ISSN 1824 – 2049 http://jcom.sissa.it/

# Comment

# Individuals, knowledge and governance in the 21<sup>st</sup>-century society

## **Andrea Cerroni**

The knowledge society is a new social species that, despite many uncertainties and some (old and new) ambiguities, is emerging on the horizon of the 21<sup>st</sup> century. Placed at the convergence of two long-term processes (society of individuals and knowledge society), it is characterised by the social-economic process of knowledge circulation, which can be divided into four fundamental phases (generation, institutionalisation, spreading and socialisation). The current situation also sees the traditional (modern) structure of knowledge being outdated by the convergence of nanotechnologies, biotechnologies, information technologies and neuro-cognitive technologies (NBIC). In the background, the need arises to cross the cultural frontier of modernity.

History does not flow away, it sediments. And when it starts to run, then ages pile up, in everyday life as much as in the depths of our mind, too fast to be metabolised. Meanders of Middle Ages coexist along with future possible prospects, timeless primal echoes and despotisms without any hope of surviving themselves along with modern structures unsuccessfully resistant to any change. Contradiction and confusion are growing, as is the need to level out the complexity of our explicative models, without diminishing the phenomena's intrinsic complexity. The social forms that have framed people's life and contributed to the knowledge heritage (theoretical, as much as practical and materialised ones), even for long periods of humankind history, never totally fade away. On the other hand, they never spring up at once, they rather want intense and thoughtful work. Appreciating social changes through a snapshot taken from within, whilst they are still mirrored in the changes of our mind, is a hard – albeit fascinating – task and, perhaps, even useful. This is now truer than ever.

It is precisely social survivals and our mental habits growing with them that complicate our individuals' life and our governments' policies, but above all they create a smoke screen on those background trends bound to survive us, in the long run. Therefore, in order to highlight the salient points of the *social species* humankind is now heading for, the endless nuances of our everyday experience should be overshadowed. The uneven, contradictory – even ambiguous – landscape will be left out, taking it almost as a background noise, the echo of past history, just because it cannot be disregarded at once. Instead, a reference should still be made to warn present policy-makers against too many inequalities on our planet (2 percent of adults own 50 percent of the wealth of all families), among continents (Africa, even though it accounts for 10 percent of the world population, only owns 1 percent of global wealth), among nations and among the citizens in a single nation (among those who own 10 percent of the world wealth, 7 out of 100 are Italians, 25 are Americans, 20 are Japanese, 8 are German and only 6 are British, 4 French and Spanish and in fact Italy has an inequality rate – Gini index – well above the OECD average, and much more above the European one, with a GDP ranking 7<sup>th</sup>, yet with a purchasing power ranking only 24<sup>th</sup>).

Once these issues are outlined, a plot for global history can still be sensed, although presently, precisely today, our history-making may need a much more conscious strategy, a real knowledge governance to relaunch a new development, a policy for the future.

Indeed, the social species in the current trend quite markedly distinguishes itself from any previous human social species. In particular, a focus should be placed on the *dual matrix* that will identify its borders (in fact, secretly hatched for long), and the contingent situation in which the traditional institutional solutions (namely, of modernity) find themselves in. Two long-term processes are actually working jointly, although at two different and uneven speeds: the *knowledge society*, in strict terms, and

the *society of individuals*. Both of them stem from modernity, yet they are quickly wearing out its typical balance solutions (scientific community, disciplinary knowledge, Fordist capitalism, national state, mass democracy, etc.). The contingent situation can be indeed qualified in various ways, but at institutional level there are some undoubtedly relevant indicators.

