change”, Cambridge J E **18** (1994) 463.
4. Giddens, A., “The Consequences of Modernity”, Blackwell, Oxford 1990.
5. Polanyi, K., “The great transformation”, Beacon Press, Boston 1957.
6. Prigogine, I., “La fin des certitudes”, Odile Jacob, Paris 1996.
7. Vieira, A., “História do Futuro” [1718], Imprensa Nacional, Lisboa 1982.
8. Wallerstein, I., “World-Systems Analysis”, Duke University Press, Durham 2004.