

## **Dinner speech**

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### **We prefer facts to fiction**

I feel honoured being invited to address the participants in this conference on nuclear data because you are among the people in the world who help us to stand on solid data in the nuclear field rather than on guesses and unproven contentions.

I am not as you know a scientist and I shall not comment on the professional subjects you are discussing. However, I do understand how relevant and practically important your work is and I should like to make some philosophical comments on the importance of looking for and relying on correct data and on the hazards of not doing so.

I shall first discuss the question in general terms. Then I shall zero in on facts and nuclear power, and facts and nuclear weapons.

Whether in the nuclear or other fields there is no lack of supply of fiction – some fabricated and circulated deliberately, some passively passed around.

We are often misled. Someone said: I rely on media – except in my own particular field...

I have heard that a web site says I am a rally driver... and a newspaper wrote recently that I have a secret passion for Karaoke... Well, I would not dare to touch the gas in a formula one car and I have never participated in Karaoke... Perhaps the writers who adorned me felt I was a bit too grey a civil servant and wanted to give me a little colour. The fiction was well intended...

One who spread fiction cheerfully was a Swedish TV teller of hunting and fishing stories. He was once asked whether he never lied.

– No, no, I never lie, he said, but I admit that when there is not enough truth, then I add. But in this way you only get a little more truth than there is in reality...

More dignified and more famous is a line by President Lincoln:

“You can fool some people all the time and all people some time but you cannot fool all people all the time.”

I am told, however, that the spin doctors who swarm around the offices of the mighty now say that this is a much too pessimistic a view. Some of them even say that they do not need to pay attention to reality. They create their own...

Spinning, hyping, disregarding, ignoring or twisting the truth may regrettably have very negative consequences. What happens when the man-made reality meets the old fashioned genuine reality on the ground? Without a correct diagnosis, how can you get the right therapy?

I recall the story about the fellow who decided to stop drinking soda water because every time he had woken up with a headache and his galoshes on was after drinking soda water. One evening he had had whisky and soda, another it was brandy and soda and the third was gin and soda...

A 15th century learned society in Paris was asked about the cause of the plague. After much thinking the learned professors came to the conclusion that the cause was a particular constellation of the stars.

We laugh at the 15th century scientists but there is evidence that some political leaders in our time have been consulting astrologers... before making decisions.

More common is probably that political leaders make diagnosis to fit the therapy they want to apply. In Iraq the diagnosis of the Alliance of Willing states was wrong and the armed intervention therapy has resulted in tragedy.

#### ***So how should we act?***

Someone said that he respected people who search for the truth and was a little worried about those who have the truth. I would add that the search for truth need not necessarily be for any direct practical purpose. Adding to the world's accumulated knowledge – basic research – needs no special justification. It is a value in itself.

When Eve gave Adam the apple, he was absolutely right to take it. If he hadn't we would all have still been hanging around in Paradise naked and with snakes all over the place. I think we are much better off here in Nice enjoying the Côte d'Azur, French cuisine and French CO<sub>2</sub> free electricity. I should add that my wife, Eva, is arriving tonight...

Can we really fool all the people all the time, as the spin doctors say? The famous Swedish social scientist, Gunnar Myrdal, said that "facts will kick", meaning that even if they are ignored or suppressed they will emerge in the long run. I hope he was right but I note that it may take time before the patellar effect occurs.

Like many other thinkers and scientists Galileo had to wait long in his grave before his scientific truth kicked in. Until that happened, the world remained on the wrong track.

The UN Iraq inspectors only had to wait a few months before the truth kicked in that there were no WMD. Even so, the cost of the delay in accepting the truth was high: it was during those months that the invasion of Iraq took place.

We are still today using the linear dose hypothesis as a basis for protective measures against ionizing radiation. Using it as a tool for predicting damage by radiation may be highly misleading. Awaiting convincing scientific data about the effects of low level radiation we are groping in the dark – perhaps incurring unnecessary expenses.

### ***Who decides what is true?***

Sometimes authorities, like kings, religious leaders or councils or legislatures take it upon themselves to decide what is true. An otherwise very competent Swedish King, Gustavus Adolphus, decided that a war ship under construction could have another deck to carry more cannons. He was not an engineer and he ignored the data of the shipbuilders. The ship capsized and sank on its maiden voyage out of Stockholm...