The first one, which will be not explored in detail here, relates to the progress of the dual exhaustion of the great organisations of individuals that have marked the entire history of modernity: the great national states and, on a smaller scale, the Fordist industry. The State has been empted both at the bottom level (subsidiarity and devolution to local authorities, free associations of citizens, down to the participation initiatives by single citizens) and at the top level (continental aggregations such as the European Union, international organisations such as ONU, IMF, WTO and the likes, up to responsible behaviours on future repercussions for our descendants and on cultural traditions inherited from our predecessors), including also the effect on the common values and on the general interests that have unfolded within it. A similar process took place on the Fordist industry, both inside factories (total quality, internal client, enterprise-network) and outside (consumerism, stakeholders, prosumers), leading to the need for a radical redefinition of social borders and of the very mission of the organisation.

However, what will be outlined here is an indicator of the overcoming of the modern organisation of knowledge itself, produced by a novelty scenario on the borders of research, thus posing some capital challenges to our cognitive capability of actually exploring a *knowledge society*.

Yet, to start with, it is now necessary to briefly consider the relation existing among individuals, society and knowledge in an advanced society.

The *Homo sapiens* species manages to build its (from what we know) still unmatched knowledge heritage through the forms taken by the socio-cognitive work of its members – the same forms it can profit from altogether. Certainly, neither all of the people produce the same amount of knowledge, nor everyone can equally benefit from it – at least up to now it has been so. However, the social dimension in the life of our biological species is the element that characterises us as individuals and differentiates us from individuals belonging to other biological species. Furthermore, it characterises the knowledge regarded here as a *scientific knowledge* and thus differentiates it from ideological forms, exclusively playful or pathologically idiosyncratic. Each and every one of us leads an individual's life (as an individual human being), as much as they lead a life in the *social species* (fulfilling themselves as a person, given their nature of social being) and, at the same time, a life within *humankind* (as participants in the *general intellect*, given its nature of symbolic being). In fact, an individual who is isolated (*homo clausus*) is merely a mental or *scholastic* abstraction, as much as a society (social *structures*) not based on individuals. In both cases, they are historical productions that cannot explain anything. Instead, all of them need an explanation. The same applies to a humankind deprived of the concreteness of concrete individuals (starting from their corporeity) and without social configurations (starting from their historicity).

Hence, each individual has their own reference system incorporating *certain* social interests and *certain* cognitive references, socially established and within a plan that is only partially conscious. Similarly, a society without a symbolic world, and more precisely without a knowledge with some degrees of *scientific character*, is purely a mental or *scholastic* abstraction, as much as a knowledge without society at some degree of historical development. Any human knowledge is produced by *a certain* social labour and *a certain* effort for generalisation.

Hence, human individuals, human societies and human knowledge, from a certain primal stage in the development of civilisation, have been tightly interwoven, neither more nor less than separate logic dimensions of a single natural phenomenon. More precisely, like three families of processes that take place on different space and time scales. The personalities of the individuals, their regular features, and the knowledge they share through either implicit practices or explicit consensus, develop precisely within the historically determined system of processes and configurations of interaction and communication, with consequent expectations and mutual obligations that establish constraints to the courses of action, to the negotiations when in contact and to the lines of reasoning and the generalisations they are able to devise.

Through the daily iteration of *personal choices* and *fiduciary delegations*, as well as through practices acknowledged as constitutive in a shared and to-be-shared sense, the *productive/prescriptive* knowledge institutions are the material substance within which the social species acts as a *historical medium* between individuals and human genus (humanity). This is the origin for the articulation of both partial

interests, which are the driving force to any single individual, and more general interests, that individuals manage to pursue more or less freely, as well as for the articulation of local knowledge, which is their starting point and which leads their lines of reasoning, making them reaching more or less general knowledge through public paths.

#### The society of individuals

The first long-term process that will be dealt upon is the *society of individuals*. Indeed, whereas all human societies are societies made up of individuals, the degree (quantitative and qualitative) of their involvement varies very much. In the early 21<sup>st</sup> century we are reporting the sensational results of an acceleration towards the formation of a *society of individuals* in its proper sense. Without any doubts, this is a long-term improvement and, as anything that takes place over a long time, it may create ambiguities over a short period, the one corresponding to the life of individuals. Indeed, this trend is anything but linear or painless, and it is not even able to remove the outcome of previous social forms, actually burying them under a thicker layer that nevertheless reveals the caves of the remotest past.

