

TOWARDS A WORLD WITHOUT NUCLEAR WEAPONS: HOW CAN SCIENTISTS HELP?

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Abstract

The Nuclear Non-Proliferation Treaty could eventually result in a significant reduction – or even complete elimination – of nuclear weapons. Technologies from the accelerator field, such as transmutation of weapon-grade uranium and plutonium, alternative techniques for nuclear power generation, detection of fissile material and verification, will be very important for this effort. The present trend in modern diplomacy is to form unconventional alliances to make progress on challenging issues. Could an alliance between diplomats and scientists help to achieve the ultimate goal of reducing and eventually eliminating nuclear weapons?

KEYNOTE ADDRESS TO IPAC2011

I must say that I feel honoured to address the IPAC 2011 Conference on the subject of how the scientific community can help move us towards a world without nuclear weapons; and not a little daunted by the breadth of scientific intellectual horsepower assembled in the room this afternoon.

I should stress that this presentation is very much a personal view; informed by my professional experience of course, but also by my contact with the scientific community over the past 5 years and in particular those involved in developing accelerator driven systems for energy production. It is an area of research where I have been struck by the potential crossover between the energy security and the wider security agenda both military and Non-Proliferation.

To set the scene for my intervention today I should say that I believe that over recent years those of us involved in multilateral diplomacy have witnessed a gradual shift from traditional power politics towards a new diplomacy; one that seeks to harness the crossover in values and interests and it is in this context that I believe scientists have a window of opportunity to inform and engage with a very important international debate – that the views and experience in this room today can play a crucial role in determining whether we achieve our ambitions, be that in the proliferation debate, the subject of my talk to you today, but also on the wider climate change agenda and the issues of sustainable energy needs.

The idea of a road towards a world without nuclear weapons is most commonly associated with President Obama's speech in Prague in the spring of 2009 where he said

One of those issues that is fundamental to the security of our nations and to the peace of the

world (is) the future of nuclear weapons in the 21st century.

The existence of thousands of nuclear weapons is the most dangerous legacy of the Cold War. No nuclear war was fought between the United States and the Soviet Union, but generations lived with the knowledge that their world could be erased in a single flash of light.

Today, the Cold War has disappeared but thousands of those weapons have not. In a strange turn of history, the threat of global nuclear war has gone down, but the risk of a nuclear attack has gone up. More nations have acquired these weapons. Testing has continued. Black market trade in nuclear secrets and nuclear materials abound. The technology to build a bomb has spread. Terrorists are determined to buy, build or steal one. Our efforts to contain these dangers are centered on a global nonproliferation regime, but as more people and nations break the rules, we could reach the point where the center cannot hold.

... Just as we stood for freedom in the 20th century, we must stand together for the right of people everywhere to live free from fear in the 21st century. And as nuclear power, ... the United States has a moral responsibility to act ... the United States will take concrete steps towards a world without nuclear weapons... We cannot succeed in this endeavor alone, but we can lead it, we can start it.

So ... , I state clearly and with conviction America's commitment to seek the peace and security of a world without nuclear weapons. This goal will not be reached quickly - perhaps not in my lifetime. It will take patience and persistence.

In fact President Obama's speech was the high point of a wider effort over the past 3 years to bring the nuclear disarmament agenda back into sharper public focus in particular by the unprecedented action of our elder statesman, notably former US Secretaries of State Kissinger and Shultz, and US Senators, Nunn and Perry; These four increasingly drew in the active participation of their counterparts in Europe under the new European Leadership Network initiative.

Their basic argument was that as senior decision makers of the Cold War the process of nuclear disarmament that they had launched through treaties such as SALT, START etc.

and which had led to the reduction of nuclear arsenals by 75% at the end of the Cold War, had become stalled; had lost momentum and as such their legacy was being squandered

5 years ago when I took up my post as British Ambassador for arms control and disarmament and first started out on this journey I could see for myself that right across the multilateral landscape much of the formal institutional architecture lay in ruins, from the Conference on Disarmament in Geneva through the Biological and Toxin Weapons Convention process to the cornerstone treaty the Nuclear Non-Proliferation Treaty (or NPT) and the review process that underpins it. All had failed to produce agreement on the way forward for the best part of a decade.

