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**ADDRESS TO THE INTERNATIONAL SYMPOSIUM ON SCIENCE DIPLOMACY AND
INTERNATIONAL POLICY**

**SCIENCE DIPLOMACY AND THE ROLE OF
ACADEMIC INSTITUTIONS**

May 12, 2016

**LOUGHBOROUGH UNIVERSITY
LONDON, UNITED KINGDOM**

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Science knows no country, because knowledge belongs to humanity,
and is the torch which illuminates the world.

~ Louis Pasteur¹

Not yet two decades into this new century, it is clear that the 21st century will be like no other – a period distinguished by an unprecedented level and depth of global interaction in all domains – economic, political, cultural. In such an interconnected environment, as I will highlight in this talk, joint efforts across national boundaries have been growing to use science and technology to address shared global challenges including global health management, food security, environmental sustainability, water shortage and global security, among others.

Science – its outcomes, outputs and impacts – has radically transformed our world, enhancing the lives of people around the globe. As Alan Bernstein, President and CEO of the Canadian Institute for Advanced Research, has noted, scientific advances have improved lives in both the developed and developing worlds – augmenting agricultural productivity, ensuring better health through vaccines and antibiotics, improving maternal and child health, and creating powerful new ways of communicating.² One fairly recent example is the development of the Ebola vaccine by Canada's National Microbiology Laboratory in Winnipeg, Manitoba, a discovery of global impact and benefit.

I. Science Diplomacy: A Definition

Science is inherently a global activity – one that transcends language, politics and geography, as Bernstein and others have noted – and is increasingly carried out by large, international teams of researchers. As such, the phrase 'science diplomacy' has itself evolved, referring to interactions among national states in science to address world challenges.

But what exactly do we mean when we use the term 'science diplomacy'? The term combines two distinctly different areas of human interest: 'science,' being a non-political evidence-based universal language; and 'diplomacy, a process of managing relations between sovereign states reflecting their individual national interests.

In January 2010, the Royal Society and the American Association for the Advancement of Science noted that 'science diplomacy' refers to three main types of activities:

- 'Science in diplomacy': Science can provide advice to inform and support foreign policy objectives.
- 'Diplomacy for science': Diplomacy can facilitate international scientific cooperation.
- 'Science for diplomacy': Scientific cooperation can improve international relations.

¹ As quoted in *Louis Pasteur, Free Lance of Science* (1960), René Jules Dubos, Ch. 3 "Pasteur in Action."

² Bernstein, Alan. "The torch which illuminates the world: Canada, science and democracy," *iPolitics*, December 1, 2015.

The growing importance of science diplomacy is reflected in incorporating scientific initiatives in diplomatic negotiations and in governments using scientific advisors in developing evidence-based international policies. A number of thinkers, including my fellow panelist Daryl Copeland, distinguish between science diplomacy and regular international scientific cooperation on the basis of state participation. As such, science diplomacy implies the engagement of states or organizations that are supported by nation states, i.e. UN agencies or similar organizations. Notwithstanding such distinctions, academic institutions are central to all forms of scientific collaborations.

As science diplomacy becomes increasingly prevalent, traditional modes of diplomacy are also evolving. Today, we are seeing the advantages of 'soft power' being joined – and dramatically enhanced – by the evidence-based decision-making and problem-solving made possible through the hard and soft sciences to solve complex, transnational, and in many cases, science-based problems. Joseph Nye and others have used the term 'smart power' to refer to the joining of soft and hard (or coercive) powers as an effective strategy in defending national security interests, and this seems an apt description for science diplomacy more broadly. That is, science diplomacy aims to create 'smart' or strategic frameworks to address multilateral issues using scientific collaborations and interventions.

II. Building Trust

Scientific and cultural exchanges established in mutual respect, alongside scientific collaboration, are essential frameworks that help to build trust and to create sustainable peace. In the 1960s, science diplomacy helped to maintain peaceful interactions between east and west during the Cold War while normal diplomatic relations were strained. These collaborations were led primarily by academics and academic institutions, with the tacit approval of national bodies. This peaceful collaboration facilitated and accelerated the later development of a number of current joint initiatives.

Many examples of such collaborations exist, but let me refer to one I am intimately familiar with. The International Center for Heat and Mass Transfer, or ICHMT, on whose Executive Committee I served for many years, is an organization created in 1968 with the blessings of scientific national agencies from the east and west as an apolitical forum for scientific exchange and cooperation among scientists from both sides. The ICHMT mission was to pursue excellence and foster international exchange of science and engineering in all branches of heat and mass transfer through symposia, publications, and the promotion of research, education and exchange of personnel for the benefit of people everywhere. Subjects such as nuclear energy and space sciences were central to its activities.