The concept of *society of individuals*, which is the inverse way to interpret the macroscopic development of our planetary society as *knowledge society*, concerns the process of individuals becoming more and more different to one another, for traditions and visions of the world, local knowledge and general expectations, and wishing to be equally free to lead a very personal, rather, unique public and private life, and also getting ever more often in closer contact with one another in ever wider areas of the planet. Thus, they influence one another's daily life and personality development.

Therefore, each one of us encounters ever more different individuals able to influence in many different ways his own personality, and this applies to everybody: the contact with difference results in one's own differentiation and develops one's individuality through more elaborate, more mediated, more general categories. In short, these dynamics among ever more different individuals, make us ever more different, unique and needy, but also capable of unity, universality: the society of individuals is *equalitarian* when everyone receives the real opportunity to take a path to be concretely different, autonomous, personal, i.e. the more this society manages to be fed by differences, the more it manages to *differentiate itself* from within and to unify itself as a whole. This is possible only producing knowledge and interests to be ever more abstract, yet ever more functional; general, yet vital; universal, yet practical.

Hence, in a future perspective, this issue does not regard only the birth of a single and broader and broader community of more and more different human beings. The intensity of the impulses that question your references and expectations – what you take for granted and your consolidated personal knowledge – is overcome only by the height of the challenge that derives from that: it is about building a common epistemic and institutional fabric, able to transform any tension into development and any threat into opportunity, to integrate interests and partial viewpoints into (more) general interest and (more) general viewpoints, thus defusing the clash between "civilisations", otherwise inevitable, and promoting the development of *Civilisation*, otherwise hold in check.

### The knowledge society

This paragraph will briefly analyse the second long-term process, the *knowledge society*. Being made up of members of the *Homo sapiens* species, all human societies have been societies founded on knowledge: so, what do we mean when we define the social species we are about to enter by the name of *knowledge society*?

First of all, it is a trend to the constitution of a *science-based* society, namely based on the knowledge formed on that very modern social institution called scientific community. Furthermore, and precisely for its parallel development as society of individuals, it is a society that qualifies as (tendentially) *democratic*, where the participation of citizens is increasingly claimed and acknowledged where there are sufficiently developed democratic institutions. But, most of all, and as a consequence of these peculiar aspects, it is better described as a society centred on a process which was previously obscured – made almost negligible – by other dominant ones, i.e. the *production of knowledge by means of knowledge*. The increased risk of local knowledge surplus being segregated by "impalpable" cognitive

monopolies qualifies communication of science as a channel of transparency, fluidity and control on the "strong links" between science and society (social construction of knowledge institutionalised as scientific and formation of techno-scientific *lobbies* in its utilisation and socialisation). Also, it turns into the channel through which the *cognitive action* of individuals (generating, sharing, using, claiming knowledge, etc.) feeds itself of knowledge and contributes to the driving force of the entire society.

In short, growing shares of citizens (*knowledgeable citizens* within an enlarged *scientific community*, tendentially expanding towards a *global society*) live to produce a knowledge that is materialised just by other people and by an increasing number of machines produced by other machines. And what it is necessary to individuals to meet their needs (material and immaterial) is more often knowledge, in its various forms. By knowledge, indeed, one should mean two different forms of knowledge: ideas and beliefs.

An *idea* is an aware (theoretical) argumentation that can be judged in various ways and acts as the linchpin for our disquisitions. Instead, a *belief* is the implicit fundament (*pre-theoretical* knowledge) of ideas, which is taken for granted in their use (*tacit knowledge*), in a generic/daily situation or in a specialised situation; for these reasons, it is socially *constituted* (without a plan, i.e. not *built* by design, on the contrary it is *constitutively* founding any idea). Changing one belief of yours implies you place your own attention on it, you elaborate it as an idea and, consequently, you formulate its refutation, propose an idea able to replace it, thus actually founding your argumentation on some other beliefs.

