When Geneva Meets Genetics

Michael West analyses the emerging nexus between science and diplomacy

On a steamy day in 1974, from a facility nestled in the mountainous Puerto Rican jungle, humankind made its first concerted attempt to cross the most imposing of borders: the void separating this solar system from the rest of the universe. The Arecibo radio telescope beamed a message to the stars, encoding a variety of mathematical and scientific concepts – from our system of counting to the structure of DNA – that would inform alien recipients about humanity.

Since that date, this method of bridging such an inevitably vast communication gap by appealing to science and mathematics, what Astronomer Royal Martin Rees called "the surest common culture", has gained traction. The obvious caveat – that contact with extraterrestrials is wildly unlikely – does not make the idea useless. Closer to home, we must take advantage of the border-crossing universality of science to forge the transnational connections needed to address the looming challenges of the 21st century.

This concept, labelled 'science diplomacy', is defined by Nina Fedoroff, the Science and Technology Adviser to the United States Secretary of State Hillary Clinton, as "the use of scientific collaborations among nations to address the common problems facing 21st century humanity and to build constructive international partnerships". Although 'science' is difficult to define exactly, scientific interactions can refer to those between individual practising scientists, officials in science-focused policy bodies and non-government organisations, or institutions such as universities, research laboratories and national, scientific academies. In these circles, science diplomacy is the subject of increasing enthusiasm. The United Kingdom appointed its first Chief Scientific Adviser to the Foreign Office last year; Fedoroff was recently elected president of the prominent American Association for the Advancement of Science; and countries from Europe to Asia are beginning to invest in similar programs. This is because politicians, diplomats and scientists all see potential benefits in the many different forms that science diplomacy can assume.

Science for Diplomacy

First, there is 'science for diplomacy', which involves states working cooperatively on joint scientific projects that target international issues like climate change, and which build closer relationships as a result. Speaking to the Royal Society, the UK's national academy of science, the British Foreign Secretary, David Miliband, quoted Thomas Paine's epigram, "an army of principles can penetrate where an army of soldiers cannot," to illustrate his belief in the utility of science to cultivate linkages despite tense political climates.

Historical collaborations between Soviets and Americans, Germans and Israelis, and Western and Eastern Europeans all provide valuable precedents that could be applied in the present day. In the Middle East, for example, eight nations – including Iran, Israel and Egypt – are cooperatively building a shared synchrotron facility in Jordan. The Royal Society is partnering with the Organisation of the Islamic Conference to produce an Atlas of Islamic World Science and Innovation, which will identify potential science linkages in Muslim-majority countries globally. These efforts aid science, while nurturing constructive international ties.

Diplomacy for Science

Second, there is 'diplomacy for science', which entails using diplomatic engagement to create cross-border political support for programs that benefit science. Examples might include providing state funding for multinational projects like the Large Hadron Collider particle accelerator or enacting less restrictive visa requirements. After the September 11 attacks, scientists from Muslim-majority countries faced difficulties in collaborating with their American and European counterparts because of prohibitive travel restrictions. Other issues, like the management of intellectual property and the regulation of potentially harmful emerging technologies, also require an international approach, with diplomats laying the foundations for scientists to conduct their work.

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Science in Diplomacy

The third major component is 'science in diplomacy', which reflects the fact that scientific advice must now inform foreign policy decision-making, from climate change to nuclear weapons. Rapid shifts in technology can break diplomatic impasses by enabling cheaper or more politically acceptable solutions to thorny problems. Negotiators must also be aware of what is still impossible, and recognise limitations in areas like the detection of nuclear material or the genetic engineering of crops. Embedding access to objective, scientific information within foreign policy departments is vital to developing a culture of respect for science, rather than only calling on

it retrospectively to justify decisions that have already been made.

Finally, science and technology are important sources of soft power in their own right. Sputnik and Apollo were key sources of global prestige in a divided world for the Soviet Union and the United States. More recently, when American and British scientists developed the Internet, English became its lingua franca, spreading powerful cultural influences into many nations whose borders were otherwise tightly sealed. The potency of the Internet has been recognised by regimes from China to Iran, which have instituted widespread, but inevitably incomplete, online censorship regimes.