Another recent example of building trust through collaborative research involving scientists in countries whose diplomatic relations are strained is the current collaboration between the US National Academies and their Iranian counterparts. I have also noted on the slide the German Academic Exchange Service – or DAAD – one of the world's oldest and most important funding organizations for the international exchange of students and researchers.

III. Advancing Knowledge through Large-Scale Infrastructure

One of the great examples of successful science diplomacy, which requires the involvement of national governments as well as academic institutions, is the development of international large-scale research infrastructures. Due to the enormous scientific and financial challenges in addressing major global and scientific issues, country states, building on existing or earlier academic collaborations, are investing in large-scale infrastructure that enable scientists from all over the world to work collaboratively to advance human knowledge.

You will be familiar with two of the more well-known examples:

- i. CERN (European Council for Nuclear Research): Today, physicists and engineers from all over the world are investigating the fundamental structure of the universe, using the world's largest and most complex scientific instruments to study the basic constituents of matter at the CERN laboratory. One of Europe's original joint ventures, the CERN laboratory now has 21 member states, and its location on the Franco-Swiss border near Geneva is itself a symbol of international cooperation and innovation on a global scale.
- ii. International Space Station (ISS): Five separate space agencies representing 15 countries built the \$100-billion International Space Station and together continue to operate it today. Along with the United States, Russia, Europe and Japan, Canada is a partner in this orbiting research laboratory, the most complex international scientific and engineering project in our history, and the largest structure humans have ever put into space.

IV. Science Diplomacy and Social Justice

Science diplomacy can be viewed as a tool to reduce the imbalances in the world, and thus as a means for advancing world peace. Building scientific and social capacity in underdeveloped countries will help to address health, environmental and security challenges faced by all, reduce poverty and violence, and support global sustainable development. Building such capacity in underdeveloped and developing countries enables their scientists to collaborate effectively with researchers in developed countries to address the many interdependent global challenges that affect us all.

While working to maintain the autonomy and integrity of academic institutions and scientific bodies, and ensuring equitable geopolitical representation of those bodies at the international table, our aim should be to look to science for opportunities to create coalitions of support, to build trust and alliances between nations, and to find mechanisms for sustainable conflict resolution.

Moreover, increasing access to science and technology in underdeveloped or developing nations in order to advance the human condition will help to address urgent global challenges ranging from climate change to infectious disease control to democratic and human rights reforms.

As Alan Bernstein has noted, science strengthens the case for open, transparent societies.³ Helping to foster a culture of science in other countries is one of the most effective, and least paternalistic, ways in which we can help other countries to develop democratic values.⁴

V. Global Health and Science Diplomacy

Global health is an excellent example of an area where science diplomacy is playing a central role in addressing a major global challenge. The importance of global health is reflected in the growth of related international collaborations in academic programs, research initiatives, policy development, and crisis management. The world interdependence and the need for global initiatives have been demonstrated by the struggle against HIV/AIDS, the Ebola crisis, and the continuing risk of transnational epidemics. Improved public health in underdeveloped countries is central to addressing these global challenges and is also central to economic development and reducing the global risk of violent extremism.

Academic institutions are playing an important role in advancing global health education and research. At York University, we launched in 2014 an undergraduate degree program in Global Health – a joint BA/BSc program that is the first of its kind in Canada. Courses are offered through an interdisciplinary framework that brings together the natural sciences, social sciences and the humanities, providing students with a breadth and depth of health knowledge as well as the opportunity to learn about the factors that affect health, ranging from biology (i.e. genetics) to the social determinants of health (i.e. poverty and human rights). With a transformational \$20 million donation from York alumnus Victor Phillip Dahdaleh, the London-based business leader and philanthropist, we also recently established The Dahdaleh Institute for Global Health, which will be a leader and catalyst in addressing global health issues, serving as a focal point for international dialogue and collaboration in health innovation research and teaching.

VI. Climate Change and Science Diplomacy

It is clear that evidence-based decision-making is necessary for addressing the increasingly urgent issue of climate change. What is also needed, as the following examples highlight, are shared frameworks and vision for tackling the challenges of greenhouse gas emissions and global warming. Climate change is multifaceted and affects different countries in different ways, with bilateral and multilateral negotiations highlighting competing interests and discrepancies between the needs and aims of the developing world versus those of the developed world.

Two fairly recent initiatives reflect the positive, transnational movement on the challenge of climate change:

i. Intergovernmental Panel on Climate Change (IPCC): Founded in 1988, the Intergovernmental Panel on Climate Change, or IPCC, is the international body for assessing the science related to climate change. The aims of the IPCC are to assess scientific information relevant to human-

³ Bernstein, Alan. "Science Diplomacy as a Defining Role for Canada in the Twenty-First Century," *Science & Diplomacy*, June 10, 2013.