Scientific *ideas*, in particular, are the ideas that, following a *scientific spirit*, resist and persist, assert themselves and stand out at the current examination of the data available, at the critical analysis of the common sense and rigour, at the replication in the public debate, at the unprejudiced control. This is, literally, the meaning of the Greek work *epistéme*. Therefore, there is a scale of increasing degrees of scientific nature as long as knowledge is shareable (for example, its validity is potentially general, it accurately describes known facts, it is useful in predicting new facts, etc.) in the opinion of the humankind members (therefore, also when contemporaries disregard it, according to a historical retrospective). There is nothing irenical in all of this, not even a mere plot of secret conspiracies. It is simply the best we can do: not very much, but evidently not even too little.

So, on a level there is *knowledge*, the real one produced by concrete historical individuals that have only a partial awareness and, on another level, there are the *individuals*, the concrete ones that produce the history of the actual species producing a knowledge that partly detach itself from their contingent situations. In between, the historical medium of the *institutions* (of the *scientific community*, in a progressive enlargement, and of the entire *global society*) those individuals temporarily manage to establish for themselves in order to share interests they find to have in common, employing the knowledge they realise to have at their disposal.

As much as an individual, as it is conceived today, is in any case an operator (carrier and producer, user and referent, legislator and subject) of knowledge, knowledge – the one regarded here – is the one concretely produced and proposed by someone, useable and refereed by many people, with rule-making and authoritative power. Through the intermediation of social institutions (from official authorities to public opinion) processes that really count do take place, from knowledge *generation* (production or acquisition) to its *institutionalisation* (identification, thematisation, organisation, sharing), *diffusion* (materialisation, utilisation, dissemination, communication/participation in strict sense), and *socialisation* (interiorisation, education, enculturation, regulation, policy making) within something that can be named *knowledge circulation* (cf. figure 1).

Hence, the two trends towards a society of *individuals* and of *knowledge* are not independent, rather they mutually reinforce each other, because *de facto* more progress in one feeds more progress in the other and vice versa (they require it and make it viable).

Characteristics such as equity, consensuality, sustainability, speed, etc. in the development of a *society-of-knowledge-and-of-individuals* (also named *democratic society based on science*) are linked to the capability of knowledge governance as a *strategic public good*, key resource to the social-economic process.

So, what about the old-style economic factors (land, capital, labour)? Obviously, they are not removed, yet they are deeply reassessed and enhanced in terms of knowledge: disvalue hits both a land not farmed applying suitable knowledge and a capital not invested in knowledge production and also, finally, a labour force not qualified through proper education and training to the knowledge dynamics (shift from a labour force to a *thought force*). Therefore, traditional inequalities (old and modern ones) are not abolished but incorporated in a soft pod, probably becoming less violent but certainly neither less

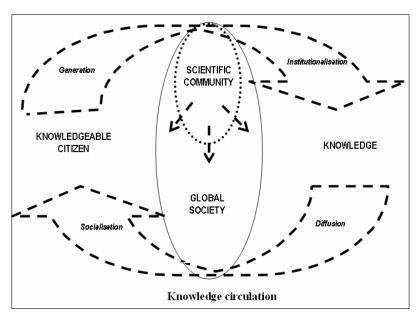


Figure 1

sensational, nor less hard to overcome. Education itself, if not supported by a cautious public governance, as known, does nothing but enhancing them with a *St. Matthew effect* ("For unto every one that hath shall be given, and he shall have abundance: but from him that hath not shall be taken away even that which he hath").

