

The Blue Edge: science and diplomacy in Antarctica

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Dedication

To Joanie and BOD, you were extraordinary parents—a poet and a cloud gazer true to the spirit of your age...

Penguins

*White flash, dash, splash
Blue light, ice cold water,
Black splash, dash, back
Blue ice, getting warmer*

Declaration

This thesis contains no material which has been accepted for the award of any other degree or diploma in any university. To the best of the author's knowledge, it contains no material previously published or written by another person, except where due reference is made in the text.

Anne Michelle Davis

17 February 2023

Acknowledgements

I am enormously grateful to my Chair and supervisor Professor William Maley, and panellists Professor Emerita Lorraine Elliott and Dr Anthony Bergin, for their academic leadership and guidance. Each a pathfinder, their collective vision about what diplomacy, science and politics contribute to the progress of human ideas cleared the way for this addition to Australia's oral history of Antarctica. Their patience never failed, no matter the myriad challenges this project threw at me.

The project itself owes a curtesy to serendipity. A poster of Emperor penguins appeared on my Canberra office wall on the thirtieth anniversary of the Antarctic Treaty. The poster was a replica of one I had seen growing up—a vision of blue and white that contrasted starkly with the red centre of the Northern Territory where I was born. It got me daydreaming about the people who work in Antarctica and the time my father nearly went there. A radio technician with skills in demand, he was posted somewhere just as remote to end up with dusty boots instead of snow shoes. Why would a technical expert like Dad want to winter in Antarctica? This wondering, plus a scant knowledge that Antarctica hosted diplomats, scientists and technicians, ignited the idea that each of those specialists must have to adapt what they do to be able to solve problems together in such a remote place. Lifting the veil on joint problem solving at the last frontier on Earth felt like reaching for the Moon, a simile often likened to living in Antarctica. To me, it represented something seriously worth knowing.

From outside the Antarctic Treaty System looking in, what diplomats and technical experts do in Antarctica is greater than the sum of their separate professional contributions. The role science has traditionally played in Antarctic diplomacy gave me my first clue. Then, early in the course of this research, I discovered that Australian scientists were members of the diplomatic delegation working behind the scenes to secure ratification of the Antarctic Treaty in 1959. As technical experts, they later teamed up with diplomats to legislate the World's first eco-border—the Antarctic convergence—in the *Convention on the Conservation of Antarctic Marine Living Resources* in 1980. They were there again as delegation members to help ban mining in Antarctica under the *Protocol on Environment Protection to the Antarctic Treaty* in 1991. The political, diplomatic and scientific dimensions of this action list was incentive

enough to learn more about the interface between their professions in Antarctica, a place where they do joint problem solving well.

The project that subsequently unfolded was enlightened by three generations of Australian scientists and the diplomats, political advisers and expedition leaders with whom they served. Thirty-three of these frontiersmen and women entrusted their knowledge of Antarctica to the next generations of practitioners through generous interviews. Their insights are a first-hand record of science and diplomacy in action. In this thesis, investigation of the blue edge that marks the interface between science and diplomacy in Antarctica draws heavily on the primary evidence they provided. The arguments and analysis are mine, and it is my hope the latter will advance the field of diplomatic practice. But more than that, I hope this thesis captures for posterity the work of those scientists who double as diplomats in Antarctica.

The Australian Government supported this research under the Australian Government Research Training Program. I was also awarded a Parliamentary Library Summer Scholarship in 2020 and would like to acknowledge the Parliamentary Librarian and her staff for that opportunity. In the Parliamentary Archives I found records that confirmed the involvement of Australian scientists at key Antarctic diplomatic moments. My thanks to Geoffrey Wade, Senior Researcher, whose combined academic and political expertise helped navigate that other interface where parliamentary, scholarly and Antarctic interests collide.

I owe special thanks to the executive and staff of the Australian Antarctic Division, to the Antarctic Climate and Ecosystems Cooperative Research Centre in Hobart for hosting fieldwork, and to Dr Tony Press in particular. Thanks also to their counterparts in the Department of Foreign Affairs and Trade who were ever present and discreet, and just as generous with their knowledge and experience. The updated typology of Antarctic diplomacy in the following chapters aims to bring the blue edge that represents joint diplomatic and scientific problem solving in Antarctica closer to a mainstream understanding. There is that, and much more, to learn at the science and diplomacy interface they steward on and off the ice.

Abstract

Antarctica is home to one of the world's most enduring joint problem solving partnerships. This thesis explores how scientists and diplomats use the interface between their professions in Antarctica to achieve outcomes in both their own and each other's interests. In particular, it updates the typology of Antarctic diplomacy through scientists' eyes. Could what scientists and diplomats do there help decision makers tackle problems with mixed political and technical features elsewhere? One answer lies in an innovative practice Antarctic that can be seen in action in Antarctic diplomacy—international technical management. Conceived by Hedley Bull mid last century but not much explored until now, international technical management offers a way for diplomats to access external, expert skill sets outside their own to help resolve complex issues. Beyond an Antarctic prototype, international technical management also has the potential to contribute to the evolving definition of science diplomacy. In the face of quickening diplomatic migration across professions in the twenty-first century, lessons learned from a case study of three generations of Australian Antarctic scientists are a timely aid to practitioners seeking pathways to joint problem solving.

Abbreviations

AAT	Australian Antarctic Territory
ANARE	Australian National Antarctic Research Expedition
AT	Antarctic Treaty
ATCM	Antarctic Treaty Consultative Meeting
ATS	Antarctic Treaty System
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources 1980
CEP	Commission on Environment Protection
CSAGI	Comité Spécial de l'Année Géophysique Internationale
IGC	International Geophysical Cooperation 1959
IGY	International Geophysical Year 1957-1958
ITM	International technical management
SDI	Science and diplomacy interface
USA	United States of America
USSR	Union of Soviet Socialist Republics

Treaties and related instruments

The Antarctic Treaty 1959 (Washington, 1959)

The Agreed Measures for the Conservation of Antarctic Fauna and Flora (adopted under the Antarctic Treaty on 1 December 1959).¹

The Convention for the Conservation of Antarctic Seals (CCAS, London, 1972)

The Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR, Canberra, 1980)

The Convention on the Regulation of Antarctic Mineral Resources (CRAMRA, Wellington, 1988)²

The Protocol on Environmental Protection to the Antarctic Treaty (Madrid Protocol, 1991)

¹ Replaced by The Convention for the Conservation of Antarctic Seals, 1972.

² Superseded by The Protocol on Environmental Protection to the Antarctic Treaty, 1991.

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1—Introduction

Antarctica is known as the last frontier on earth.³ As an example of human engagement with a hostile environment, the continent's history holds examples of uncommon engagement involving two different international systems: diplomacy and science. Through this lens, Antarctic diplomacy has become a practice that integrates traditional diplomacy and specialised knowledge in its approach to international engagement. This thesis scrutinises how scientists and diplomats have created an enduring science and diplomacy interface in Antarctica, and how they use it to make science count in diplomatic problem solving.

The Antarctic science and diplomacy interface is an important example of how diplomacy might continue to evolve in the twenty-first century. Costas Constantinou, Noé Cornago and Fiona McConnell herald this as a time of 'visible diplomatic migration across professions' where 'scientists increasingly have an influential voice in critical international negotiations in matters of technical complexity.'⁴ In support of this evolution, Daryl Copeland singles out the global science and diplomacy interface as an area in particular need of focus and development.⁵ Anne-Marie Slaughter captures the political complexity of contemporary international relations at such interfaces. She argues for a 'new sovereignty of status' in which each state's 'connection to the world and political ability to be an actor in it, is defined by the extent they are willing and able to engage other states, and thus necessarily accept mutual obligations.'⁶ New frontiers in diplomatic practice are accelerating these priorities. There is Jodok Troy's shift from 'diplomats serving the goals of a territorial unit' and Paul Sharp's discourse of rebalance between the 'diplomacy of relations and the diplomacy of problems

³ Sahurie, Emilio (1992) *The International Law of Antarctica*, New Haven: New Haven Press, p xxi.

⁴ Constantinou, Costas, Noé Cornago and Fiona McConnell (2016) 'Transprofessional Diplomacy', *Diplomacy and Foreign Policy*, Vol. 1, No. 4, pp 1-66, 2016, pp 3-4.

⁵ Copeland, Daryl (2016) 'Science Diplomacy' in Costas Constantinou, Pauline Kerr and Paul Sharp (eds) (2016) *The SAGE Handbook of Diplomacy*, London: SAGE Publications, Chapter 51, pp 628-64.; The Royal Society (2010) *New frontiers in science diplomacy: Navigating the changing balance of power*, Report of the Meeting hosted by the Royal Society from 1-2 June 2009 in partnership with the America Association for the Advancement of Science (AAAS), London: The Royal Society, pp 5-17.

⁶ Slaughter, Anne-Marie (2009) *A New World Order*, Princeton: Princeton University Press, pp 266-267.

and problem solving.⁷ These new orientations are creating a tipping point. Increasingly, people expect diplomacy and science to be conducted 'without further damaging the ecological environment of the planet on which they are undertaken.'⁸ More than ever, diplomats and scientists need to work together at the interface between their professions. This raises questions about the dynamics of diplomatic practice where these two international systems meet and interact.

Research questions

In Antarctica, diplomats and scientists share a political lineage. Centuries-long interaction between them over the discovery of Antarctica, and subsequent decades-long interaction in the regime developed to implement it, has resulted in an interface where practitioners in both professions team up over diplomatic and technical aspects of the same problems. The Antarctic interface delineates a frontier in diplomatic practice, a blue edge where diplomats and scientists manage complex relationships and issues by interchanging the diplomat's hallmark skills of representation, communication and negotiation, and the scientist's signature skills of technical problem-solving. Their interaction enables these practitioners to bridge the political subject matter of diplomacy and the technical challenges science and technology throw into its path. As a result, diplomacy at the Antarctic interface spans the 'high politics of war, peace, trade and international relations among states' and is able to deal with 'problems common to many actors' such as ecosystem management.⁹ Could what diplomats and scientists do at the Antarctic interface enhance joint problem solving elsewhere? The answer to this question requires exploration of two others. How does the Antarctic science and diplomacy interface come about? And how do diplomats and scientists make use of it to achieve outcomes in their own and each other's interests?

⁷ Troy, Jodok (2018) 'The Pope's own hand outstretched: Holy See diplomacy as a hybrid mode of diplomatic agency', *The British Journal of Politics and International Relations* 2018, Vol. 20, No. 3, 2018, pp 521-539. p 522.; Sharp, Paul (2019) *Diplomacy in the 21st Century: A Brief Introduction*, Milton: Routledge, p 6.

⁸ Sharp, Paul (2019) *Diplomacy in the 21st Century*, p 6.

⁹ Cooper, Andrew, Jorge Heine and Ramesh Thakur, 'Introduction: The Challenges of the 21st Century' in Andrew Cooper, Jorge Heine and Ramesh Thakur (eds) (2013) *The Oxford Handbook of Modern Diplomacy*, 1st Edition, Oxford: Oxford University Press, pp 20-26.

Knowledge gap

Diplomatic and scientific engagement over Antarctica spans three centuries. Scientists have worked with diplomats this whole time in the vanguard of science diplomacy, increasingly as diplomatic actors. As the chronologies of Antarctic diplomacy and Antarctic science intersect, they have left traces of how scientists' have impacted statecraft and the diplomatic machinery put in place to conduct it. Still, not enough is known about diplomatic practice in Antarctic scientists' hands. Addressing this gap is important. Diplomats' working relationships with scientists in Antarctica fostered a treaty that accords science a formal status in the management of the earth's fifth largest continent and its environment. The Antarctic Treaty 1959 provides an ideal setting to investigate how scientists engage in diplomacy, because the Antarctic Treaty System that implements it draws scientists into the nerve centre of decision making at annual Treaty conferences, where diplomats more usually expect to work solo.¹⁰

Scholars such as Anne-Marie Brady, Richard Powell and Klaus Dodds, Donald Rothwell and Andrew Jackson, Alan Hemmings, Marcus Haward et al, and Lorraine Elliott have repeatedly raised awareness about the need for a holistic picture of how science functions in the mix of sovereignty, diplomacy and environmental regulation now used to govern Antarctica.¹¹ Others such as M. J. Peterson and Aant Elzinga are seeking a better picture of how, and with what effect, scientists in Antarctica emulate traditional diplomacy, adapt it, or perhaps augment the

¹⁰ The Antarctic Treaty 1959, 402 UNTS 71, (opened for signature 1 December 1959, entered into force 23 June 1961). Referred to as the Antarctic Treaty.

¹¹ Brady, Anne-Marie (2011) 'The Emerging Economies of Asia and Antarctica: Challenges and Opportunities', in Julia Jabour, Marcus Haward and Tony Press (eds) (2012) *Australia's Antarctica: Proceedings of the Symposium to mark 75 years of the Australian Antarctic Territory*, Institute for Marine and Antarctic Studies, University of Tasmania, 24 August 2011, Hobart, Tasmania, Occasional Paper No 2, February 2012, pp 106-107.; Powell, Richard and Klaus Dodds (2014) 'Polar Geopolitics' in Richard Powell and Klaus Dodds (2014) *Polar Geopolitics? Knowledges, Resources and Legal Regimes*, Cheltenham: Edward Elgar, Chapter 1, pp 3-18.; Rothwell, Donald and Andrew Jackson (2011) 'Sovereignty' in Marcus Haward and Tom Griffiths (eds) (2011) *Australia and the Antarctic Treaty System: 50 years of influence*, Sydney: University of New South Wales Press, Chapter 2, pp 48-67.; Hemmings, Alan (2014) 'Re-justifying the Antarctic Treaty System for the 21st century: rights, expectations and global equity', in Richard Powell and Klaus Dodds (2014) *Polar Geopolitics? Knowledges, Resources and Legal Regimes*, Cheltenham: Edward Elgar, Chapter 4, pp 55-73 ; Haward, Marcus, Donald Rothwell, Julia Jabour, Robert Hall, Aynsley Kellow, Lorne Kriwoken, Gail Lugten and Alan Hemmings (2006) 'Australia's Antarctic Agenda', *Australian Journal of International Affairs*, Vol. 60, No. 3, September 2006, pp 439-456.; Elliott, Lorraine (2004) *The Global Politics of the Environment*, 2nd Edition, Houndmills: Palgrave Macmillan, pp 123, 146.

practice of diplomacy from a technical perspective.¹² This requires careful study of the efforts Antarctic diplomats and scientists have made to bring their separate endeavours into proximity so that the governments they represent can take both sets of priorities into account as part of a bigger picture. At the interface between science and diplomacy in Antarctica, science operates in proximity to diplomacy at the level of the state. A relationship between diplomats and scientists based on mutual recognition, mutual reliance and a capacity for mutual engagement helps to keep it there. These relationship attributes influence how diplomats and scientists work together in Antarctica, and as this thesis demonstrates, they single out the Antarctic science and diplomacy interface as one of the world's most enduring joint problem-solving partnerships.

Mutual recognition is the bridge between professions that diplomats and scientists use to work through points of difference in the priorities they want decision makers to address. It is a product of the political proximity diplomats and scientists find themselves in after three centuries of advocacy undertaken in the pursuit of scientific knowledge as well as territory and resources. Antarctica is now one continent governed by a single treaty that legitimises science as the mainstay for its peaceful use. Mutual recognition lets scientists and diplomats see what members of the other profession are doing, not from the usual perspective of the traditional roles that compartmentalise their activities, but from a position of trust and confidence that makes it possible for them to work together even when their interests are not entirely convergent.¹³

Mutual reliance is the mainstay of interdisciplinary engagement in Antarctic diplomacy. The historical proximity of science to diplomacy at the level of the state in Antarctic affairs motivates diplomats to acknowledge scientific priorities as a legitimate part of their decision-making process. It also gives scientists an incentive to take diplomatic considerations into

¹² Peterson, M. J. (1988) *Managing the Frozen South, The Creation and Evolution of the Antarctic Treaty System*, Berkeley: University of California Press, pp 41-49.; Elzinga, Aant (1992) 'The Interplay of Research and Politics—the Case of Antarctica', in Uno Svedin and Britt Aniansson (eds) (1992) *Society and the Environment: A Swedish Research Perspective*, Dordrecht: Kluwer, Chapter 14, pp 257–286. pp 259-260, 263-264.

¹³ Needall, Allan (2010) 'Lloyd Berkner and the International Geophysical Year Proposal in Context: with some comments on the Implications for the Comité Spécial de l'Année Géophysique Internationale (CSAGI) Request for Earth Orbiting Satellites' in Roger Lanius, James Fleming and David DeVorkin (2010) *Globalising Polar Science: Reconsidering the International Polar and Geophysical Years*, New York: Palgrave Macmillan, Chapter 11, p 206.

account while conducting their research activities. When they draw on each other's expertise and experience, mutual reliance between diplomats and scientists imbues their joint recommendations to government with political and technical credibility. As a result, they are better able to persuade decision makers to concentrate on problems with mixed technical and political features at points in the decision-making process where the interests of science and politics converge. Over time, mutual reliance has become the bedrock for a vision of Antarctica as a scientific and a political domain.

Mutual engagement is a norm that has evolved in Antarctic diplomacy to enable diplomats and scientists to operate in the same problem-solving space. Where diplomatic and scientific agendas overlap, mutual engagement is a beneficial offshoot of mutual recognition and mutual reliance that enables an interdisciplinary response to issues that might otherwise languish in the decision-making process as competing priorities.

The interface that has evolved in Antarctic diplomacy is also a product of proximity between science and diplomacy in Antarctic discovery, exploration and regime creation. The interface gives diplomats, scientists and decision makers the capacity to operate in a mutually inhabited problem-solving space. This space is a proving ground for the adaptation of diplomatic techniques that enable diplomats and scientists to accommodate each other's interests while pursuing their own. As they do so, these practitioners adapt traditional diplomatic and scientific practices in ways that provide a prototype that speaks to where Constantinou, Cornago and McConnell see diplomacy in the twenty-first century, that is, a quickening diplomatic migration across professions.¹⁴

Significance

Adaptations in the conduct of traditional diplomacy in the Antarctic context shine a light on particular techniques that have nurtured science diplomacy within the evolution of Antarctic diplomacy. The chronology of Antarctic diplomacy incorporates diplomatic activities, those driven by political interests including the pursuit of territory in an unmapped continent, and scientific activities stimulated by the quest to discover this continent and understand more about it. At points where diplomats and scientists' interests converged over the continent, the evolutionary chronologies of diplomacy and science crossed over too. During the course of

¹⁴ Constantinou, Costas et al (2016) 'Transprofessional Diplomacy', pp 3-4.

Antarctic discovery, the chronologies cross often enough to leave traces of a combined chronology of Antarctic science and diplomacy. These crossovers afforded diplomats and scientists periods of interdisciplinary observation and professional exchange. They gradually adapted the traditional techniques of their own disciplines to accommodate the practices of the other in order to interact politically when these opportunities presented themselves.

Adaptive techniques that have emerged at the Antarctic science and diplomacy interface support a concept of ‘international technical management’ that Australian diplomatist Hedley Bull put forward in his seminal work *The Anarchical Society*.¹⁵ In 1977, Bull’s vision about the future of diplomacy included the notion diplomats would need to call on what he termed ‘international technical management’ for their diplomacy on issues with human impact beyond politics—like ecology and the environment—to be effective.¹⁶ I put Bull’s concept to the test using the combined chronology of Antarctic diplomacy as a framework. Since Bull’s initial discussion, international technical management has remained a largely unexplored technique. However, updating the typology of Antarctic science and diplomacy in this thesis provided an opportunity to seek it out. This research effort adds to the body of knowledge in the field of diplomacy by scrutinising the role scientists have played in Antarctic diplomacy in the past, and how they work with diplomats now, to profile them as diplomatic actors. It explores Bull’s concept of international technical management in the context of how scientists and diplomats approach joint problem solving in the Antarctic Treaty System. In that regime, the Antarctic Treaty ‘suspends and withholds national territorial claims in favour of maintaining a cooperative transnational scientific continent’.¹⁷ By means of a longitudinal study of scientists’ engagement with diplomats over the course of Antarctic discovery exploration, and the negotiation and implementation of the Antarctic Treaty, this research presents a typology of Antarctic diplomacy seen through scientists’ eyes. This is an example worth documenting because the updated typology of Antarctic diplomacy that results posits a rationale for international technical management as a science diplomacy technique that

¹⁵ Bull, Hedley (1977) *The Anarchical Society: A Study of Order in World Politics*, 4th Edition (2012), Houndmills: Palgrave Macmillan, pp 170-171.

¹⁶ Bull, Hedley (1977) *The Anarchical Society*, p 170.

¹⁷ O’Reilly, Jessica (2017) *The Technocratic Antarctic: An Ethnography of Scientific Expertise and Environmental Governance*, Ithaca: Cornell University Press, p 3.

supports the combined geopolitical, diplomatic and scientific effort that takes place as part of the Antarctic Treaty Consultative Meeting convened annually to govern the Antarctic.

Method

The longitudinal study provides evidence to support the viability of the prototype definition of international technical management, demonstrated three ways. There is the historical case of the interaction between Antarctic science and diplomacy during the discovery era of Antarctic geopolitics from the 18th to the 20th century, the modern case of trailblazing scientist-diplomats who engaged in Antarctic diplomacy in the lead up to the Antarctic Treaty negotiations in 1959 and the International Geophysical Year in particular, and a case study of three generations of Australian Antarctic scientists who transfer practices learned from diplomats from one scientific generation to the next.