⁴ Bernstein, Alan. "The torch which illuminates the world: Canada, science and democracy," *iPolitics*, December 1, 2015.

induced climate change and its impacts, as well as options for adaptation and migration. Thousands of scientists and other experts contribute on a voluntary basis to writing and reviewing reports, which are then reviewed by governments.

IPCC reports contain a 'Summary for Policymakers.' These assessments are policy-relevant but not policy-prescriptive – they may present projections of future climate change based on different scenarios and the risks that climate change poses and discuss the implications of possible responses, but they do not tell policymakers which actions to take. The IPCC embodies a unique opportunity to provide rigorous and balanced scientific information to decision-makers because of its scientific and intergovernmental nature.

ii. Paris Agreement: At the Paris climate conference (COP21) in December 2015, 195 countries adopted the first-ever universal and legally binding global climate deal. This historic agreement sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to well below 2°C. The agreement is due to enter into force in 2020.

This will call for not only international agreements, but working-level relationships between scientists and engineers from countries that are often political and economic rivals. In developing countries, clean energy technologies must be considered in conjunction with both economic development and poverty reduction efforts.

VII. Higher Education and the Mobility of Scientists

As an engineer and former international student, my perspective on global partnerships in higher education and the mobility of scientists reflects my personal experiences as well as my views as President of Canada's third largest – and possibly most diverse – university. The imperative to adopt such policies and practices is even more critical at organizations such as my own, where students are admitted from all walks of life – from urban to rural regions; from upper to lower-income backgrounds; from new immigrant families and from many historically disadvantaged groups and communities. This diversity in our student body is further enhanced by the University's goal of attracting a greater number of international students from every part of the world. We see diversity as one of our greatest strengths as it exposes our students to the multiplicity inherent in world cultures, religions, political views, etc.

With their academic mission of discovery and the transmission of knowledge in research and scholarship, universities have a key role to play in improving cross-cultural understanding and collaboration. Moreover, universities' role represents a virtuous circle as these cross-cultural connections drive and accelerate further innovation: indeed, today's modern technologies, which are in many cases the product of academic research and development, allow researchers to collaborate in unprecedented ways to foster better understanding among world cultures and address transnational issues. As we have seen, research and knowledge-generation are universal enterprises -- activities not limited by borders – and as William Burns has noted, benefits to one nation need not come at the expense of another.⁵

⁵ Burns, William J. "The Potential of Science Diasporas," *Science & Diplomacy*, December 2013.

VIII. Conclusion: The Future of Science Diplomacy

To conclude, among the many compelling reasons to pursue science diplomacy, I would suggest that one of the most important is its relevance to the future of the world's young people. The Millennial generation is increasingly globally oriented; they identify as world citizens and are looking to their countries to form the global coalitions and partnerships necessary to address the challenges the planet faces. Upon graduation from universities – and even before – our young people are actively looking for opportunities, whether through employment, internships or volunteering, that balance their ideals and aspirations with the chance to apply their knowledge and skills.

Accordingly, the ultimate aim of leading universities today is the development of global citizenship. As universities develop internationalization strategies to address the needs of their graduates in the global landscape of the twenty-first century, it is important to ensure that their academic programs, research activities and student life reflect a strong commitment to promoting and supporting intercultural understanding, providing opportunities for dialogue, and championing the values of equity, inclusivity and freedom of expression. This should be a priority for all institutions of higher learning today, as what is at stake is not only the development of world citizens, but also the possibility of world peace.

Canadian universities are increasingly adopting internationalization strategy, as was shown in a comprehensive survey conducted in 2014 by the Association of Universities and Colleges in Canada (AUCC).⁶ We are fortunate that our country's deliberate immigration policies over the last 50 years have helped to make Canada the model state for multiculturalism that it is today.

Indeed, Canada's new government, led by Prime Minister Justin Trudeau, has signaled that international relations and diplomacy are a high priority for the government and for the country. They have adopted a mandate to lead international efforts in climate change, to develop a North American clean energy and environment agreement, and to re-energize our role in international development and culture and education exchange.

Science and science-related diplomacy can play a central role in building and strengthening our relationships with other countries and organizations. As I have outlined, these activities, collectively referred to as 'science diplomacy,' can involve formal and informal exchanges of knowledge and talent, collaborative research networks, and the sharing of scientific resources and infrastructure.

Today, scientists are playing an increasingly visible and critical role as knowledge brokers, creators and disseminators, ensuring that the outputs, ethos and values of science and knowledge and technology are available to all. In these efforts, science diplomacy – which is, as I have suggested, quite literally a form of 'smart power' – can and should be central to each of our nations' focus on foreign policy and our role in the world.

⁶ *Canada's Universities in the World* – AUCC Internationalization Survey (December 2014). <http://www.aucc.ca/wp-content/uploads/2014/12/internationalization-survey-2014.pdf>