The Science-Diplomacy Interface – Has It Changed?*

Peter Gluckman[a], Annalise Higgins[b]
[a]Director, Koi Tū Centre for Informed Futures, Auckland, New Zealand;
President, International Science Council
[b]Senior Fellow, Koi Tū Centre for Informed Futures, Auckland, New Zealand
E-mail: peter.gluckman@informedfutures.org; annalise.higgins@informedfutures.org

In the last few years, science diplomacy has become a 'buzzword'. The concept has apparently undergone a degree of evolution – or has it? Certainly, the science-diplomacy interface's focus has recently become more explicitly pragmatic and transactional.[1] The issues that can and might be addressed via an effective interface have evolved. However, science and diplomacy have always been intertwined.

Understanding the science-diplomacy interface requires understanding the relationships between science and knowledge, knowledge and power, and between power and the advancement of state interests. Diplomacy, in the context used here, is a means of seeking to advance national interests in relationships between states. The science-diplomacy interface has always sat within this set of relationships.

Science, Patronage and Power

Patronage sits at the heart of understanding the science-knowledge and knowledge-power nexus. Science is an empirical form of enquiry that seeks to advance knowledge through enquiry, testing, and refining hypotheses. But scientific enquiry carries a cost. Science has therefore long attracted patrons. For much of recorded history, polities have relied on knowledge and the technologies that flow from it in one way or another as central to power, influence, and economic growth.

The nation-state has been modern science's primary patron for well over 150 years. That patronage has been motivated by the national benefits derived from science. However, national interests, the international advancement of science, and issues of the global commons are not mutually exclusive. They often reinforce one another. Indeed, for much of the post-Second World War period, significant progress has been made in addressing global challenges, and science, supported by national investments and international cooperation, has been integral to that progress.

However, recent events have highlighted the risks, including those of missing opportunities, if the focus of science diplomacy is reduced to promoting direct progress on issues of the global commons and giving inadequate attention to questions of how science diplomacy can pragmatically serve national interests. A longer-term perspective on how the science-diplomacy interface has developed over this time frame offers insights into the possibilities and limits of science diplomacy as the world confronts a new era of heightened instability.

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Science, Diplomacy and National Interests

During the nineteenth and twentieth centuries, science was given increasing focus by many nation-states because of its interface with economic, defence, and security interests. The relationship between empires, power, and international law has been well documented.[2] While states were major patrons of science, during and after the Industrial Revolution, industries also invested heavily in knowledge-based innovation and technology. This has become particularly apparent in the past two decades.

In many cases, state-sponsored science and international goods aligned, providing fertile ground for science diplomacy. The late nineteenth and early twentieth centuries witnessed a plethora of examples of international cooperation across the practice of science, the adoption of international agreements informed by science, and the setting of standards to facilitate technological progress.[3] The international sanitary conferences (1851-1938), the establishment of the International Telegraph Union (1865), the series of conferences culminating in the International Meteorological Organisation's founding in 1873, and the *Convention du Mètre* (1875) offer a small number of well-known examples.

Interest in science's interface with defence and security accelerated with the Second World War, particularly in the United States of America. It has been well recognised that under the influence of Vannevar Bush and his report[4], *Science: the Endless Frontier*, science became more tightly linked in the minds of policymakers with economic growth.[5]

The post-1945 period is also seen by many modern practitioners as the time when science diplomacy emerged as a distinct practice.[1] The UN's establishment in 1945 ushered in an (imperfect) era of multilateral cooperation spanning significant periods of global challenge and change, including the Cold War, Decolonization processes, and rapid technological change with the rise of computing.

Science, technology, economic power, security and geostrategic interests remained linked across these periods. What has changed over the last century is how that linkage operates, as well as the focus and opportunities for science diplomacy.

Immediately after the Second World War, the focus was on building international organisations in a framework set by the victors (in particular, the USA). International science received increased focus with the establishment of UNESCO. Scientific activity and advice were embedded across other UN agencies, particularly in developmental aid agencies and in areas such as public health (World Health Organization), food security (Food and Agriculture Organization) and environmental stewardship (United Nations Environment Programme).

Science supported soft power projection during the Cold War. Nevertheless, international science working in partnership with diplomats could still have a major impact. Examples include the Antarctic Treaty (1959), the Montreal Protocol (1987), and the formation of the Intergovernmental Panel on Climate Change (1988). International scientific cooperation grew, although many countries across Asia, Africa, Latin America, and the Middle East remained peripheral participants, and the institutions and networks of science remained heavily concentrated in Europe and North America.

After the Cold War, the global order shifted again. While unequal representation persists, the geography of science has diversified. China and India invested heavily in science and experienced sustained economic growth. In the early part of the twenty-first century, science and diplomacy made significant advances in addressing issues of the global commons. In 2015, several landmark agreements were concluded: the Sustainable Development Goals, the Sendai Framework for Disaster Risk Reduction, and the Paris Accord on Climate Change.

And yet, over the past decade, the enthusiasm of that period has been replaced by more overt superpower competition, an increasingly multipolar world, weakened multilateral arrangements, and more cynicism towards the post-1945 rules-based world order.