The historical study establishes that the chronological evolution of Antarctic science and Antarctic diplomacy is in fact a combined chronology and provides evidence that, as a result, Antarctic scientists and Antarctic diplomats can be observed operating as an early epistemic community. This study is based on historical records such as the diaries Captain James Cook published on return from his Antarctic voyage of discovery in 1772, and the typological evolution of science and diplomacy documented in the historical and contemporary definitions applied to the activities of both disciplines and discussed in detail in Chapter 3.

The modern case documents examples of scientists such Sir Douglas Mawson and Dr Phillip Law in their dual role as diplomatic actors who applied traditional diplomatic techniques in scientific circles, and technical expertise in diplomatic channels, to negotiate scientific and well as diplomatic outcomes. This study draws on primary evidence in the National Archives of Australia and the Official Oral History of the Australian Antarctic Division to showcase the influence of scientists as diplomatic actors who engage in traditional diplomacy using a combination of technical expertise and traditional diplomatic practices.¹⁸

¹⁸ *Australian Antarctic Division Oral History Collection*, National Library of Australia: <https://nla.gov.au/nla.cat-vn7330911>.; Law, P. G., *Papers of Phillip Law, 1870-1010* (manuscript), National Library of Australia, Manuscript Collection, MS 9458/7/14, Box 21.; Conley Tyler, Melissa, John Robbins and Adrian March (eds) and Australian Institute of International Affairs (2102) *R.G. Casey: Minister for External Affairs 1951-60*, Deakin: Australian Institute of International Affairs, pp 93-94.

The case study of Australian Antarctic scientists provides evidence of international technical management as an emerging science diplomacy technique reinforced by the fact that three generations of scientists serving in the Australian Antarctic Division from 1961 to 2021 consider science diplomacy a normal part of their research activities. This study draws on a storehouse of primary evidence about science in Australia's Antarctic diplomatic journey in the Official Oral History of the Australian Antarctic Division. In a series of elite interviews recorded from 1986 to 1996, Tim Bowden captured scientists' unsolicited observations on Antarctic diplomacy from a science point of view.¹⁹ I was privileged to talk with some of those same scientists again for this project and to explore this science diplomacy angle with them front and centre. They shared their insights into what makes a scientist a diplomat with the benefit of another thirty years hindsight.

In a series of semi-structured interviews conducted in Hobart and Canberra over three years from November 2017 to December 2019, 34 Australian Antarctic scientists, diplomats, political advisers, policy officers and expedition leaders put their experience on record. All interviewees spoke at length about their understanding of how Antarctic diplomacy has been practised by diplomats and scientists as technical specialists who deploy diplomatic practices over the lifetime of the Antarctic Treaty Regime. Their insights ranged from the finesse required to speak knowledge to power at the level of statecraft to the tiring and demanding work of maintaining relationships with fellow scientists and diplomats no matter how problematic shifts in geopolitical thinking about Antarctica made that effort sometimes. Altogether, 34 Australian Antarctic scientists, diplomats, political advisers, policy officers and expedition leaders put their experience on record. Key leaders in Antarctic diplomacy, science, policy and academia such as Richard Rowe (First Assistant Secretary, Department of Foreign Affairs and Trade), Dr Tony Press (Director Australian Antarctic Division), Andrew Jackson (Principal Policy Officer, Australian Antarctic Division) and Marcus Haward (Professor Ocean and Antarctic Governance, University of Tasmania) agreed to be interviewed more than once. A list of interviews is at Appendix A.

¹⁹ *Australian Antarctic Division Oral History Collection*, National Library of Australia: <https://nla.gov.au/nla.cat-vn7330911>. 205 audiocassettes recorded from 1986 to 1996 by Alison Alexander, Annie Rushton, Daniel Connell, Alex Nicol, Peter Fry, Ros Bowden and Tim Bowden.

Overall, the findings from these studies invite a renewed focus on Bull's concept of international technical management and its potential to play a part in the ongoing evolution of science diplomacy. Are they just scientists? When pressed, the answer is—'No, diplomats!'²⁰ This response, and interviewees' collective reflections, corroborate the presence of international technical management in the practice of Antarctic diplomacy. As a result, this thesis is able to bring forward evidence to advance the discussion Bull initiated in response to the technical challenges shaping contemporary diplomacy. The potential for techniques practised at the Antarctic interface to augment the skills of future scientists and diplomats, international technical management included, makes the research reported in the following chapters innovative as well as significant.

Bull was a noted theorist in The English School. The School is associated with inquiry into the features of world politics that attend states' historical, structural and functional engagement in international relations.²¹ This project hones in on the emphasis that Bull places on the epistemic and intellectual connections between diplomacy and how world politics are ordered.²² He championed the idea of an international society, a structural phenomenon formed when 'a group of states conceive common interests and values, conduct their relations on the basis of a common set of rules, and share in the working of common institutions.'²³ In *The Anarchical Society*, Bull holds that one function of international society is to orient states towards incorporating human interests among the concerns they should conceive themselves as bound to address. In what Wiseman later describes as 'practice-based theorising', Bull embarked on an extended investigation into the inner workings of international engagement from this perspective.²⁴ In doing so, Bull critically analysed the direction in which human engagement as a fundamental enabler of international relations might head if states were to

²⁰ Tony Press interviewed by Anne Michelle Davis on 18 October 2018.

²¹ Alderson, Kai and Andrew Hurrell (eds) (2000) *Hedley Bull on International Society*, London: Macmillan, pp vii-ix.

²² Linklater, Andrew, and Hidemi Suganami (2006) *The English School of International Relations: A Contemporary Reassessment*, Cambridge: Cambridge University Press, pp 67-68, 141-142.

²³ Bull, Hedley, (1997) *The Anarchical Society*, p 13.

²⁴ Wiseman, Geoffrey (2006) 'Bridging Diplomacy Back In: Time for Theory to Catch Up with Practice' in Andrew Linklater and Hidemi Suganami (2006) *The English School of International Relations: A Contemporary Reassessment*. Cambridge: Cambridge University pp 711-712.

attempt problem solving in the ‘common interests of humanity’ rather than continuing to assert their own national interests as an exclusive priority in international problem solving.²⁵

Bull conceptualised international technical management as part of this intellectual venture. He assessed that rapid post-war advances in scientific knowledge and technology spelt changes for traditional diplomatic approaches to solving international problems. Notably, Bull was struck by the increasingly technical future that diplomatic practice faced should its evolution follow this trajectory. There are echoes of Bull’s observation about of technology and the practice of diplomacy in the inroads that science made into Antarctic diplomacy over the course of the combined chronology. My research picks up on Bull’s thinking about international technical management as a way for diplomats to access external expert skill-sets beyond their own to help resolve complex issues.²⁶ Present day diplomats and scientists resonate with Bull’s assessment based on their own understanding of the impetus that diplomacy needs in order to keep pace with science. Dr Andrew Klekociuk is Principal Research Scientist in the Future Climate and Sea Level Group at the Institute for Marine and Antarctic Studies (IMAS) in Hobart, Australia. The group supports the Australian Delegation at meetings called under the *1985 Vienna Convention for the Protection of the Ozone Layer*, and provides scientific advice to support Australia’s obligations under the *1987 Montreal Protocol on Substances that Deplete the Ozone Layer*.²⁷ He provided the following insight into this challenge:

The thing that diplomacy really has to catch up on is the rate of change. That plays into the diplomatic side of things when we are trying to project into the future. That, then, must have an influence on the way that there is negotiation on things like environmental controls. It’s that ‘being on the frontier’ in various ways, probably challenges some of the decision making in other ways. ²⁸

²⁵ Bull, Hedley (1977) *The Anarchical Society*, pp 156-177.

²⁶ I am indebted to insights about Hedley Bull’s thinking that Paul Keal, Bull’s long-time colleague, shared in discussions on 5 December 2019 in Canberra, Australia. Paul Keal provided access to Bull’s unpublished essay ‘Resources Diplomacy’ which prompted the in-depth analysis of international technical management as a diplomatic technique in Chapter 8.

²⁷ 1985 Vienna Convention for the Protection of the Ozone Layer; 1987 Montreal Protocol on Substances that Deplete the Ozone Layer.

²⁸ Andrew Klekociuk—Principal Research Scientist, Future Climate and Sea Level Group, Antarctic and Global Systems Program, Antarctic Climate and Ecosystems Collaborative

In Bull's forecast, scientists were one of many expert groups with whom generalist diplomats needed to engage more.²⁹ In Antarctic affairs, scientists are historically the expert profession diplomats have engaged the most. Even as Bull was making his observations mid last century, Antarctic scientists had already teamed up with their diplomatic counterparts to establish 'this enormous collaborative, cooperative approach that is taken among Antarctic scientists, and all the Treaty parties, to working together.'³⁰ This thesis presents evidence that at the Antarctic interface where this interdisciplinary exchange takes place, the interaction between scientists and diplomats fosters technical approaches to international problem solving that complement traditional diplomatic techniques. The accompanying discussion about the inner workings of that interface, derived from interviews with three generations of Australian diplomats, scientists and policy advisers, seeks to answer 'yes' to the primary research question, and to add a building block to the wider endeavour underway in the discipline to define science diplomacy.

International technical management can be seen in action at the Antarctic science and diplomacy interface, where the case study of Australian Antarctic scientists shows how it emerges as an adaptive technique that complements traditional diplomatic practices. Chapter 8 and Chapter 9 document findings about how Australian scientists and diplomats adjust their skill sets, activities and persona in order to maximise the use of technical advice in Antarctic diplomacy. Capturing what these scientists and diplomats have learned from working together at the Antarctic interface points to the utility of Bull's concept of international technical management in practice. So, investigating Bull's concept is more than a matter of academic curiosity. International technical management looks set to come of age in our times as decision makers confront more and more problems with mixed political and technical features. In that case, future diplomats and scientists might draw on those lessons to enhance joint problem solving at the global science and diplomacy interface, itself a joint problem solving space where practitioners confront increasingly complex problems.

Research Centre (ACE-CRC), Institute for Marine and Antarctic Studies (IMAS), Hobart. Interviewed by Anne Michelle Davis on 24 November 2017.

²⁹ Bull, Hedley (1977) *The Anarchical Society*, p 170.

³⁰ Richard Rowe—First Assistant Secretary, Legal and Treaty Division, Department of Foreign Affairs and Trade, Head of the Australian Delegation to the Antarctic Treaty Consultative Meeting, interviewed on 3 August 2018 and 6 December 2018.

Approach

Politics and science are human endeavours with global impacts. Politics is traditionally the domain of diplomacy. Science traditionally stands as an apolitical domain dedicated to the discovery and application of knowledge.³¹ In Antarctic diplomacy, science in the physical sphere and diplomacy in the political sphere converge over a common interest in the continent itself, laying the foundations of a combined or “federated” chronology. Approaching the research questions from the perspective of a combined chronology helps fit Antarctic scientists’ experience into the bigger diplomacy picture as a missing piece in the evolution of science diplomacy. A focus on this missing piece is timely. Cooper, Heine and Thakur acknowledge the practice of diplomacy ‘now competes and interacts with a much wider divergence of agency and needs to be applied with a greater technical orientation.’³² *The Oxford Handbook of Modern Diplomacy* delves into economic, digital and climate diplomacy as technical branches of diplomacy, but not science diplomacy specifically.³³ *The Sage Handbook of Diplomacy* grapples with it, where in Chapter 51, Daryl Copeland calls for a detailed analysis of science diplomacy techniques that go hand in hand with the Antarctic Treaty and its implementation.³⁴ In Antarctic affairs, diplomats carry out their traditional functions, such as negotiation, representation, communication and reporting and observing with scientists working alongside them. The value of exploring science in Antarctic diplomacy as a case study lies in articulating scientists’ function as technical intermediaries, technical enablers and technical partners in diplomatic problem solving.

Getting to a discussion about the Antarctic science and diplomacy interface as a crucible for international technical management brings with it an analytical challenge. Scientists and diplomats have interacted over Antarctica since the 17th and 18th centuries when the high cost of voyages provided an incentive to link up their separate political and scientific endeavours in pursuit of a common interest—discovering the Southern Continent. Today, they continue to engage each other in statecraft, negotiations and the diplomatic machinery of Antarctic affairs. This interaction is noticeable at Antarctic Treaty Consultative Meetings where

³¹ Popper, Karl (1959) *The Logic of Scientific Discovery*, London: Hutchinson, pp 48-56.

³² Cooper, Andrew et al (2103) ‘Introduction: The Challenges of the 21st Century’, p 1.

³³ Cooper, Andrew, Jorge Heine and Ramesh Thakur (eds) (2013) *The Oxford Handbook of Modern Diplomacy*, 1st Edition, Oxford: Oxford University Press.

³⁴ Copeland, Daryl (2016) ‘Science Diplomacy’, pp 628-641.

scientists join delegations and can be seen talking to diplomats in corridors, intent on communicating facts-based common ground. For example, Richard Rowe was the First Assistant Secretary of the Legal and Treaty Division in the Department of Foreign Affairs and Trade, and Head of the Australian Delegation to the Antarctic Treaty Consultative Meeting. He worked with the Australian Antarctic Division, and two generations of Australian Antarctic scientists, at ATCMs and on diplomatic negotiations such as Marine Protected Areas (MPAs) under the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). Mr Rowe recalls that scientists were respected and hard-working members of the Australian delegation to annual Treaty Conferences. As he put it:

It's very linked up. It's not stove-piped in the sense that, when the delegations are at these meetings, there's constant interaction during the day between the scientists and the Foreign Affairs representatives who mainly constitute the rest of the delegation. ³⁵

In order to come as far forward as scientists involvement in diplomatic practices at the Antarctic science and diplomacy interface, the investigation first has to look back in search of examples of hitherto unidentified elements of science diplomacy and international technical management in Antarctic diplomatic practice. This approach respects Bull's own, which is that the 'theoretical and systematic study of international relations requires us to study the past history of relations between states, as well as contemporary examples, in order to convey a sense of time and change.'³⁶ The thesis tackles this challenge by following two analytical threads that intersect over and over in the combined chronology of Antarctic science and diplomacy. Crossovers reveal how diplomats and scientists have inculcated a technical orientation to international engagement, a diplomatic orientation to expert advice, and an evidence orientation to diplomatic problem solving in their professional practices. The result is an interface capable of sustaining interdisciplinary agendas and relationships.

To bring the operations of the Antarctic interface as it is now into relief, one thread looks back over the chronology of Antarctic diplomacy from the 1700s to treaty negotiations in the 1950s.

³⁵ Richard Rowe interviewed by Anne Michelle Davis 3 August 2018.

³⁶ Bull, Hedley (1972) 'International Relations as an Academic Pursuit' in Kai Alderson and Andrew Hurrell (eds) (2000) *Hedley Bull on International Society*, London: Macmillan, Chapter IX, pp 246-263, p 253. First published in *Australian Outlook*, Vol. 26, Issue 3, December 1972.

This strand explores points of commonality, departure and innovation between Antarctic diplomacy and Antarctic science as subcategories of the fields of diplomacy and science at large to establish that an interface exists and define its characteristics. The outcome is a model typology that accounts for inroads scientists make into Antarctic diplomacy when they deploy their technical expertise in service of the State. In pursuit of proof about how scientists acquire and use the diplomatic techniques needed to achieve this, a second thread traces crossover points in Antarctic diplomacy where scientists interact with diplomats. This strand exposes the fundamentals of a practice that unlocks the inner workings of joint problem solving at the interface. Among these inner workings, international technical management emerges as an adaptive practice that draws the threads of Antarctica's science and diplomacy chronology together.

The updated typology of Antarctic diplomacy that results provides the backdrop for the case study of three generations of Australian Antarctic scientists who demonstrate everyday diplomatic practices in their engagement with Australian diplomats and the Australian Government. Scientists in each of these generations have been involved in Antarctic diplomacy, either of the discovery era, the International Geophysical Year, negotiating the Antarctic Treaty and its subsequent Conventions, or most recently, as members of Australian Delegations to the annual Antarctic Treaty Consultative Meeting. This approach is in keeping with Bull's appreciation of change over time, allowing analysis of the past practice of Antarctic diplomacy to extend to a discussion about its contemporary status with science and science diplomacy providing the essential common thread.³⁷

The reason for positioning the study at the intersection of diplomacy and science is that, at diplomatic frontiers like Antarctica, state sponsorship of Antarctic science, and therefore engagement with that science itself, provides the political continuity necessary to prompt diplomacy to normalise a role for scientists in the execution of Antarctic policy objectives.

Over the years, statements come out about why we are doing stuff in the Antarctic. And there'll be some dot points. Every time those points come out people go—'where is science? What level is it?' ³⁸

³⁷ Bull, Hedley (1972) 'International Relations as an Academic Pursuit', pp 248-249.

³⁸ Andrew Klekociuk interviewed by Anne Michelle Davis on 24 November 2017.

This pattern of interweaving scientific objectives into Antarctic diplomacy endorses further investigation into the journey Antarctic science took to become a currency capable of political influence. With a diplomatic currency in hand, it follows that scientists' agency as diplomatic actors could have increased along the way. A quick glimpse into the past comes up against the annals of Captain Cook's 1772 voyage to confirm the existence of Antarctica. In the personal account he published on his return, Cook exposed this twofold scientific and political agenda that tethered scientists to Antarctic diplomacy as a driving force behind the mission.

*The British King, directed renewed discoveries be made in the South Hemisphere. Mr Banks and Dr Solander, animated by the love of science and by a desire to pursue their inquiries in the remote regions I was preparing to visit, desired permission to make the voyage with me. The Admiralty readily complied with a request that promised such advantage to the Republic of Letters.*³⁹

The twofold scientific and political agenda is evident in the historical and contemporary Australian foreign policy perspective on Antarctic diplomacy and Antarctic science. A look forward to Antarctic diplomacy in the twentieth century shows that, in addition to being an original signatory to the Antarctic Treaty 1959, Australia is a Treaty party that places considerable emphasis on this combined diplomatic and scientific heritage. In the Second Reading Speech for *The Antarctic Treaty Bill 1960*, Senator John Gorton, then Minister for the Navy representing the Minister for External Affairs, formalised the link between conventional diplomacy and its primary goal of protecting national interests, and science diplomacy and its goal of scientific exploration for human good. The Bill was the instrument by which Australia ratified the Antarctic Treaty.

The government welcomes the Antarctic Treaty which, if ratified by all its signatories, will satisfactorily meet Australia's requirements by protecting our position in Antarctica and, at the same time, by providing an atmosphere—

³⁹ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World Performed in His Majesty's Ships 'The Resolution' and 'The Adventure' in the Years 1772, 1773, 1774 and 1775*, Vol. 1, 2nd Edition, London: Strahan and Cadell, MDCCLXXVII, p xviii.

and a legal framework—in which scientific exploration may continue unhindered by controversy over territorial sovereignty. ⁴⁰

Such strong political emphasis on scientific activities as diplomatic engagement is an acknowledgement of the role that Antarctic scientists played in achieving the conventional diplomatic outcome the Treaty itself represents. In the ensuing debate on the Bill, Senator Nick McKenna also recognised scientists as diplomatic actors, citing their collective professional efforts during the treaty negotiations.

The scientists have been the inspiration of this Treaty. It is most interesting to see that this Treaty comes about as a result of contacts made during the International Geophysical Year 1958, where the scientists of the world came together in co-operative work for the benefit of mankind generally. The scientists of various nations worked together, pooling their resources. There one sees the virtues of contacts at the personal level in international affairs. ⁴¹

Science as a soft diplomacy buffer for otherwise hard geopolitical strategy is a policy approach unchanged since the early 20th century when the activities of Australian scientists such as Sir Douglas Mawson become part of the combined chronology. The soft science diplomacy overlay to Australian Antarctic foreign policy that scientists enable has helped Antarctic science gain credibility as ‘a narrative tool, used to legitimise a national presence on the continent.’⁴² The Australian Government uses this narrative to boost its conventional diplomatic efforts and sovereignty over the Australian Antarctic Territory in particular.

What goals does the Foreign Policy White Paper set for Antarctic diplomacy?

A measure of reliance on Antarctic science as a support for foreign policy has always accompanied Antarctic exploration in the Australian case as Chapter 3 and Chapter 4 set out in more detail. The 2017 *Foreign Policy White Paper* is evidence of the longevity and

⁴⁰ Senator John Gorton, Minister for the Navy representing the Minister for External Affairs, Second Reading Speech: Antarctic Treaty Bill 1960, Senate, Debates, 8 September 1960, pp 490-491.

⁴¹ Senator Nick McKenna (Tasmania), Second Reading Speech: The Antarctic Treaty Bill 1960, Senate, Debates, 21 September 1960, pp 581-586.

⁴² Garrick, John (2022) ‘Time for Australia to Rethink its Antarctic Policy’, *The Diplomat*, 13 January 2022.

contemporary relevance of the Australian twofold scientific and political agenda. The *2017 Foreign White Paper* upholds the role of science as a pillar of the Antarctic Treaty, using scientific activities to underscore Australia's national interest and the maintenance of its historical claim to territory as the subject of future diplomatic efforts. The 2017 White Paper states that scientific activities are essential 'in achieving Australia's ambitious agenda for its future in Antarctica'.⁴³ The *Australian Antarctic Strategy & 20 Year Action Plan* sets out specific research goals to be carried out in support of this agenda.⁴⁴ The Government's *Update 2022—Australian Antarctic Strategy & 20 Year Action Plan* is the most recent policy guidance to uphold science connections to statecraft in Australia's foreign policy approach to Antarctica.⁴⁵ The *Update* articulates the diplomatic mandate for science as 'ensuring Australia retains influence as a Treaty party by delivering a world class scientific program.'⁴⁶

What role does conventional diplomacy and science diplomacy play as a means to those goals?