The first task was therefore to rebuild the architecture, sometimes to put in place new platforms, but most important to establish new ways of thinking and renewed confidence that progress on these important issues was possible.

Traditionally the focus of much of the diplomatic and political effort to make progress on this agenda has been the negotiation of new international norms in large part expressed as international treaties such as the Nuclear Non Proliferation Treaty itself.

The NPT often seen as the cornerstone to the disarmament and non proliferation architecture does not seek to ban nuclear weapons, but has at its heart a bargain between the 5 Nuclear Weapon States (NWS) — China, France, Russia, US, UK — with the Non Nuclear Weapons States, under which the NWS agree to disarm over time in exchange for the Non Nuclear Weapons States agreement not to acquire nuclear weapons. In return for this bargain the NPT parties agreed not to restrict cooperation in and development of the peaceful uses nuclear energy i.e. of nuclear fuel cycle.

While there are disagreements over the pace of nuclear disarmament and concern about whether countries such as Iran and Syria are respecting their obligations, in general the NPT has worked well particularly if one considers that in the 1960s it was thought that between 20–30 countries would acquire nuclear weapons.

But International norms, be they those established 40 years ago in the realm of Weapons of Mass Destruction (WMD) or in other fields, are not panaceas. They will not in, or by themselves make the world a better or a safer place, or get us onto that elusive road towards a world without nuclear weapons.

We only need to look at the norms we establish in the domestic environment to observe this. Most of our countries have laws to prevent people driving too fast on the roads and yet these laws are broken many times per day and this in a society with the full panoply of the police and justice system. Of course International society has no such apparatus and nation states, like people will still transgress against the norm.

So norms are probably only part of the solution. I am no philosopher, but even while wrestling with intractable diplomatic issues I am frequently struck by how little we deploy the theories of causality; an area of philosophy that

all here would recognize given its crossover into scientific research.

So perhaps a step back from the politics and diplomacy might allow us to see that the creation of international norms are a Necessary but probably not a Sufficient condition for success.

That we need to achieve a better understanding of why the problem of nuclear proliferation exists and why it is a particularly intractable problem for the 21st century.

Today there are many who would assert that Nuclear Weapons have little or no military utility and that the Nuclear Weapons States retain them more for reasons of political power and prestige.

While there may be an element of truth in the fact that those who have or who seek to obtain nuclear weapons, also seek to retain or acquire political benefit from so doing, But this only a part of the motivation.

The reasons why the original 5 Nuclear Weapons States acquired nuclear weapons are well known, embedded as it was in the huge loss of life caused by two conventional world wars within a space of a generation and the deep distrust that existed across the ideological, and geographical fault lines of what became the Cold War.

For those states who decided not to sign up to the NPT obligations, Israel, Pakistan and India it is also perfectly clear that these countries have from their history perceived a real military risk and that this was one of the motivations for acquiring nuclear weapons.

In the more recent cases of concern over Iran and North Korea's decision to leave the NPT, the motivation can also be seen in part a response a perceived military threat. If the countries with the most powerful military machines in the world start talking openly about ideas such as Axes of Evil and instigating Regime Change and moreover begin to put such ideas into practice, we cannot be too surprised if this behaviour, rightly or wrongly, prompts a response by those who feel themselves to be a potential target.

If action to address the military and strategic rationale for nuclear weapons is clearly an essential part of getting us onto the road towards a world without nuclear weapons I believe we have to delve further back into the first principles if we are understand how to make sustainable progress.

Nuclear physicists to whom I have posed the question have described Three essential steps that would allow us to have a degree of certainty about being on that road:

Firstly one would require a Commitment by all countries not to acquire nuclear weapons and to abolish those that they have

Secondly one would need a similar commitment not to test nuclear weapons.

Thirdly one would need a commitment not to produce the raw material for nuclear weapons and to destroy weapon grade uranium and plutonium stockpiles.

In order to have a degree of assurance that our path down the road was irreversible, one would need mechanisms to monitor that countries were meeting their commitments.

