

## New Questions for Science

by Étienne Klein

*Some of us are convinced that machines have “freed” us, at least provisorily, in terms of time: machines “buy” us time, “save” us time. Terrific. However this is not always a good thing. When you’re on your way to the gallows, walking as slowly as possible is probably the best way to go.*

Georges Bernanos, *La Liberté, pour quoi faire? (Freedom, to do what?)*

The general consensus is that the relationship between Science and Society is now undergoing a major change. In some ways it reminds us of an embittered old couple whose arguments are still heated but whose private moments are now chilly and distant. This evolution can at times be extreme, and it is marked by easily identifiable symptoms.

### *The general context*

First, it seems that society has found a new obsession, *fear* as a (hitherto unknown) component of its relationships. Some of that fear is attributable to Science, as we become aware of genetically modified foods, nuclear energy, animal cloning, Mad Cow disease ... we wonder if the storm clouds are not gathering just a little too ominously on the horizon –

In order to understand the newness and scope of this phenomenon we need to look at the distance separating our society from the earliest instances of democracy. After the devastating earthquake of 1755, which killed thousand in Lisbon, Portugal -- the reaction of the best minds of that century was actually optimistic. For example, there was this poem of Voltaire<sup>1</sup> which “used” the catastrophe, saying that “in the best of worlds, everything cannot [always] go well,” but that it is reasonable to expect that things would go better in the future. The general idea was that with future progress in science and technology assured, the great cataclysm would be avoided, advances in geology, mathematics and physics would help us to predict and prevent the disasters caused by Mother Nature. Science and its applications would save us from nature’s tyranny, if we posit that the sum total of scientific knowledge would quantitatively increase future technical and industrial accomplishments. This would then in turn improve the general human condition, and perhaps even bring us happiness. This “doctrine” became a sort of catechism, with its roster of disciples, zealots and theorists, from Descartes to Auguste Comte. The idea of progress, which is secular, replaced the idea of Salvation, which is religious, and the future was transformed into a vessel of hope.

Today, things have changed. We are consumed with fears and worries about the future. We feel an anticipatory remorse over what may happen. We now feel instinctively that our control over things is both disproportionate and incomplete, sufficient in that we are aware of

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<sup>1</sup> “Deluded philosophers who cry, “All is well, Hasten, contemplate this frightful ruin, This wreck, these shreds, these wretched ashes of the dead; These women and children piled on top of one another/ [...]Will you say, in seeing this mass of victims: “God is revenged, their death is the price for their crimes?” But what crime, what sin did these children commit?/[...] “All’s well,” you say, “and all is necessary.” Do you think this universe would have been worse/ Without this hellish hole in Portugal? [...] All will be well one day, thus is our hope./ All now is well, but an idle dream.”

making history, but not really sufficient to grasp *what* history it is that we are making. What is happening, what is not happening? No one seems to know.

At the same time, modern society has attained a level of security unparalleled in history, assuming its identity as a society of risk. Everything is weighed, analysed and considered as a possible threat. Some say we have entered the “Era of Catastrophe.”<sup>2</sup> A kind of “it’s all going to blow up” attitude has permeated the collective consciousness; a new invention is announced and we immediately make a list of all the potential dangers that same invention may bring. The acceptability of risk in technology is no longer automatic, and radically new ethical questions of an unexpected complexity regularly emerge as part of the scientific process.

The image of the scientist has also taken a hit. The head of Dr. Frankenstein has now been Photoshopped, superimposed on the body of Pasteur. As researchers, scientists are both admired and feared, or at the very least misunderstood. They fear that the man of the 21<sup>st</sup> century, who has seemingly lost both his innate curiosity and his critical awareness, pressing buttons without caring about what they represent nor what happens when they do - is now susceptible to all sorts of wacko gurus and their beliefs. The world zigzags between infatuation and distrust; we may be frightened by science but we still rush to buy the latest technological gadgets, the products of its invention.

### *The ambivalence of our relationship to progress*

An insidious process brings us to doubt ideas which two centuries ago seemed to be the foundation blocks of our civilisation. Is it out of guilt or denial? The scientists think so. Or is it merely the passing tantrum of spoiled children? Those who do not share our level of development think so. Perhaps it’s because we maintain a healthy dose of lucidity. The ecologists and others think so; hasn’t our nascent interest in “sustainable development” only emerged because we know current development will not be universal, certainly neither sustainable in time nor predictable in space?