This is the origin for the great impasse in the two political traditions of modernity: the one founded on the value of property, and consequently of capital-factor (*liberalism*), and the one founded on the value of labour-factor (*socialism*). To Adam Smith, I'm certainly performing an unproductive job by writing here and now, probably as much as those who are now reading my writings. And this is true for the majority of the jobs that proliferate today and, on top of that, we wish to see increased in the future (schooling and scientific research, technological innovation, knowledge governance, quality and welfare services, politics and governance and the likes). Similarly, Smith would have felt puzzled in addressing the issue of property, as demonstrated by the current conceptual and political difficulties in establishing what intellectual property is, starting from fields such as software and the genome. Rather, knowledge more often qualifies as *public good* and the contrast with the patent right logic becomes plainer and plainer to see, also in the light of the now undeniable *perverse effects* of the patent policy of the enterprises all over the world (exploitation of monopoly rent and consolidation of cognitive monopolies). Knowledge circulation, however, does not only characterise the work-economy cycle, but permeates and deeply redefines also our extra-professional life, namely our spare time, life-long training, post-labour and non-working phases, in short, the entire quality of our life.

So, knowledge is both an immediately productive factor and a general value, as it measures the capability of producing and the one of enjoying, participating in and benefit from it. Knowledge is what provides the measurement of goods and services, of qualities and values.

#### **NBIC** convergence

This paragraph will deal with the contingent situation – a complete novelty, defined by the sociocognitive structure of scientific knowledge, that is to say by the structure of social work (frontier of research) and cognitive work (cultural frontier).

What is taking shape is a *Convergence* between nanotechnologies, biotechnologies, information and neuro-cognitive technologies (*NBIC Convergence*) that in fact outdoes many presuppositions of modern science, which have also guaranteed its uncontainable rise in the past four centuries.

Given the trends sketched for future developments in the next fifteen-twenty years, maintaining that we are about to witness a new scientific revolution apparently is not an overstatement. A great change has been being outlined in the social and cognitive organisation of research and, at the same time, it has been shaking the disciplinary structure and the "founding myth" of our modernity (a neutral and autonomous scientific community, objective and freely available scientific knowledge, a society naturally eager for progress and so on) so deeply that one may even anticipate the overcoming of the traditional category structures in the anthropological experience our species has lived over a long portion of the two hundred millennia of its history.

Nanosciences and nanotechnologies, biosciences and biotechnologies, information sciences and technologies and neurocognitive science and technologies will be more and more required to tackle common problems jointly, hybridising atoms, genes, bits, neurons, but also concepts and models, approaches and cognitive references. Ever more abstract theorisations and ever more incisive applications will empty the material world as we know it and will fill it with abstract concepts, theoretical models, projects hardly evaluable at political level, futuristic teleologies. Our very experience of the physical, biological, information, mental world is bound to change radically.

Our senses are modulated on the actual experience of a species that, over the course of its history (and especially prehistory) of two hundred thousand years, moved along an *intermediate* scale (neither too small, nor too large).

Notwithstanding Zeno's paradoxes, Achilles always caught his tortoise: hard stumbling rocks, ultimate and indivisible, did exist. Our traditional categories (concepts such as *homo* or *platypus*, *star* or *planet*, and so on) were devised *as if* they were not to change, *as if* they were not ambiguous because they are linked to *a certain* experience. Indeed, variations on a human scale have been quite limited up to now. Wars were once won or lost thanks to *certain* pieces of information that one possessed, or else, that were not received on time; still in 1812, even battles could be fought only because the news of a peace treaty signed three weeks earlier might not reach Andrew Jackson. Modern civilisation, in a legal sense, was born with the *habeas corpus*: then the availability of one's mind was not questioned and, in any case, its vicissitudes took freely place inside the cuirass of "its" body. But what about actual prospects?

An indefinite greatness allows the possibility of an ultimate, all-encompassing, higher "vision", but in that boundless space "down below", on a nano-scale of 1-100 atoms, there will not be any immediate sensation, nor any non-problematic background knowledge. And yet, it will be starting from there that we should learn to sight the events on our daily scale, because from "down below" innovations may come within the constitutive bricks of matter (nanomaterials) and within the constitutive processes (self-assembly, nanofactories).

