

SCIENCE, TRUTH and TRUST

Permanent and novel challenges, individual and collective responsibilities

G rard Toulouse
Laboratoire de physique de l' cole normale sup rieure, 75231 Paris, France
toulouse@lpt.ens.fr

Since wars begin in the minds of men, it is in the minds of men that the defences of peace should be constructed
(Preamble to the Unesco Constitution, 1946)

To survive in the world we have transformed we must learn to think in a new way
(Nobel Declaration, 2001)

This presentation surveys a selection of actions and statements made by a variety of scientific institutions or individual scientists, and it ends with a few insights.

I . The Nobel declaration

For the centenary of the creation of the Nobel prizes, all living laureates were invited to Stockholm. Drafted at the initiative of the Canadian chemist John C. Polanyi, a declaration entitled *The next hundred years* was signed by 110 laureates and issued during the centennial ceremonies, on 11 December 2001.

Note that the Nobel foundation may be viewed as an example of influential and thoughtful scientific NGO. The chemist Alfred Nobel, inventor of dynamite, was eager to complement the 3 scientific prizes (physics, chemistry, physiology or medicine) with the literature and peace prizes. The economics prize was a later addition (see the Nobel web site at www.nobel.se).

THE NEXT HUNDRED YEARS

The most profound danger to world peace in the coming years will stem not from the irrational acts of states or individuals but from the legitimate demands of the world's dispossessed. Of these poor and disenfranchised the majority live a marginal existence in equatorial climates. Global warming, not of their making but originating with the wealthy few, will affect their fragile ecologies most. Their situation will be desperate, and manifestly unjust. It cannot be expected, therefore, that in all cases they will be content to await the beneficence of the rich. If, then, we permit the devastating power of modern weaponry to spread through this combustible human landscape, we invite a conflagration that can engulf both rich and poor. The only hope for the future lies in co-operative international action, legitimized by democracy. It is time to turn our backs on the unilateral search for security, in which we seek to shelter behind walls. Instead we must persist in the quest for united action to counter both global warming and a weaponized world. These twin goals will constitute vital components of stability as we move toward the wider degree of social justice that alone gives hope of peace. Some of the needed legal instruments are already at hand, such as the Anti Ballistic Missile (ABM) Treaty, the Convention on Climate Change, the Strategic Arms Reduction Treaties (START), and the Comprehensive Test Ban Treaty. As concerned citizens we urge all governments to commit to these goals which constitute steps on the way to the replacement of war by law. To survive in the world we have transformed we must learn to think in a new way. As never before, the future of each depends on the good of all.

Those fourteen sentences do speak for themselves, but it is worth adding that the penultimate one contains an echo coming from the Russell-Einstein Manifesto (1955). This landmark manifesto provided a background for the subsequent creation (in 1957) of the Pugwash Conferences on Science and World Affairs, which became recipient in 1995 of a well deserved peace Nobel prize. The Pugwash Conferences have devised and nurtured many activities aiming at the mitigation of international conflicts (notably during the Cold War) and at the promotion of socially responsible

behaviour among the scientific community.

II. Science Academies

On 21 May 2000, in Tokyo, more than sixty scientific academies belonging to the InterAcademy Panel on international issues (www4.nationalacademies.org/iap/iaphome.nsf) issued a solemn Statement. Some extracts are reproduced below.

TRANSITION to SUSTAINABILITY in the 21st CENTURY: The CONTRIBUTION of SCIENCE and TECHNOLOGY

During the 21st century, human society faces the daunting yet inspiring task of forging a new relationship with the natural world. This new relationship is captured by "sustainability," a concept that has emerged from a number of international conferences concerned with regional and global trends in population, development, and the environment. Sustainability implies meeting current human needs while preserving the environment and natural resources needed by future generations.