If we accept this description of three key steps as a benchmark, then we can see that we are probably not yet on that road towards a world without nuclear weapons.

While the NPT largely meets the first requirement, 3 countries have refused to sign the commitment to disarm

Although the Comprehensive Test Ban Treaty (CTBT) meets the second requirement, we have unable to get the treaty into force; where one of the key obstacles is the US Senate's reluctance to ratify the Convention.

And for more than a decade we have failed to begin negotiations of an Fissile Material Cut-Off Treaty (FMCT) in Geneva, where Pakistan is currently blocking the start of work.

While the Institutional framework for verification of the IAEA and CTBO already exists it has not been able to deal with the intractable problem of the international communities confidence gap in what Iran and some other Middle East countries nuclear programmes.

This is an area where scientists also have an important role to play and the United Kingdom has been doing ground-breaking work with Norway and the NGO "Vertic" in recent years on the verification of nuclear disarmament. More about this important project is available at Vertic's website. But that is not the focus of my presentation to you this afternoon.

To my mind beyond the military, political, institutional obstacles to progress there is a more profound issue that we ought to consider and that is the technology itself.

While I am no scientist, it does seem worth posing the question whether it is realistic to expect to be able to remove the threat of nuclear proliferation over the long term while we continue to base our civil nuclear industry on a technology that is so closely, if not inextricably linked to the development of nuclear weapons.

Let me be quite clear on this point. I am not suggesting that civil nuclear power is intrinsically unsafe, or environmentally unsustainable as part of a diverse portfolio guaranteeing energy security.

I recognize that there are those who do take that view and who point to Chernobyl and Fukushima and the challenge of what to do with nuclear waste both civil and military, as evidence for their view.

I accept that these are questions that must be addressed. But the anti-nuclear agenda it is not my personal conviction, still less the view of the UK government. Rather I believe that civil nuclear power has served us well, but equally that it is right to question whether new technologies, such as accelerator driven systems might not offer alternative and indeed better long term solutions.

These are questions that decision makers and policy advisors are not necessarily well equipped to answer and in far too many case perhaps not even aware of the possibilities.

Even if one ignores the power and influence of what president Eisenhower called the military industrial complex, it is the nature of our societies and institutions that without inspirational leadership think of for example Bill

Gates, or Steve Jobs we all have a natural tendency to stick to the familiar.

For the past 5 years I have been living next door, or strictly speaking above, the CERN project; a quite remarkable example of international cooperation; accepting of course that scientists are like any other human beings subject to petty jealousies and at times ruthless competition for scarce funding.

However I believe that the world scientific community arguably contains more visionary leadership than perhaps any other part of our societies and that scientists have an innate understanding of the interconnectivity and interdependence of this 21st Century world in which we live.

In my own field of diplomacy, Over the past 5 years a number of senior British political and military leaders have been arguing that while the world of Power Politics has not gone away, we do need to adapt international diplomacy to better reflect our interdependent and interconnected 21st century world. Some have argued that the limitations of power politics are increasingly becoming evident, be they in the way we wage war or in our efforts to pursue the climate change agenda.

The lesson I personally draw from the last 5 years in Multilateral Disarmament is that Power Shared is Power Multiplied; that a multidisciplinary approach that focuses on our shared values and interests is more likely to bear fruit. It is an agenda where I believe scientists have a key role to play

But I do not underestimate the challenge

Our political leaders will often talk of the importance of shared values and interests in foreign policy More rarely do they refer to power; although terms such as "exceptionalism" indicate that power politics still permeate our thinking.

And this attachment to power politics is still reflected in our international organisations and groupings, most of which were established during the last century – a period dominated by power politics – take for example the UN or the G8, or the newer G20 - all are to some extent an expression of the "The Big Boys club"

In my personal view this is often a rather unhelpful way of viewing the world. It leads to disempowerment and reinforces the view that the worlds problems are all the fault of a small group of nations and moreover that is their responsibility to fix them, rather than a collective endeavour in which we share responsibility, but perhaps more important, it is neither an inaccurate reflection of our modern networked international society not the way we interact in our own societies.