The slow casual mutation (also when following *punctuated equilibria*) will become extremely fast and the deterministic selection of nature will be replaced by an artificial selection by design. Our very life as a species will be determined (by quality and quantity) by prevailing interests pursued by design (with treacherous unintentional effects): by whom? how evident will they be? how shared? how controlled?

On its side, information, once scarce, has diffusely penetrated each and every product and process, and has already been integrated in N-technologies, B-technologies and C-technologies. It has now become exorbitant, even excessive for our individual (cognitive) and collective (technological) capabilities, posing real challenges to our ability in selectivity, usability, sociability. Only consider the genetic information that will be shortly available by sequencing the genome of millions (billions?) of people: who will have access to that? to what purposes? under what controls? with what capabilities of discriminating between a statistical disposition to develop a certain pathology in an undefined future instant and a certainty on which to found a dramatic, irreversible, yet shareable choice? what meaning should be attached to the genetic differences that will be found among us humans without relapsing into past horrors (which are periodically revived in any case)?

The more our mind will be searched through the walls of our body – where almost half of the neurons are not in our head – the more treatment of pathologies and enhancement of the regular state will overlap, the less it will be possible to conceive parts of our body as completely free from subjectivity, well beyond Descartes's mistake, up to affect the tacit presumptions of our language and the most intimate dialogue with oneself. The brain, each one's brain, is nothing but a ramification (certainly, a particular one) of the habitat being built precisely by us, for the most part unconsciously. We are re-

building our ship at sea and, into darkness, the great sea (it. 'largo pelago', Lorenzo Magalotti) swarms with enchanting sirens.

Actually, when facing these great changes, quite predictably, we suffer from a cognitive inertia with a great influence on any further development. Our ability to think still remains grounded to categories – suitable for a age now gone – that constitute the cognitive inertia that tricks us, hindering our ability to elaborate novelties, shared novelties, desirable novelties.

#### The cultural frontier

The mere assemblage of the two dynamics we have encountered in the prospect of this Convergence forces us to re-interpret the traditional image of knowledge, as much as the one of individuals, and therefore of the prospect of our entire society. Where to start from?

So, this is our final point. The past has given us two great intellectual traditions: let's call them, for greater convenience, Enlightenment and Anti-Enlightenment. Both were sustained by praiseworthy purposes, even though sometimes they have been sensationally betrayed by the realisations of their highest ideals, both declined into too many and too much contradictory variants; they are now exhausted by worn-out and exacerbated disputes. Science communication, without the theoretical support of a strategic vision, has to pay for the lack of communication between these two traditions; rather, it increases the occasions for open conflict.

Controversy is now three centuries old, dating back to the early 18<sup>th</sup> century, having gone through the contraposition between Romanticism and Positivism, the debate between Kultur and Zivilisation, the emersion of the *two cultures*, up to the recent *science wars*. Scientists-technologists or intellectuals-humanists, respectively sensitive to scientistic objectivism or to anti-scientific subjectivism; loud apocalyptic prophets, glowing nihilists or silent integrated, yesmen of technoscience; modern or post-modern; still too many of us struggle between the Apollonian and Dionysiac concepts (in their endless declinations: Reason, objectivity and neutrality, calculation and profit, order, the universal, the real Values, and so on; Anti-reason, heart and subjectivity, blood and humanity, life, one's own clod of earth, the *particular*, the absolute relativism of values and so on). Often, crossing from side to side the interpretation of the same author (the emblematic cases of Rousseau and Marx above all), the contraposition is more fascinating the more it is soaked in symmetrical rhetorics, debtors to one another.