A Challenging New Era for Science Diplomacy

The world has rapidly progressed to a new and worrisome phase. With good reason, uncertainty is

high. It is a period characterised by fractured globalisation, multipolarity, and the emergence of non-state actors with a size and influence that is highly disruptive. These actors have an uncertain synergy with superpower interests, focusing middle and lesser powers into somewhat uncertain choices and direction. It is uncertain whether full technological sovereignty will remain possible in all but the most powerful nations.

Science-based technologies, especially in the digital space, have more clearly than ever demonstrated the linkages between science, technology, economics, security, and power. AI and quantum technologies have emerged rapidly and profoundly impacted superpower competition and economic strategies. Such technologies inevitably have defence applications, as seen in the use of autonomous weapons and drones in armed conflict.

We are seeing barriers being erected to knowledge sharing in science, both in the name of security and economic growth, especially in areas related to platform-based science.[6] These barriers, that emerge from the very different geostrategic context of the last decade, have created challenges for many in the scientific community. These barriers also raise uncomfortable debates in an era of more overt conflict over the probity or not of whether scientific institutions could, in some circumstances, such as nuclear research facilities, be legitimate targets of war.

Technological developments have fundamentally altered the global information environment. The combination of behavioural science and information technologies has reinforced the ability to deploy disinformation in cognitive warfare.[7] Information disorder[8] and cognitive warfare disrupt democracy, drive polarisation, and generate conditions that are generally destabilising.

The science-power relationship is stark across all of these examples. That is an unavoidable component of the context in which the next era of science diplomacy will be practised.

Looking Forward

As the multipolar world has become overtly more transactional, it is inevitable that science is caught up in how national strategies evolve. Science and technology are also increasingly core to how trade agreements operate. But there has been a cost: a relative loss of focus on and commitment to the issues confronting the global commons. Global commons span many of the examples of international interests listed above, including places, interests, challenges, and resources.

Growing polarisation and changed attitudes to both international cooperation and long-term thinking in some liberal democracies also impact scientists' and diplomats' ability to focus on the global commons. While there are growing concerns about the limits being placed on international scientific cooperation in an era of heightened economic and geostrategic competition, of which restraints on global scientific mobility are but one example, there remain pragmatic paths forward to address issues of the global commons.

Taking those paths will require a mature understanding of how to navigate the relationships among science-knowledge, knowledge-power, and power-state interests. The science community might accelerate this progress by recognising the pragmatic side of science diplomacy.[1,9] The challenge for those pursuing progress on the global commons will increasingly be finding points of alignment between domestic political and business interests and issues of the global commons.

Progress on the global commons relies on international scientific and diplomatic cooperation, the multilateral system, and the achievement of global or near-global agreements. There will continue to be many opportunities where scientific and diplomatic interests can align.

However, given the urgency associated with many issues of the global commons and the relative failure of interventions such as the Sustainable Development Goals, new forms of dialogue and cooperation may need to be considered. Those new forms must better consider the different incentive structures and interests associated with different types of global commons and integrate this nuanced understanding alongside robust scientific capability. The role of non-state actors, particularly platform companies, must

be considered. International cooperation will be increasingly shaped by infrastructure, governance, and institutional design.[6]

The practices of science and diplomacy have both evolved during the last two centuries. So too has the interface between the two disciplines. The next era of that evolution must be characterised by a deeper understanding of the pragmatic constraints and emerging opportunities on both sides of the interface.

References

1. Turekian VC, Gluckman P (2025) Rewiring science diplomacy. *Science*, 389 (6762): 761. https://www.science.org/doi/10.1126/science.aeb4815
2. Benton L, Ford L (2016) Rage for Order: The British Empire and the Origins of International Law, 1800-1850. Cambridge, MA: *Harvard University Press.*
3. Headrick DR (1981) The tools of empire: Technology and European imperialism in the nineteenth century. New York: Oxford University Press.
4. Bush V (1945) Science, the endless frontier: A report to the President. Washington: United States Government Printing Office.
5. Rayward WB (2024) The attempt to create a post-World War II international information order. *IFLA Journal*, 50(4): 732–754. https://doi.org/10.1177/03400352241242123
6. Turekian VC (2026) Platform science and the fragmentation of global scientific cooperation. *PNAS Nexus*, 5(6): 140. https://doi.org/10.1093/pnasnexus/pgag140
7. Blatny JM, Steen S (2025) Cognitive Warfare: NATO Chief Scientist Research Report. NATO Science and Technology Organization. https://www.sto.nato.int/wp-content/uploads/chief-scientist-report-cognitive-warfare-final.pdf
8. Wardle C, Derakhshan H (2017) Information Disorder: Toward an interdisciplinary framework for research and policymaking. Council of Europe report DGI(2017)09. https://rm.coe.int/information-disorder-report-2017/1680766412
9. The Royal Society & American Association for the Advancement of Science (2025) Science diplomacy in an era of disruption. https://royalsociety.org/-/media/about-us/international/science-diplomacy/science-diplomacy-in-an-era-of-disruption.pdf