Communicating Science for Peace: the Chemical Disarmament Experience

Keynote Address at the ECSITE 2014 Conference

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Thank you, Dr Hagmann, for that generous introduction.

Ladies and gentlemen,

I am very pleased to address the ECSITE 2014 Conference.

As you can imagine, all of us at the Organisation for the Prohibition of Chemical Weapons, States Parties, staff past and present, are immensely proud of having been awarded the Nobel Peace Prize last year. We are especially pleased that this award acknowledged the tangible nature of our achievements in eliminating chemical weapons.

This is because we are an organisation that has been going about the task of disarmament as a practical and attainable reality, not a distant aspirational goal.

The facts speak for themselves.

In only seventeen years, our membership has grown to 190 countries – just six short of universal membership. And having overseen the destruction of some 82% of declared chemical weapons over this time, the goal of a world free of these barbarous weapons is not a distant prospect – it is very much within our reach.

But the Nobel Prize also gave us pause to consider how our work, and that of disarmament more generally, contributes to peace.

In its simplest formulation, disarmament removes illegal weapons and therefore the possibility of recourse to them. In the case of nuclear, biological and chemical weapons, this means removing the possibility of radioactivity, poisoning and disease increasing the number of victims in any conflict, combatants and civilians alike.

But does this amount to peace, one of the themes of this Conference? Peace is, after all, not as simple a concept as we might like to think it is. For most of us, the absence of war, or threat of war, does not equate to peace – at least not in a durable sense.

These are questions we address in a very direct and practical way on a daily basis at the OPCW, because our work goes well beyond what many people understand as disarmament. Or rather, our work involves a very broad understanding of disarmament to fit a very broad understanding of peace.

Many of you are probably unfamiliar with just how extensive the OPCW's mission and mandate are. Although, hopefully, some of you will have learnt more by either participating in yesterday's lunchtime tour of our headquarters next door, or visiting our booth at the conference.

The Chemical Weapons Convention, which we are charged with implementing, is not just a vehicle for ridding the world of existing chemical weapons – as vitally important a task as this is. It also obliges us to work to prevent the re-emergence of such weapons, to render assistance to protect against chemical attacks or incidents, and to promote peaceful uses of chemistry.

In short, it is a regime for comprehensively moving chemistry and related applications away from the potential for harmful misuse, towards actively beneficial use.

The former UN Secretary-General Kofi Annan put it eloquently when he said of the Chemical Weapons Convention that, "It is not merely a great step in the cause of disarmament and non-proliferation. It is not merely a signal of restraint and discipline in war. It is much more. It is a momentous act of peace."

The simple formula behind our regime, one which goes to the broader understanding of peace I have been hinting at, is this: durable peace and security can only be built on a willingness to share knowledge and prosperity.

In our efforts to achieve this broadly based goal, engagement with science, industry and other stakeholders, plays a key role. And it does so at several levels.

At the most fundamental level, the OPCW's interaction with scientists helps us create a baseline for distinguishing between malevolent and benevolent science. Because what we are dealing with more often than not are materials and technologies that have multiple uses. They can render great benefits for human and economic development, but they can also cause great harm if misused.

Consider these examples.

We were all tragically reminded of the deadly effect of the nerve agent sarin, when it was used in the Damascus suburb of Ghouta last August. Nerve agents attack the nervous system by inhibiting – a key enzyme for muscle and brain function. These agents prevent muscle relaxation, effectively forcing the body into overdrive, with high exposure leading to death through respiratory failure.

Yet, some drugs used in the treatment of Alzheimer's Disease, act by targeting and inhibiting the same enzyme. In therapeutically effective doses, these medicines help to increase the levels of neurotransmitters in the brain, resulting in improved cell signalling and temporarily reducing symptoms of this disease.

Other chemicals of interest are less sophisticated in their composition and far more commonplace in enriching our daily lives.

Chlorine, for example, is a widely used industrial chemical, and can be used for municipal scale water purification.

Yet, the same chemical that purifies drinking water was also the first chemical weapon to be used on a mass scale almost one hundred years ago near Ieper in Belgium.

Sadly, this was not the last that we have heard of such attacks. Earlier this month, we sent an OPCW fact-finding mission to Syria to examine allegations of chlorine gas attacks.

The challenge for us at the OPCW, and all 190 member states of the Chemical Weapons Convention, therefore, is to strike a balance between prevention and promotion in chemical science. This effort is being closely informed by our collaboration with scientists and researchers.

The OPCW Scientific Advisory Board is a key vehicle in this regard. It is a rotating group of 25 independent experts from around the world. The overarching challenge that they face is to ensure the OPCW is keeping abreast of new discoveries in science and technology that could not only pose challenges for implementation of the Convention, but also enable more effective monitoring and inspection on the part of the OPCW.