The Academies of Science of the world, as represented by the signatories to this Statement, offer here a collective set of observations about how the challenges can be addressed. In particular, we focus on what the scientific and technological community can do in the short and longer term, and what the Academies can contribute. In almost every instance, technical and analytical contributions of the scientific and technological community can be critical, but many facets of the problem require economic, social, and political efforts as well.

I. SCIENTIFIC ACHIEVEMENTS AND FUTURE CHALLENGES

A. Meeting the Needs of a Larger World Population: Reducing Hunger and Poverty and Preserving Human Well Being

B. Preserving and Maintaining the Environment and the Natural Resource Base

C. Moving Toward Sustainable Human Consumption Patterns

II. WHAT CAN AND MUST BE DONE BY THE SCIENTIFIC AND TECHNOLOGICAL COMMUNITY

A. Achieve a Much More Equitable Access to and Use of Knowledge

B. Actively Generate New Knowledge

C. Apply the Values of the Scientific and Technological Community to Build Sustainability

CONCLUSION

To preserve human well-being over the long term, people need to move toward new ways of meeting human needs, adopting consumption and production patterns that maintain the earth's life support systems and safeguard the resources needed by future generations. Yet if current trends in population growth, consumption of energy and materials, and environmental degradation persist, many human needs will not be met and the numbers of hungry and poor will increase.

Such a dismal forecast need not come to pass. Scientific, technological, and health capabilities--if supported by the necessary worldwide political will and international cooperation, and mobilized by appropriate social and economic policies--can produce substantial progress over the next two decades toward a sustainable human future. Realizing this progress will demand a threefold effort by the scientific and technological community: to promote the use of existing knowledge more widely and effectively, to generate new knowledge and beneficial technologies, and to work with governments, international organizations and the private sector to promote a worldwide transition to sustainability.

We, as Academies of Science, pledge our cooperation in these efforts.

Most conspicuous and original in this Statement is the last line. Because the Academies are ancient, genuine emanations of the scientific community, they are endowed with a traditional prestige which gives special influence to their advices. In this context, it is worth emphasizing that the above Statement (in favour of sustainability, openness, equality, etc) is, to my knowledge, the first collective pledge taken by scientific institutions. Pledges in science, so far, had been taken by individuals and restricted to the medical professions. This double evolution (extension to institutions, and to the whole realm of science and technology) constitutes therefore a significant step forward.

III. An oath for scientists

In a lucid column, published in *Europhysics News* (Nov/Dec 1999), Sir Arnold Wolfendale, then president of the European Physical Society (a disciplinary regional scholarly society), examined anew the old question of a pledge for scientists.

After recalling that *the doctors' Hippocratic Oath is universally acknowledged and serves to allay many fears that patients might otherwise have*, the author mentions two new factors: *the increasing fragility of the planet to scientific "advances" and the increasing gap between the public and science.*

Usual objection: *Of course, critics say, "it will be very difficult, what about work for the defence industries?" but then most of the work that we do is difficult; we do not build elaborate theories of the origin of the universe, or the nature of plasmas, without a lot of effort.*

Then Wolfendale offers a compact formulation for a scientists' oath:

** I will not, knowingly, carry out research which is to the detriment of humanity.*

** If, in the event, research to which I have contributed is used, in my view, to the detriment of [humanity] then I shall work actively to combat its development.*

His final comments: *It is this continuing responsibility which will, I think, be of such value. Hopefully, the knowledge of such a responsibility by scientists will deter politicians and such like from embarking on unethical activities in the first place; it should also get the public on our side. I am not so naive as to think adoption of an oath of this sort would solve all our problems, but at least it would be a start. Something has to be done, that's for sure.*

The notion of "continuing responsibility" is essential indeed. Because the outcome of scientific research (its direct and indirect consequences) is at least partly unpredictable, this continuing responsibility implies a duty of discernment and vigilance, sustained on the long term. Seen in this context, the lives of Andreï Sakharov and David Kelly do provide enlightening examples of courage and dedication, in the accomplishment of such a continuing responsibility.