Science and Politics

However, where scientists begin to be drafted as soldiers on the battlegrounds of international diplomacy, objections begin to be raised. Politics and science are two very different cultures. Many researchers are cautious about diluting the distinguishing features of the scientific method, such as objectivity, transparency and accepting uncertainty, in pursuing diplomatic goals. David Dickson, the former news editor of the prestigious science journal Nature, has warned of the "danger of distorting the integrity of science itself". Two main notes of concern have been sounded.

First, scientific impartiality must not be undermined by political entanglement. If scientific advice is to be used to inform foreign policy conclusions, it has to be unbiased or its value is lost. Scientific credibility could vanish if political forces exert pressure on scientific institutions to produce outcomes that are deemed politically convenient. Of course, governments may direct more funding to areas that they consider to be of national concern; but attempting to control the conclusions of such research, as the Bush administration did by rewriting reports from the Environmental Protection Agency, conflicts with scientific values.

Yet interference may occur even with the best of intentions. Bringing science and politics closer together invites politicians into the realm of scientific debate. However, there is a disconnection between politicians' need for firm action and digestible sound bites, and the hedged conclusions with which scientists are more comfortable. Even the many leaders who genuinely value impartial scientific input may request more certainty than scientists can legitimately provide. In 2009, the Danish Prime Minister Anders, Fogh Rasmussen, demanded a "yes or no" response from scientists on whether his proposed cuts to carbon emissions would be adequate, thereby reducing a complex issue with significant uncertainty to an overly simplistic answer.

Second, the genuine pursuit of science must not be subordinated to international showmanship. Although successful science can provide valuable 'soft power' capital, it is vital that scientists are not diverted into sham programs more focused on generating publicity than achieving scientific progress. Equally, the influence of state disputes on international scientific exchanges should be limited where possible, unlike situations in which national sporting teams are made to boycott disputant countries. Discretion is required on the part of scientists, but heavy-handed direction from the state would be detrimental to the free flow of ideas.

An example from the Cold War illustrates the fact that past governments have not always taken a hands-off approach. In 1955, the American physicist and Nobel laureate Richard Feynman was invited to a scientific conference in Moscow. He sought the advice of the U.S. State Department because he had worked on the Manhattan Project and was concerned about the possibility that he might be detained and questioned. The Department responded that they believed that the Soviet Government was "primarily motivated by the prospect of propaganda gains in the international political field, and [had] little intention of establishing more normal scientific relations which would involve great exchange of mutually beneficial scientific information", and urged him to decline the invitation. He did not attend. Clashes like this may strain relationships between scientists and politicians, but should not prove intractable.

Australia's Role in International Scientific Exchanges

Where does Australia stand amongst these global science linkages? Unfortunately, not yet at the forefront. An Australian Academy of Science report, published in February 2010, surveyed our level of internationalisation and identified several areas for improvement.

One crucial program is employing scientific staff in embassies to facilitate international collaboration and secure access for Australian scientists to expensive research facilities that we cannot afford to build ourselves. Disappointingly, Australia has only five scientific attachés abroad. By contrast, the UK's Science and Innovation Network employs 90 staff in 40 embassies worldwide. The UK has only twice Australia's GDP and three times its population, so our shortfall cannot be explained solely by appealing to our smaller size. Australia's Department of Foreign Affairs and Trade also lacks an equivalent to the high-level scientific advisers present in the British and American departments.

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The Academy's report also recommended the appointment of an Australian envoy for science. This figure would be a prominent scientist, empowered to work across borders to locate opportunities for Australian science. Such a position would mirror the science envoys to Muslim-majority countries announced by Barack Obama in his landmark speech in Cairo in 2009; these representatives have recently begun visits to North Africa, the Middle East and Indonesia. Programs like these should be embraced to secure and extend Australia's place on the global scientific stage.

The most significant challenges over the coming decades, for Australia and the world, will only be met by the fusion of scientific progress and diplomatic consensus-building. Societies will require breakthroughs from laboratories and conference halls in equal measure. As a result, governments must invest in ensuring that science informs and reinforces diplomacy, and flourishes in a supportive international environment. To transcend borders in the pursuit of global goals, we may indeed find that one of our best tools is science, the most universal of languages.

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