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A commentary on the Declaration of the Academic Freedom, by dr D Rabounski

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Science and technology changed essentially and irreversibly the human life, both personal and social, the environment, and created a new, artificial world with profound cultural implications at the level of human behaviour, psychic life and mentality. The human society of today depends essentially on science and technology, to the point that life on the Earth can be irreversibly damaged by the loss of science and technology. The only thing that still remains today outside the scope of science and technology is creating life, though basic modification of life are already current, and destroying life by science and technology is routine. Science and technology of today teach us that the Planet Earth, the Solar system and perhaps the whole Universe are very likely casual, and perhaps not eternal. It is therefore as much more sensible to do everything as to preserve life, as long as possible.

Science and technology are today in a great peril, caused not only by social and political changes, and not only by a very incontrollable economic activity, but also by various misconceptions. The later are the most pernicious, because the human world is indeed a "matter of will and representation" (Schopenhauer). There are at least four plagues which the vulgarization of the science and technology have generated in our modern society: relativism, indeterminacy, utilitarianism, manipulation and domination, and which turn now against the science and technology.

I enumerate here a series of such current misconceptions related to science and technology.

It is wrong but widely held today that science must satisfy any immediate desire or need, either physical or mental, as whimsical be it, and that technology must do it as soon and best as possible. This is profoundly wrong. Science responds only to our intellectual issues, this is its nature, to "accommodate in the most economical way our sensations to our ideas, which is a basic need for our survival" (Planck). It is indeed a deep wonder, which nobody could have ever explained, and probably cannot ever, that answering our intellectual questions may sometimes result in practical, technological applications that make our life more comfortable. History shows this, without no explanation, but it also shows definitely that the way from science to technology is not direct, but a very mediated one. To bring the scientific discoveries to the practical life one needs commitment, investment, patience, competence, a lot of work, and, especially, the acceptance of the possibility that it may never happen as well. Science teaches us basically that its technological applications are in fact a matter of good luck, and we must accept this point as a scientific statement, as strange as it may sound. It reveals the autonomy and the freedom of the science, which bear upon its profound nature. The politicians and policy-makers of today must accept that it is not they that conduct the science and technology, but instead precisely the opposite, it is the science and technology which should conduct them, if life is going to be preserved and cultivated. Admittedly, it is difficult to accept that science would not be "scientific". Actually, as a matter of fact, science

is nothing else but that endeavour that makes human the misteries of the natural world. That this is possible Mankind's history proves it.

Another common misconception about the science nowadays is that science must be done exclusively in collaboration, and, as such, the larger a collaboration, the better. It would be the only possible way to achieve scientific advances. This is wrong. First, the history shows the contrary. Newton worked alone, Maxwell similarly, Boltzmann worked alone and much against the current wisdom, Einstein likewise notoriously, the quantum people in the first half of the 20th century worked in a restricted cooperation, etc, etc. Feynman used to talk a lot with people around, find problems and work them for himself, alone. There is no other way. Similar, notorious examples are in other sciences, beside Physics. No scientific discoveries has ever been made by many people, but always by one or, occasionally, by a few at a moment. This is not only a historical fact, but a logical one too. If a discovery would appear in the heads of many, then it would not be something new, nor revolutionary, but instead, it would be a routine, trivial thing, by definition. Another, positive argument, without resorting to the *demonstratio per absurdum*, is the following. Suppose that for one scientific problem there would be many, most valuable contributors. Since the problem is one and these contributors are many it follows that each of them brings only a small contribution. Then, the problem is never solved by anyone of them, but by one, who synthesized the work of the many. That does not mean that many workers in science or technology are not desirable, or they would be futile and superfluous. On the contrary, they make a valuable environment, their work is the fuel of the great discoveries, but it is only the coal in the scientific furnace. It is not science, it is only the probable way toward science. Science is what a few do based on the work of many. As such, the opinion of the many in science is useless, and always dangerous, because they do not know. They are non-scientific, they are only the material used in scientific and technological discoveries. The democracy in science and technology is one of the most dangerous thing, because it is contrary to the scientific spirit and to the nature of these endeavours. In contrast with the political and social life, where today the democracy is the accepted way of doing mistakes, in science and technology the only acceptable way of doing mistakes along the way to the correct answer is the scientific and technical aristocracy. Only the latter "knows what knows and what does not know" (Socrates), which is competence. The former, people at large, do not know what know, nor what they dont. In its eandevour of acquiring positive knowledge, *i.e.* that knowledge which is as probable as it may be taken as granted and warranted, the science could only use lucidity and honesty, and cannot afford any inconsequential talking. This points again toward a basic feature of the science and technology, that of creativity, which comes from their profound freedom and autonomy, the sense of honour generated exclusively by honesty and lucidity. Our attention nowadays is insistently and ideologically forced, by political and media means, toward great scientific and technological organizations, as the best and the only way of doing science and technology. This is a dishonest enterprise, the content of such actions is anti-scientific. Such people say something and mean the opposite. They abuse the science, falsify and manipulate it, for image and political ends. The science and technology can only be achieved in an adequate environment, and the institutions of research of today are more than welcome, the larger the better. But we must be aware that they are there only for being consumated in an act of scientific or technological discovery, and not for becoming ends in themselves. Scientists must not belong by necessity to any of such big organizations, in order to be scientists, or engineers. The requirement of an institutional enrollment for scientists and engineers is an abusive plague of our mentality nowadays, with profound negative consequences. Today, the scientific work can be done by electronic means as an individual, building upon the work of smaller or bigger scientific and technical organizations. The factual reality shows that any discovery in science and technology was made by individuals, who used the work of many, sometimes of hordes of the many. The

big organizations of scientific research and technology are necessary, but not sufficient, by no means. They are just disposable means. As the means should not govern upon our aims, so the democracy must not be permitted to decide in scientific and technological matters. It must be fully and for ever banished from science and technology. In science and technology we do not know the solutions. But certainly the "solutions" of the many are wrong, especially because they do not know what they do not know. This is why the opinion of those who "know what they do not know" is by far preferable, and history proves this point. In political and social life democracy may be a convenient instrument, especially when and where the majority is meagre. Then, we have a permanent civil war in the society, without a very definite output, which gains time for the social life.

Another misconception which produces much damage to the scientific research is related to the scientific publications. The scientific publications are a means of doing scientific research, and they do occur naturally in the process of research. They are meant to present results of the scientific research to the scientific public, in order to help the science advance. The aim of the scientific research is to get scientific results, which naturally are materialized in scientific publications. If we define, as today, the scientific publications as the aim and the goal of the scientific research we mistake the means for the aim, which falsifies the scientific research and impedes upon the progress of science. The scientific authors of today do not publish anymore for a scientific aim, they publish instead for the number of "papers". The great pressure of "publish or perish" put today upon the scientific researchers by various political and administrative bodies, by the research institutional organizations and universities, turned definitely the attention of the researchers from science to publications. The scientific literature is invaded by an enormous amount of publications, at a tremendously increasing rate, which contains no scientific result, which nobody reads, and which is completely useless. Such publications are merely "progress reports", which mean only that "time has passed" (Oppenheimer), and tell only that the research funds have been spent. They have been spent indeed, but not for research. They have been spent for useless publications, and the costs obviously do not match the output. The requirement of publications as an end *per se* is one of the greatest attack the political and administrative media are running to the scientific research, to its freedom, liberty and to its very nature. It has misled definitely the scientific research of today to a false route, and forced genuine scientific individuals outside the social organization of the scientific research. Mankind is losing and wasting on this occasion one of its most valuable natural resources, the scientific creativity. More, influential political and administrative bodies and organizations with a commercial orientation defined a number of scientific journals as the "main stream", according to their rate of citations, the "impact factor", in complete disregard of their scientific contents. The research which is not in this "main stream" perishes, it is not funded anymore, while the one which belongs to such influential organizations gets published, funded and run forever, without no scientific result: only with a massive literature, good for nothing. Because the frequent citations of such literature are improper, they do not refer to the scientific content, which is absent, they are just a formality, a ritual, of the publications industry. The "impact factor" is defined by these organizations as the ratio of the number of citations to the number of published papers, so the scientific journals of today publish only those papers which are most likely to be cited, *i.e.* those which come precisely from the same influential organizations which define the impact factor. This is a self-approving type of institutional activity, which is closed in itself, permits no criticism, no contrary opinion, and, as such, it is typical for underground, criminal, terrorist-like, dictatorial, secret societies and organizations. In fact, the secret character of these organizations is obvious in their practice of "anonymous peer review" procedure. These "main stream" journals have in fact a notorious quite non-glorious past: they have rejected from publication authors like Einstein, Schwinger, Fermi and

even Feynman. Many articles published today by the most "main stream" scientific journals are withdrawn soon thereafter by the authors, which reflects internal fights inside those organizations, very similar with the fights between criminal mobs. Moreover, if the "impact factor" would be referred to the number of papers in the sold copies according to declared users, we will have a very different picture, and the "main stream" would be seen immediately to be in fact a "mean stream", because there are a lot of declared-users sold copies of these journals which nobody reads. The research funds are spent not only to produce such journals, but to buy them, without being read or used. This is a vicious activity which falsifies the scientific research, and to impose that "main stream" upon the scientific activity is another great attack to the freedom of the scientific research. To exclude from publishing people who do not belong to those influential organizations is an attack to the universality of science. In 1920 Sommerfeld has been called to establish a new scientific journal, to become soon the famous *Zeitschrift fur Physik*. This journal had never reviewers, nor "anonymous reviewers", the scientific articles were published under the sole scientific and moral authority of Sommerfeld. This real freedom warranted the birth of quantum mechanics, nuclear and solid-state physics and all the other branches of modern Physics. Of course, not all of the papers published in *Zeit Phys* were good, nor Sommerfeld was understanding them all. But he was a professional of science, and where his professional expertise was not helping him, he exercised his honesty and lucidity. This is competence in science.

Another misconception regarding the scientific research of today is that it must be sustained by itself as any commercial activity. This is a non-sense. The nature of the scientific "products", which are the scientific results, is so that not only nobody buys them, but they are also offered freely. These "products" have no immediate practical utility. What the best we can expect from them is to bring them to the attention of as many learned people as possible, and even to the society at large, in order to get new ideas, visions, perspectives, angles, etc, and to make appear possible practical applications. The latter depend on technological skills and means, which is an activity in its own. It does not only make use of the scientific results, but it provides the scientific research with new suggestions and ideas. As such, both the scientific research and the technological activity which aims at practical applications of the scientific results must be funded by society with no regard to immediate commercial rewarding. In comparison with other social costs, and in regard to its enormous benefits, as proved by history, the funding of the scientific and technological research is modest; the highest spending on science and technology does not exceed today about 3-4% of the GDP of the most developed countries. The scientific and technological research is funded today by government or corporate organizations, by universities and private companies, and to a much lesser extent by sponsors, benefactors, philanthropists or sort of "mecena". In all of these situations the misconceptions described above prevail and dominate, mixed up with a misleading financial "reasoning". First, the notion of "project funding" tends to be generalized up to the point that researchers get their salaries exclusively on an "competitional" basis. This is a non-sense: one cannot expect a honest work from a worker which is not paid a regular salary. Consequently, the "project competition" generates corruption, it is "lobby and lottery", it provides only an occasional, temporary and irregular income. The scientific researchers turn their attention from their work of scientific research to the process of getting funded through such a "competitional" basis. The "project funding" was originally restricted to temporary jobs of PhD students or post-doc researchers, until these beginners get a stable research or teaching, or technical position, and was mainly limited to universities as a form of superior, further education and instruction, facilitating the social insertion. Today, this "competition of project funding" tends to be generalized, which destroys the scientific research and the scientific education. Because, indeed, it is almost generally accepted today that the university professors should not do their teaching mission anymore, but instead they should do research. This is a grave diversion, which

explains why the scientific education degraded so much in our modern society. As for a research funding from sponsors or other individuals, this is a naive conception. Nobody gives personal money without asking for something rewarding in return. The scientific results produce satisfaction only when one takes part in getting them. Otherwise, such sort of things are absurd. An old joke says "I love work. I would sit and watch it for hours". Such sponsors, benefactors, philanthropists and various "mecena", wish in fact publicity and image for their money, to use these for getting in turn other money. But image and publicity gained by scientific research mean diverting the latter from its nature, and, in fact, abusing it. This is another grave damage inflicted to the scientific research by our modern society. A guy who put relatively recently \$50 000 into a private institute of research, took twice as much from govern and public funds, and what achieved was a 3-4 permanent staff. The institute accommodates many visitors, who came on their own institutions' money, and deliver public lectures on light things like black holes, the Big Bang, conscience, etc, etc. This is nice, to "scientize" the public at large, but it is pseudo-science. In addition, that guy became an influential member of various government and academic bodies, wherefrom he pulls a big salary, which overcompensated by far the original \$50 000, just because he vulgarized in fact the scientific research and brought such a "great service" to society. Like such are the modern ways of our society for destroying the science.

Funding the scientific and technological research without asking for an immediate revenue, according to the nature of these activities, does not mean that these activities are unaccountable. On the contrary. But first let us remark that their products are not physical, but spiritual. As such, the printed paper, or the electronic archives, which embody the present scientific literature cannot be mistaken for the scientific results. Not even the experimental setups or apparatus produced by the technological research should be mistaken for the result of this research, because they only serve to represent physically a possible idea. The scientific and technological research is accountable by its scientific and technical results, which are essentially spiritual, or intellectual, objects. This accountability is realized by the scientists themselves, who are able to speak clearly, logically and, especially, critically about their own work. The democratic vote of the majority is a non-sense in this enterprise. (I have witnessed once a degraded nuclear laboratory where the neutron lifetime was established by majority vote; they decided about 1 sec). The political, administrative and social responsables are afraid of not getting trumped by scientists in this process of accountability. I can assure them that they wouldnt. But, of course, these responsables must try to be a little literate in science and technology. And, finally, what is not risky today in any enterprise? A sure and safe business either does not exist or it is illegal. The fact that we do not know does not give us the right to abuse and destroy the scientific research, nor to falsify it. The latter is illegal, and deserves legal punishment, the former is badly and irreversibly damaging for us, for our children and for the whole future of Mankind. It is morally punishable.

A Declaration of the Academic Freedom, or Scientific Freedom, is quite welcome, and must essentially declare the following Rights.

According to its nature, the scientific research has the Right of doing Science; it has the Right of doing it in perfect Freedom and Universality, aiming exclusively at spiritual and intellectual results, without no ingerince from political, administrative or social organizations, to publish its scientific results wherever, whenever and in whatever way it considers appropriate. It has the Right of discussing openly, freely and critically whatever result declared as being scientific, and the society must warrant this Right and facilitate its exercise. It has the Right of being funded appropriately by the society and the Right of accounting of its own results according to its own criteria, ways, norms and procedures. The scientific and technological research has the Right of dismissing as abusive, intruding and falsifying the democracy in scientific matters, the "main stream" publishing and "impact factor" as means of evaluation, the "project competition" as a

means of funding. It has the Right of being Free and Autonomous, and to give account of its results to the whole society, according to its own norms, practices, procedures, historically established. The Right to the Scientific Research is a Fundamental Human Right.