In the last few decades, the concept of progress has become problematic. The major scientific advancements of the past are undeniable, but we now ask progress to prove both their value and their validity. Have we become blind? We see that we are living in a fantastically productive time, with advances exceeding the wildest dreams of the utopians of the 19<sup>th</sup> century, but still we find fault, in particular as we realise that science has not found a way to stop evil, unhappiness or poverty. We know there is something missing. We know the situation is worsening, but we don’t know how. Is the concept of progress meant to expire before our very eyes? No, that would be too terrible. We are not Tarzan, we may accept – even dream of one day actually “returning to nature,” as long as we can take along our *dri-fit* clothing, a cellphone, credit cards and a backpack full of antibiotics.

This is the paradox of our relationship to progress: we pretend we no longer believe, but in reality we believe fiercely, even if it’s only in a negative way, in direct proportion to the fear we have -- that it may all suddenly just stop.

### *New questions*

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<sup>2</sup> Cf. the book by Jean-Pierre Dupuy, *Pour un catastrophisme éclairé: quand l'impossible est certain* (For an enlightened catastrophe, when the impossible is certain), published by Le Seuil, 2002.

The scientists giving the swaggering press conferences know that our fellow citizens have a wide range of questions for them, some embarrassing, some delicate. By and large they can be categorised as being about the link between *science and power*, between *science and democracy*, between *science and development*, between *science and technology*, between *science and the truth*, and finally between *science and universality*.

***Science and power:*** Science is an unfortunate accomplice to war and its horrors and there is no antinomy or contradiction of principle between science and oppression, as certain events of the 20<sup>th</sup> century have shown.<sup>3</sup> We ask whether there is an ontological link between scientific practice and domination by violence. The desire to understand the world and destroy the “other”-- are these two actions generated by the same unconscious impulse? Is science’s goal still to know the world and to create new things in it? Has science not turned into *techno-science*, in which all the busy activity focuses on command, control, innovation and efficiency rather than process? The State running the scientific process – does it dream of anything more than patents and technological improvements? We are seeing contemporary technoscience instead of pure, original, what could be mythical discovery.

***Science and democracy.*** In our society, whenever we are dealing with science and technology, we feel the weight of our collective responsibility, even if its modalities are not easy to grasp. We ask ourselves, “Who – in science – is watching me? What is up for debate? What science is considered ‘public domain’? And especially, where exactly is the line between that which is expert knowledge, that which requires our participation in the debate, and that which is purely political?”

If each of us were able to make an enlightened decision about the greatest scientific and technological challenges facing us, the answers to these questions would surely be clear and concise. But we cannot, so what do we do? How do we motivate those who do not know science to approach it without fear? How can we change the *droit de savoir* (the *right to know*), which is both legitimate and free, into the *desire to know, to learn*? And how to get those who profess to be less interested in these matters to question the scientists, asking, “What are you doing, what do you know and how does it apply to us?” Reciprocally, how do we get these so-called “experts” to be answerable to our standards, as well as to their own? How can we equitably share the burden of uncertainty and risk with those experiencing them? There has been one recent development worthy of mention: lately the role of the consumer in decisions has been increased, although attempts to further define these roles inspire continuing and heated debate. Many scientists are convinced it is time they came down from their ivory towers, believing that all they need to do is explain simply that which is not clear. And the general public leaps at the chance to be more than auditors and outsiders – they seek to be both comptroller and co-legislator, aware that their conclusions while not being entirely rational nor enlightened – are at least reasonable. Some politicians do not yet realise how much science is at the centre of the system. Politics may be divided into left and right wings, business and economic worlds, family and the retirees, marijuana and drivers’ safety but the stakes are so high, the scientific and technological choices we make will in theory insure our future.

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<sup>3</sup> In Nazi Germany and in the Soviet Union, major advances in science were obtained through generous grants and direct financing from non-democratic governmental sources.

**Science and development.** Many critics are now addressing the idea of “development,” even when it is modified to read “sustainable development” (blithely ignoring the fact that some things are neither quantifiable nor calculable, i.e. the quality of life), feigning perhaps to see that technological and economic development can also induce moral and psychic *underdevelopment*. These arguments no longer come only from the ecologists, they are based upon the fact that promises the scientists made at the end of the 19<sup>th</sup> century were not kept – though science itself is not culpable in that it did not make these promises, the pace of scientific and general progress not being quite as parallel as we had hoped. What did Descartes say? That we would methodically and technically become Lords and Masters of Science in order to make Man’s life easier. Well, it seems that today, as Milan Kundera has said, “The ‘master, the possessor’ of nature – soon realises that he in fact possesses nothing and is neither master of nature (which is in any case disappearing off the planet) nor of history (which escapes him), nor, indeed, of himself.<sup>4</sup>”

Our belief in the benefits supposedly inherent in development has gone up in smoke, to the point where our relationship to history has changed. For our grandparents, the ruins of history, the battle fields, the dead bodies, the destroyed cities – did not negate the essential “goodness” of historical process. The gallows, the despots and their wars were the price we paid for progress, the bloody sacrifices we made to the god of history. Today we no longer consider history as the convoluted accomplishment of reasoned thought.