Deciding by voting, whether in parliaments or other assemblies what are true facts and what is untrue is not recommendable – whether it is about the existence of the devil, the occurrence of the holocaust or the massacre of Armenians. We had better content ourselves with a never ending search for the truth and the best conditions for such search exist in open societies where the right of free speech is respected.

Being in France, let us pay tribute to the enlightenment that established empirical experience and rational argument as modern standard demands in the search for secular truth. Action may have to be taken on incomplete or unproven data.

We have to face the reality, however, that decisions on action may have to be taken by governments and parliaments long before clear and convincing data are on the table. If we wait until all is known with certainty, action may be too late. Hopefully we make "educated guesses" – but there is no guarantee.

You may remember the field of strawberries which straddled the German-French border after the Chernobyl accident. The German strawberries were destroyed for having too high a level of Becquerel. The French were happily sold in the market.

The least one can demand in these common and practical cases is that it is openly recognized that the data are incomplete or uncertain and that the data, which are available, should be critically examined.

In the case of Iraq in 2003 the available data were certainly not subject to critical examination by the governments of the Alliance. Rather, they contented themselves with replacing question marks by exclamation marks...

### ***The role of data for nuclear energy***

Reliable nuclear data are a precondition for the safe use of nuclear energy. Some of the examples I have given show that we need more data, for instance, on the effect of low level radiation.

However, many of the problems we have in making use of nuclear energy in our societies are due to the difficulty of explaining facts to the public. Radiation – penetrating and perhaps damaging but invisible to the eye and without smell – remains scary. Cases like the murder in London by the use of polonium 210, adds mystique and terror. Becquerel measurements are usually frighteningly big numbers. Perhaps as human beings – this is speculation – we also have a need for a daily dose of anguish. In our urbanized lives the wolf of Little Red Riding Hood does not provide it. We turn to cholesterol, the electromagnetic field of power lines or mobile phones or – indeed – nuclear power plants...

It is sometimes argued that we must take people's anguish seriously. Yes, by all means, if we think it is justified. If we think it is not, then it is our duty to explain why not. Nuclear institutions and nuclear experts have a special duty to take part in this process. National and international nuclear related institutions have a fundamental role to play to create trust. UNSCEAR has been one such institution deserving confidence. Its objective research and advice helped bring about the partial test ban treaty that stemmed radioactive fall out in the atmosphere. The ICRP and IAEA have, similarly, through their long standing activities earned respect and public confidence.

The individual members of the nuclear profession have an educational role to play that few outsiders can credibly do. This role is particularly important at the present juncture, when the public has discovered that nuclear power generation of electricity gives rise to minimal emissions of CO<sub>2</sub> and yet remains wary of radiation and hesitant. However, while we need more professionals credibly explaining to the public we must also ask all engaged in nuclear energy applications – especially those in nuclear power – to operate at the highest attainable standards: an AHARA<sup>1</sup> principle. No industry can run completely without incidents but nuclear can hardly afford big accidents.

Recently I listened on the Swedish radio to a representative of a green movement saying that the best thing a private individual could do to help counter global warming was to reduce his or her electricity consumption. This in a country where about half of the electricity is generated by hydropower and nearly half by nuclear power!

If I am allowed to speculate again – in this talk about facts – I would suggest that electricity generation will be even more vital in the future. The day when a break through is achieved in the capacity of electric batteries and we can refill them overnight by plugging in I think we shall see global switch to electric engines in the vehicle sector. The elderly lady, who said she was against both gasoline and nuclear power plants and wanted only electricity, might be satisfied. I would try gently to sell the use of nuclear power to her by telling her what my mother once said about perfume: that it is a pity that it is needed and good that we have it.

### *Nuclear weapons: disarmament and non-proliferation*

The growth of nuclear weapons arsenals during the Cold War and widening of the circle of nuclear weapons states have contributed and continues to feed the anguish about civilian nuclear power.

The present public debate often focuses on states and non-state actors, who might acquire nuclear weapons rather than on the risks posed by the weapons that do exist.

Sometimes this is done with good intention: the risk of proliferation is a reason for nuclear weapon states to show the way and move toward disarmament. Their current preaching to others to stay away from nuclear weapons inevitably sounds a bit hollow, when they, themselves, plan new generations of weapons.