A rupture point has been reached: behind (apparently) naïve sensationalisms and scientistic reductionisms, as well as behind the fresh anti-Darwinian outbreaks (and, more recently, anti-Copernican) of unexpected allies, such as Theoconservatives and Islamists, behind the technophobic proclaims (*Free from GMOs!* just because what counts is the word itself, the label) or technophrenic proclaims (establishment of an *Upper House for Science* to wisely orientate the EU policy), there rise stances that support (or can now easily be alleged to defend) mere positions of power *lobbies*, at times already on a global scale.

In short, on the one hand, there is the abstract Rationalism, built on the axis of the Cartesian-Kantian Enlightenment, of an utopian knowledge also outside time (*uchronian*), i.e. *without a knowing subject*, which is to present in an undercover and ideological way the product of *a certain* history course, as if it were an absolute reality, loosen from any contingent bond, yet full of universalistic claims with an unmatchable flavour of *power rhetoric*. A similar job is carried out by the outdated doctrine of natural law, which cannot find anymore a single natural ground for the new citizenship rights in the 21<sup>st</sup>-century society, simply because there is not *natural* experience anymore, but everything is a construction of ours, more or less designed beforehand, yet in any case outside "natural" logics. Science itself, in its turn, is reduced to a universal calculation, a *problem-solving* process, leading to various forms of reductionism (and of dualism on the human part which is inevitably irreducible to inhuman) or to an empiricism equally abstract, scholastic, pseudo-scientific, prone to technocratic deviations, in any case unable to realise the complexity of a symbolic genre and to become the subject of the studies of a scientific reflexivity to return it as a determined historical product. Actually, rather an unscientific conception of science.

On the other hand, very similarly, there is the historicist Anti-Enlightenment for which individual lives are articulated by the expression of their merely volitional or profound subjectivity, in any case irreducibly idiosyncratic because pertaining to an *abstract subject*. Then, the human world is full of essential and irremediable differences, compatible only with the absolute relativism of human reasons

and its cynical and useless game, the suspicion of a global conspiracy, the technological and material-civilisation-produced Satanism, the redeeming hermeneutical empathy, the eternal rhetoric of vital values, the irremovable contraposition between facts and values and so on. Nature, in its turn, is full of natural essences, to be intuitively grasped in their timeless purity as an *ab Eterno* munificent gift. The consequent interpretativism presumes, against all evidence, that everything and the contrary to everything may be said or, rather, that it may apply *de facto* to *any* fact, in a so-called "free" way, actually only indescribable, inscrutable to the human reason's investigation and to the ability to form a statement. Actually, rather an inhuman – and not historical at all – conception of life.

In both cases, the presuppositions of human thinking and acting are always defined as boundary conditions (desires, beliefs, voluntariness, rationality) and never as an object to be explained "naturalistically", as a specific product of a specific history. Facts *do have* a value, yet this value, in its turn, *is* a determined historical fact: from this circle one can escape through an effort for dialogue and reflexivity, through rigour and common sense, taking endless small steps.

In conclusion, what is missing is a real *social science*, i.e. it is not allowed the space in which, too often, it does not even want to measure itself. A social science that has indeed introjected those *two cultures*, without even wondering about the issue of their partiality or of the impasse to which, doing so, they deliver the governance of the new social forms. A social science that should be *integrated* internally and with the visions emerging from the adjoining disciplines: reality is not informed about our disciplinary divisions or preferences in approaches; instead, they are a very precise reality, a study subject for sociology of science. For all of that, each and every one of us is a culprit.

Thus, any communication contact, and even any contact with reality, becomes an occasion – conscious, or unconscious, more often than possibly reckoned – to consecrate "the current status quo", with all the declinations ranging from the political sphere to the ontological one. In conclusion, it is not only a misunderstanding, yet serious and radicalised: we are all called upon to address what has now become a real cultural challenge – a challenge of methodological reflexivity: our current *ultimate frontier*.