**The “problem” of technique.** – In his *Dépassement de la métaphysique (Overcoming metaphysics)*, Heidegger mapped out a critique of the domination of technicity which had a measure of success and weight with other philosophers as well as with other *milieus*, notably in literary and journalistic circles. As such we will examine his point of view, that we “got our feet tangled up in the rug” – in other words, that we took something from Descartes while at the same betraying him. For Descartes, the pursuit of the scientific domination of nature must be guided by an emancipatory hand, in that its execution must follow certain rules: if we are trying to dominate the universe, it is not out of a desire to increase our own power, but is instead a search for both freedom and happiness. The development of science is thus the vector of another kind of progress, that of civilisation itself. The will to dominate, to master, is expressed in objectives exterior to it, and it cannot be reduced to pure instrumental reason which takes into consideration only its resources.

Today the will to control is not only about controlling something, rather the “will to will,” to master even the controlling process, to literally apply brute force to brute force. It ceases to be subject (as it was in the age of Enlightenment) to exterior sources.

Consideration of “ends” has declined somewhat in favor of an overriding interest in “means.” In the world of technology, what counts are results – the goals don’t matter, or more precisely, the only goal is the extrapolation and magnification of the means. Today, the stakes are even higher, focused on development for the sake of development, innovation for the sake of innovation, without regard for costs, real or projected – the idea is to keep advancing so as not to perish, since no one can say if what we discover will in fact bring true happiness and freedom to Man. The world is obsessed with technology, and it looks

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<sup>4</sup> Milan Kundera, *L’Art du roman, (The art of the novel)*, published by Gallimard, 1986, p. 182.

something like a gyroscope, a mechanism which spins continuously to keep it from falling, independent of project identification since no particular global vision is required to keep it going, in fact it sort of definalises itself. There is a generalised feeling that the course of the world escapes us, in fact it escapes our representatives, our leaders, and sadly our scientists. We have apparently been deprived of our own future, we have been dispossessed.

**Science and the truth.--** Another contemporary critic of science uses some of Nietzsche's favorite arguments: using the cover of "the triumph of reason" and the pursuit of happiness for humanity, science continues on with its "will to power," masking what the new idol must be. It carries a metaphysical illusion, that of entirely revealing the Being, as Nietzsche wrote, "There was a deeply buried fantasy which came to the world for the first time in the person of Socrates, the unshakeable belief that the mind, if it follows the through line of causality, can reach into the farthest depths of the being, able not only to know that self but somehow to *correct* it. This sublime metaphysical illusion of power is attached to science like instinct."<sup>5</sup>

The principal goal of scientists doing research is to "discover the truth," to obtain a true representation of the world as it is. For example, the physician Brian Greene declares that he is waiting for the finalisation of the Superstring Theory, which will give us our first consistent theory of quantum gravity as well as a unified theory of all forces and all matter, "revealing the mysteries and fundamental truths of the Universe."

Is the link between science and truth exclusive? Can science have a monopoly on the "truth"? Is it the only human activity which can remain independent of our actions, our culture, of the contextual nature of our systems of thought?

Diametrically opposed to the postivists who claim that science is the only authority on the truth in the world are the scientific sociologists who think that the "truth" is a hollow word. It should be considered a standard in scientific investigation or as the ultimate goal of research. These "truth-o-phobes" refuse to think that there may be a way of thinking which would be in more direct contact with the world, tweaked to be better than any other. Some people think that physics as a science only evolves contingent on sociological interests. If we wish to explain how the scientists build their knowledge, we need to interpret the principles of social determinism, to study equivalent, "symmetrical" theories – whether they are considered "true" or "false" by the scientists, since the raw facts are not the only consideration, there are sociological interests at work. After which it is but a short step to decide that scientific theories are only "social conventions" established by a community of researchers, as did authors such as Steven Shapin and Simon Schaffer, who posited, "Recognising the conventional and artificial nature of our knowledge, we can only accept that it is we, not reality, who hold the origin of what we know?" In other words, our knowledge is a collection of little pieces assembled by the scientists.