IV. The S of Unesco

A few months after the fall of two A-bombs on Hiroshima and Nagasaki, was held in London (1-16 November 1945) the founding Conference of what became the United Nations Education, Science and Culture Organization. The president of the Conference, Ellen Wilkinson, British minister of education, pleaded eloquently and successfully in favour of the inclusion of science, together with education and culture:

In these days when we are all wondering, perhaps apprehensively, what the scientists will do to us next, it is important that they should be linked closely with the humanities and should feel that they have a responsibility to mankind for the result of their labours ...

Two British scientists played decisive roles at the start of Unesco (1946-1948): the biologist Julian Huxley served as first Director general, and the biologist-turned-historian Joseph Needham as first Head of the Natural Sciences sector.

Within the UN system, Unesco is a special Agency because of the principle of double representation: each country is represented by an ambassador (permanent delegate of the government) and also by a "national commission for Unesco" (representative of civil society). Thus this UN agency has a status that goes beyond the strictly intergovernmental. As heir of the Institute for Intellectual Cooperation (1925-1946), Unesco does maintain a vocation to remain an open forum of free minds, and to promote the intellectual and moral solidarity of mankind. For that purpose, Unesco has established many cooperation links with international NGOs including those representative of the world scientific community (such as ICSU, the International Council for Science, itself a confederation of representative organizations) and it has served as a workhouse for the advancement of international law, through production of a wide variety of normative instruments: recommendations, declarations, conventions.

V. *The only safety possible lies in an intelligent exercise of day-to-day judgment*

In 1955, not long before his death, the famous Hungarian-American scientist, John von Neumann (mathematician, physicist, economist, pioneer of scientific computers) published in Fortune Magazine an article strikingly entitled: *Can we survive technology?* Here is some of his message:

For progress there is no cure.

Any attempt to find automatically safe channels for the present explosive variety of progress must lead to frustration. The only safety possible is relative, and it lies in an intelligent exercise of day-to-day judgment.

Useful and harmful techniques lie everywhere so close that it is never possible to separate the lions from the lambs.

These sentences contribute to explicit the notions of discernment, and continuing responsibility. Actually, not only are the 'lions' hardly distinguishable from the 'lambs', ab initio, but moreover, in the course of time, lions may turn into lambs and lambs into lions. Thus the need for a continuing day-to-day vigilance which requests a mix of responsibilities, adequately shared between individuals and institutions.

VI. From Andreï Sakharov to David Kelly

The unprecedented trajectory of Sakharov's life led him from arms-making (forging nuclear bombs, the most terrible weapons of mass destruction) to social advocacy (including hunger strikes, internal exile) in favour of democracy and human rights.

Second paradox: Sakharov, who never left his motherland (except at the very end of his life, when he was allowed to

travel abroad, under Gorbachev), became one of the most universally respected moral figure. In a highly significant and innovative move, the European Parliament launched in 1988 the annual Sakharov Prize for Freedom of Thought, a distinction which seeks *in the spirit of Andreï Sakharov ... to honour individuals or organisations who have devoted themselves to the defence of human rights and fundamental freedoms and the struggle against oppression and injustice.*

Just before the opening of the official celebrations for the 300th anniversary of the city of Saint Petersburg (May 2003), was unveiled a statue of Sakharov on a square situated between the main building of the State University and the library of the Russian Academy of Sciences. This square had already been named after "Academician Sakharov" a few years earlier (1996). Due to the sculptor Levon Lazarev, the monument succeeds in conveying an expression of indomitable intellectual resistance. While the hands are held behind the back, in a gesture of powerlessness, the head stands high and defiant as if meaning: "I chose truth, not force". This deprived and ascetic silhouette forms a symbolic contrast with the glorious equestrian statue of Peter the Great (inaugurated in 1782) which exalts the impetuous drive of strength and power, on the other side of the Neva.