Translated by Massimo Caregnato

# **Notes and references**

- <sup>1</sup> E. Bellone, *La scienza negata*, Codice, Torino (2005).
- <sup>2</sup> P. Bourdieu, *Il mestiere dello scienziato*, Feltrinelli, Milano (2003).
- <sup>3</sup> A. Cerroni, Scienza e società della conoscenza, Utet, Torino (2006).
- <sup>4</sup> U. Eco, Apocalittici e integrati. Comunicazioni di massa e teorie della cultura di massa, Bompiani, Milano (1964).
- <sup>5</sup> N. Elias, *La società degli individui*, Il Mulino, Bologna (1990).
- <sup>6</sup> N. Elias, *Che cos'è la sociologia*, Rosenberg & Sellier, Torino (1990).
- <sup>7</sup> R.P. Feynman, "There's plenty of room at the bottom", *Engineering and Science*, (1960) http://www.zyvex.com/nanotech/feynman.html.
- <sup>8</sup> L. Gallino, Tecnologia e democrazia. Conoscenze tecniche e scientifiche come beni pubblici, Einaudi, Torino (2007).
- <sup>9</sup> F.A. Hayek, *L'abuso della ragione*, Seam, Roma (1997).
- <sup>10</sup> G. Lakoff and M. Johnson, *Metafora e vita quotidiana*, Bompiani, Milano (1998).
- <sup>11</sup> P. Laslett, *Il mondo che abbiamo perduto*, Jaca Book, Milano (1973).
- <sup>12</sup> M. Nacci, Pensare la tecnica. Un secolo di incomprensioni, Laterza, Roma-Bari (2000).
- <sup>13</sup> A. Nordmann (Rapporteur), Converging technologies: shaping the future of European societies, http://cordis.europa.edu/foresight/ntw\_expert\_group.htm (2004).
- <sup>14</sup> R. Richta, La via cecoslovacca. Civiltà al bivio: le proposte di Praga per un nuovo socialismo, FrancoAngeli, Milano (1968).
- 15 J. Rifkin, Il secolo biotech. Il commercio genetico e l'inizio di una nuova era, Baldini & Castoldi, Milano (1998).
- <sup>16</sup> M. Roco and W.S. Bainbridge (eds.), Converging technologies for improving human performance: nanotechnology, biotechnology, information technology, and cognitive science, National Science Foundation and Department of Commerce, Washington D.C. (2002).
- <sup>17</sup> A. Sokal and J. Bricmont, *Imposture intellettuali. Quale deve essere il rapporto tra filosofia e scienza?*, Garzanti, Milano (1999).
- <sup>18</sup> N. Stehr, *Knowledge societies*, Sage, London (1994).
- <sup>19</sup> Z. Sternhell, *Contro l'Illuminismo. Dal XVIII secolo alla guerra fredda*, Baldini Castoldi Dalai, Milano (2007).
- <sup>20</sup> Unu-Wider, *The World Distribution of Household Wealth*, Helsinki (2006(.
- <sup>21</sup> L. Wallerstein, La retorica del potere. Critica dell'universalismo europeo, Fazi, Roma (2007).
- <sup>22</sup> F. Wheen, *Come gli stregoni hanno conquistato il mondo*, ISBN Edizioni, Milano (2005).

### Author

A graduate in Physics and former R&S Controller in high-tech companies, Cerroni is a sociologist at the University Bicocca of Milan, where he holds the chairs of Sociology and science communication and Theory of knowledge society. He is the author of various publications in Italian, including: Scienza e società della conoscenza (Utet 2006), Homo transgenicus. Sociologia e comunicazione delle biotecnologie (FrancoAngeli 2003), Valutare la scienza (Rubbettino 2003), Libertà e pregiudizio. Comunicazione e socializzazione alla conoscenza (FrancoAngeli 2002), Categorie e relatività. Metodo, cognizione e cultura nella scoperta di Albert Einstein (Unicopli 1999). Currently, he is a national delegate in the "Science in Society" Programme Committee (7°FP). E-mail: andrea.cerroni@unimib.it.