The majority of our populations share similar basic values. The same is generally true of nation states. While a good number of our domestic political leaders come from wealthy and powerful elites, we do not generally elect them because they are wealthy and powerful. We elect them in large part because they reflect our values and our interests.

In the domestic environment politicians are perfectly aware of this and deliberately position themselves to do

harness these dynamics. President Clinton's "It's the economy stupid" although I am not sure he ever said that himself, is an appeal to the citizens direct interest in having a job and a reasonable degree of material wealth. The current fashion of many British politicians for ties and jackets off informality is a deliberate visual signal, not of power but of shared value and interest with the citizen.

Modern political leadership in the realm of domestic politics involves identifying the common ground. The shared values and interests agenda and building up on this to create a network of support for action. The failure to pay attention to this aspect of domestic politics in certain parts of the world has been only too apparent in recent months. But it is also striking how rarely we think to transfer these important lessons from domestic politics to the way we behave in the international arena.

As I mentioned earlier, a number of leading British political and military thinkers are calling for change in international efforts to meet the challenges of the 21st century, and in this context I believe that scientists have an increasingly important role to play in articulating our shared interests at global level.

An example of what I mean was the creation of a coalition of the UK, Algeria, Iran and Cuba that allowed us to put the Biological and Toxin Weapons Convention (BTWC) Review Conference back on track in 2006.

Prior to this date the BTWC was locked in an acrimonious debate where the countries of the Non Aligned Movement rejected efforts to strengthen the regime. Some because they resented the implication that they represented a proliferation concern, others because the debate provide a focus and opportunity to frustrate "big power" ambitions.

The turning point proved to be to argue that strengthening the regime would lead to benefits and new opportunities for research in Life Sciences, which is of course the flip side of the proliferation concern in the field that the BTWC covers. But the important lesson I drew was that a focus on the shared scientific (and of course economic) interest rather than the risks was the approach that unblocked a 5 year impasse.

From what I have heard from the scientific community I believe that there is an important window of opportunity to bring policy and decision makers on-side in supporting the development of accelerator driven energy systems, but that it will be important to couch this as an important technological contribution to the wider debate of nuclear disarmament and non proliferation.

WHY A WINDOW OF OPPORTUNITY?

Firstly, because the issue of disarmament and non-proliferation is at the forefront of international decision makers current concerns.

Secondly, because despite all the hype and enthusiasm about the supposed renaissance in civil nuclear power the reality as the Canadian Academic Trevor

Finlay has pointed out in his report for the Nuclear Energy Futures Project, even by 2030 a very large number of countries would simply not be able to integrate traditional nuclear power plants into their electricity grids as their infrastructure is not strong enough to do so.

The recent events in Fukushima have also caused countries to pause and look for alternatives to nuclear power, despite the very real need to increase clean energy production capability to meet both economic development and climate change targets.

The challenge for the international diplomatic community over the past 5 years has been to put an end to the ten years of acrimony and stalemate in the international institutions such as the UN and the NPT regime. To a large extent that has been achieved. This means that an international debate on the future of nuclear technology can move forward.

What is needed now is for the scientific community to bring forward your vision of how new technology and techniques might answer some of the questions diplomats and decision makers are grappling with.

As I indicated when referring to the BTWC this does not need to be done by a group of powerful states. What is needed is for a group of likeminded countries to table proposals. Other examples of this have been the launch of the proposal to establish a new Arms Trade Treaty to regulate the international arms trade, or the Cluster Munitions Coalition that successfully negotiated a new treaty banning these weapons in 2008

In some countries arrangements exist for a structured dialogue between scientists and government such as the Jason Group in the United States, but again there is nothing to prevent scientists engaging directly with government.

The key point will be to engage; not simply to secure funding, but to bring to the table new ideas and inform politicians and decision makers dealing with the wider international issues, to explain how the important technologies around particle acceleration might provide answers to much wider concerns.

In short to match your agenda to theirs.

I do not suggest that this will be easy. There are many vested interests who wish to preserve the status quo and many who will doubt and question the validity of any new technology.

But as Eleanor Roosevelt, one of the founders of the United Nations once famously said "Nothing much has ever been achieved by those who said it couldn't be done".

Thank for your attention.