In a statement, written during his seven-year relegation in Gorky, which managed to get published in *Physics Today* (June 1981) under the title *The social responsibility of scientists*, Sakharov said:

Every true scientist should undoubtedly muster sufficient courage and integrity to resist the temptation and the habit of conformity.

Unfortunately, we are familiar with too many examples in the Soviet Union ...

and he went on:

Western scientists face no threat of prison or labor camp for public stands; they cannot be bribed by an offer of foreign travel to forsake such activity.

But this in no way diminishes their responsibility.

Some Western intellectuals warn against social involvement as a form of politics. But I am not speaking about a struggle for power. This is not politics. It is a struggle to preserve peace and those ethical values which have been developed as our civilization evolved.

By their example and by their fate, prisoners of conscience affirm that the defense of justice, the international defense of individual victims of violence, the defense of mankind's lasting interests are the responsibility of every scientist.

Andreï Sakharov's life (1921-1989) illustrates the tensions of a bipolar world (the Cold War era). One generation later, the destiny of David Kelly (1944-2003) illustrates the tensions of our contemporary unipolar world.

A renowned microbiologist, turned weapons inspector (with many missions accomplished in Russia, then in Iraq), David Christopher Kelly committed suicide on 17 July 2003. He was then senior adviser to the Directorate of counter proliferation and arms control of the UK Ministry of defence and to the counter proliferation Department of the UK Foreign and Commonwealth Office.

The tragic death of this internationally respected expert created a moral shock in his country, and abroad. Entrusted to Lord Hutton by Tony Blair, the long judicial enquiry allowed to reveal and publicize many episodes and circumstances of the drama but the final report revived the controversy, so biased appeared its conclusions in favour of the power and against the press.

What was at stake in this affair ? Concerning the alleged possession of WMD (weapons of mass destruction) by Iraq, and its potential threat for the outside world, it turned out that the claims made by the US-UK-led coalition were considerably exaggerated in comparison with the reality (as later found on the ground). The alternative is then: did the UK government commit an assessment error in good faith ? or did it knowingly attempt to mislead its public opinion and the international community, in order to legitimate an invasion war, disguised into pre-emptive action ?

VII. Good faith in science

Within science, there is a "right to error in good faith". During the investigations of scientific research, while we make experiments or invent theories, mistakes can occur and unforeseen effects eventually happen (sometimes for the better, and that is then praised as serendipity). More generally, it is commonly agreed that one gets experienced via processes of trial and error.

For scientists, the right to error in good faith does not mean a free license (under the blessing of a glorious uncertainty of the scientific method). It implies scruples in preparing, monitoring, checking, reporting, correcting, alerting. The word "scruple" comes from the Latin *scrupulus*, meaning a small grain of sand in the shoe which keeps recalling its presence.

In summary, there is no good faith without scruples. And without a readiness to pay a price in the service of truth.

Andreï Sakharov (two decades of harassment from a totalitarian regime), David Kelly (supreme sacrifice of his life), and Mordechai Vanunu (18 years of imprisonment, including 11 years in solitary confinement) paid heavy prices for telling the truth. Although the three cases obviously differ in many aspects, there is one remarkable similarity which deserves notice: systematic persecutions from the ruling powers started after talks of the scientists with journalists.

Scientific institutions should provide protection for the courageous individuals who proffer disturbing truths, so that the penalty does not become unbearably heavy. This is a most important lesson to be drawn from history, and an instructive one about the proper articulation of individual and collective responsibilities.

Nowadays, there seems to be an increasing tendency among politicians to claim acting in good faith, without care for the burden of scruples. But good faith without scruples is just another name for impunity culture, i.e. it is not trustworthy.

Truth and force do not always get along in harmony, and at times, one must choose.

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Background documents:

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- Eisenhower's US-presidential swansong (1961)
- Sakharov's Thoughts on Progress, Coexistence and Intellectual Freedom (1968) and Nobel Lecture (1975)

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