However, the expression “virtual nuclear weapon states” is unfortunate. Countries like Germany, Japan, Belgium, Switzerland and Sweden would have the technical capability to move to nuclear weapons. It does not make them “virtual nuclear weapon states”. It takes both technical capability and the will to develop nuclear weapons. These countries have long ago decided against the weapon option. They should be called “virtuous nuclear power states”.

It is true, of course, that nuclear weapons may be particularly dangerous in some hands. The independent international Weapons of Mass Destruction Commission (WMDC), which I chaired, stressed, however, that nuclear weapons are dangerous in anybody’s hands and that we must strive to eliminate them.

This was well understood by the public during the Cold War, when the number of nuclear warheads peaked at about 55.000. There was a genuine anguish in many countries that MAD – mutually assured destruction – might occur through an exchange between the US and the Soviet Union. After the end of the Cold War all drew a sigh of relief and few if any are marching for nuclear disarmament and for eliminating now remaining some 27.000 nuclear warheads – directed against whom?

Paradoxically, at a time of détente between major powers and increasing interdependence, disarmament talks have been at a standstill for some ten years. Indeed, new generations of nuclear weapons are being planned at least in the UK and the US and preparations for a space war continue in high gear. Kofi Annan has talked about the world “sleep walking” into new arms races and MAD being replaced by MAS – mutually assured stagnation in the field of disarmament.

In the discussions by the interested parties about nuclear armament in Iraq, Iran and the North Korea facts are often dressed in spin. It led the world to an unjustified war in Iraq. Let us hope that it does not do the same in the cases of Iran and North Korea.

A prominent member of the US administration, noting that many weapons in Iraq were “unaccounted for”, went on to ask “Where are they?” rather than noting that they might or might not exist. Well, it turned out they did not exist. What has been termed “faith based” evidence was advanced in support of the war in Iraq. In the case of the alleged contract for the import of uranium oxide from Niger to Iraq, one might even talk about “fake based” evidence.

I am happy to have been associated with the authority that the Security Council gave the task of compiling for it facts about Iraqi WMD. UNMOVIC was composed of civil servants working for the Security Council. As I have said: “Maybe we were not the brightest people in the world, but we were professional and in nobody’s pocket.” We carried out 700 inspections at some 500

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<sup>1</sup>As High As Reasonably Achievable.

different sites and found none of the WMD alleged to exist. As you cannot prove the negative we could never say positively that there were no WMD but we could see and we said that some evidence that had been advanced was shaky.

It was reported that our phones were bugged. If so, I only wish they had listened more carefully to what we had to say. Is this not the height of misery: being bugged and ignored!

Yet, for all that misery, the inspections by UNMOVIC and the IAEA in Iraq contributed decisively to develop the safeguards system, including on site inspection and this may be of great importance for the future. National intelligence has an important role to play, not least in times of terrorism, but intelligence and inspection are not alternatives but supplement each other as means of finding facts.

Objective data are often of utmost importance in security. During the Cold War, when on site inspection was not acceptable to the Soviet Union the use of satellite photography was helpful to provide facts and to reduce mutual uncertainty. In our inspection work in Iraq we did not even have to rely on the military powers to provide the pictures. We could buy them commercially.

Environmental sampling is another scientific method of great value to give objective data. We have seen how the IAEA using this method first discovered that some equipment in Iran carried traces of highly enriched uranium and then concluded that the enrichment had taken place in Pakistan from where the equipment had come.

States are not very keen on international inspection. Indeed, is anyone keen on inspection? As the world is likely to need more objective data, say, measuring our emissions of green house gases or our catches of fish in the oceans, it is desirable to develop remote real time methods of verification, as they will be perceived as less intrusive. Yet, I think states will also have to realize that verification is in essence a service, enabling them to show that they are abiding by obligations they have undertaken.

Once, when my Iraqi opposite number looked particularly pained at some demand I made for intrusive inspection, I asked him to remember what the dentist said to the patient: "It does not hurt. It just feels that way..."

Ladies and gentlemen, let me conclude:

This is the International Conference on Nuclear Data for Science and Technology. I would submit to you that the scope and implication of your work is wider than the title suggests. Maybe the name of the conference should be *Nuclear Data for Science, Technology and Society?*

The problems and challenges I have discussed this evening all have to do with Society's vital need for reliable data. Let me end by paying tribute to you: Your scientific attitude and the examples that you set in your work are part of the solution of the problems.

Thank you very much.