These priorities are reflected in what the Board is currently assessing – namely, potential benefits for the Convention arising from discoveries brought forward by convergence of chemistry, biology and other scientific disciplines, and new verification methods and technologies.

I will not delve into these issues here. Suffice it to say that the Scientific Advisory Board's work refracts, and focuses in sharper detail, cross-cutting networks underpinning broader partnerships between the OPCW, its Member States and their scientific establishments.

Nonetheless, I would like to highlight a third issue that the Scientific Advisory Board is presently working on – one that goes to the very heart of the subject you are addressing at this conference. That is enhancing education and outreach.

No matter how targeted our controls are, or how state-of-the art our verification techniques are, the effectiveness and achievements of the Chemical Weapons Convention owe much to the good faith, political will and transparency of its stakeholders – in government, in industry, in civil society, as well as in science.

On the basis of this experience, we are now moving to broaden this community of stakeholders.

In the first instance, this means making emerging and future generations of scientists aware – in our case, of the multiple uses of chemicals – and exploring with them the potential societal implications, both positive and negative, of scientific and technological advances. Such discussion fits well with the attention paid nowadays to the responsible conduct of research, which I see has been the subject of a number of sessions at this conference.

Our purpose is not only to nurture more ethical scientists, but also more capable and rounded ones.

This means helping young scientists develop a world view from the very beginning of their careers, and as an integral part of them. However specialized their work might be, it is vital that scientists are able to contextualize its broader purpose and applications.

We need to remedy Albert Einstein's observation that "our technology has exceeded our humanity."

To be blunt – the loner doing chemistry in a hidden laboratory is no longer an option. Science has long entered the mainstream in our vibrant, information-rich digital age. It has no choice but to engage in a multidisciplinary way.

The challenge for us involved in disarmament and non-proliferation is to make responsible science – science that at all times constrains its potential to harm and proactively engages on global issues – an integral professional trait for all of its practitioners around the world.

This bottom-up approach must, therefore, start early – in high school or before.

One of the most ardent spokesmen for teaching students about chemists' social and ethical responsibilities is a retired Dutch chemistry teacher, Chrétien Schouteten. So persuasive are his appeals that we decided to film him in the first part of a documentary film series by the OPCW known as the Fires Project.

In the film, "A Teacher's Mission," which you can watch from our website, Chrétien tells the story of how he sought to instill through a variety of innovative teaching methods, an awareness of the ethical and

moral dilemmas that chemists can face in his students as an integral part of their curriculum

One of his students, now a postgraduate chemistry researcher, fondly recalls this legacy and how it has affected his work in another interview in the film.

In support of this noble goal, the OPCW has been rolling out tools and materials for awareness-raising, education and outreach. For example, working with the Junior Science Lab at Leiden University, some local Dutch and international high schools and the International Baccalaureate Organisation, we have developed modular educational materials for use by high school students. The student workbook is based on an active-learning approach and includes not just theoretical work, but also suggestions for role play and practical experiments.

At the same time, we have sought to make students part of our education and outreach mission. For example, we have recently initiated a project with students of a science communication course at the University of Groningen to help provide materials that speak to younger audiences – the scientists and leaders of our future.

However, our efforts to reach young scientists – to help them work actively towards science in the service of security – must cut both ways. This is not just a matter of more well-rounded scientists being able to communicate their ideas to non-scientists. We also need more science-

literate officials and diplomats who are engaged in setting security policy.

In this way, we can create a common community rather than seek to span two separate communities. Such a community will serve to mutually reinforce and extend our collective knowledge and expertise – from ideas to implementation. It will provide a vital foundation for building future success in multilateral disarmament.

Beyond the scientific community itself, whether in the making among high school students or fully formed at universities, the OPCW has another, even broader target audience – namely, everyone else, the public at large.

The OPCW has been far from a household name over most of its seventeen-year history. I am sure that many of you coming from outside The Hague had not even heard of the OPCW before the award of the Nobel Peace Prize and the establishment of the mission to eliminate Syria's chemical weapons last year.

But the very high profile we are currently experiencing, together with intense international scrutiny of our work, have compelled us to see our mission in a way that we can explain it more clearly to more people.

Certainly, the international limelight offers us a unique opportunity. We need to make use of it in a way that outlives the headlines. And we can

best do this by making everyone a stakeholder in the goal of a chemical weapons-free world.

One lesson we have learnt is that we cannot expand our community of stakeholders by simply disseminating more broadly the sort of information we share with those who ask for it.

We need first to expand our constituency. And the way to do this is by imparting a sense of the challenge that we are addressing, to encourage participation through shared experience. In other words, before someone can show an interest in what we do, they must first relate to the challenges we are addressing, understand how they can be affected them personally.