Conventional diplomacy and science diplomacy both play a role as means to achieving those foreign policy goals. Current practitioners in both disciplines draw on the historic connections between their activities in Antarctica to highlight overlaps in policy that advantage the achievement of both foreign policy and scientific objectives. The combined political rhetoric first noted in 18th century can be observed in the Australian government's prioritisation of science as an essential support to the conduct of Antarctic diplomacy. For example, in further recognition that science is a diplomacy enhancer, the *Update 2022—Australian Antarctic Strategy & 20 Year Action Plan* champions science as a conduit for Antarctic diplomacy by entrusting scientists to identify new opportunities for scientific cooperation and expansion. In particular, the revised *Strategy* calls for increased scientific activities, support capabilities and infrastructure to enhance collaboration with other Antarctic nations.⁴⁷ The Australian

⁴³ Australia, Department of Foreign Affairs and Trade, *2017 Foreign Policy White Paper*, Department of Foreign Affairs and Trade, Barton, ACT, 2017, pp 85-86.

⁴⁴ Australia and Australian Antarctic Division (2016) *Australian Antarctic Strategy and 20 Year Action Plan*, Australian Government (Australian Antarctic Division) Canberra, <https://www.antarctica.gov.au/about-us/antarctic-strategy-and-action-plan/>

⁴⁵ Australia and Australian Antarctic Division (2022) *Update 2022—Australian Antarctic Strategy and 20 Year Action Plan*, Australian Government (Australian Antarctic Division) Canberra, pp 7, 12.

⁴⁶ Australia and Australian Antarctic Division (2022) *Update 2022*, pp 7, 12.

⁴⁷ Australia and Australian Antarctic Division (2022) *Update 2022*, pp 7, 12.

Antarctic science program is therefore key not only to maintaining Australia's foreign policy posture on Antarctica, it is key to Australia's influence in the decision making forum of the Antarctic Treaty Consultative Meeting. By charging Australian Antarctic scientists to communicate between treaty parties, the Australia government recognises science as a currency of influence essential to its diplomacy at Antarctic Treaty Consultative Meetings.⁴⁸

What does the government think about science in Antarctica, and how does it use science and scientists as a diplomatic tool to achieve those goals?

What the Government thinks about science in Antarctica, and how it uses science as a diplomatic tool to achieve those goals is reflected in the Australian Government's funding commitment to Antarctic science in the Annual Budget. In conjunction with the *Update 2022*, the Government announced an increased funding package of over 2.2 billion AUD to strengthen its capabilities and presence in Antarctica, most notably to 'boost its influence amid renewed competition in territory to which it maintains an historical claim.'⁴⁹

Australian Antarctic scientists can be observed acting in combined diplomacy and science roles as a cohort of diplomatic enablers since Sir Douglas Mawson doubled as a scientist-diplomat in the interwar period of the 1920s and 1930s.⁵⁰ The lived experience of the next three generations of Australian Antarctic scientists confirms they too took up the mantle of diplomacy to sustain a science track in Antarctic diplomacy. That track has enabled them to operate across informal, formal and official channels to influence political decision-making in relation to the Antarctic Treaty System. In doing so, these scientists increasingly emulated some of the approaches and techniques of their diplomatic colleagues, thereby contributing to a study-worthy example of science diplomacy in action.

⁴⁸ Belot, Henry (2022) 'Australia to invest \$800 million shoring up Antarctic claim amid strategic competition', ABC News, 22 February 2022, <https://www.abc.net.au/news/2022-02-22/australia-to-invest-800-million-shoring-up-antarctic-claim/100849734>

⁴⁹ Commonwealth of Australia, 'Budget 2022-23', *Budget Measures: Budget Paper No. 2 2022-23*, Circulated by The Honourable Josh Frydenberg MP, Treasurer of Australia, and Senator the Honourable Simon Birmingham, Minister for Finance of the Commonwealth of Australia, 28 March 2022, pp 55-56.; Smith, Elizabeth (2022) 'Antarctica', Budget Review 2022-23 Index, https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview202223/Antarctica

⁵⁰ Kerr, Alan and Australia, Attorney-General's Department (2009) *A federation in these seas: an account of the acquisition by Australia of its external territories*, Canberra: Attorney General's Department, Chapter 9, 'Antarctica', pp 224-225.

As a foretaste of the discussion about the evolution of science diplomacy to which Antarctic scientists have made a notable contribution, Dr Tony Press combines experience on all these tracks as a long-serving Director of the Australian Antarctic Division, CCAMLR Commissioner, and Chair of the Antarctic Treaty's Committee for Environment Protection. Dr Press works closely with Australia's Antarctic diplomats as a member of Australia's delegation to the Antarctic Treaty Consultative Meeting. As both scientist and a scientist-diplomat, Dr Press has observed the role that science plays in the Antarctic Treaty System from inside the diplomatic machinery. This practical perspective is evident in the reflections Dr Press makes throughout the thesis, starting below:

*There is that view of science as an activity that leads to status, and also that allows countries to influence either directly through leading scientific programs or indirectly through having the standing to influence political decisions in the Antarctic Treaty.*⁵¹

The constancy of this pattern of connecting science to the primary objectives of diplomacy leads to a high level of political awareness across generations of Australian Antarctic scientists. This awareness primes scientists to be more tolerant of diplomacy. It accounts for a bigger Antarctic picture in which science conducted in the national interest takes a stand alongside science for science' sake. Dr Tom Remenyi is a climate systems expert and Antarctic expeditioner. His role as Adjunct Professor at the Institute of Marine and Antarctic Studies (IMAS) is to communicate the results of fieldwork on the ice and in the Southern Ocean to decision makers. As a third generation Antarctic scientist, Dr Remenyi is aware that Antarctic science operates within a geopolitical framework, as he freely acknowledges below:

The Antarctic Treaty is significant to scientists because geopolitics is what we understand as being the reason that Australia is actually doing science. The Antarctic Treaty has basically kept that alive for Australia so their claim to Antarctica is still legitimate. Maybe the science was originally funded because

⁵¹ Tony Press—Director Australian Antarctic Division, Chair of the Committee for Environmental Protection of the Antarctic Treaty Consultative Meeting, and Australian Delegation Member to the Antarctic Treaty Consultative Meeting. Interviewed by Anne Michelle Davis on 14 November 2017.

people understood—‘we really need to know about that for a political reason.’⁵²

Looking at the intergenerational work of Australian Antarctic scientists as a specific case study is, therefore, thought provoking for science diplomacy as an evolving discipline as well as for diplomacy at large.

Overview

The thesis is divided into ten chapters. Chapter one introduces the interface between science and diplomacy in Antarctica, and three research questions that guide an investigation into how scientists and diplomats use it to bridge political and technical challenges they encounter when the international systems of diplomacy and science meet and interact. At this interface, diplomats and scientists find ways to tackle issues with mixed political and technical features and to solve those problems together. Could what diplomats do at the Antarctic science and diplomacy interface enhance joint problem solving elsewhere? The answer to this question requires exploration of two others: how does the Antarctic science and diplomacy interface come about, and, how do diplomats and scientists make use of it to achieve outcomes in their own and each other’s interests?

Chapter two sets out a puzzle in Antarctic diplomacy centred on science as a pillar of diplomatic engagement, not just an advisory function. In the Antarctic Treaty 1959, science anchors diplomacy in a way that implies equivalency between science and traditional diplomacy when it comes to influencing Antarctic affairs. Scientists’ close involvement with diplomats over three centuries leading up to the Treaty paves the way to explore the concept of ‘international technical management.’⁵³ This theory-building concept, espoused by Hedley Bull in 1977 but not widely explored until now, is the rationale for a Within-case study to gauge how, when and why Antarctic scientists influence diplomacy, and if as a result, international technical management is a prototype technique practitioners could use to enhance interdisciplinary engagement at the global science and diplomacy interface.

⁵² Dr Tom Remenyi—Adjunct Professor, Antarctic Climate and Ecosystems Collaborative Research Centre, Institute for Marine and Antarctic Studies, Hobart, Tasmania. Interviewed by Anne Michelle Davis on 25 November 2017.

⁵³ Bull, Hedley (1977) *The Anarchical Society*, p 170.

Chapter three presents a conceptual framework to enable a longitudinal investigation into the Antarctic interface as a co-evolution of diplomacy and science. It draws attention to points in common and crossovers in the lexicons of diplomacy and science to reveal that the typology of Antarctic diplomacy is actually a combined chronology. This chapter uncovers that back story to provide the structural details needed to pin centuries of Antarctic diplomatic practice to an interdisciplinary framework. The outcome is an updated typology that permits further analysis of the signature characteristics of the interface in Chapters five and six.

Chapter four chronicles a working definition for science diplomacy in the context of Antarctic diplomacy. By comparing and contrasting what scientists do at the Antarctic science and diplomacy interface with The Royal Society's definition of science diplomacy, the analysis in this chapter shows how the interface enables scientists to interact at the geopolitical, normative and machinery levels of diplomacy. The analysis confirms the value of science as measure for diplomatic currency based on the political, technical, diplomatic and combined agency scientists accrue at the interface, and the value of this currency as leverage to extend the reach of traditional diplomacy to support alternative visions of Antarctica as a scientific and a political domain. Lesson learned from the Antarctic science and diplomacy interface start with examples from the combined chronology that demonstrate science diplomacy in practice.

Chapter five investigates science in Antarctica's diplomatic venture. The investigation focuses on the inroads science and scientists made into traditional diplomacy over the course of Antarctica's combined chronology. It commences a longitudinal investigation into the interface by probing a select body of academic literature in search of previously unidentified elements of science diplomacy and international technical management in historical practice. The results demonstrate how science diplomacy practices at the interface enhance traditional diplomacy by allowing diplomats and scientists to adapt it by degrees so that scientists can perform diplomacy service through the agency of their science.

Chapter six exposes the track that Antarctic science occupies in Antarctic geopolitics and draws on scientists' interventions at key diplomatic moments, such as the International Geophysical Year 1957-58, to showcase their role as political advocates, negotiators, and technical experts whose scientific advice gives states an incentive to act on science in diplomatic ways. In the lead up to the Antarctic Treaty negotiations in 1959, scientists' wide-

ranging activities took place on a dual track that fostered interdisciplinary relationships. The interactions that resulted are used to map the Antarctic science turn to diplomacy that furnished scientists with experience in the conduct of traditional diplomacy at the level of statecraft, diplomatic problem solving and the machinery of diplomacy. This step forward in interdisciplinary relations enabled scientists to participate in statecraft, diplomatic problem solving and the machinery of diplomacy hands-on.

Chapter seven correlates crossover points in the development of the science and diplomacy interface with phases of Antarctic regime creation to articulate a model typology of Antarctic science and diplomacy. The correlation reveals how diplomats and scientists made science a permanent feature of Antarctic diplomacy during treaty negotiations. The science and diplomacy interface delineates a circular relationship between science and politics (geopolitics), alternative visions of Antarctica as a scientific and political domain (norms), and the interdependence of science and diplomacy in the machinery of Antarctic diplomacy (joint problem solving). The model is applied in chapters eight and nine to define how the Antarctic science and diplomacy interface makes it possible for diplomats as generalists, and scientists as technical experts, to adjust their skills sets, activities and persona to achieve outcomes in their own and each other's interests.

Chapter eight explores the line of sight between the complementary practices observed at the Antarctic science and diplomacy interface and the working definitions of science diplomacy discussed in Chapter four. Commensurate with Bull's vision of the future practice of diplomacy, this chapter then analyses the adjustments that scientists and diplomats make within the practices of their respective disciplines that, in turn, make international technical management feasible in the Antarctic context. The chapter then profiles the signature characteristics of international technical management as a technical orientation to international engagement, a diplomatic orientation to the provision of technical advice, and an evidence orientation to diplomatic problem solving.

Chapter nine reports the results of a case study of involving three generations of Australian Antarctic scientists. As scientist-diplomats, these scientists contributed to a science diplomacy legacy that continues to influence how, when and why they seek to participate in diplomacy. Their science diplomacy legacy includes a *modus operandi* for science *and* diplomacy that enables them to prioritise the importance of their relationships with diplomats as part of their

problem solving approach, and to transfer the diplomatic skills they acquire from one generation of practitioners to the next. First generation scientists opened the door for diplomats to seek out scientists to expand their diplomatic efforts. Second generation scientists undertook diplomatic activities in support of national initiatives for which Antarctic science was an element. Third generation scientists provide the scientific advice that underwrites Australia's participation in Antarctic Treaty Consultative Meetings and its compliance with the Antarctic Treaty 1959. The modus operandi of science *and* diplomacy emerges as a vital pointer to international technical management because of the dual-purpose engagement by scientists that it fosters. Chapter ten concludes that the adaptive practices and science diplomacy techniques deployed by scientists and diplomats at the Antarctic interface enhance the practice of diplomacy at large by enabling those practitioners to present solutions with mixed political and technical features in response complex issues. International technical management as emerging diplomatic technique plays a part in this approach. In the joint problem solving space between their professions at the Antarctic interface, Bull's concept of international technical management offers a way to describe the kind of diplomatic actors Antarctic scientists have turned out to be.

2—Science in the Antarctic Treaty

When negotiators finalised the Antarctic Treaty in 1959, they accorded science a formal status in the ongoing management of Antarctica.⁵⁴ The diplomatic innovation of using science to level geopolitical competition gave science procedural form. From an academic perspective, Jeffrey Myhre, Steven Blumenfeld, and Donald Rothwell and Andrew Jackson adjudge the legislative approach in the Antarctic Treaty as unique in the world.⁵⁵ They are not alone in this thinking, and this is not the only ground of uniqueness.⁵⁶ Diplomats think the treaty is unique because it broke new ground in negotiations when it suspended sovereign claims in Antarctica.⁵⁷ Scientists consider the treaty achieved a unique outcome in international relations—'a continent for peace and science.'⁵⁸ Contemporary researchers such as Christie Collis affirm the treaty establishes a 'unique legal geography, unpossessed land in which scientific data is the main resource extracted.'⁵⁹ Principal participants in the Antarctic Treaty System have come to appreciate the Treaty in terms of this uniform attribution, as Sir Guy Green, Governor of Tasmania, reflects below. The Tasmanian Government appointed Sir Guy Green their Antarctic Ambassador in 2003. Sir Guy facilitated connection between Antarctic personnel and the diplomatic community in this capacity. He also developed, and chairs, Sub-

⁵⁴ The Antarctic Treaty, opened for signature 1 December 1959, 402 UNTS71, (entered into force 23 June 1961), Secretariat of the Antarctic Treaty, <https://www.ats.aq/e/antarctictreaty.html>

⁵⁵ Myhre, Jeffrey (1986) *The Antarctic Treaty System: Politics, Law, and Diplomacy*, Boulder: Westview Press, p 23.; Blumenfeld, Steven (2010) 'For science and peace: The creation and evolution of The Antarctic Treaty System', *Yale Economic Review*, Vol. 6, No.1, 2010, pp 28-34 and pp 54-55.; Rothwell, Donald and Andrew Jackson (2011) 'Sovereignty' in Marcus Haward and Tom Griffiths (eds) (2011) *Australia and the Antarctic Treaty System: 50 years of influence*, Sydney: University of New South Wales Press, Chapter 2, pp 48-67.

⁵⁶ The United States Department of State, *Handbook of the Antarctic Treaty System*, Ninth Edition, 2002, <https://www.state.gov/e/oes/rls/rpts/ant/>

⁵⁷ *The Antarctic Treaty*, Article IV. The United States Department of State defines *The Antarctic Treaty* as a 'unique precedent', <https://www.state.gov/t/avc/trty/193967.htm>; Denning, Esler (1960) 'The Antarctic Treaty', *Royal Institute for International Affairs*, RIIA/8/2678, Chatham House, London, 9 February 1960, p 5. Sir Esler Denning was Head of the United Kingdom Delegation at the Washington Conference that negotiated the Antarctic Treaty from 15 October to 1 December 1957.; Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

⁵⁸ Blumenfeld, Steven (2010) 'For science and peace', pp 32-34.

⁵⁹ Collis, Christie (2010) 'Critical legal geographies of possession: Antarctica and the International Geophysical Year 1957-1958', *GeoJournal*, Vol. 75, No. 4, 2010, pp 387-395, p 394.

Antarctic Conference initiative set up for dialogue among principal Antarctic actors over these territories.

The Antarctic Treaty is referred to as being unique, special, different. Scientists perceive it that way, and I perceive it exactly the same way. The Antarctic Treaty is literally unique. I think every Member of the Treaty, every Treaty nation, accepts that philosophy. It's not just scientists. It's an astonishing thing, but they all observe it. ⁶⁰

The treaty affords Antarctic science the status of a diplomatic principle and an activity in its own right. The Preamble prescribes the practice of international scientific cooperation demonstrated during the International Geophysical Year 1957-58 (IGY) as the engagement model for Antarctic diplomacy.⁶¹ To enact this overarching principle, Article I, Article II and Article III of the treaty push science to the forefront of diplomatic engagement. These provisions circumvent military occupation and establish scientific cooperation and exchange as lawful uses of Antarctica. The treaty goes further in Article IX which permits access to the continent and a role in making decisions about Antarctica via the singular means of conducting scientific activity there:

Because science is so fundamental to the raison d'être of the Antarctic Treaty, obviously that's enshrined in the terms of the Treaty. ⁶²

The twelve original signatories to the Treaty were countries that conducted Antarctic research programs during the International Geophysical Year that ran from 1 July 1957 to 31 December 1958.⁶³ After that, only maintaining a program of scientific activity of credible standard leads

⁶⁰ Sir Guy Green, Governor General of Tasmania (1995-2003), Antarctic Ambassador (2003-date), interviewed by Anne Michelle Davis on 5 December 2017. Australia's Sub-Antarctic territories comprise Heard Island and McDonald Island in the south Indian Ocean, and Macquarie Island in the South Pacific Ocean. An Australian Station operated on Heard Island from 1947 to 1955. Macquarie Island is part of Tasmania. Macquarie Island Station has hosted scientific research since 1948.

⁶¹ Denning, Esler (1960) 'The Antarctic Treaty', p 5.

⁶² Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

⁶³ Secretariat of the Antarctic Treaty, 'Parties' <https://www.ats.aq/devAS/Parties?lang=e>
The twelve countries that were active in Antarctica during the International Geophysical Year of 1957-58 and then accepted the invitation of the United States of America to participate in the diplomatic conference at which the Treaty was negotiated in Washington in 1959

acceding powers to obtain and retain decision-making status at Antarctic Treaty Consultative Meetings.⁶⁴ Together, these features distinguish the Antarctic Treaty from other international regimes by positioning science as an activity at the centre of treaty relations:

*Antarctica is referred to as the continent for peace and science—and the framework for international collaboration is around the conduct of science in the Antarctic region. The Antarctic Treaty establishes not only a legal regime that covers a major part of the globe. It also puts science at the forefront of that legal regime.*⁶⁵

Puzzle

The interface between science and diplomacy in the Antarctic Treaty System is home to a puzzle. How did scientists negotiate the interests of science into a treaty aimed at settling territory? When it comes to influencing Antarctic affairs, science anchors diplomacy in the treaty structure in a way that confers equivalency between the conduct of science and traditional diplomatic practices. There has to be scientific activity on the continent for participating nations to fulfil their treaty obligations and be Antarctic decision makers.⁶⁶ This makes science a pillar of diplomatic engagement not just an advisory function. As a result, scientists are an essential cohort for diplomats to engage, and having scientists in the mix while conducting Antarctic diplomacy reshapes a well-established diplomatic practice whereby diplomats ‘tend to resolve issues among themselves.’⁶⁷ For example, Dr Patrick Quilty led the biology team in the Australian Antarctic Division as that discipline expanded in response to the implementation requirements of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). The Convention opened a new dialogue in Antarctic diplomacy for evidence-based diplomacy. Dr Quilty advised the political community

were: Argentina, Australia, Belgium, Chile, France, Japan, New Zealand, Norway, South Africa, the Union of Soviet Socialist Republics, the United Kingdom, and the United States of America.

⁶⁴ The Antarctic Treaty, Article IX.2 and Article XIII.1.; Parsons, Anthony (1987) *Antarctica The Next Decade*, Report of a Study Group, The David Davies Memorial Institute of International Studies, Cambridge: Cambridge University Press, p 9.; Denning, Esler (1960) ‘The Antarctic Treaty’, pp 13-14.; Chaturvedi, Sanjay (2009) ‘Antarctica’ in Rob Kitchin and Nigel Thrift (eds) (2009) *International Encyclopedia of Human Geography*, Elsevier Science, pp 133-139.

⁶⁵ Tony Press interviewed by Anne Michelle Davis on 14 November 2021.

⁶⁶ Parsons, Anthony (1987) *Antarctica The Next Decade*, pp 4-5.

⁶⁷ Cooper, Andrew et al (2013) ‘Introduction: The Challenges of the 21st Century’, pp 15-19.

when his scientific activities intersected matters of political interest. As a result, he followed politics in action at Parliament House in Canberra, as well as on scientific tracks in Antarctica. As he put it:

Diplomats tend to work strictly within a track, they respond to instructions and they are very cautious by nature and by instruction. Scientists have a similar track when they are working as scientists. But, when they are working on Antarctic matters, that interface between them as scientists and the diplomats, my impression is that scientists move further into the diplomatic world than diplomats ever move into the science world. While a politician may not have listened to the scientists, the scientists have listened to him. ⁶⁸

Another facet of the puzzle is what might this experience at the Antarctic science and diplomacy interface offer to future diplomats and scientists who will likely confront problems with increasingly mixed political and technical features? It seems that Antarctic scientists are capable of taking up diplomacy practices and using them in their own discipline. The adjustments Antarctic diplomats and scientists make in order to facilitate joint problem solving is worth exploring. As Dr Quilty observed above, scientists' ability to participate in Antarctic diplomacy means that the Antarctic science and diplomacy interface has become a crucible for mutual recognition, mutual reliance and mutual engagement between scientists and diplomats. The importance of these observations to this thesis is that, in turn, these particular adaptations in scientific and diplomatic techniques mould the practice of each otherwise-separate discipline in observable and enduring ways.