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<sup>5</sup> Friedrich Nietzsche, *La Naissance de la tragédie (The Birth of Tragedy)*. Certain books written by scientists would have us believe that science continues to follow along the same optimistic path so disdained by Nietzsche. This is true of the latest book by Stephen Hawking, *Une Belle histoire du temps (A Briefer History of Time)*, published by Flammarion, 2004. The author concludes his presentation of the latest advances in physics by these words: "If we do eventually find a unifying theory, it must be something everyone can understand at least in principle, not only by a handful of scientists. Philosophers, scientists and ordinary people, everyone will be able to participate in the discussion on the questions of our existence and of our universe. And if we find the answers, this would be the triumph of reason, which would allow us to know the mind of God." The mind of God? Not hardly!

These “relativist” theses have had a strong impact, notably among students. Even if their dissemination is peppered with misinterpretations and misunderstandings, it feeds the general scepticism and leads to stronger and stronger criticism being directed at research professionals, “Is your science the truth? How can you pretend it references rationality when aesthetic judgment, metaphysical prejudice, and subjective desire permeate its entire process, or at least certain of its phases? Is your uncontested legitimacy founded on something else than power? You scorn myth, but are they not also part of the truth?”

The most remarkable thing is that relativism benefits, under all its forms, from a quasi-spontaneous intellectual sympathy. What is its seductive value for those asking themselves about the impact of science’s treatises? Perhaps because they have (erroneously) been interpreted as a way to reconsider the presumption/pretences of science, giving way to a generalised suspicion of imposture, “After all, in science as in other things, all is relative.”

**Science and universality** – Science allows us to have a universal point of view of the world. But is this universality truly complete? To believe that would be to forget how modern science evolved, especially since Galileo: it becomes powerful only when it accepts limits in its ambition. For example, physics does not explore all questions, only those to which its approach may be applicable. In general, science only examines questions of -- science. Thus the universality of application remains incomplete, in that questions outside the scientific fields remain unanswered: the meaning of life, love, freedom, justice, our core values. Awareness of this limitation is one of the principal factors in the decline in our collective enthusiasm about science: “You must understand that questions about our values are the ones which matter the most, in any case much more than your litany of the great laws of physics, because it is through our values that we build our dreams, our actions, our projects. And if science cannot help us to illuminate humanity in its quest, if it cannot show us the points of reference we need, if it only uncovers truth without finding its meaning, do not be surprised if we do not flock to your community.”

The power of scientific rationality and the impact of technology on our lifestyles has engendered serious resistance from the masses: there is the desire to reaffirm one’s autonomy in the face of processes which are beyond us; the wish to defend alternative ideals against the threat of unilateral modes of comprehension or development; and the will to open science to democratic debate when the complexity of problems threatens to keep it the exclusive province of the “experts.”

At issue is the ability to remain open to this kind of question or demand without falling into confusion, paralysis or outright irrationalism.

Two recent examples of this: On one side, as fast as the controversies spring up and intensify, committees calling themselves “Science and Society” spring up as well: the humanities and moral reflection are more and more called upon to endorse the development of new technologies or to prevent their potentially perverse side effects. And in most of the developed countries, fewer and fewer students are opting for scientific careers<sup>8</sup>. There has been a marked slump in *libido sciendi* in the younger generations, in fact a growing percentage

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<sup>8</sup> The OECD (Organisation for Economic Co-operation and Development) did a massive survey, results of which were published in 2005, (*Declining Enrollment in S&T Studies. Is it real? What are the causes? What can be done?*). The declining interest of students in scientific careers is a serious concern for the developed countries (but not emerging ones), notably in the classical disciplines, physics, chemistry and mathematics.

of the top-ranked high school seniors is NOT opting to study science in college. This could – if it continues, in the near future, endanger the influence and credibility of research labs as well as the competitiveness of certain businesses, along with a projected shortfall of qualified professors. From certain perspectives, the current situation is comparable to that of the French Army before WW II, when the best students from Saint-Cyr (the foremost French military academy) were appointed to logistic or supply positions.

What do these two trends really mean? There are so many overlaying causes and questions, principally that the spate of questions which have recently been flung at science have certainly been in the public eye and have at least partially contributed to our reactions. If we want science to one day truly belong to us, we will have to reconcile the problem: the “calculated thought” which is part of science and technology, which is applicable to finite subjects and objectives – will have to, at least provisionally, give way to a different, “meditative thought,” which allows us to find meaning in our actions and our plans for the future.

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