The Fires Project, which I mentioned earlier, perhaps best illustrates what I mean by this.

The second part of this series features the film, “Ich liebe Dich” (“I Love You”). In it, two personal accounts are intertwined to weave a narrative of how chemical weapons continue to affect two lives in present-day Vienna – one of Kayvan, a survivor of the chemical attack in 1988 on Halabja, and the second of the physician who treated him.

The film very poignantly demonstrates how any of us, in an affluent western city, could encounter these two individuals, without knowing

their past experience of chemical weapons, and how it impacts their consideration of their present and future.

Our hope at the OPCW is that this sort of experience, as conveyed in film, will stimulate not only greater interest in our work, but also participation in our mission. For this reason, Fires is intended as a participative project: we want to receive feedback and ideas from viewers on how we can reach more people.

This sort of interaction is key to how we are scoping our education and outreach endeavours. For it is not our intention simply to expand the chemical disarmament constituency and to ensure it is well informed about our work – we also want it to participate in our common purpose of ridding the world of chemical weapons and ensuring that these weapons never re-emerge.

How we use diverse media to reach an ever wider audience will be a key driver of our success in this regard. There will always be a place for briefing interested parties through traditional formats and presentations. But, wherever possible, we are moving towards more dynamic, interactive vehicles for communicating our goals.

These vehicles include live webinars in cooperation with national and international scientific societies, as well as increasing our activity and visibility in social media. We have seen participation in our social media networks increase exponentially over recent months, with ever more

connections being made between disarmament and other global challenges that serve to challenge conventional wisdom.

A case in point are efforts in industrial chemistry production to make processes more efficient, generate less waste, and reduce the use of toxic materials. These efforts – driven by global concerns about pollution, the environment, human health and corporate responsibility, are thus enhancing the goals of the Chemical Weapons Convention.

Another example of this sort of cross-fertilization of knowledge, relevant to our work in protecting against chemical weapons, is healthcare-focused research related to epilepsy, Parkinson's disease and Alzheimer's disease. New knowledge on biological processes resulting from this research has helped us develop more effective countermeasures against chemical warfare agents.

In this context, I hope as many of you as possible will take part in this afternoon's panel discussion on how science centres and museums can help raise awareness of these sorts of connections.

This brings me to how we can work with science centres to our mutual benefit.

The OPCW's success in broadening our constituency and communicating a science-based vision of peace will depend on two

factors: innovation and interaction. To this end, we will need help, and we will ask for it.

Science centres reach a broad public with innovative exhibitions using cutting-edge multi-media technology and participative design. They are vital partners for organizations such as our own in extending our reach.

By the same token, science centres need to be alert to opportunities for cooperation arising from heightened public interest and physical proximity. I know that this has very much been in the minds of our colleagues at Museon and The Hague Municipality in fostering more linkages within the international zone where we are now meeting. The recent Nuclear Security Summit and heightened interest in the work of the OPCW provide especially salient opportunities.

The present exhibition at Museon, "Give Peace a Chance," is a case in point of what can be achieved in this area. In fact, the Dutch title is perhaps more descriptive of what the exhibition invites visitors to do, namely, "Werken aan Vrede" – "Working Towards Peace." It does nothing less than empowering the public to take a stand on issues through mixed media displays and to respond to an imaginatively created survey.

We were very happy to provide some of our inspection and analytical equipment to Museon for the current exhibition, which provides an

opportunity to explain our activities to the general public, something which is not possible in our security-conscious headquarters next door.

We are therefore working with the Nobel Peace Center in Oslo, which also has an exhibition about the OPCW on display currently, in order to develop a travelling exhibition which can be displayed at different venues around the world.

We are all here to exchange ideas on how we can push the boundaries of learning as a total experience – not only to convey information as effectively as possible, but also to directly engage people from all walks of life in what we do, why we do it, and what this means for all of us.

This conference is bringing to light vital points of intersection that create a sense of practical common purpose. This purpose, surely, is to show how we can educate and empower through participation and interaction.

It is my firm belief that education and outreach are the building blocks of the durable peace I alluded to at the beginning of my remarks – building blocks to which more of us must continue adding.

As far as our mission at the OPCW is concerned, a world forever free of chemical weapons cannot be achieved through mechanisms aimed at preventing misuse of science and technology. We must create a culture

of responsible science working in the service of security as well as prosperity.

For disarmament is not just the absence of weapons, no more than peace is just the absence of war.

Just as peace is not anyone's prerogative, but rather, everyone's responsibility and vested interest.

The message I want to leave with you is:

All **people** of this **planet** working together for **peace**.