According to Dr Quilty, the key to success for science in diplomacy is to let scientists and diplomats talk, preferably with each other to start.⁶⁹ So, already, the puzzle at the Antarctic interface points to an interdisciplinary interchange, one with historical antecedents thanks to centuries of participation in Antarctic affairs by scientists and diplomats, and later on government officials as well.⁷⁰ Alessandro Antonello acknowledges that 'James Cook's 1773

⁶⁸ Patrick Quilty—Principal Research Scientist, Antarctic Biology, Australian Antarctic Division, interviewed on 20 November 2017.

⁶⁹ Patrick Quilty interviewed by Anne Michelle Davis on 20 November 2017.

⁷⁰ Antonello, Alessandro (2013) 'Australia, the International Geophysical Year and the 1959 Antarctic Treaty', *The Australian Journal of Politics and History*, Vol. 59, No. 4, 2013, pp 532-546, p 533.

crossing of the Antarctic Circle is a symbolic start for Antarctica's human history.'⁷¹ The success of Cook's political endeavour depended on his knowledge set as much as on his official appointment and rank. Cook was a naval captain and a scientist. The dual role is noteworthy because it set a precedent. Cook's dual-hatted precedent is a building block for the evolution of complementary practices in Antarctic affairs, that is, the norm of conducting science and politics at the same time, in the same place, and both in the service of the State.

As imperial ambitions expanded to target the southern-most continent, Antarctic science established an intermittent voice in political decision making. Nearly two centuries later, the leaders of the 12 countries active in Antarctica during the global scientific initiative that was the International Geophysical Year 1957-58 signed the Antarctic Treaty on 1 December 1959.⁷² By means of the Treaty, the signatories granted science a permanent voice in the management of the continent.⁷³ On the cusp of the Treaty's implementation in 1961, Robert Hayton made particular note of this developmental trajectory. His assessment of science in Antarctic diplomacy was that 'policy and operational affairs of the South Polar Regions had gradually become almost 'orthodox', that is, handled on a daily basis by government officials and institutions in the near-normal manner of dealing with any matter in modern bureaucracy and research.'⁷⁴ Hayton intimates that the norm of Antarctic science conducted in close proximity to Antarctic politics allowed science to become part of the diplomatic machinery, or at least for scientists to participate in diplomacy at this level, and from there, to influence political decision making in favour of scientific objectives.

At first glance, participation in the diplomatic machinery may look like a secondary track that limits scientists' agency to advocacy; however, the developmental trajectory did not stop there. Thirty years later, Gordon Fogg noted that, in relation to Antarctic diplomacy,

⁷¹ Antonello, Alessandro (2013) 'Australia, the International Geophysical Year and the 1959 Antarctic Treaty', p 535.

⁷² Secretariat of the Antarctic Treaty, *Parties, Parties* (ats.aq)

⁷³ Davis, Anne Michelle (2021) *Resurgent geopolitics in Antarctica: the nexus between science and diplomacy in Antarctic policy making*, Parliament of Australia, Parliamentary Library, Summer Scholar Report, October 2021, p 12.

⁷⁴ Hayton, Robert (1960), 'The Antarctic Settlement of 1959', *The American Journal of International Law*, Vol. 54, No. 2, April 1960, pp 349-371, p 349.

‘politicians have allowed science to become a political force.’⁷⁵ Fogg’s observation about the politicisation of Antarctic science draws attention to its status as a diplomatic currency. In 1991, the Antarctic Treaty passed an important milestone. Article XII.2 came into effect that year to make the treaty reviewable.⁷⁶ No consultative party called for a review. Instead, all treaty parties went to pains to reaffirm their commitment to the Antarctic Treaty System and to scientific cooperation as the paramount diplomatic norm of that regime.⁷⁷ In a contemporaneous analysis, David Campbell reported ‘the primary purpose of every nation’s Antarctic station is political: the science (even good science) is just an excuse for a presence on the continent.’⁷⁸ Campbell’s point underscores the level to which the combined nature of Antarctic science and diplomacy had, by then, become sufficiently institutionalised to give each discipline leave formally to entertain the interests of the other. This rendered scientists’ participation in Antarctic diplomacy flexible enough for them to keep scientific priorities neck and neck with sovereignty and resource management issues.

Antarctic diplomacy of the 1950s was directed at resolving outstanding territorial tensions hanging over from centuries of geographic and scientific exploration.⁷⁹ It took place amidst rising geopolitical tensions on the one hand, and rapid scientific breakthroughs that accompanied the Cold War on the other. The conduct of the International Geophysical Year mid-decade was a moment in the combined chronology when issues high on the international scientific agenda coincided with renewed geopolitical attention on Antarctica. In terms of diplomacy at large, it is important to note Rip Bulkeley’s summation that ‘the IGY did not inspire or initiate the diplomatic process that eventually resulted in the Treaty.’⁸⁰

⁷⁵ Fogg, Gordon (1992) *A History of Antarctic science*, Cambridge: Cambridge University Press, p 406.

⁷⁶ Rothwell, Donald (2012) ‘The Antarctic Treaty as a security construct’ in Alan Hemmings Donald Rothwell and Karen Scott (2012) *Antarctic Security in the Twenty-First Century*, 1st Edition, Abingdon: Routledge, Chapter 3, pp 33-50, p 42.; Antarctic Treaty 1959, Article XII.2(a) provides that after 30 years, any participating State can request a Conference to review the operation of the Treaty. The 30-year anniversary was 1991.

⁷⁷ Final Report of the Sixteenth Antarctic Treaty Consultative Meeting, Bonn, 7-18 October 1991, ‘Message from the XVIth Consultative Meeting to Stations in Antarctica’, p 346.

⁷⁸ Campbell, David (1992) *The Crystal Desert: Summers in Antarctica*, Boston: Houghton Mifflin, p 9.

⁷⁹ Berkman, Paul (2010) ‘Common Interests in the International Space of Antarctica’, *Polar Record*, Vol. 46, No. 1, 2010, pp 7-9.

⁸⁰ Bulkeley, Rip (2009) ‘The Political Origins of the Antarctic Treaty’, *Polar Record*, Vol. 46, No. 1, January 2010, pp 9-11, pp 10-11.

Nevertheless, the International Geophysical Year was an event that attracted a lot of attention globally and its Antarctic program 'revived Antarctica in political consciousness.'⁸¹ The number of participating scientists, and the volume of scientific activity in Antarctica, threw a spotlight on the continent and drew attention to its unresolved territorial status at a time when diplomats were labouring through secret channels towards a political settlement.

The IGY spotlight also made the proximity of Antarctic science to diplomacy known to the general public, giving scientists pause to reflect on Cold War political priorities as well as their own scientific ambitions for Antarctica. Diplomats and scientists found themselves in the same political space and having to marry up differences in their political and scientific interests in the continent, in full public view on the global stage. This pause created a turning point in Antarctic affairs where the 'powerful ideas of cooperation and internationalism that attended the IGY efforts challenged then dominant territorial and geopolitical practices.'⁸² The shift in the order of scientists' priorities led Hayton to describe the eventual Antarctic Treaty as 'an unusual example of diplomatic and political service to the goals of science and the general international interest.'⁸³

The diplomatic pivot to science that followed was not a sudden move. Prior to actual treaty negotiations in the 1950s, diplomats had a hand in proposals to try and resolve uncertainty over Antarctic sovereignty. From a diplomatic perspective, international engagement over Antarctica intensified after the end of World War II as states sought to ride out the 'systemic rebalancing among major players that accompanies major war' without triggering another. Unresolved territorial claims made Antarctica a post-war geopolitical flashpoint.⁸⁴ Starting in 1948, diplomats from countries staking claims—Argentina, Chile, Norway, France, Britain in conjunction with Commonwealth members Australia and New Zealand, and the United States—secretly considered and rejected seven proposals.⁸⁵ These proposals included: settlement by the International Court, partition by agreement, internationalisation, an

⁸¹ Belanger, Dian (2010) *Deep Freeze: The United States, the International Geophysical Year, and the Origins of Antarctica's Age of Science*, Boulder, Colorado: University Press of Colorado, p 324.

⁸² Antonello, Alessandro (2013) 'Australia, the International Geophysical Year and the 1959 Antarctic Treaty', pp 534-535.

⁸³ Hayton, Robert (1960), 'The Antarctic Settlement of 1959', p 367.

⁸⁴ Chaturvedi, Sanjay (2009) 'Antarctica', pp 133-134.

⁸⁵ Hayton, Robert (1960) 'The Antarctic Settlement of 1959', pp 352-353.

International Commission, a condominium, a New Zealand Plan for tripartite control of the Australian and New Zealand sectors with the United States, and a compromise solution to contested claims—a ‘concealed condominium’—based on de-facto recognition and joint administration by existing claimants.⁸⁶ Then, in 1956, diplomats proposed the ‘IGY Solution’, so named to take advantage of the international scientific cooperation already underway across the continent under the auspices of the International Geophysical Year’s Antarctic programs.⁸⁷

The International Geophysical Year was a ‘bold coordinated global effort’ aimed at extending scientific discovery of the Earth and its environment.⁸⁸ The scientific initiative provided the rationale for countries to work side by side in a concentrated and simultaneous research effort coordinated by an international, non-governmental organisation—the International Council of Scientific Unions (ICSU).⁸⁹ Antarctica was a particular focus. Scientists interested in south polar research wanted to catch up with its better-known and better-resourced north polar twin.⁹⁰ Antarctica was still largely unmapped at the time, a status that fuelled scientific ambitions as well as political disquiet. Completing the discovery of the continent became the billboard for ‘selling the IGY to the press, governments and popular audiences.’⁹¹ It proved a public relations coup, and Robert Hayton gives credit to the diplomats of the day who were able to move forward with that.⁹² By linking their efforts to the internationally popular science initiatives in Antarctica, diplomats were able to finalise preparations for their treaty negotiations buffered by more political will than secret diplomacy alone could muster. The

⁸⁶ Royal Institute of International Affairs (1957) ‘Antarctica’, Summary of a Private Meeting held at Chatham House on 13 December 1956, RIIA/8/2445. Chatham House, London, 22 January 1957, pp 6-7.

⁸⁷ Denning, Esler (1960) ‘The Antarctic Treaty’, pp 4-5.; National Research Council (1986), *Antarctic Treaty System: An Assessment: Proceedings of a Workshop Held at Beardmore South Field Camp, Antarctica, January 7-13, 1985*, Washington: The National Academies Press, pp 31-32.

⁸⁸ Antonello, Alessandro (2013) ‘Australia, the International Geophysical Year and the 1959 Antarctic Treaty’, p 532.

⁸⁹ Belanger, Dian (2010) *Deep Freeze*, p 324.

⁹⁰ Baker, F. W. G. (1982) ‘The First international Polar Year, 1882-83’, *Polar Record*, Vol. 21, No. 132, 1982, pp 275-285, pp 276-277.

⁹¹ Belanger, Dian (2010) *Deep Freeze*, p 52.

⁹² Hayton, Robert (1960) ‘The Antarctic Settlement of 1959’, pp 352-353.

pivot to science paid off for diplomats by providing otherwise elusive negotiating leverage for subsequent treaty negotiations.

Professor Donald Rothwell, an international law expert on the Antarctic Treaty, makes the case that the Treaty system is probably the best example of the precautionary principle in action. The precautionary principle was written into the Convention on the Conservation of Antarctic Marine Living Resources in 1978, an outcome scientists' facilitated during their participation in negotiations at Special Antarctic Treaty Consultative Meetings. Professor Rothwell's insights about the Antarctic Treaty System are grounded in the historical connections between governments, bureaucracies, diplomats and scientists, and the influence and responsibility that comes with that:

Without science the Treaty wouldn't have been established to a degree, because the International Geophysical Year proved that, notwithstanding the Cold War and all of the tensions associated with the Cold War, and the tensions associated with the overlapping territorial claims, people could actually get on in Antarctica—that they could work collaboratively and that there was political and diplomatic benefit associated with that. ⁹³

The Antarctic science programs of the IGY got underway in 1956, a year out from its official launch in 1957, to accommodate the lead times needed to build and provision bases. On a parallel diplomatic track, diplomats representing claimant countries agreed through traditional diplomatic channels that there 'should be a standstill with no advancement of political claims during the IGY, and the results of scientific investigations should be pooled.'⁹⁴ Often referred to as Antarctica's 'gentlemen's agreement, the diplomacy behind the IGY solution was a response to the novel complication 'scientific occupation' posed as potential new grounds to assert, support or deny sovereignty.⁹⁵ From a diplomatic perspective, the IGY solution had to come into effect ahead of the logistics effort. One outcome of this timing

⁹³ Donald Rothwell—Professor of International Law, College of Law, Australian National University, interviewed by Anne Michelle Davis on 13 August 2018.

⁹⁴ Denning, Esler (1960) 'The Antarctic Treaty', pp 4-5.

⁹⁵ Triggs, Gillian (1981) 'Australian Sovereignty in Antarctica, Part I', *Melbourne University Law Review*, Vol. 13, No. 2, December 1981, pp 123-158, p 158.

would be to collate efforts undertaken by scientists and diplomats on separate professional tracks within the same political space.

Diplomacy on show to the international community preparatory to the International Geophysical Year centred on 'keeping Antarctica as a region of peace, stability and cooperation and preventing the possible emergence of international tensions.'⁹⁶ However, intensifying Cold War geopolitics gave claimants and non-claimants an incentive to magnify their Antarctic interests.⁹⁷ Some non-claimants used the proposed year-round scientific activities of the IGY's Antarctic program as cover to establish a permanent presence. For example, there was diplomatic concern, especially in Australia, over the Soviet Union's privately-stated aim to use the IGY to build up a comprehensive legal push for a future claim based on 'extensive exploratory, scientific and similar activities spreading from initial bases in the Australian Antarctic Territory to all other parts of the continent.'⁹⁸

Unable to press their concerns in public without compromising the cooperative face of the international scientific effort, diplomats kept talking behind the scenes as the International Geophysical Year proceeded. Treaty negotiators would go on to deal with scientific occupation head-on at the conference table by excising scientific activities from future geopolitical bargaining. This was the diplomatic backdrop to Article IV which prevents countries from defining 'occupation for scientific purposes' as a basis to claim, or contest, Antarctic territory.⁹⁹ In the interim, with international power plays over the continent ramping up under cover of the logistics effort, the IGY Solution united diplomatic opinion around the possibility that 'further progress towards an international settlement might be achieved by keeping the

⁹⁶ Joint Standing Committee on the National Capital and External Territories Inquiry into the adequacy of Australia's infrastructure assets and capability in Antarctica, 2017, 'Submission 21—Submission by the Embassy of the Russian Federation', https://www.aph.gov.au/Parliamentary_Business/Committees/Joint/National_Capital_and_External_Territories/AntarcticTerritory/Report

⁹⁷ Quigg, Phillip (1983) *A Pole Apart: The Emerging Issue of Antarctica*, New York: McGraw Hill, p 138.

⁹⁸ Gan, Irina (2010) 'Soviet Antarctic plans after the International Geophysical Year: changes in policy', *Polar Record*, Vol. 46, No. 3, July 2010, pp 244-256, p 246.; Turchetti, Simone, Simon Naylor, Katrina Dean and Martin Siegert (2008) 'On thick ice: scientific internationalism and Antarctic affairs, 1957–1980', *History and Technology*, Vol. 24, No. 4, 2008, pp 351-376, p 358.

⁹⁹ Triggs, Gillian (1981) 'Australian Sovereignty in Antarctica, Part I', p 158.

IGY Organising Committee in existence as the nucleus of a permanent association of user nations.’¹⁰⁰

The IGY solution not only pivoted the machinery of treaty diplomacy towards science, this diplomatic manoeuvre had the effect of pointing negotiators towards an alternative avenue of engagement, one where influence among scientists could be a foil for diplomats’ otherwise moribund discussions.¹⁰¹ By making accommodations to consider the interests of science, diplomats hoped to contain the Antarctic scientific and political agendas within the same problem solving space. However, the IGY Organising Committee, known as the Comité Spécial de l’Année Géophysique Internationale (CSAGI), comprised mostly scientists. So instead, the agendas bumped into each other head-on at CSAGI meetings, where opportunities for scientists and diplomats to take stock of each other’s interests soon surfaced.¹⁰²

Scientists envisioned the IGY as the mainspring for a post-war state of affairs in which politics would no longer interfere with scientific research.¹⁰³ At the front of scientists’ minds was the political opportunity the International Geophysical Year presented to re-open science pathways to international exchange that governments around the world had shut down during the First and Second World Wars. At wars’ end, free exchange of scientific publications had become the subject of political representations in its own right. The International Council of Scientific Unions (ICSU) and The Royal Society both lobbied over this cause, and both organisations were involved in organising the International Geophysical Year.¹⁰⁴ Chapter 4 outlines the significant role The Royal Society played in advancing science diplomacy in Antarctica. For the puzzle still under perusal, when diplomats sought to move Antarctic diplomacy forward under the aegis of the IGY Solution, decades of science advocacy behind the scenes coalesced on a track that overlapped with the geopolitical priority of settling

¹⁰⁰ Denning, Esler (1960) ‘The Antarctic Treaty’, pp 4-5.

¹⁰¹ Turchetti, Simone et al (2008) ‘On thick ice’, p 368.

¹⁰² Royal Institute of International Affairs (1957) ‘Antarctica’, p 8.

¹⁰³ Bulkeley, Rip (2009) ‘Politics at the First Comité Spécial de l’Année Géophysique Internationale (CSAGI) Antarctic Conference’, *Polar Record*, Vol. 45, No. 4, January 2009, pp 381-383, p 381.

¹⁰⁴ ‘The Royal Society Empire Scientific Conference (June-July 1946)’, *Notes and Records of The Royal Society London, The Royal Society Journal of the History of Science*, Volume 4, 1 October 1946, pp 162–167.

Antarctic territory.¹⁰⁵ Whether or not scientists coordinating the Antarctic program of the International Geophysical Year welcomed traditional diplomacy nestling in on their vision, diplomats were in no doubt about the benefits of doing so.¹⁰⁶ At the front of diplomats' minds was that scientists on the IGY Organising Committee, including Soviet scientists invited by their peers through the channel of the International Council of Scientific Unions without prior diplomatic approval, 'could continue to cooperate over Antarctica on some less rigid base than a formal declaration of sovereignty.'¹⁰⁷ As Green put it:

*I've heard Foreign Affairs people tell me that there were times during the Cold War that the only, literally the only line of communication—and forum of communication—between the United States and the Soviet Union during the Cold War was within the Forums of the Antarctic Treaty System. It was a 'civilising umbrella.'*¹⁰⁸

Territory was a significant, but not the only, point of contention. A looming showdown over the installation of nuclear weapons added a strategic imperative to settling questions about who owned what parts of Antarctica. The United States of America and the Union of Soviet Socialist Republics were nuclear super-contenders at the time. Both eyed Antarctica as a possible weapons site. At the same time, Britain, Argentina and Chile were hotly contesting overlapping claims in West Antarctica. Treaty diplomacy needed a way forward. In the margins of CSAGI, diplomats banked on scientific engagement as a way to keep the machinery of diplomacy turning. They seized the upcoming moment of the International Geophysical Year to carry Antarctic diplomacy on to what looked like a way to keep territorial contestants talking despite geopolitical tensions amongst them.¹⁰⁹

As IGY organisers shaped the Antarctic science program, its proximity to the geopolitics of the Cold War elevated the program's science priorities to first track diplomacy where participating

¹⁰⁵ Needall, Allan (2010) 'Lloyd Berkner and the International Geophysical Year Proposal in Context', pp 213-216.

¹⁰⁶ Denning, Esler (1960) 'The Antarctic Treaty', p 5.

¹⁰⁷ Belanger, Dian (2004) 'The international geophysical year in Antarctica: Uncommon collaborations, unprecedented returns', *Journal of Government Information*, Vol. 30, 2004, pp 482-489, p 488.; Royal Institute of International Affairs (1957) 'Antarctica', p 8.

¹⁰⁸ Sir Guy Green interviewed by Anne Michelle Davis on 5 December 2017.

¹⁰⁹ Turchetti, Simone et al (2008) 'On thick ice', pp 355-358.

states gained visibility of them, and decision makers were able to perceive political advantage in acting on them.¹¹⁰ When Treaty negotiators translated the IGY-sponsored ‘gentlemen’s agreement’ to suspend claims into an express accommodation of scientific interests, they institutionalised scientific engagement and sharing results as the pillar of international engagement mentioned above. The Treaty Preamble pins this science track to traditional diplomacy by ‘acknowledging the substantial contributions to scientific knowledge resulting from international cooperation in scientific investigation in Antarctica’. Article II and Article III of the Treaty then direct ‘freedom of scientific investigation in Antarctica and cooperation towards that end’, and formalise the IGY practice of ensuring ‘scientific observations and results from Antarctica shall be exchanged and made freely available.’¹¹¹ This formulation establishes the permanent role of science in Antarctic relations:

*Science is so deeply embedded in the Antarctic System. It’s not at the periphery—it’s at the centre of the System. The Antarctic Treaty was really quite pivotal in terms of moving forward the freedom of science.*¹¹²

Accommodating the interests of science at a geopolitical level signals that there was more going on than a concession to the scientific community as the countervailing face of Antarctic sovereignty during high stakes bargaining. Scientists were indispensable to diplomats on the first track of geopolitics because they were the gatekeepers of the voice of international goodwill that surrounded the International Geophysical Year.¹¹³ Diplomats needed this goodwill to support treaty negotiations. Preoccupation with Antarctic territory gave diplomats cause to listen to scientists. Their primary challenge lay on the geopolitical track, where territory is a necessary ingredient of sovereignty in international law.¹¹⁴ Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom were asserting claims based on the test for territorial recognition, including discovery, exploration and commercialisation of

¹¹⁰ Berkman, Paul (2010) ‘Common Interests in the International Space of Antarctica’, pp 7-9.; Belanger, Dian (2010) ‘The International Geophysical Year in Antarctica: A Triumph of “Apolitical” Science, Politics, and Peace’ in Roger Lanius, James Fleming and David DeVorkin (2010) *Globalising Polar Science: Reconsidering the International Polar and Geophysical Years*, New York: Palgrave Macmillan Chapter 14, pp 263-278, p 274.

¹¹¹ The Antarctic Treaty 1959, Preamble, <https://www.ats.aq/e/antarctictreaty.html>

¹¹² Donald Rothwell interviewed by Anne Michelle Davis on 13 August 2018.

¹¹³ Berkman, Paul (2010) ‘Common Interests in the International Space of Antarctica’, p 8.

¹¹⁴ Triggs, Gillian (1981) ‘Australian Sovereignty in Antarctica, Part I’, p 158.; Peterson, M. J. (1988) *Managing the Frozen South*, p 123.

living resources.¹¹⁵ At the time of treaty negotiations, however, none of these seven claimant states had perfected a title sufficient to assure their claims in the face of geopolitical competition over Antarctica.¹¹⁶ In addition, the United States and the Soviet Union both reserved the right to claim all of Antarctica, which significantly raised the negotiating stakes. So the interests of science got a hearing all the way to the Treaty Conference convened by the United States of America in Washington in 1959.

When scientists found themselves actors with agency on the geopolitical track, they used the second diplomatic track CSAGI provided as an echo chamber to reinforce support for their scientific priorities. This stratagem reflected scientists operating as science diplomats of the day. As Rothwell put it:

*The scientists who were involved in terms of driving the IGY were well aware of the geopolitical issues confronting the regions of the Arctic and Antarctica during the middle of the Cold War. Many of the scientists of the era were prominent Russian and American scientists, so, they were well and truly political actors.*¹¹⁷

On the dual science and diplomacy track that scientists worked on during the treaty negotiations, the non-traditional leverage of scientific cooperation enhanced the diplomatic prowess the general public accorded the profession of science in its own right. To green-light their Antarctic science programs, participating nations had already settled on a principle of scientific engagement, in effect establishing unfettered access to the whole continent for research purposes for the duration of the IGY.¹¹⁸ No country up till then had had any claims to sovereignty recognised, so scientists could, and did, treat the whole continent as a natural laboratory. Under the auspices of the IGY, scientists found themselves operating at a 'para-

¹¹⁵ Department of Agriculture, Water and the Environment, Australian Antarctic Division (AAD), 'Antarctic territorial claims', <https://www.antarctica.gov.au/about-antarctica/law-and-treaty/history/antarctic-territorial-claims/>

¹¹⁶ Kerr, Alan and Australia, Attorney-General's Department (2009) *A federation in these seas*, pp 224-237.

¹¹⁷ Donald Rothwell interviewed by Anne Michelle Davis on 13 August 2018.

¹¹⁸ Berguno, Jorge and Aant Elzinga (2010) 'The Achievements of the IGY' in Susan Barr and Cornelia Lüdecke (2010) *The History of the International Polar Years (IPYs)*, Berlin: Springer, Chapter 11, pp 259-278, pp 270-272.

sovereign' level.¹¹⁹ For example, IGY organisers were able to coordinate separate national commitments as a line of action spanning the continent.¹²⁰ With the backing of peak bodies with global reach such as the International Council of Scientific Unions, the scientific effort in Antarctica attracted a critical mass of technical gravitas on the same global stage where diplomats were operating. Diplomats were used to letting far less light shine on their activities, and in the court of international opinion, vision and gravitas favoured the scientists.¹²¹

With a foot on each track of traditional geopolitics and a novel scientific advisory track that scientists worked on during the treaty negotiations, the difference between the scientists' approach and traditionally secret Antarctic diplomacy advantaged the vision of Antarctica as a scientific domain. Scientists stepped closer than ever before to traditional diplomatic tracks as policy makers recognised that scientists 'quasi-formal network was accomplishing a détente that would be impossible officially.'¹²²

*Many scientists were clearly political actors within Government bureaucracies and they realised the importance of bringing together collaborative groups of scientists who don't operate at the same political level as elected politicians or even very senior bureaucrats. But they nonetheless understand the politics of what they're doing.*¹²³

By airing their popular alternative in public, scientists attached their own definition of value to the traditional diplomatic currency already being deployed in the diplomatic efforts over unrecognised claims. The IGY's high profile meant each treaty delegation was able to bring an equal measure of science-based international goodwill to the negotiation table. As a result, scientific engagement attracted renown as a diplomatic leveller.¹²⁴ Diplomats from IGY

¹¹⁹ Opening Address by Sir Robert Robinson, President of The Royal Society in 'International Council of Scientific Unions', *Nature*, Volume 158, 17 August 1946, pp 227-229, pp 227-228.

¹²⁰ Belanger, Dian (2004) 'The international geophysical year in Antarctica', p 484.; Letter, Detlev Bronk, President, National Academy of Sciences, to Sherman Adams proposing the International Geophysical Year, April 21, 1954, DDE Records as President, Official File, Box 624, OF 146-E International Geophysical Year (1); NAID #16645592, p 3.

¹²¹ Belanger, Dian (2004) 'The international geophysical year in Antarctica', p 486.

¹²² United States of America, National Security Council, (NSC 5424/1, 1954, 19 July) in Belanger, Dian (2004) 'The international geophysical year in Antarctica', p 486.

¹²³ Donald Rothwell interviewed by Anne Michelle Davis on 13 August 2018.

¹²⁴ Opening Address by Sir Robert Robinson, President of The Royal Society in 'International Council of Scientific Unions', pp 227-228.

nations clearly recognised scientific engagement as a circuit breaker, and took it to the Treaty Conference with the aim of leveraging it to keep the political temperature amongst negotiating parties as low as possible. Scientists had been key technical advisers in the decade leading up to the negotiations.¹²⁵ When negotiators went on to legislate terms for science in the treaty, they opened this door to scientists permanently.¹²⁶ As Rowe put it:

*Science was always the main focus, and of course, diplomats were involved in negotiations. But it was very much a linked-up perspective and the science fed into the diplomatic imperatives. And the diplomats or the Foreign Affairs representatives and legal advisers—from their side—had to be very conscious and aware of the scientific dimensions, and in the different areas of Antarctic science, both on the landmass and also in the waters. But equally, while the diplomats had to be aware, the scientists had to be also very conscious that they were involved, in those early days particularly, in contributing to an international framework and agreement that would enable them and states to pursue their activities. So, they had a vested interest in ensuring that they in fact were active in a diplomatic sense to ensure that the scientific imperatives were fully understood and reflected, and that those interests and concerns were taken account of by the negotiating diplomats per se.*¹²⁷

The puzzle the Antarctic interface poses for the practice of diplomacy is more than just whether Antarctic diplomacy has unique characteristics because of this outcome. If diplomatic migration across professions is set to become an enduring trend, as Constantinou, Cornago and McConnell attest, then the Antarctic example merits a closer look to see what scientists do there, and in particular, to find out how diplomats and scientists integrate technical expertise and diplomacy in the problem-solving space they share.¹²⁸ What stands out, and this study pursues, is that access to Antarctic diplomacy and credibility in its conduct depends on scientists as much as diplomats, and perhaps on scientists as diplomats. In Rowe's words:

¹²⁵ Needall, Allan (2010) 'Lloyd Berkner and the International Geophysical Year Proposal in Context', pp 216-217.

¹²⁶ Berkman, Paul (2002) *Science into Policy: Global Lessons from Antarctica*, New York: Academic Press, pp 22-23.

¹²⁷ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

¹²⁸ Constantinou, Costas et al (2016) 'Transprofessional Diplomacy', pp 3-4.

There's no doubt that the scientists are diplomats as well when they need to be. And in the Antarctic context that happens quite a lot. ¹²⁹

For their part, from the time diplomacy over Antarctica began in the 1700s, Antarctic scientists entered into a working arrangement with diplomats that encompassed the interests and preoccupations of both professions. Finding ways to make this accommodation work has been scientists' intergenerational challenge. The Antarctic science and diplomacy interface is a working interface, an indication of how much diplomats have come to rely on joint political and technical problem solving too. Understanding how this interface came about, and what keeps it going, is an opportunity to capture lessons learned. The benefit in documenting how diplomats and scientists carry out their professions at the Antarctic interface is that the research effort offers newcomers an expanded typology of practice, and new techniques to augment their skills.

Antarctic science on diplomatic tracks—international technical management

Argument

The role scientists' play is an underexplored element in Antarctic diplomacy despite the fact they operate in the traditional diplomatic strongholds of negotiation and consensus-building there.¹³⁰ Arguably, the science and diplomacy interface in Antarctica is a prototype for how diplomacy might continue to evolve, that is, an approach to international engagement that enables diplomats and scientists to step beyond the traditional bounds of their professions to bring technical expertise to bear on political solutions. Dr Nick Gales is Director of the Australian Antarctic Division (AAD). The Division leads Australia's Antarctic program and coordinates its many layers by facilitating access to Antarctica in support of work undertaken there, developing whole-of-government positions on Antarctic issues, and representing the Australian Government in Treaty forums such as the Antarctic Treaty Consultative Meeting and the Commission on Environmental Protection. Dr Gales is a member of the Australian Antarctic Delegation, and he put it thus:

¹²⁹ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2017.

¹³⁰ Dodds, Klaus, Alan Hemmings and Peder Roberts (2017) 'Introduction: the politics of Antarctica' in Klaus Dodds, Alan Hemmings and Peder Roberts (eds) (2017) *Handbook on the Politics of Antarctica*, Cheltenham: Edward Elgar, pp 1-17, p 12.

There is room to bring scientific agendas and diplomatic agendas, globally, closer together. I know we can interact. We can always improve the way in which we interact, and we can learn more from each other from the two elements. ¹³¹

The science-based innovations in the Treaty provide an underlying rationale for this argument. Anchored by the Preamble, Articles I, II and III interconnect with Article IX.2 to establish science on a distinct diplomatic track. Together, these articles attest to scientific cooperation as a common interest between states in the management of Antarctica. It is to be expected scientists on the ground, working separately or together with diplomats, contribute technical expertise to the conduct of Antarctic diplomacy. The argument in this thesis goes deeper to target how scientists facilitate statecraft beyond this technical niche.

The Antarctic Treaty System is an ideal setting to explore Hedley Bull's concept of international technical management. As outlined in the introduction, Bull's vision about the future of diplomacy included the notion diplomats would need to call on what he termed 'international technical management' for their diplomacy on issues with human impact beyond politics—like ecology and the environment—to be effective. In Bull's words:

While in some areas of international relations diplomacy has given place to political warfare, in others it has given place to international technical management. It is clear that in a number of areas of international discussion the conciliator or negotiator has given place to the technical expert – military, economic, social, educational, scientific, ecological. ¹³²

The diplomats Bull had in mind were generalist diplomats commensurate with Nicolson's definition of officers who represent their government in the negotiation of national interests and implement state policy by this means.¹³³ The international technical managers Bull envisaged were experts operating at the level of the state to enable traditional negotiations

¹³¹ Nick Gales—Director, Australian Antarctic Division (2015-2018), interviewed by Anne Michelle Davis on 25 September 2018.

¹³² Bull, Hedley (1977) *The Anarchical Society*, p 170. Scientific expertise dominates the Antarctic context this study investigates.

¹³³ Bull, Hedley (1977) *The Anarchical Society*, pp 156-157.; Nicolson, Harold (1969) *Diplomacy*, pp 13-15.

to go beyond national interests for solutions to global problems.¹³⁴ Diplomats open to technical solutions and willing to act on expert advice are candidates. Antarctic scientists who work with these diplomats are also candidates to be international technical managers as Bull describes them.

Bull's forecast was part of an idea about what might happen if the diplomatic priorities of states waned in the face of the 'common interests of humanity'.¹³⁵ In regard to state interests in this scenario, Bull predicted longevity for traditional diplomacy and a future role for diplomats 'communicating and negotiating among states to minimise friction in international relations.'¹³⁶ When he speculated about what international engagement over common interests of humanity might look like, Bull noted the suspension of the preoccupation with sovereignty as one of the prerequisites for international technical management to fully emerge.¹³⁷

It is hard to think of any candidates for 'international technical management' where sovereignty could be explicitly suspended, except the Antarctic Treaty, which suspends sovereignty while it is in force. The practical effect of Article IV is to hold territorial claims in abeyance while Article I, Article II and Article III circumvent states' recourse to military capabilities to enforce them.¹³⁸ This combination constrains diplomats' access to the lever of sovereignty as the go-to heavy-hitter in international engagement.¹³⁹ In Antarctic diplomacy, sovereignty is consistently put aside in preference to exhausting other diplomatic options first.¹⁴⁰ In the frame that remains, the two-track diplomacy States adopt to respond to Antarctic tensions relies as much on the Preamble's alternative vision of 'peaceful use in the interests of all humankind' based on international scientific cooperation, as on how much diplomatic weight they can bring to bear on deliberations at annual Antarctic Treaty Consultative Meetings.¹⁴¹ De-emphasising sovereignty shifts the diplomatic norm towards

¹³⁴ Bull, Hedley (1977) *The Anarchical Society*, pp 170-171.

¹³⁵ Bull, Hedley (1977) *The Anarchical Society*, p 247.; Paul Keal interviewed by Anne Michelle Davis on 5 December 2019.

¹³⁶ Bull, Hedley (1977) *The Anarchical Society*, pp 163-166.

¹³⁷ Bull, Hedley (1977) *The Anarchical Society*, pp 21, 248-271.

¹³⁸ Hayton, Robert (1960) 'The Antarctic Settlement of 1959', pp 350-371.

¹³⁹ Rothwell, Donald and Jackson, Andrew (2011) 'Sovereignty', pp 54-57.

¹⁴⁰ Rothwell, Donald and Andrew Jackson (2011) 'Sovereignty', pp 48-67.

¹⁴¹ Stokke, Olav and Davor Vidas (1996) 'Effectiveness and legitimacy of international regimes' in Olav Stokke and Davor Vidas (eds) (1996) *Governing the Antarctic: the effectiveness and*

science as common ground in Antarctic diplomacy. In that space, Bull's concept of international technical management offers a way to describe the kind of diplomatic actors Antarctic scientists have turned out to be. Ms Penelope Richards is the Senior Legal Adviser in the International Organisations and Legal Division of the Department of Foreign Affairs. Ms Richards also served as Head of the Australian Delegation to the Antarctic Treaty Consultative Meeting, and in this capacity, tasked and received expert support from Australian Antarctic Division scientists as part of joint planning, preparation and negotiation at both Antarctic Treaty Consultative Meetings and its advisory organs such as the Committee on Environmental Protection. Ms Richards's view is:

*I would say that diplomats are more essential than ever and that to solve problems on a global scale, diplomats need to rely on those who are technically qualified in a much closer and more direct way. I think in the sphere of Antarctic diplomacy that scientists are diplomats, and diplomats support science.*¹⁴²

In practice, scientific cooperation and exchange distinguish a role for scientists in Antarctic diplomacy on a track alongside the traditional tracks dominated by geopolitics and resources on which diplomats usually operate.¹⁴³ Scientists are able to interact with treaty parties over scientific and multiple other interests from this additional point of engagement. Richards also observed:

As a diplomat, I also think it's a valid general concept that scientists are diplomats in the Antarctic sphere. That's because I'm going to respect you for a number of reasons: maybe you're very rich, maybe you have a big gun. But there's another reason I might respect you, because you know what you're

legitimacy of the Antarctic Treaty system, New York: Cambridge University Press, Chapter 1, pp 13-31, pp 26-28.

¹⁴² Penelope Richards—Senior Legal Adviser, International Organisations and Legal Division, Department of Foreign Affairs and Trade, Head of the Australian Delegation to the Antarctic Treaty Consultative Meeting, interviewed by Anne Michelle Davis on 21 August 2018.

¹⁴³ Chaturvedi, Sanjay (2009) 'Antarctica', pp 133.

*talking about, you're knowledgeable in a particular field, you are competent, you are trustworthy, you have integrity.*¹⁴⁴

Observations about this parallel track, and how diplomats and scientists conduct themselves in relation to it, permit consideration of international technical management as a diplomatic technique. Along with insights about what the Antarctic science and diplomacy interface can tell practitioners about working together, insights about this technique have the potential to entice twenty-first century diplomats and scientists to look in Bull's direction in furtherance of the global science and diplomacy interface.

Science as a diplomatic currency

One angle of observation is to consider how scientific cooperation and exchange attract value as a diplomatic currency at the interface. This perspective focuses on evidence that the Antarctic science and diplomacy interface is traditional diplomacy adapted by degrees of difference by generations of diplomats and scientists to extend its reach. Extended reach is a measure of interdependence between these practitioners, observable where diplomats accommodate science in their statecraft, and scientists adopt diplomatic approaches in the conduct of science.¹⁴⁵ Mutual recognition of the need for such accommodation gives rise to and sustains the Antarctic science and diplomacy interface. So agreed Tony Press:

*You could actually see in the development of the Antarctic Treaty System how these science questions have transformed it. ...The corollary of that, which is just as important, is that science becomes a platform that allows collaboration and political influence in environments where it might be difficult to do so otherwise.*¹⁴⁶

¹⁴⁴ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

¹⁴⁵ Nicolson, Harold (1969) *Diplomacy*, pp 37-38.; Berridge, Geoff (2005) *Diplomacy: Theory and Practice*, 3rd Edition, Houndmills: Palgrave Macmillan, pp 72-79.; Bergin, Anthony and Tony Press (2020) *Eyes wide open: managing the Australia-China Antarctic relationship*, Special Report, Barton: Australian Strategic Policy Institute, pp 18, 23.; Slaughter, Anne-Marie (2017) *The Chessboard and the Web: Strategies of Connection in a Networked World*, New Haven: Yale University Press. p 73.

¹⁴⁶ Tony Press interviewed by Anne Michelle Davis on 14 November 2017.

Diplomats and scientists make efforts to supplement traditional diplomacy with science that have seen them cross each other's paths over centuries of Antarctic diplomacy. This proposition affirms that, at historical and contemporary crossover points, diplomats deploy science for political purposes, and in return, advocate to advance agendas on which Antarctic science depends. This creates a need and a purpose for science in Antarctic politics and a reason for scientists to be involved. Scientists' progressive discovery of the continent and its resources stimulate sovereign attention, so the need and purpose for scientists' involvement includes scientific expeditions as 'a means to discover new territory and establish sovereignty over it, to protect and strengthen national claims, and to establish the rights of nations active in Antarctic science to be involved in any international discussions about Antarctica.'¹⁴⁷ In Richard's words:

From the point of view of a Foreign Ministry, the Antarctic Treaty is all about territory. It's a delimitation treaty in effect, about where a country's borders are. If you look historically, you were getting to the point where more and more countries were sending expeditions to Antarctica and there was tension and pressures building. It was realised that we would need to do something to sort that out before it got into a very nasty situation. And science opened the door to find a really unusual and creative way to solve those territorial tensions. So, science is inherently important in itself, but that was the key to unlocking a way to solve those territorial tensions. If you look at the classical international bases for establishing a territorial claim, exploration, discovery and occupation are some of the traditional bases on which you'd stake a claim. And of course, our scientific Bases in Antarctica are doing just that. ¹⁴⁸

The Antarctic science and diplomacy interface extends the reach of traditional diplomacy by supporting alternate visions of Antarctica as a diplomatic and a scientific domain. When diplomats and scientists articulate the continent itself as an interest they have in common,

¹⁴⁷ Law, Phillip (1962) 'The John Murtagh Macrossan Memorial Lecture, 1960' delivered by Phillip Law, Director of Antarctic Division, Department of External Affairs, and published as *Australia and the Antarctic*, St. Lucia: University of Queensland Press, p 21.

¹⁴⁸ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

science as a diplomatic currency keeps the priorities of science close to those of diplomacy, and in the orbit of statecraft. Richards added this:

*There's a lot of indefinable factors in terms of negotiating prestige, and if you have a serious science program, especially if you're a collaborative operator who does joint projects with other people or who shares logistics, then that gives you some gravitas. It gives you influence. You can earn respect through that. It's that gravitas. It's the weight. It's the respect you gain through that.*¹⁴⁹

Scientists as diplomatic actors

Another angle of observation is to consider scientists as diplomatic actors. This perspective is concerned with evidence that the Antarctic science and diplomacy interface is a diplomatic evolution that provokes scientists to perform diplomatic service through the agency of science. In the Antarctic Treaty System, states depend on scientific activities to maintain decision-making status. Under the terms of the Treaty, consultative parties must conduct research programs to establish and maintain their bona fides to be there, so the interface acts as a bridge between scientific activities and diplomatic priorities. Rothwell explores this:

*It's undoubted that unless you are a credible scientific actor in Antarctica your ability to influence the System and the development of the System is much compromised. If you are a credible scientific actor and if you are a territorial claimant that influence is even greater. And if you are a significant scientific actor and if you are an Original Treaty Party, that's also a significant factor.*¹⁵⁰

In the main, diplomats are not trained to conduct scientific activities, which establishes a need for diplomats to engage with Antarctic scientists.¹⁵¹ As well as mutual recognition derived from the negotiating coin that scientific activities provide, a mutual reliance develops between

¹⁴⁹ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

¹⁵⁰ Donald Rothwell interviewed by Anne Michelle Davis on 13 August 2018.

¹⁵¹ There are exceptions, of course. British Antarctic diplomat, John Heap, started his career as an Antarctic scientist. In the Australian context, there are some diplomats in the Department of Foreign Affairs and Trade who trained as scientists first, for example, the former Director of the Tasmanian State Office, Dr Tim Ault, is an Antarctic marine biologist (University of Tasmania).

the professions where States must depend on contributions from both diplomats and scientists to fulfil their treaty obligations. As Rowe puts it:

If you look back over the treaty, there has been a steady assumption of that dual hatted role of the scientists, of scientists engaging in diplomacy within the context of the Antarctic Treaty Consultative Meetings. ¹⁵²

Scientists become diplomatic actors when they use the medium of scientific cooperation and exchange to act on state interests. This proposition addresses the frequency with which scientists wear two hats, necessitated when Treaty parties superimpose national interests on their Antarctic science programs. This overlay generates a need and purpose for scientists to accommodate state interests as they conduct research, and as a flow on, to adopt diplomatic approaches when they engage fellow scientists. In Richard's formulation:

Scientists play a dual role. Obviously, they conduct scientific research and that's important for a number of reasons. But they are also key members of the delegation to the Annual Antarctic Treaty Consultative Meeting. I would not distinguish between scientists and diplomats because every member of that Australian Delegation—be the person a scientist, a lawyer, a public servant—is as a diplomat. When they are on that delegation, they are acting as diplomats in negotiating and furthering Australia's national interests. Scientists do all the core things that diplomats do, which is information gathering, networking, seeking access to key decision makers, trying to influence and persuade people, negotiating. ¹⁵³

Working at the Antarctic science and diplomacy interface requires scientists to attune their technical expertise to diplomatic problem solving, which also means they have to learn and deploy diplomatic skills while being scientists. Dr Knowles Kerry, Senior Biologist and Head, Australian Antarctic Division Biology Program, was a member of the Australian delegation to the Antarctic Treaty Consultative Meeting during negotiations to secure the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). Dr Kerry was Australia's

¹⁵² Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

¹⁵³ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

technical adviser to the Drafting Committee for the Convention, a responsibility that included ensuring that the text of the Convention achieved scientific as well as diplomatic outcomes. As Dr Kerry recalled:

It was a very fast learning curve as to how to do these things and talk to people and not give your hand away, or try and move people around to your way of thinking, which of course we had to do. ¹⁵⁴

When scientists exercise their technical agency in support of diplomatic activities, they foster a two-way communication that politically advantages practitioners in both professions. Diplomats gain access to a non-traditional track where scientists' evidence-based engagement can help offset prevailing political positions. Scientists gain diplomatic access and influence, enabling them to advocate for science priorities within political decision making processes.¹⁵⁵

In Rowe's words:

The advocacy role, the representation role of scientists transcends just their pure scientific contribution in Meetings. It's broader than that. If we talk about diplomacy as building bonds and good relations between states, then the scientists have made an enormous contribution in that regard, because they have established over the years, excellent links with counterpart bodies in other states, at the scientific level. In doing so, those relationships at the scientific level feed into Australia's relations with those states. And so, it is an aspect of Australia's Antarctic relations which are not just at the political and legal level. They actually are very much at the scientific level and level of scientific engagement. ¹⁵⁶

The two-way street between diplomats and scientists at the Antarctic interface contributes to the evolution of diplomatic practice by facilitating the deployment of scientists' technical agency on, or close to, traditional diplomatic tracks:

¹⁵⁴ Knowles Kerry—Head Antarctic Biology, Member of the Australian Delegation to the Antarctic Treaty Consultative Meeting, Technical Adviser to the Drafting Committee for the Convention on the Conservation of Antarctic Marine Living Resources (CCAMPR), interviewed by Anne Michelle Davis on 18 September 2018.

¹⁵⁵ Bergin, Anthony and Tony Press (2020) *Eyes wide open*, p 16.

¹⁵⁶ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

Scientists succeed in getting that very important flow of information legislated through the very clever diplomats that we had with us. The moment you have something based on science then you've got to get the diplomats to take note of the science. ¹⁵⁷

Scientists as international technical managers

A third angle of observation is to appraise the science track in Antarctic diplomacy from the perspective of international technical management. This perspective takes the combined chronology of Antarctic diplomacy into account. It acknowledges the Antarctic interface is a diplomatic frontier where states may choose to act on science in diplomatic ways. Consistent with Bull's vision, diplomats deployed on Antarctic affairs are generalists charged to communicate and negotiate between treaty parties. Scientists provide expert advice to square scientific data and diplomatic decision making. The treaty supports diplomacy and science on closely correlated tracks, and by their own account, diplomats and scientists work on both tracks in the interests of building consensus to support decision making. Gales draws this out:

You look at the make-up of the delegations that countries bring and they bring their specialists sitting alongside their diplomats. You'll see them in the different parts of the meeting, especially because there's a lot of subcommittee work that goes into leading towards the final plenary sessions where decisions are made. The scientists are working incredibly hard in those subcommittees to talk through and try to form a view that can come through in a Subcommittee report that has really done the preparatory work to enable some sort of consensus decision. ¹⁵⁸

Diplomacy in the Antarctic Treaty System is consensus-based and the interface between science and diplomacy interface paves the way for scientists to work with diplomats to frame political interventions and build consensus for decisions contingent on scientific input. At the Antarctic interface, mutual engagement generates tolerance for overlapping political and

¹⁵⁷ Knowles Kerry interviewed by Anne Michelle Davis on 19 September 2018.

¹⁵⁸ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

scientific agendas. Tolerance among diplomats and scientists is a signature feature of the typology of Antarctic diplomacy that underpins the mutual reliance they depend on to collaborate in problem solving over the same issue. Consistent mutual engagement allows Antarctic science to rise to a level of political salience where diplomats can attract the exercise of statecraft on its behalf. This proposition recognises statecraft is core diplomacy, so by necessity, Antarctic scientists align their work closely with diplomats' activities. Gales and Richards both capture this:

Our colleagues in the Department of Foreign Affairs and Trade lead our delegation to the Antarctic Treaty Consultative Meeting and we participate very strongly and support our DFAT colleagues in that. And then we lead interactions in other parts of the treaty organisation, and in scientific and operational spheres. ¹⁵⁹

Usually, you'd have more than one Delegation member in the relevant Antarctic Treaty Consultative Meeting. So you'd have the scientist who was very familiar with the operational issues and scientific principles at stake sitting cheek by jowl with the lawyer, for example, who would assist with the wording for the appropriate resolution or explain the legal principles behind how the Treaty documents interact with each other. But I like to think that the scientists, just because they are scientists, doesn't mean that they don't know about those things. ¹⁶⁰

At Antarctic Treaty Consultative Meetings, it is customary for diplomats to steward technical input from the Treaty's scientific organs through political agendas with scientists' help.¹⁶¹ The treaty provisions that establish these organs—the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and the Committee on Environmental Protection (CEP)—require diplomats to have regard to the 'best available science' when making decisions

¹⁵⁹ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

¹⁶⁰ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

¹⁶¹ Berkman, Paul (2002) *Science into Policy*, p 24.

but do not bind them to act on it.¹⁶² To help reduce the deficit, scientists use skills amassed from diplomats to position their expert advice in the closest possible proximity to decision makers:

*At Antarctic Treaty Consultative Meetings, you'll see early on the divides, if there is not going to be an opportunity to derive consensus. You then have an opportunity for the scientists, the technical specialists, to try and seek where common ground can be found, and to try to bring something through to plenary that, at times, is a big step that everyone was ready to take—or, maybe, has been tailored to a slightly more modest step that the diplomats in the broader plenary can then land some sort of agreement on.*¹⁶³

The Antarctic science and diplomacy interface delineates a diplomatic frontier where professional interaction between diplomats and scientists resembles the mix of traditional diplomacy and technical problem-solving Bull describes as international technical management. Gales argues that:

*It's a really important interaction. There are very few of the influential and hard-working parties that are not supported by a very strong scientific and technical team.*¹⁶⁴

Scientists' lived experience at the interface provides primary evidence with which to articulate international technical management as a diplomatic technique. At this blue edge, diplomats already define scientists as international technical managers. Ms Lynne Goldsworthy worked for a number of non-government organisations on Antarctic Treaty System conventions from 1983 to 2019. She attended Antarctic Treaty Consultative Meetings from 1985, including as a Member of the Australian Delegation negotiating the Convention of the Regulation of Antarctic Mineral Resources (CRAMRA), and advised the Drafting Committee for the Protocol

¹⁶² Commission for the Conservation of Antarctic Marine Living Resources, 'Conservation at CCAMLR: Understanding Article II of the Convention for the Conservation of Antarctic Marine Living Resources', report by the delegations of Australia and the United States, Hobart, 17–28 October 2016.

¹⁶³ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

¹⁶⁴ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

on Environmental Protection to the Antarctic Treaty. Ms Goldsworthy observed the roles that diplomats and scientists fulfil in the Antarctic Treaty System closely over decades. Goldsworthy concludes:

*Scientists are very comfortable defining themselves as technical experts, but that's not their job. It is, if they are scientists working in a university and their job is to write papers and further knowledge. But if their job is to progress Australia's aspirations in the Antarctic, their job is to provide scientific foundations to Australia's policy. So, they actually should be science diplomats.*¹⁶⁵

Counterargument

There is a counterargument to the prototype value of the Antarctic interface for modelling technical expertise in diplomatic problem solving. It could be argued that science in Antarctic diplomacy is an exclusive operating context enabled by a treaty whose unique features render the adaptive practices of diplomats and scientists there non-transferable. In effect, treaty-derived science and diplomacy practices are a prototype with nowhere to go. This is refutable. The Antarctic science and diplomacy interface is an end-product of how useful scientists' activities are to diplomats operating on traditional tracks. It is a working interface through which diplomats transfer diplomatic knowledge and skills to Antarctic scientists. In Rowe's words:

There is sometimes a need for scientists who are doing their work with their scientific colleagues, quite often they will reach out to other members of the delegation and say the Foreign Affairs representative –'look, we need some assistance'. Or indeed, if it is a really significant national issue that is being identified, a scientific issue, then obviously there will be a very concerted strategy going into a Treaty Meeting that's been worked out between the scientists and the diplomats, the Foreign Affairs representatives. So, there's a

¹⁶⁵ Lynne Goldsworthy—NGO Representative to the Antarctic Treaty Consultative Meeting, Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR), Convention on the Regulation of Antarctic Mineral Resources (CRAMRA) and Protocol on Environment Protection to the Antarctic Treaty, interviewed by Anne Michelle Davis on 13 December 2019.

lot of preparation, pre-planning, interaction, dialogue between the scientists and the non-scientists on the Australian side. ¹⁶⁶

There is value in documenting these phenomena, not only to update the typology of Antarctic diplomacy, but also because they attest to traditional diplomatic techniques and international technical management as complementary practices.

Table 1 below shows the framework of arguments, questions and hypotheses as they relate to outcomes observed at the Antarctic science and diplomacy interface. Those outcomes include the hierarchy of mutuality between Antarctic diplomats and scientists, and diplomacy techniques, including international technical management.

¹⁶⁶ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

Table 1 Argument, Questions and Hypotheses

Argument: The science and diplomacy interface in Antarctica is a prototype for international engagement that enables diplomats and scientists to step beyond the traditional bounds of their professions to bring technical expertise to bear on political solutions			
Questions: Could what diplomats and scientists do at the Antarctic interface enhance joint problem solving elsewhere? How does the Antarctic science and diplomacy interface come about? How do diplomats and scientists make use of it to achieve outcomes in their own and each other's interests?			
Antarctic example (hypotheses)	Antarctic context (propositions)	Antarctic experience (observations)	Antarctic outcomes (diplomatic techniques, mutuality and international technical management)
The science and diplomacy interface in Antarctica is evidence of traditional diplomacy adapted by degrees of difference by generations of diplomats and scientists to extend its reach	Science is a diplomatic currency	Diplomats accommodate science and scientists in their statecraft. Scientists conduct science in diplomatic ways	Mutual recognition The interface sustains alternate visions of Antarctica as a diplomatic and a scientific domain.
The science and diplomacy interface in Antarctica is a diplomatic evolution that provokes scientists to perform diplomatic service through the agency of science	Scientists are diplomatic actors	Scientists attend to national/treaty interests and scientific interests	Mutual reliance At the interface: - via scientific activities, diplomats gain another avenue to offset prevailing politics - scientists gain diplomatic access and influence, a reason to learn diplomatic techniques and an avenue to use them
The science and diplomacy interface in Antarctica is a diplomatic frontier where states act on science in diplomatic ways	Scientists are international technical managers	Scientists align their work with diplomats' work to elevate science to a level that attracts the exercise of statecraft on its behalf	Mutual engagement The interface facilitates professional interaction between scientists and diplomats that resembles the mix of diplomatic and technical problem-solving Bull describes as international technical management

3—Antarctic diplomacy and science: a combined chronology

Science and scientists have been a part of Antarctic diplomacy for a long time. In the 1700s, science anchored the pursuit of knowledge about Antarctica. Politics anchored the same quest in state interests aimed at gaining control of the continent and its resources. Having a continent in common gave science and diplomacy in Antarctica a jump on the current definition of geopolitics as ‘constraints imposed on foreign policy by location and environment.’¹⁶⁷ From the outset, Antarctic diplomacy fused ‘geo’—relating to the earth, and ‘politics’—the ideas and activities involved in exerting power over a particular area of the world, into a single domain.¹⁶⁸ The typology of Antarctic diplomacy is actually a combined chronology of Antarctic diplomacy and Antarctic science that encapsulates a co-evolution of both disciplines. This chapter uncovers that back story to provide the structural details needed to pin centuries of Antarctic diplomatic practice to an interdisciplinary framework.

Cornago has a take on the proximity of science and diplomacy that challenges the assumption that scientists are relative newcomers to the geopolitical mix, renown for engaging diplomats in the twentieth century to purvey technological advances. He maintains ‘science and technical expertise permeate the history of diplomacy and correspondingly, the historical development of geography, architecture, engineering, administrative and information science is closely related to the practices and institutions of diplomacy.’¹⁶⁹ Cornago’s approach, laid over the practice of Antarctic diplomacy as a whole, brings the antecedents of the Antarctic science and diplomacy interface into focus as a combined chronology.

¹⁶⁷ Jones, Charles (2018) in Garrett Brown, Iain McLean and Alistair McMillan (2018) *A Concise Oxford Dictionary of Politics and International Relations*, 4th Edition, Oxford: Oxford University Press.

¹⁶⁸ Oxford English Dictionary 2023:Online
<https://www.oed.com/view/Entry/77723?rskey=qbMCqfandresult=2#eid>, and
<https://www.oed.com/view/Entry/237575?rskey=8m7L9sandresult=3#eid>

¹⁶⁹ Cornago, Noé (2016) ‘Diplomatic Knowledge’ in Costas Constantinou, Pauline Kerr and Paul Sharp (eds) (2016) *The SAGE Handbook of Diplomacy*, London: SAGE Publications, Chapter 11, pp 133-146, pp 135-136.

Typology of Antarctic diplomacy

The critical analysis undertaken in this chapter pins centuries of Antarctic diplomatic practice to an interdisciplinary framework. To permit theory building from practices observed at the Antarctic science and diplomacy interface, identifying a typology of Antarctic diplomacy is a crucial first step in understanding how, over time, interactions between diplomats and scientists provide incentives for them to adapt how they practice their disciplines separately and together in relation to matters Antarctic. The analysis contributes to an ongoing discussion in the field of diplomacy studies spelt out by Christer Jönsson. Jönsson's criticism of diplomacy studies is that they are 'short on theory but long on typologies.'¹⁷⁰ However, for the purposes of this analysis, Iver Neumann's counterview provides redress. Neumann holds that, where a typology lays bare a 'longue durée overview that is not readily available from elsewhere it allows us to speculate about the evolution of diplomacy from a wider and hence more solid base.'¹⁷¹

The first reference point for analysis is Bull's own typology that acknowledges diplomacy as serving international relations through political engagement that takes advantage of understandings that exist between and amongst actors to whom states accord official, representational or symbolic status.¹⁷² Sharp provides a contemporary reference point for this discussion with his observation that in this century 'new sorts of people with new priorities have become directly involved in diplomacy: technical experts, people from other professions and branches of government and, latterly, private citizens.'¹⁷³ To standardise the critical analysis, the Oxford English Dictionary definition of a typology is applied to enable comparisons between what diplomats and scientists do at the level of statecraft and their contribution as participants in the machinery of diplomacy that supports international

¹⁷⁰ Jönsson, Christer (2002) 'Diplomacy, bargaining and negotiation' in Walter Carlsnaes, Thomas Risse and Beth Simmons (eds) *Handbook of International Relations*, London: Sage, Chapter 11, pp 209-257, p 215.

¹⁷¹ Neumann, Iver (2016) 'Diplomatic cooperation: an evolutionary perspective' in Dirk Messner and Silke Weinlich (eds) (2016) *Global Cooperation and the Human Factor in International Relations*, London: Routledge, Chapter 10, pp 225-245, p 226.

¹⁷² Hedley Bull (1977) *The Anarchical Society*, pp 157, 163-166.

¹⁷³ Sharp, Paul (2009) *Diplomatic Theory of International Relations*, Cambridge: Cambridge University Press, p 47.

negotiations. As the case study of Australian Antarctic scientists in Chapter 9 shows, the practices that lead to international technical management sit between these two points.

A standard typology accounts for 'commonality, human behaviours and comparative structural characteristics.'¹⁷⁴ Throughout this chapter, close attention is paid to where definitions in the disciplines of diplomacy and science point to practices, actors and structures in common. Analysis starts with diplomacy and diplomats to explore the technical side of the diplomatic profession which is less often referred to in the evolution of diplomacy than definitions of what diplomats do. The chapter then looks across to the discipline of science to reveal a soft diplomacy underbelly that correlates with the technical side of diplomacy. The correlation is observable in both historic and contemporary examples of how diplomats and scientists work together in Antarctica. The narrative surrounding the interface that emerges from this technical and diplomatic Antarctic dialogue adds to traditional definitions of diplomacy by theorists such as Ernest Satow, Geoff Berridge, Harold Nicolson, Geoffrey Wiseman, Pauline Kerr and Jan Melissen as well as Hedley Bull and Paul Sharp. That narrative illuminates new points of reference in the relationship between diplomats and technical experts like scientists in a discussion that reveals the relationship between Antarctic diplomats and scientists as an early example of an epistemic community in international relations.

As an Antarctic community of practice grew over centuries, diplomats and scientists were able to strengthen the interface between their disciplines through mutual recognition, mutual reliance and mutual engagement that facilitated strong relationships. As Antarctica was discovered and explored, the development of these norms enabled diplomats as generalists and scientists as technical specialists to combine their otherwise separate practices in the interests of working together over Antarctica with its mixed political and technical challenges. Diplomatic and scientific activities conducted in complementary ways can then be traced to where they coalesce on a dual science and diplomacy track that enables the preconditions for international technical management to emerge in Antarctic diplomacy.

¹⁷⁴ Oxford English Dictionary 2023:Online:
<https://www.oed.com/view/Entry/208394?redirectedFrom=typology#eid>

Diplomacy and diplomats

Different theorists define diplomacy in different ways. Some see it as a practice exclusive to States. For example, Ernest Satow's seminal definition of diplomacy is 'the application of intelligence and tact to the conduct of official relations between the governments of independent States, through negotiations and by applying not only persuasion but also different forms of pressure.'¹⁷⁵ Likewise, Geoff Berridge states that 'diplomacy is an essentially political activity and a major ingredient of power. Its chief purpose is to enable States to secure the objectives of their foreign policies without resort to force, propaganda or law.'¹⁷⁶ Other scholars see diplomacy as a pluralistic endeavour. Harold Nicolson defines diplomacy as 'the ordered conduct of relations between one group of human beings and another.'¹⁷⁷ Iver Neumann identifies diplomacy as an evolutionary instrument of human cooperation.¹⁷⁸ Geoffrey Wiseman conceives diplomacy as an historic, adaptive and complex function encompassing relations between states, non-states and non-state entities.¹⁷⁹ As a practice, Pauline Kerr and Geoffrey Wiseman define diplomacy as 'the management of international relations by negotiation; the method by which these relations are adjusted and managed by ambassadors and envoys; the business or art of the diplomatist; skill or address in the conduct of international intercourse and negotiations.'¹⁸⁰ Attributed to the Oxford English Dictionary in 1933, this is the same definition cited by Nicolson in use during the Antarctic Treaty negotiations of the 1950s.¹⁸¹ Diplomats engaged in Antarctic affairs in that

¹⁷⁵ Roberts, Ivor (ed) (2017) 'Diplomacy—A short history from Pre-Classical Origins to the Fall of the Berlin Wall' in *Satow's Guide to Diplomatic Practice*, 7th Edition, Oxford: Oxford University Press, Chapter 1, pp 3-19, pp 3-4.

¹⁷⁶ Berridge, Geoff (2015) *Diplomacy: Theory and Practice*, 5th Edition, Houndmills: Palgrave Macmillan, p 1.

¹⁷⁷ Nicolson, Harold (1969) *Diplomacy*, pp 5-6.

¹⁷⁸ Neumann, Iver (2016) 'Diplomatic cooperation: an evolutionary perspective', in Dirk Messner and Silke Weinlich (eds) (2016) *Global Cooperation and the Human Factor in International Relations* London: Routledge, Chapter 10, pp 225-245, p 266.

¹⁷⁹ Wiseman, Geoffrey (2020) 'Diplomacy' in Dirk Berg-Schlosser, Bertrand Badie and Leonardo Morlino (eds) *The Sage Handbook of Political Science*, Los Angeles, California: Sage Publications, pp 1193-1213, p 1193.

¹⁸⁰ Kerr, Pauline and Geoffrey Wiseman (2017) *Diplomacy in a Globalizing World: Theories and Practices*, 2nd Edition, Oxford: Oxford University Press, p 1.; Oxford English Dictionary, 2023: Online: <http://www.oed.com/view/Entry/53200?redirectedFrom=diplomacyand>

¹⁸¹ Nicolson, Harold (1969) *Diplomacy*, pp 3-5.

decade would recognise this definition, and Antarctic diplomacy conducted in its general form conforms to it.

Jan Melissen defines diplomacy as 'the mechanisms of representation, communication and negotiation through which states and other actors conduct their business.'¹⁸² Melissen considers the essence of modern diplomacy as 'the management of change', necessitated by the impact that rapid technological changes have on these mechanisms. As a result, Melissen champions diplomatic practice as including 'an adaptive response to the impact of change on international relations aimed at preserving an essential degree of cohesion in international society as a whole.'¹⁸³ For Melissen, the important thing is that the definition of diplomacy is 'not limited to certain purposes, performed by a particular type of agent, or centred around only one of its multiple functions.'¹⁸⁴ Melissen's approach to defining diplomacy encapsulates Bull's reference point of diplomacy serving international relations, which Bull further refines as 'the conduct of official relations not only by states but also of political entities with standing in international politics'. Melissen's approach also links to Sharp's observation about the inroads made by technical experts and others into diplomatic activities, which Sharp clarifies as 'an adjustment conventional diplomats make.'¹⁸⁵

This triumvirate of forward-looking definitions captures a key notion of 'adjustment' in usual methods of conducting diplomacy, thereby pointing to where a definition of international technical management may fit into diplomatic practice. Another key pointer relevant to the investigation of the Antarctic science and diplomacy interface that lies ahead in Chapter 5 is Sharp's acknowledgement that 'the hard boundaries of traditional diplomacy as the exclusive province of states and diplomats are melting'.¹⁸⁶ With this in mind, and despite differences in emphasis across the definitions cited above, the scholars who formulated them all theorise the diplomatic domain as a sphere in which humans meet, communicate and confer. Notably,

¹⁸² Melissen, Jan (ed) (1999) *Innovation in Diplomatic Practice*, Houndmills: Macmillan, p xvii.

¹⁸³ Melissen, Jan (ed) (2007) *The New Public Diplomacy: Soft Power in International Relations*, Houndmills: Palgrave Macmillan, p 23.; Melissen, Jan (ed) (1999) *Innovation in Diplomatic Practice*, p xix.

¹⁸⁴ Melissen, Jan (ed) (2007) *The New Public Diplomacy*, p 23.

¹⁸⁵ Bull, Hedley (1995) *The Anarchical Society*, p 157.; Sharp, Paul (2009) *Diplomatic Theory of International Relations*, p 47.

¹⁸⁶ Sharp, Paul (2009) *Diplomatic Theory of International Relations*, p 47.

the definitions share a common basis in the acknowledgement of an ongoing need for skilled practitioners in the conduct of international relations.

In the etymology of diplomatic practice that accompanied the evolution of these definitions of diplomacy, it is possible to identify the development of a skill set from activities stretching from remote origins in the courts of the Near East, to the Greek city-state system of the fourth and fifth centuries to the foundational norms of what is now referred to as traditional diplomacy with its rise in the Italian Peninsula in the late fifteenth century.¹⁸⁷ Drawing on Satow's compendium of diplomatic practice, Ivor Roberts distinguishes a track within these political arenas on which diplomats exercise the core diplomatic skills of communication and negotiation. Roberts states that 'diplomacy itself is the epitome of 'soft power' and that in normal circumstances 'a state will conduct its international intercourse by negotiation, a form of soft power. This is diplomacy.'¹⁸⁸ It is on this track that the majority of diplomatic activities as we know them today continue to occupy diplomats. According to Bull, these activities typically include: establishing and maintaining official relationships between sovereign states, transmitting messages between one independent political community and another, formulating and executing foreign policy, gathering and assessing information about the international environment, and communicating, explaining and justifying policy to secure the cooperation of others or to neutralise their opposition.¹⁸⁹ Even as diplomatic practice itself has evolved, the diplomat's preferred approach to the conduct of these activities has remained one of reason or persuasion.¹⁹⁰

In tandem with evolution of diplomacy, the definition of a diplomat evolved from officials connected to a state's international relations to more aptly describe their principal role as a representative of state skilled in communication, negotiation, information collection and

¹⁸⁷ Berridge, Geoff (2015) *Diplomacy Theory and Practice*, 5th Edition, Houndmills: Palgrave Macmillan, pp 1-3.

¹⁸⁸ Roberts, Ivor (ed) (2017) 'Diplomacy—a Short History from Pre-Classical Origins to the Fall of the Berlin Wall' in Ivor Roberts (ed) (2017) *Satow's Diplomatic Practice*, Oxford: Oxford University Press, Chapter 1, p 5.

¹⁸⁹ Bull, Hedley (1995) *The Anarchical Society*, p 156-159.

¹⁹⁰ Bull, Hedley (1995) *The Anarchical Society*, p 156-159.

relationship management.¹⁹¹ The definition of a diplomat in the Oxford English Dictionary is ‘an official representing a country abroad’ and ‘a person who can deal with others in a sensitive and tactful way.’¹⁹² This summation retains the essence of Satow’s definition of diplomats as ‘public servants employed in diplomatic affairs, whether serving at home in the Department of Foreign Affairs, or abroad at Embassies or other diplomatic agencies.’¹⁹³ Importantly, Roberts expands Satow’s definition to affirm the increasingly functional role of a diplomat as ‘an official who applies an internationally recognised similitude of approaches to negotiations.’¹⁹⁴ Roberts expanded application allows this analysis to consider scientists as diplomats when scientists conform to those same norms during international negotiations that they are either engaged in directly or assisting through the provision of technical advice.

The discovery and exploration of Antarctica facilitated ongoing engagement between diplomats and scientists in both national and international arenas. During the formation of the Antarctic science and diplomacy interface that ensued, scientists accumulated experience in diplomats’ traditional activities such as advocacy, international representation and negotiations, collaboration, policy advice and political problem solving and consensus building, and added these diplomacy skills to their portfolio of specialised knowledge. As Chapter 9 discusses in depth, ‘being a scientist’ in Antarctica carries with it the hallmarks of what it is to be a diplomat. Rowe concurs:

Scientists have this almost dual role when necessary to not just be scientists pure and simple, and focus on that aspect, but also to, if they’re trying

¹⁹¹ Roberts, Ivor (ed) (2017) ‘Diplomacy—a Short History from Pre-Classical Origins to the Fall of the Berlin Wall’ in Ivor Roberts (ed) (2017) *Satow’s Diplomatic Practice*, 7th Edition, Oxford: Oxford University Press, Chapter 1, pp 3-19.; Bull, Hedley (1995) *The Anarchical Society*, p 156-159.

¹⁹² Oxford English Dictionary, 2023:Online:

<https://en.oxforddictionaries.com/definition/diplomat>

¹⁹³ Satow, Ernest (1957) *A Guide to Diplomatic Practice*, 4th Edition, London: Longmans Green, pp 3, 254-273.

¹⁹⁴ Roberts, Ivor (ed) (2017) ‘Diplomacy—A short history from Pre-Classical Origins to the Fall of the Berlin Wall’, p 5.

particularly to present and support and gain support for a proposal, they have to hone their advocacy skills, their representative skills. ¹⁹⁵

Diplomats as technicians

Pioneering diplomacy theorists Nicolo Machiavelli and Francois De Callières, and modernists Andrew Cooper, Jorge Heine and Ramesh Thakur, emphasise the extent to which statecraft and diplomats' personal qualities advance the conduct of diplomacy.¹⁹⁶ To this, Nicolson adds technical expertise as a foundational characteristic of diplomatic practice. He holds diplomats to be technicians, stating 'modern diplomacy—meaning not only the art of negotiation but the technicians by whom the art is practised—arose in the thirteenth and fourteenth centuries.'¹⁹⁷ This less frequently cited feature of diplomacy affirms diplomatic and scientific practices have elements in common during their early formation. The notion that the formative practice of diplomacy is in part technical is an important consideration in the centuries-long development of the science and diplomacy interface in Antarctica. The shortened gap enhances the likelihood of technical expertise playing a role in how diplomats and scientists identify and engage interests they have in common. It offers the prospect that the distance between their approaches to international engagement may not be as great as initially assumed.

Building on Nicolson's wider view, Geoff Berridge and Alan James challenge the emphasis on state representation in the current lexicon because it does not account for a technical dimension that generalist diplomats accomplish through means other than their own. They define diplomacy as 'the conduct of relations between sovereign States through the medium of officials based at home or abroad, the latter being members of their State's diplomatic

¹⁹⁵ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

¹⁹⁶ Nicolson, Harold (1969) *Diplomacy*, pp 45-46.; Russell, Greg (2005) 'Machiavelli's Science of Statecraft: The Diplomacy and Politics of Disorder' *Diplomacy and Statecraft*, Vol. 16, 2005 pp 227-250, pp 241-242.; De Callières, Francois (1716) *The Art of Negotiating with Sovereign Princes*, London: Strahan, pp 151-162.; Malone, David (2013) 'The Modern Diplomatic Mission' in Andrew Cooper, Jorge Heine and Ramesh Thakur (eds) (2013) *The Oxford Handbook of Modern Diplomacy*, 1st Edition, Oxford: Oxford University Press, Chapter 6, pp 122-141, pp 136-137.

¹⁹⁷ Nicolson, Harold (1969) *Diplomacy*, p 12.

corps or temporary diplomats.¹⁹⁸ A temporary diplomat is someone ‘temporarily attached to a diplomatic service in the capacity of a diplomatic agent.’¹⁹⁹ This acknowledgment of links between technical expertise and diplomatic agency is important for understanding how scientists influence Antarctic diplomacy from their side of the science and diplomacy interface. Antarctic scientists accentuate this alignment whenever they undertake representational duties wearing a ‘science hat’. Rowe notes this as follows:

*If a particular proposal is put forward for Marine Protected Areas, that has to be negotiated. And sure, the case is made on the basis of science and the need, but states and other scientific representatives have to be brought on board and have to appreciate the science. And so, there’s always that need to engage by scientists in an advocacy, a convincing, a representative type of role from what I call ‘a broad diplomatic perspective’.*²⁰⁰

Diplomatic agents

Rebecca Adler-Nissen defines a diplomatic agent as ‘an individual or collective unit that commits an act of consequence upon its environment.’²⁰¹ The target environment is the world of statecraft. Anne-Marie Slaughter quotes distinguished diplomat Dennis Ross to advance a practitioner’s definition of statecraft as ‘a joint enterprise of political planning and execution.’²⁰² Ross himself characterises statecraft as ‘the use of the assets or the resources and tools (economic, military, intelligence, media) that a state has to pursue its interests and to affect the behaviour of others.’²⁰³ As it unfolds, Chapter 5 reveals that scientists are ever-present and influential participants in Antarctic diplomacy, especially at the Antarctic science and diplomacy interface, where they generate a currency of influence that diplomats can

¹⁹⁸ Berridge, Geoff and Alan James (2001) *A Dictionary of Diplomacy*, Houndmills: Palgrave, pp 62-63.

¹⁹⁹ Berridge, Geoff and Alan James (2001) *A Dictionary of Diplomacy*, p 232.

²⁰⁰ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

²⁰¹ Adler-Nissen, Rebecca (2016) ‘Diplomatic Agency’ in *The SAGE Handbook of Diplomacy*, London: SAGE Publications, Chapter 7, pp 92-103, p 93.

²⁰² Slaughter, Anne-Marie (2017) *The Chessboard and the Web*, pp 114, 275. Slaughter served as Director Policy and Planning at the US State Department under Secretary Hilary Clinton from 2009 to 2011.; Ross, Dennis (2007) *Statecraft: And how to Restore America’s Standing in the World*, New York: Farrer, Straus and Giroux, p. 4

²⁰³ Slaughter, Anne-Marie (2017) *The Chessboard and the Web*, p 73.

deploy in pursuit of their government's specific Antarctic interests alongside diplomacy practised in traditional ways. In this context, science is an important addition to the assets Slaughter and Ross list at states' disposal. Dr Ian Allison was the Senior Principal Research Scientist, Australian Antarctic Division, and Co-Chair of the International Polar Year 2007-08 Group that coordinated the IPY International Program. The IPY Joint Scientific Committee admitted diplomats as delegates in a reverse example of the CSAGI model of the International Geophysical Year 1957-58. Dr Allison observes that:

We are told, and we like to think, that science is the currency of influence in Antarctic diplomacy. And at the moment there's really no other currency that's measurable for Antarctic influence unless it's the number of Stations you build and the number of ships you put to sea. The expressed reason for doing that—building Stations and putting ships to sea—is not because you are Helen of Troy but because you're supporting a science project. ²⁰⁴

Typology of Antarctic science

Science and scientists

The Oxford English Dictionary defines science as 'the intellectual and practical activity encompassing the systematic study of the structure and behaviour of the physical and natural world through observation and experiment.'²⁰⁵ A scientist is a 'person who conducts scientific research or investigation, an expert or student of science, especially one or more of the natural or physical sciences.'²⁰⁶ Disciplines such as physics and geology that have an historic footprint in Antarctica also derive their bona fides from the evolution over hundreds of years of the scientific method, defined as 'observation or procedure based on scientific ideas or methods.'²⁰⁷ This hierarchy of definitions is the empirical formation by which science

²⁰⁴ Ian Allison—Senior Principal Research Scientist and Field Glaciologist, Institute for Marine and Antarctic Studies (IMAS), University of Tasmania, interviewed by Anne Michelle Davis on 8 December 2017.

²⁰⁵ Oxford English Dictionary, 2023:Online:
<https://en.oxforddictionaries.com/definition/science>

²⁰⁶ Oxford English Dictionary 2023:Online:
<https://www.oed.com/view/Entry/172698?redirectedFrom=scientist#eid>

²⁰⁷ Oxford English Dictionary 2023:Online:
<https://www.oed.com/view/Entry/383323?redirectedFrom=scientific+method#eid>

practitioners have pursued science since the eighteenth century and the one to which Antarctic scientists subscribe.

Like diplomacy, Antarctic science is part of an international system that consolidates institutional structures as its general practice has continued to evolve. Karl Popper formulates science as a system of norms that guides scientists in research and identifies them by their attitude to discovery, criticism and knowledge revision based on facts and learned experience.²⁰⁸ Alan Chalmers conceives science as a 'knowledge industry' in which the production and appraisal of scientific knowledge is a 'complex social activity.'²⁰⁹ A *longue durée* view of scientists' Antarctic research accords with the typology of science Popper and Chalmers construct.

In addition, Alan Chalmers and Jerome Ravetz uphold the view that 'scientific knowledge is achieved by complex social endeavour and derives from the work of many craftsmen in their very special interaction with the world of nature.'²¹⁰ By inference, science as a 'complex social endeavour' describes what scientists do at the science and diplomacy interface. The addition of a role as diplomatic actors helps explain how scientists operate in overlapping political and scientific domains. To wear both hats, scientists must understand statecraft and emulate the personal qualities that diplomats rely on to facilitate diplomacy—competencies based on social patience and negotiation skills the scientific discipline does not otherwise emphasise.²¹¹ Rowe observes:

I suppose its natural in a way, I mean, representatives go to Meetings on any subject, and they talk about their subject, but they've also got to try and convince people of their ideas or build support for a particular proposal. They

²⁰⁸ Popper, Karl (1959) *The Logic of Scientific Discovery*, pp 48-56.

²⁰⁹ Chalmers, Alan (1976) *What is this Thing Called Science? An Assessment of the Nature and Status of Science and its Methods*, St Lucia: University of Queensland Press, p 104.

²¹⁰ Ravetz, Jerome (1971) *Scientific Knowledge and its Social Problems*, Oxford: Oxford University Press, p 81.

²¹¹ Nicolson, Harold (1969) *Diplomacy*, pp 53-57.; Bull, Hedley (1977) *The Anarchical Society*, pp 156-160.

have to engage in outreach and advocacy, which might in one sense seem totally normal, but for scientists it is an added dimension. ²¹²

Antarctic science and scientists

In 1978, Australian scientist John Béchervaise defined science in the Antarctic context as ‘knowledge’ and an Antarctic scientist as ‘one who by critical experiment and observation, extends the pool of knowledge about the continent.’²¹³ Fellow Antarctic scientist and British diplomat John Heap defines an Antarctic scientist as a ‘natural philosopher’ consistent with the legacy orientation of Antarctic science to the Earth sciences. Heap goes on to categorise Antarctic science as ‘severely practical’, linking it to the logistics needed to equip, transport and sustain science programs in Antarctica year after year.²¹⁴ Such strictures affirm iterative steps science historian Fogg identifies in his typology of Antarctic science.²¹⁵

According to Gordon Fogg, Antarctic science conforms to the evolution of science in general. It is holistic and practised in compliance with its parent international system. However, like Heap, Fogg locates some characteristics of Antarctic science in a category of their own. These include its characterisation as science ‘despite widespread disciplinary diversity’ and the fact that it ‘partly originated with and is still sustained by the necessity for scientists to share common logistic support.’²¹⁶ The harsh physical environment scientists encounter on the Antarctic continent render these characteristics inseparable features of the typology of Antarctic science.

An Antarctic epistemic community

As representatives of their separate professions, diplomats and scientists influence Antarctic diplomacy as individuals and as epistemic communities. The definition of an epistemic community is recent in international relations. In 1982, Haas defined an epistemic community

²¹² Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

²¹³ Béchervaise, John (1978) *Science: Men on Ice in Antarctica*, Melbourne: Lotham, p 14.

²¹⁴ Heap, John (2003) ‘The Scope of Antarctic Science’ in Patrick Quilty, Desmond Lugg, Harvey Marchant and Australian Antarctic Division (eds) (2003) *Australian Antarctic science: the first 50 years of ANARE*, Kingston, Tasmania: Australian Antarctic Division, pp 9-14, p 9.

²¹⁵ Fogg, Gordon (1992) *A History of Antarctic science*, p 1.

²¹⁶ Fogg, Gordon (1992) *A History of Antarctic science*, p 2.

as a ‘network of professionals with recognized expertise and competence in a particular domain and an authoritative claim to policy-relevant knowledge within that issue area.’²¹⁷ By 2019, the *Concise Oxford Dictionary of Politics and International Relations* cited scientists as a specific epistemic community, including them ‘among the experts on whom political actors may rely for aspects of international policymaking.’²¹⁸ Both definitions are contingent on four elements common to epistemic communities that Haas summarises as ‘shared principled beliefs, shared professional judgement, common criteria for validating knowledge and a common policy enterprise.’²¹⁹

A defining feature of the combined chronology of Antarctic diplomacy is that Antarctic scientists evince these elements in their work much earlier than the advent of the modern definition. As will be discussed in Chapter 4, there are grounds to regard Antarctic scientists as an epistemic community who practised neophyte science diplomacy skills in support of their engagement in Antarctic affairs dating from the 1700s. Encounters between scientists and diplomats during the ensuing centuries affirm that Antarctic scientists have always had three out of Haas’s four elements in common with diplomats. These encounters are early indicators of an interface that enabled science and diplomacy professionals to interact politically at the level of the State. Like Antarctic diplomacy’s jump on the definition of geopolitics, initial indicators of an Antarctic epistemic community lie in a common policy enterprise, a shared belief in the necessity of that enterprise, and a shared professional judgment that the State could not accomplish that enterprise without science. The common policy enterprise was Antarctica.

From seventeenth-century discovery voyages to expeditions to the South Pole in the 20th century, scientists and diplomats held fast to a belief that discovering Antarctica was imperative. Despite different motives for going there—scientific advancement versus

²¹⁷ Haas, Peter (1992) ‘Introduction: Epistemic Communities and International Policy Coordination’, *International Organization*, Vol. 46, No. 1, Winter 2002, pp 1–35, p 3.

²¹⁸ Brown, Garrett, Iain McLean and Alistair McMillan (2018), ‘Epistemic communities’ in *The Concise Oxford Dictionary of Politics and International Relations*, 4th Edition, Oxford: Oxford University Press, <https://ebookcentral.proquest.com/lib/anu/reader.action?docID=5824844>

²¹⁹ Haas, Peter (2011) ‘Epistemic Communities’ in Bertrand Badie, Dirk Berg-Schlosser and Leonardo Morlino (2011) *International Encyclopedia of Political Science*, Thousand Oaks: SAGE Publications, pp 788-791, p 788.

territorial acquisition—discovery as a shared belief progressively took iterative steps towards becoming a shared principle as scientists and diplomats crafted a common ‘rhetoric of exploration’ to solicit support for their undertakings. Scientists and diplomats conflated scientific information about Antarctica with territorial ambitions to better prosecute their respective cases for acquiring scientific knowledge and cartographic information on which to base territorial claims.

Diplomats and scientists were able to get behind Antarctica as a common policy enterprise by jointly acknowledging the necessity of state sponsorship for these endeavours and then combining efforts to secure it. Each profession adopted the same catch cry for their political engagement—‘for king and knowledge.’²²⁰ This coordinated approach got the sovereign’s attention, and from there, neither profession could afford to disaggregate science from diplomacy in the emerging political vision of Antarctica. Reinforcing each other’s professional judgments as a basis for political engagement then became essential for diplomats and scientists to amplify their access and influence with decision makers.

Scientists are differentiated from diplomats by Haas’ remaining element, that is, criteria for validating knowledge. In the centuries it took to find and set foot in Antarctica, the scientific method became ubiquitous among scientists, but not among scientists and diplomats. The scientific method underpins how knowledge is acquired and how scientists represent that knowledge in policy development and negotiations. In contrast, diplomatic methods focus on the core practices of communication, persuasion, negotiation and even coercion.²²¹ Over the course of diplomats’ interactions with scientists, the conduct of diplomacy over Antarctica and its core practices has been advantaged by, but never solely dependent on, science as a boon to diplomats’ geopolitical influence. For this reason, throughout Antarctica’s combined chronology, scientists have had to expend more effort tethering specialised knowledge about Antarctica derived from scientific discoveries to diplomacy, than diplomats the other way around.

²²⁰ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, pp xxxiv-xxxv.

²²¹ Bull, Hedley (1995) *The Anarchical Society*, p 156-159.

Epistemic communities and the role of experts in regional and global governance

Merje Kuus asserts that ‘geopolitical argumentation is not simply created in some places and transported to others; it is rather crafted in a process of circularity.’²²² The visible early markers of an epistemic community in the case of Antarctic diplomacy point to an incentive for scientists to adopt a diplomatic orientation to enhance their political engagement. Chapter 8 analyses this and other adjustments to conduct of Antarctic diplomacy that can be observed in current practice. However, Kuus’ point about the role of epistemic communities play in establishing expert authority in the ‘negotiations for which the content may be political power and national interest, but the medium is technical expertise’ is relevant to the historic typology of Antarctic diplomacy.²²³ Historically, Antarctic scientists’ willingness to engage in politics helped diplomats build relationships with them. As the Antarctic interface continued to evolve over the course of Antarctica’s combined chronology, these relationships provided scope for communication to become a signature activity between scientists and diplomats, and a cornerstone of joint problem solving.

Prototype value of an Antarctic epistemic community

The Antarctic Treaty System is a political space dedicated to managing Antarctic continent and region below 60° South latitude delineated by the Treaty and its Conventions. Consultative parties to the Antarctic Treaty meet annually at Antarctic Treaty Consultative Meetings which operate as a standing diplomatic conference. As in diplomacy-led negotiations that States conduct between themselves elsewhere, the function of technical expertise within the Antarctic Treaty System is ‘not a thing, but a social relation.’²²⁴ The prototype value of the early emergence of an Antarctic epistemic community is that as a group of professionals from different disciplines, the diplomats and scientists who came together because they identified Antarctica as a common policy enterprise then became a group capable of providing relevant contextual and expert knowledge.

²²² Kuus, Merje (2014) *Geopolitics and Expertise: Knowledge and Authority in European Diplomacy*, John Wiley & Sons, p 32.

²²³ Kuus, Merje (2014) *Geopolitics and Expertise*, p 32.

²²⁴ Kuus, Merje (2014) *Geopolitics and Expertise*, p 3.

The value of observing how diplomats and scientists evince elements of an epistemic community early in the case of Antarctic diplomacy is the prototype they provide for Bull's emphasis on epistemic and intellectual connections between diplomacy and the ordering of world politics. Prototype elements are observable in how Antarctic scientists staked a presence in early Antarctic diplomacy by helping to shape the emerging geopolitical reasoning about the continent. A key point is how, over time, Antarctic scientists became experts in diplomacy. Kuss has closely studied diplomats and experts representing the European Union on regional and global issues. Her findings reinforce a line of sight between early developments in Antarctic diplomacy and contemporary epistemic communities.

Kuus interviewed practitioners from all EU member states and identified among them experts who fit the profile of practising diplomats even though they have not attended a diplomatic academy. These experts learn on the job in the way that Antarctic scientists have done before them.²²⁵ Like their forebears, when engaged in diplomatic activities such as preparing briefings and negotiation strategies ahead of Antarctic Treaty Consultative Meetings, Australian Antarctic scientists communicate with both diplomats and fellow scientists. The fact that the scientific method does not require accommodation of national interests enables scientists to participate alongside diplomats in an epistemic community that 'can both provide and interpret expert knowledge, triggering a learning process that enables decision-makers to act.'²²⁶

In Antarctic diplomacy, that learning process has been sustained by the Antarctic science and diplomacy interface where the enduring point of difference in Haas' criteria for epistemic communities, that is, the criteria for validating knowledge, manifests as a relationship enhancer. Diplomats bring domain knowledge, scientists contribute specialised subject matter expertise, and the Antarctic science and diplomacy interface facilitates a flow of information between practitioners that connects them politically while maintaining the authority of diplomacy as the key State arbiter in international relations:

²²⁵ Kuus, Merje (2014) *Geopolitics and Expertise*, pp 86-88.

²²⁶ Cross, Mai'a (2011) *Security Integration in Europe: How Knowledge-Based Networks Are Transforming the European Union*, Ann Arbor: University of Michigan Press, p 21.

In some of the fora in the Treaty System you see a lot of diplomats with quite significant and considerable domain knowledge. They bring with them knowledge of the legalities and the evolution of the treaty. So, you bring in more than your generalist diplomat skills. ²²⁷

The point of difference between such technical and generalist skills reaffirms the need for scientists and diplomats to continue working on the mutual recognition, mutual reliance and mutual engagement that initially enabled them to prosecute their separate interests in the same political space.

Complementary practices in Antarctic diplomacy

In the way Antarctic scientists and diplomats' mutually recognise each other's expertise there are echoes of Hare's typology of diplomatic practice, that is, diplomacy that is 'performed by distinct groups and has evolved into a permanent activity with content, partners, and measurable results.'²²⁸ Communication occupies the top spot in Hare's typology where, he insists, it is paramount in putting diplomacy and its techniques to work.²²⁹

In the Antarctic Treaty System, geopolitical and scientific priorities are managed under the one regime, requiring diplomats to engage in diplomacy beyond the traditional bounds of state interests in order to resolve issues with mixed political and scientific features. Scientists are recognisable as diplomatic counterparts because of the three elements of an epistemic community diplomats have in common with them:

Scientists support diplomacy in Antarctica the same way diplomats do. They contribute to the process. On the delegation we would have people from AAD—some would be policy people, some would be scientists. We would have DFAT people—some policy officers, some lawyers. We would have somebody from Attorney-General's. Everybody had tasks of working to find out what was

²²⁷ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

²²⁸ Hare, Paul (2015) *Making Diplomacy Work: Intelligent Innovation for the Modern World*, 1st Edition, Washington: SAGE Publications, p xv.

²²⁹ Hare, Paul (2015) *Making Diplomacy Work*, p xvi.

going on and starting to try and persuade people of our position. And so, a scientist might talk to a fellow scientists in another delegation because there is always that established relationship. It may be about some science angle, or maybe it wasn't, but, in that sense, everybody went into their specialist field, talked to their counterparts, and then came back and contributed to— 'okay, what does this mean for us as Australia'.²³⁰

The capacity for diplomats to communicate through scientists expands problem solving options where the professional boundaries of diplomacy and science abut. At the Antarctic interface, the interdisciplinary nature of this communication between diplomats and scientists is a likely precondition for international technical management:

It's the connections you make through those shared programs or joint logistics, because, actually, negotiating is all about human relations. And so those human connections and organisational connections you make are very helpful in getting that network you need as a base for negotiating particular outcomes.²³¹

Scientists' historical efforts to engage diplomats in order to keep science under the noses of political decision makers helped to establish the bona fides of interdisciplinary communication as a practice in Antarctic diplomacy. Diplomacy at Antarctic Treaty Consultative Meetings showcases why such constancy is significant. Scientists' communication with diplomats about technical issues is the backbone of agenda setting. Prior to annual meetings, diplomats engage scientists to align political and scientific aspects of agenda items so the Head of Delegation can advance a unified national case. Richards describes the process thus:

First of all, before you even get to the Meeting you have to have an Inter-Departmental process to determine what your objectives are for that Meeting. We would have series of meetings between the key departments which would be the Australian Antarctic Division, DFAT and Attorney-General's. And those

²³⁰ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

²³¹ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

would be formalised as Australia's objectives. So, before you get to the Meeting you've already been working as a team. You've already worked out—'what are the things we're going for, or, what are the things we have to defend against.' So, you'd already understand before you got to the Meeting what you wanted to achieve, and other people's agendas that were going to be contrary to your interests. ²³²

Interdisciplinary communication facilitates flexibility in professional boundary setting about who does what. Present-day practitioners liken it to a dance where diplomats and scientists alternatively take the lead dealing with political constraints, or working through hesitancy around science-guided decisions. In Gales' words:

There is a dance, and I think it's an important tension between the two, that you need each to understand each other's role, and they are different roles. You need scientists who understand diplomacy, and you need diplomats who understand science. I say that because, for example, if the pure mission in the end was to learn about Antarctica, we may go down to do something important in the climate space—high latitude climate science—and the scientists we would choose the best scientists from university such and such, and they would choose their collaborators as the one, or two, or three global leaders in that space, and assemble a team and go down and do the best science they can. And that's a wonderful thing. But in the context of Antarctica, you may want to ensure that that collaborative arrangement includes lead scientists from some countries that would not necessarily be selected on the basis of the science alone. ²³³

In the Antarctic setting, scientists' technical expertise comes to the fore in identifying interests in common, which makes the mutual recognition, mutual reliance and mutual engagement profiled in Chapter 2 essential to the overall conduct of Antarctic diplomacy. In the twists and turns of the dance between the professions at the interface, both groups

²³² Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

²³³ Nick Gales interviewed by Anne Michelle Davis on 21 September 2018.

acknowledge access to domain expertise and specialised knowledge helps glue their work together, and most importantly, helps expand the political scope of their activities. Rowe captures this as follows:

In the Australian case we have such excellent scientists who have been working on Antarctic issues for decades. It's highly regarded from a world perspective, just really thorough experts in their fields down at the AAD and whole generations of them including to this day. And so, from an Australian representative perspective, the delegations going to the Annual Meetings—particularly the ATCMs but also CCAMLR and other related Meetings in the Antarctic Treaty System—there has been a tendency to basically, and understandably, put our trust in the scientists. They are so across what they need to do from a broad Treaty perspective but also an Australian interest perspective, that they basically manage themselves in the Meetings of the Committee on Environmental Protection, and obviously keeping the other members of the delegation fully informed. And sometimes there might be a need, for example on a particular proposal, for the scientists to call on the Foreign Affairs representatives to assist in advocacy. ²³⁴

In the shortened gap between their general and specialised practices, Antarctic diplomats and scientists have a predilection to combine the political, technical and diplomatic agency they have at their disposal but usually exercise on separate tracks. Mutual recognition, mutual reliance and mutual engagement between the professions then become hallmarks of an epistemic practice that combines aspects from the practices of each discipline that complement each other. The dance between diplomacy and science in Antarctic diplomacy not only stimulates complementary practices, it permits international technical management to emerge at crossover points between scientific and diplomatic activities where the two systems might otherwise operate at cross purposes:

The scientists are very diplomatic. When they meet for example in the Committee on Environmental Protection, which as you know is the main focal

²³⁴ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

gathering for the scientific specialists in the Annual Meetings of the Parties – the ATCMs – the discussions and the approach taken to various matters are not just narrowly scientific. There's always, I would suggest, an awareness of the diplomatic dimension. ²³⁵

Where the evolutionary paths of diplomacy and science converge in Antarctic affairs, interconnected pathways in the combined chronology brought scientists and diplomats together on and off as their parent disciplines and practices evolved. For example, Cohen traces the evolutionary path diplomacy followed from the practice of sovereigns sending ambassadors abroad to represent them, to diplomats negotiating state interests on behalf of their governments, to diplomats leading international conferences.²³⁶ Along the way, diplomatic practice advanced from secret diplomacy between nations to a conception of common international interests requiring multilateral engagement.²³⁷ Nicolson and Wiseman consider that over the course of this evolution, diplomats became members of a professional corps with a negotiation skill set and an international language in common.²³⁸

Scientific engagement with Antarctica evolved in tandem with the evolution of the scientific method. In addition to the definitions above, Chalmers relates how scientists accreted knowledge to understand and explain the world, generating classical disciplines such as physics, astronomy, geology and specialities emphasised in Antarctic science including geophysics and climatology.²³⁹ The scientific method emerged in response to derive, test and

²³⁵ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

²³⁶ Cohen, Raymond (2017) 'Diplomacy through the Ages' in Kerr, Pauline and Geoffrey Wiseman (2017) *Diplomacy in a Globalizing World: Theories and Practices*, 2nd Edition, New York: Oxford University Press, Chapter 1, pp 21-35.

²³⁷ Nicolson, Harold (1969) *Diplomacy*, pp 28, 36.

²³⁸ Nicolson, Harold (1969) *Diplomacy*, pp 55-67.; Sharp, Paul and Geoffrey Wiseman (2007) 'Conclusion: The Diplomatic Corps' Role in Constituting International Society' in Paul Sharp and Geoffrey Wiseman (eds) (2007) *The Diplomatic Corps as an Institution of International Society*, Houndmills: Palgrave Macmillan, Chapter 13, pp 265-277, pp 265-267.; Sharp, Paul and Geoffrey Wiseman (2016) 'The Diplomatic Corps' in Costas Constantinou Pauline Kerr and Paul Sharp (eds) (2016) *The SAGE Handbook of Diplomacy*, London: SAGE Publications, Chapter 14, pp 171-184, p 172.

²³⁹ Chalmers, Alan (1976) *What is this Thing Called Science?* pp 1-11.

refine theories via observation and experimentation.²⁴⁰ Thomas Kuhn, and Chalmers, consider scientists became members of an epistemic community with an investigative skill set and a methodology in common over the course of this parallel evolution.²⁴¹

Fogg assembles the techniques associated with the investigative skill set scientists bring to problem solving with the negotiation skill set diplomats bring to managing international affairs to confirm complementary practices between the disciplines in Antarctic diplomacy. He categorises Antarctic science within the domain of general science that brings scientific laws and methods to bear on research, requiring scientists to adopt professional values of rationality, transparency and universality.²⁴² In contrast, he positions the practice of Antarctic science in the domain of politics because government provision of funds, logistics and technological support has always been crucial to the 'reach, conduct and nature of Antarctic science.'²⁴³ To secure government sponsorship, the latter requires that scientists join forces with diplomats, and in so doing, adopt the diplomat's quintessential 'personal qualities of amiability and discretion along with the professional attributes of intelligence, general knowledge and social patience.'²⁴⁴ Rowe captures this in the following way:

*Sometimes when there are controversial issues that come up, for example in relation to CCAMLR and the Marine Protected Areas, scientists have been front and centre of that issue. And sure, the science and the arguments and the disagreements about what the science actually is based on research and surveys has been hotly contested. But in the negotiations in the Meetings the scientists have to really put on a hat of a 'negotiator' in presenting the science in a persuasive way and be convincing.*²⁴⁵

²⁴⁰ Chalmers, Alan (1976) *What is this Thing Called Science?* pp 17-19.; Kuhn, Thomas (1962) *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press, pp 10-22.

²⁴¹ Kuhn, Thomas (1962) *The Structure of Scientific Revolutions*, pp 16-19.; Chalmers, Alan (1976) *What is this Thing Called Science?* pp 140-142.

²⁴² Fogg, Gordon (1992) *A History of Antarctic Science*, pp 4-6.

²⁴³ Fogg, Gordon (1992) *A History of Antarctic Science*, pp 395-396.

²⁴⁴ Nicolson, Harold (1969) *Diplomacy*, pp 53-57.

²⁴⁵ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

Proximity between diplomacy and science in Antarctic affairs evident over throughout the course of the combined chronology of Antarctic science and diplomacy steers the evolution of practices in both disciplines towards where Constantinou, Cornago and McConnell see diplomacy in the twenty-first century, that is, towards a quickening diplomatic migration across professions.²⁴⁶ The Antarctic science and diplomacy interface has a role to play in this. From the perspective of statecraft, the Antarctic interface encourages diplomats and scientists to link their activities, and to keep doing so, as new issues and challenges present themselves. The expectation of mutuality it fosters between diplomats and scientists serves the advance of complementary practices in Antarctic diplomacy. Historically, and contemporaneously, mutual recognition of each other's expert contributions entices diplomats and scientists into mutual relations and quickens long-standing relationships between them into mutual engagement. There is a practical affinity between this aggregate effect and international technical management. On the surface at least, international technical management fits the profile of a complementary science and diplomacy practice.

²⁴⁶ Constantinou, Costas et al (2016) 'Transprofessional Diplomacy', pp 3-4.

4—Science diplomacy and Antarctica

With the clues to international technical management inherent in the combined chronology of Antarctic science and diplomacy identified in Chapter 3, science diplomacy may seem an obvious way to frame what scientists do at the Antarctic science and diplomacy interface. For example, Pierre-Bruno Ruffini points out that even though science diplomacy only appeared in the new millennium, there were a number of recognised practices since the Great Voyages in the eighteenth century, including Captain Cook's search for a Southern Continent, when the ties between science and foreign policy were fully acknowledged and sovereigns from competing nations relied on those ties.²⁴⁷ According to Ruffini, 'a country's science diplomacy refers to all practices in which actions of researchers and diplomats interact at the intersection between science and foreign policy.'²⁴⁸ By situating the definition of science diplomacy at this intersection, Ruffini's definition is relevant to the discussion in this chapter because it enables the analysis begun in Chapter 3 to progress to further study of adaptations in the way that diplomats and scientists engage each other at the Antarctic science and diplomacy interface, where Ruffini acknowledges that 'far from home, the scientist turned sometimes into a diplomat.'²⁴⁹

Nina Federoff defines science diplomacy as 'the use of scientific collaboration among nations to address common problems facing 21st century humanity and to build constructive international partnerships.'²⁵⁰ Federoff's definition provides a stepping off point to reappraise lessons learned from the joint problem solving and relationship building of distant collaborations between diplomats and scientists over Antarctica through a contemporary lens. Paul Berkman, Michael Lang, David Walton and Oren Young identify science, and Antarctic science in particular, 'as a tool of diplomacy.'²⁵¹ In that capacity, Berkman et al assert that science diplomacy in support of the Antarctic Treaty Summit in 1959 facilitated

²⁴⁷ Ruffini, Pierre-Bruno (2017) *Science and Diplomacy: A New Dimension of International Relations*, Berlin: Springer, p 18.

²⁴⁸ Ruffini, Pierre-Bruno (2017) *Science and Diplomacy*, p 16.

²⁴⁹ Ruffini, Pierre-Bruno (2017) *Science and Diplomacy*, p 18.

²⁵⁰ Federoff, Nina (2009) *Cell*, Issue 136, pp 9-11.

²⁵¹ Berkman, Paul, Michael Lang, David Walton and Oren Young (eds) (2011) 'Preface' in *Science Diplomacy: Antarctica, Science and Governance of International Spaces*, Washington: Smithsonian Institution Scholarly Press, pp ix-x.

opportunities to ‘identify and assess science-policy lessons of international cooperation that have enabled both the flexibility and resilience of the Antarctic Treaty.’²⁵² The Antarctic Treaty represents what the application of diplomats and scientists separate skills in the service of a joint international enterprise can achieve.²⁵³ Ruffini acknowledges that ‘the polar regions are unique because of their special place in the analysis of interactions between geopolitics—and therefore diplomacy—and science. Countries covet them as much as they attract the curiosity of researchers. All the conditions are thus met for scientists and diplomats to work together.’²⁵⁴ Despite this acknowledgement, there nonetheless remains a gap between the iterative development of definitions for diplomacy and diplomatic practice, and science and the scientific method, and the millennium definitions of science diplomacy mentioned briefly here. For example, Copeland remarks that science diplomacy, ‘unlike its constituent elements of science and diplomacy, is a relatively new and unfamiliar term and a consensus on its definition is still unfolding.’²⁵⁵ Nonetheless, there are some current working definitions that shed light on the agency scientists accrue at the Antarctic science and diplomacy interface, and how they deploy this agency as technical experts and diplomatic agents.²⁵⁶ This chapter explores these working definitions and adds examples from the combined chronology of Antarctic science and diplomacy that demonstrate science diplomacy in practice.

Noting that ‘the interest in Antarctica has never been limited to governmental interests alone’, science diplomacy can be seen in action at the Antarctic science and diplomacy interface in interdisciplinary communications between scientists and diplomats, and in the different kinds of agency scientists develop to maximise their participation in joint problem solving.²⁵⁷ For example, political agency allows scientists to influence geopolitics through the provision of scientific advice. Technical agency provides an alternative to traditional

²⁵² Berkman, Paul, Michael Lang, David Walton and Oren Young (2011) ‘Preface’, pp ix-x.

²⁵³ Federoff, Nina (2009) *Cell*, Issue 136, p 9.

²⁵⁴ Ruffini, Pierre-Bruno (2017) *Science and Diplomacy*, p 18.

²⁵⁵ Copeland, Daryl (2016) ‘Science Diplomacy’, p 629.

²⁵⁶ Berridge, Geoff and Alan James (2001) *A Dictionary of Diplomacy*, pp 62-63, 232.; Adler-Nissen, Rebecca (2016) ‘Diplomatic Agency’, p 93.

²⁵⁷ Jacobsson, Marie (2011) ‘Building the International Legal Framework for Antarctica’ in Paul Berkman, Michael Lang, David Walton and Oren Young (eds) (2011) *Science Diplomacy: Antarctica, Science and Governance of International Spaces*, Washington: Smithsonian Institution Scholarly Press, pp 1-16, p 2.

diplomatic leverage in problem solving. Diplomatic agency is a vehicle for scientists to support diplomats in the Antarctic Treaty System without displacing them, or the governments they represent, over who has the final say. Combined agency is a sequel in the evolution of complementary practices in Antarctic diplomacy. With characteristics of science diplomacy and traditional diplomacy, diplomats and scientists use combined agency to extend the content, and reach, of negotiations. It represents the soft power face of the Antarctic interface, for example, when scientists contribute to consensus building, as well as the hard power edge of treaty compliance where it is used in to conduct inspections under Article VII of the Antarctic Treaty. