

**54th Pugwash Conference on Science and World Affairs  
Bridging a Divided World Through International Cooperation and  
Disarmament**

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**Science and Politics: Lessons from Iraq**

**Hussain Al-Shahristani**

*Dorothy Hodgkin Memorial Lecture*

## **INTRODUCTION**

Madame chairman,  
Colleagues and guests!

It is a great honour to be invited to give this lecture in the memory of a great scientist and humanist, Dorothy Hodgkin who maintained a life-long commitment to issues of peace, justice and security. She was the recipient of the Nobel Prize in Chemistry in 1964, President of the Pugwash Conferences from 1976 to 1988 and great source of inspiration for many of us here.

I would also like to pay tribute here to Professor Sir Joseph Rotblat who has spent more than half of his life campaigning for ethical science. His argument has the kind of authority that only comes with experience. Rotblat was among the team of scientists who developed the atom bomb, and he is the only member to have left the project on moral grounds.

Following his footsteps, in December 1979, I had to make a choice: either to work for Saddam on his nuclear weapons programme, or to pay a price. The choice was simple, and the price turned out to be reasonable: 11 years and 3 months in prison.

When I made that choice, it never crossed my mind that I would have to explain my decision to such a distinguished gathering of scientists. Then, I was more concerned with how to explain myself to my interrogators.

The chief of the Iraqi security organisation at that time, Barazan Al Tikriti, Saddam's half-brother, came to visit me after I was initially tortured for 22 days and nights. He told me that Saddam wanted me to work on developing nuclear weapons, because he needed "a long arm to reshape the map of the Middle-East." This was in June 1980, even before he waged war on Iran later that year. When I explained to Barazan that my scientific training was not in the field of bomb

making, he forcefully told me that "It is a man's duty to serve his country" and that "those who do not abide by this precept do not deserve to be alive." I nodded that I agreed it to be a person's duty to serve his or her country, but I had a different understanding of what constituted a service to my country. I was then taken into solitary confinement, where I was to remain for ten years.

Nevertheless, the regime, as we know, did manage to mobilise the nation's resources and to generate not only a nuclear military programme but also chemical and biological weapons programme. Scores of very talented Iraqi scientists and engineers were directed to work on these programmes. I knew most of these people personally. Many of them were scientists with clear ethical values. Why then, one wonders, would they put their talents at the disposal of such a vicious and brutal dictator as Saddam?

I will come to this question later, but first I would like to ponder on our social responsibility and moral obligations as scientists.

### **Moral obligation of scientists**

"Science is not immune to the infection of politics and the corruption of power," as Jacob Bronowski once said. He himself worked on war programmes and only woke up to the catastrophic effects of some of science's applications after he visited Nagasaki with a British Mission to study the effects of the atomic bomb.

Science and technology have been affecting every aspect of the daily lives of all peoples of the world ever since the industrial revolution. Scientists have been revered for their contribution to the expansion of our frontiers of knowledge and for the improving quality of life for many on this planet. Our generation is thus the custodian of the tirelessly earned recognition, respect and authority accrued by many generations of scientists; and we should therefore be very alert to any misuse of scientific knowledge which may tarnish or undermine these accomplishments.

The most obvious example of misuse is, of course, allowing scientific knowledge to become a destructive force in the hands of dictators or even, I dare say, politicians who are not strictly controlled by the general population and held accountable both by their constituents and by the wider community of nations.

Another possible misuse of science in our modern society is the over-commercialisation of scientific advances. This is partially due to the fact that scientific research is increasingly directed by corporate funding, and is thus more and more inclined towards ends deemed commercially attractive to these financiers. Of course the commercial exploitation of science in the fields of physics and chemistry started in the early days of the industrial revolution, and in many ways it was desirable as it provided the required resources for scientific research.

However, if the moral values of honesty, objectivity, reliability and transparency associated with science are to be upheld, and if science is perceived as being a contribution to the public good, scientists must remain free to pursue knowledge guided by these morals and the needs of the public, rather than by corporate interest and short term profiteering.

I believe one of the foremost duties of scientists is to ensure that their discoveries and achievements are used for the benefit of mankind; to improve the quality of life of as many people as possible, to prevent further damage to the environment, to find means to regenerate our planet and make life sustainable for human beings and all our co-inhabitants on earth. Our meaningful survival depends upon these traditional ideals of science.

Independent, honest scientists are needed today as they have always been, whether they are working within governments, or in the commercial sector. Important decisions impacting society depend on the integrity of scientists and upon the reliability of the scientific data they provide. Wrong decisions can cost us the earth.

This puts a serious responsibility on the shoulders of scientists. Should we not work together to change the world from what Omar Bradley described as "a world of nuclear giants and ethical infants" into a world where we strive to know more about peace than about war, where we invest more of our intellectual and material resources in caring than in killing?

I leave it to you to answer that question, and would turn now to the proliferation of weapons of mass destruction and disarmament. Of course, this issue is very important in the Korean Peninsula and in South Asia, but I will focus on the Middle East, as other distinguished colleagues may cover the other areas.

### **Proliferation of WMD**

Historically, the United States, with the support of European scientists, developed the atomic bomb because it feared German research on fission reaction might lead to such a development. The Soviet Union soon followed suit because it too felt threatened - by the West. China too developed its nuclear bomb after its relationship with the Soviet Union deteriorated. As soon as India tested its second atomic bomb, Pakistan matched the test with one of its own. Israel developed its nuclear arsenal as its ultimate deterrent to perceived threats to its existence from Arab countries.

Talking to senior Iraqi scientists who worked on the military nuclear programme, I am told that they started to work on the programme after Israel attacked the Iraqi nuclear research reactor in June 1981. That attack kindled a patriotic spirit among them that would have been otherwise difficult for Saddam to inspire.

Turning to Iran's nuclear programme and its possible impact on the security of the

region, I do not know what the Iranian capabilities are in developing nuclear weapons. It appears that its current policy is to develop nuclear power for energy production while keeping its options open for the future. Such a policy is to be expected given Israel's massive nuclear arsenal, some of which are aimed at Iran. The only way to assure Iran of its security, is to get all Middle Eastern countries to sign the NPT and to open all their nuclear sites to inspectors. These countries should be subjected to an IAEA regime of unannounced inspections, whenever and wherever the agency deems necessary.

Before leaving this subject, I would like to seek this opportunity to call from this podium on fellow scientists around the world to refrain from working on weapons of mass destruction. Such weapons will not enhance national security, but rather encourage rulers to be more aggressive and less compromising in solving international problems. The nuclear states should take the lead in reducing and eventually eliminating nuclear and other weapons of mass destruction in their possession while at the same time strict adherence to non-proliferation be respected by the states that have not developed such weapons.

## **Iraq**

I would like now to share with you my deep concerns with what is going on in Iraq. Let us recall that today's Iraq is the ancient Mesopotamia. The civilization that grew in the river valley of the Tigris and the Euphrates produced the world's first writing, first calendar, first library and the world's first democracy. Hammurabi, the king of Babylon was the first to codify laws governing the social life of citizens. It was a code in which abandoned women, slaves, and even animals had rights. The Hammurabi code is acknowledged not just as the birth of legality, but the beginning of an understanding of the concept of social justice.

Most of these treasures were kept at the Iraqi Museum in Baghdad, one of the greatest repositories of human heritage. The museum was the second on the list of 16 crucial sites which the Office of Reconstruction and Humanitarian Assistance asked the Pentagon to protect before the invasion of Iraq. Yet the Museum was left unprotected and was - inevitably - looted. The last building on that same list was the Ministry of Oil. It was the only one that was given protection.

Iraq has more than 10,000 listed archaeological sites. These sites were not protected either, and several sites have been irreparably damaged because they were used as military camps. At Babylon, the military have located their helicopter-landing field in the heart of the ancient city. The frequent daily flights of the helicopters rattled the ancient walls and the winds blown by them damaged the fragile ancient bricks.

The Iraqi National Library and State Archives Building which contain some very old copies of the Quran were left to be burnt without any attempt to secure them by the occupying forces.

Iraqis were liberated from Saddam's tyranny with promises of democracy and of assistance in the rebuilding of their country. Several nations, most notably the United States, pledged many billions of dollars for the reconstruction of Iraq. Iraq's own oil revenues were also put at the disposal of the Coalition Provisional Authority (CPA), for the purpose of financing reconstruction.

To this end, the UN Security Council passed resolution 1483 in May 2003 to set up the Development Fund for Iraq giving control of Iraq's oil revenues along with other Iraqi funds, to the CPA on condition that these funds be spent in the interests of the Iraqi people and that they be independently monitored and audited. However, not until April 2004, almost a year later, was an auditing firm appointed, leaving it only a few weeks to go through the books before the CPA dissolved itself and handed over authority to the Interim Iraqi Government. This meant that for the entire year that the CPA ruled in Iraq, it was not brought to account for what it had done with some US\$20 billion of Iraq's own money.

Meanwhile, in a different pot, the US congress approved US\$18.4 billion for the Iraq Relief and Reconstruction Fund. In addition to these two funds, the Madrid conference of donor nations last year pledged over US\$15 billion towards reconstruction in Iraq.

So, how were these major funds spent, and what impact have they have on Iraqis?!

Well:

Of the \$18.4 billion Iraq Relief and Reconstruction Fund approved by the US, only \$366 million of the total pledged was actually spent by the time the CPA ended its work-merely 2% of the total. Of the Madrid Conference pledge of \$15 billion, to date less than \$2 billion has materialized but even this has not found its way to Iraq yet.

As for the Iraqi oil money, almost \$20 billion was spent with no clear records and no accountability. At the time of the handover of power in June 2004, Christian Aid issued a report that read: "billions of dollars of oil money that has already been transferred into the U.S.-controlled Coalition Provisional Authority has effectively disappeared. . . . The U.S.-controlled coalition in Baghdad is handing over power to an Iraqi government without having properly accounted for what it has done with some \$20 billion of Iraq's own money."

Not much can be shown to Iraqis in terms of basic services or construction projects for the billions of their money that has apparently been spent. The lack of progress in reconstruction has only made the security situation worse, providing as it does a

point of focus for the grievances of those deprived of their share in the national wealth and denied participation in Iraq's social and economic advancement.

Transparency is essential in any democracy. Without transparency and accountability, Iraq will go the route of riches and power for the few, and poverty and marginalization for the many. If a unified Iraq with territorial integrity is to be preserved, only a democratic system that holds integrity, transparency and accountability as the main pillars of governance will be capable of holding the country together. No reform in Iraq will bear fruit without the establishment of a pluralistic and democratic system. Iraqis, in all their different hues, ethnic affiliations and religious and sectarian factions are unanimous in believing democracy is the only framework capable of allowing them to live together as equal citizens.

### **Conditions in Iraq today**

I returned to Iraq on 7 April 2003, two days before the fall of Saddam's regime, on a humanitarian mission. I had to go first to Abu Ghraib prison, where I had been imprisoned, to look for fellow political prisoners. None was found. I then went to look for them in mass graves. Tens of mass graves were uncovered; some held a few dozen remains and others many thousands. Only a few people could be identified.

On this humanitarian mission I visited many towns and villages and talked to common people about their hopes, expectations and dreams. Despite the diversity of Iraqi society one common theme was repeated to us.

An Iraqi woman told us: "These three decades (under Saddam's rule) were very hard. The first decade melted away our fat. The second ate the flesh. The third crushed the bones. But we are determined to keep our heads up."

An Iraqi man said: "Saddam tried to destroy the goodness of the Iraqi people. We must prove that he has failed."

A common commitment was: "Never again another dictator."

The laws of occupation - derived primarily from the Hague and Geneva Conventions and the International Bill of Human Rights - impose two fundamental obligations on Occupying Powers. The first is for it to withdraw its military forces and to end the occupation as soon as possible. The second is for it to safeguard the rights of the occupied population during the temporary period before the occupation is ended.

Ordinary Iraqis have lost hope that the occupying forces can or even care to protect them from local and international terrorism or to provide for their basic needs. The

only hope left for them is to have elections where they can choose their representatives from among themselves and entrust their governance to an authority that cares about them.

If we fail to hold free and fair elections by January 2005 as envisaged by the UN, and thereby kill this last hope of the ordinary people, then Iraq will be on a very dangerous course and the chaos that will result could lead to a civil war and the disintegration of the country. Under such pressures, Iraq will quickly turn into a breeding ground for anarchy and terrorism that would not only engulf the region but also threaten the rest of the world.

There are dangerous forces, both local and external, that are working to undermine the January election. They do not want a stable, progressive and prosperous Iraq, and see their interests in tightening their control on the people and plundering the national wealth. Iraq needs all the help and support of the international community and the UN it can get to organise and carry out these elections in accordance with international norms. Such a distinguished group as Pugwash can play an important role in joining Iraqis in calling for these elections to be held in a timely and a fair manner.

The reason that is normally cited for delaying elections is the security situation. The security situation will not improve under military occupation and not until a legitimate government is elected; legitimate in the eyes of its own citizens. Hence, elections are a prerequisite for security and not visa versa.

### **What can the international scientific community do to help Iraq?!**

First and foremost of the ways in which the community can help is by calling upon the UN Secretary General, Security Council members and on their respective governments to provide all the necessary support and the political will to ensure that free and fair elections are held on time by January 2005. The Iraqi Independent Electoral Commission that was set up by the UN is determined to succeed in organising this election on schedule and in accordance with international norms. The Commission should be given all the backing and tools it needs to succeed in this mission.

Secondly, the community has a role to play in rebuilding institutions of higher education, universities and research centres; this is an important and urgent task in Iraq. Iraqi universities have been cut off from the rest of the world for thirteen years. Most of the universities and research centres in Iraq were looted during the war and need to be re-supplied with laboratory and research equipment and instruments. They also lack scientific journals. If international scientific journals cannot be provided directly, then internet access to them would be very helpful.

Under Saddam, the whole population has suffered, but the scientists were a special case. The majority of competent scientists, professionals and technologists were forced to work on military programmes, to develop weapons of mass destruction: chemical, biological and nuclear. After the fall of the regime, most of these scientists have been left without jobs, even though some of them may still be paid salaries. There isn't any real work for them, and no facilities for them to work in. A primary task in the reconstruction is to rebuild those facilities and engage these scientists in a way that would benefit the country and serve the people. I regret to report that there has not been much progress on this front.

Weapon scientists, as the experience in the ex-Soviet Union shows, can produce research and contribute to the national development if properly organized and provided with the appropriate incentives. But, in general, these scientists do not have a real or clear understanding of global scientific and development needs. Iraq requires international support to help it establish Science and Technology Centres for the re-employment of these scientists and engineers and put them in touch with similar centres in other countries. Such centres can be good incubators for projects that absorb the talents and expertise of these scientists and redirect their work into the reconstruction and development of the country.

Restoration of the southern Iraqi marshes is another area where international collaboration is required and the contribution of the scientific community is essential. These marshes were the cradle of human civilization and supported a unique culture and way of life that had continued almost unchanged for over 5000 years, since Sumerian times.

The marshes were drained by Saddam's regime during 1992-95 and turned into salty wasteland. The southern Iraqi Marshes are of global importance and their restoration is a human, cultural and environmental concern, not only for the Iraqi people but for humanity at large.

Recognising these needs and the role which the scientific community is capable of playing, a group of distinguished Iraqi scientists have set up the Iraqi National Academy of Science to promote natural and applied sciences for the service of the people and country, and to revive Iraqi creative talents for the good of humanity. Among the aims of INAS is to develop an ethical framework for the application of science for the benefit of the people and the country. The support of the world academies, scientific institutions and the world scientific community is needed to help the Iraqi academy through its initial stages.

## **Conclusion**

This morning I have tried to concentrate on two principal themes, and I thank you all for bearing with me if at times I appear to have digressed or indulged in personal, anecdotal meandering!

On the one hand, I wanted to bring our attention here at this gathering to the thorny issue of ethics and science; to attest to the possibility as well as to the imperative of an ethical approach to science. I believe that in pursuing this debate, and working together towards an understanding of the relationship between advancements of human knowledge and human ethical conduct, we as scientists must have respect for those who went before us and to whose collective canon of knowledge we can only hope to add microscopically to.

In seeking an engaged debate on the role of ethics in science we are also acknowledging the responsibility of the individual at a time when it has become too easy for the scientist to absolve himself or herself of personal responsibility, as macro forces - be they driven of the market economy or forced upon us by political or military circumstances - tend to depersonalise the motor propelling scientific knowledge forwards.

This is not to say that I judge or am in any way capable of judging scientists and others who are forced into the morally unpleasant circumstances in which many ethically grounded and intellectually solid Iraqi scientists sadly found themselves. It is rather to suggest that as a community of scientists, growing technologically closer together and globally more responsive to each others realities, we owe it to one another and to the fields of knowledge in which we work, to make those circumstances as rare as possible and to provide one another with the kind of support that will ensure no scientist that stands by his ethical or moral position in the face of political, military or other pressures, will stand alone.

My second area of focus has, of course, been Iraq and the present situation there. The scientific community, which has historically owed so great a debt to this little patch of the planet, yet which has recently seen almost only its horrific and destructive forces at work, must now look again to the possibilities in Iraq. These are virtually unlimited in terms of the scale of the need in the country. None is more important and urgent than helping Iraqis carrying out their first elections free and fair. Also engagement of the scientific community in new Iraq is necessary and urgent; it is also vital that a new era of ethical scientific conduct be heralded and supported.

Finally, I wish to thank Mr Park and the Korean Pugwash Group for such a wonderful organisation of this conference. No wonder after he organised the Seoul Olympics. Thank you.