

SCIENCE, SCIENTISTS AND SHOW*

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Already more than 3 centuries ago, a famous French writer observed that the old people love to give good advise because they are no longer able to give bad examples. I was invited here to play this role and I accepted it with pleasure. In fact, I feel well qualified to the task, as I am most probably the oldest participant of the meeting.

The key point of this lecture is based on my firm conviction that, when discussing the problems facing science and its relation to society, we should not forget that the main goal in studying physics and other sciences is *search for the truth*. I shall try to convince you that, when taken seriously, this idea has many rather demanding consequences.

The most important one is that we, the scientists, are expected not only to find the truth but we are also expected to communicate *truth and only truth* to other fellow scientists and to the public. This never was an easy task and we know from history that many great scientists paid dearly for being attached to this principle. And it is also not easy today. After all, the society we live in is overwhelmed by lies. One may even say, I think, that we are governed by lies. Politicians, salesmen, media, bankers use lies as a very effective tool, and to such extent that we even ceased to pay much attention to this. In this situation someone who steps out of the line and tries to be honest must look primitive, maybe stupid, and certainly naive.

I am afraid, Ladies and Gentlemen, that our profession demands from us this stupidity, this naivety of being utterly honest. In the world literally saturated with lies we are — unfortunately, or perhaps fortunately — put in the difficult and unrewarding role of “guardians of the truth”. The society, the public, expects and demands our integrity. It is the basis, the pillar of the authority the science and we, the scientists, still have. It seems obvious that we should do everything possible that this authority does not evaporate.

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To illustrate the kind of problems implied by this argument, let me first consider the question of practical applications of research. No one can deny that science in general and physics in particular were fundamental in building our present material civilization. So this is not the issue. The issue is, if the practical applications should be the main motive for the scientific endeavor or if they should rather be treated as side-effects of the fundamental research.

You may easily guess my position on this: once we agree that the real goal of science is to search for the truth, we have to accept that fundamental research is the primary thing and that it should be conducted for its own merit, independently of the prospect of possible applications¹.

This point of view is certainly not dominant today. We are told by the governments to be practical. We hear the same from private sponsors. The so-called Lisbon program — the official European policy — states explicitly that the aim of the proposed increase in research funds is to get European economy more innovative. With the idea that we shall win the competition with US². The point which upsets me in this story is that we, the European scientists, did not object when the Lisbon program was proposed and accepted. We were just happy that more money will come hoping that, once it is there, we can use it in a reasonable way, not paying too much attention to the stupid arguments. But that simply means that we sacrificed the basic principle of telling the truth and only truth. To put it bluntly, we were accomplices to this big lie. We lost a chance to emphasize that science is an important part of human culture, that its role is not to support economy but other way around: it is the role of economy to support science. Incidentally, I think we shall pay for it, for it will surely be the scientific community which, at the end, shall be taken responsible for the failure of the Lisbon program.

I should perhaps explain that by invoking all these arguments I do not want to suggest that science has no role to play in economic development of the rich as well as poor countries. On the contrary, I believe that its role is fundamental. But it cannot be realized by forcing scientists to work on “practical” things. The point is that the basic goal in economic development is to construct the society based on knowledge. This is what modern economy demands. Thus the key issue is education. Without a sufficient number of well educated people, the society simply cannot cope with the pressure of the competitive world. You may ask what this has to do with science? The answer is that nobody was yet able to create a good university with an output of really well educated students without, at the same time, conducting

¹ We all know that, as shown by many examples, this attitude may actually be very practical; But I do not want to discuss this question here.

² Of course to old guys like myself this immediately recalls the memory of a certain Nikita Khrushchov who also vowed similar claims some 50 years ago.

the research at highest possible level. I think this is the basic reason why even the poorest countries should invest in science. And remember: our principle demands that we convey this message to everybody.

The integrity of physicists, and of the scientific community in general, faces, however, another even more serious danger. I am not discovering anything new by observing that in today's world more and more dominant role is played by entertainment, by SPECTACLE. We live in the world which escapes reality, replaces it by the show, and tries to live with illusions. SHOW often seems and indeed IS more important than reality, as it is the best way one can address the public.

For many professions this is only slightly harmful. But it is deadly for science. Because science is anchored in the REAL WORLD and cannot be shifted into the virtual one. The reason is again the same: science is here to find truth and to tell truth and only truth. But when you look, *e.g.*, into the science sections of large newspapers or in TV, they are dominated by scientific "sensations" of the day, usually expressing unjustified hopes for quick applications or announcing a fundamental "breakthrough" in our knowledge. They know that this is what the public wants to see, to hear and to read. Most of these sensations actually do not live longer than a couple of weeks. Were they all true, we would have already live on the Moon and on Mars, cure all kinds of cancer, understand theory of everything, and so on.

Even worse, I am observing with a real horror that an increasing number of our fellow scientists enter such games, pushed by competition for public funds and by pressure from sponsors. I can understand them: in the "good old days" the success was measured by the recognition from the few world experts in the subject. Now this is not enough. Now one needs recognition from the crowd, the crowd which may even not know what it is all about. Therefore, to quote again the same famous Frenchman: we promise according to our hopes, we deliver according to our fears.

This mediatic competition incurs indeed a serious damage to the authority of science. Moreover, one should realize that in this game we have no chance against pseudo-science, against charlatans of all kinds who are certainly better qualified to amuse the public and who are not bound by any restrictions. The best way out seems clear: one should keep honestly to the rule of telling truth and only truth. I suspect, however, that this battle is already lost.

My last point concerns the scientific competition. Anybody who had a chance to conduct a serious scientific research agrees that it requires a really great effort: searching for truth is certainly not an easy task. The path leading to it is full of traps, wrong steps and dead ends. It is well known that even the greatest scientists are prone to make mistakes, sometimes very serious ones. It is therefore essential that the organization of science

allows the mistakes to be found and corrected as quickly as possible. Again, the scientific community developed methods to deal with this problem, the most effective one is to conduct independent research by separate, often competing, teams.

It seems to me that this healthy, competitive situation is now in danger and may be in real trouble in not-so-distant future. The point is that the global character of science tends to reduce the independent research and even independent thinking. I see on the horizon the frightening approach of the MONOPOLY. Monopoly of one or two “schools”, which do not accept any “dissident” ideas. The central system of financing, often necessary — I agree — pushes us in this direction. All this works against the basic foundations of our trade: free exchange of ideas, the right to criticize the established theories, and the possibility to contest concepts of even the most venerable members of the community. It gives me shivers when I hear that one physicist in US controls 80% of jobs in his area. This may be an exaggeration but, in any case, I think we should do everything possible to avoid such anomalies.

In many branches of science the situation is aggravated by the dominance of just few journals which dictate what is “politically correct”. Surely, we are not yet at the stage which would justify a call for alarm (internet certainly helps). But the trend is clear. To stop it, we should oppose the building of monopoly of scientific publications by one or two large companies which, by the way, are getting profits really out of proportions. Of course the economy works against this. But we should, I think, implement reasonable “anti-trust” rules to curbe this obvious attempt to achieve monopoly. The time is quickly running out, I am afraid.

Ladies and Gentlemen, I presented some implications of the idea that we, the scientists, are obliged to search for truth and to tell truth and only truth. Let me finish with the story showing yet another side of this problem. The story is very old, was known already in Ancient Greece.

It happened that a scientist (a philosopher?) received a high prize from a king. He bowed and said: Your Majesty, thank you very much for this prize which I fully deserved. The surprised king answered: I congratulate you, but don't you think that your words are a bit strange? The answer was: Yes, I know they are not very polite but I am scientist and I am obliged to tell truth and only truth. But — said the King — I gave this prize to other scientists before you and they were all humbly saying that they do not deserve it. I am convinced that they were also telling the truth, was the answer.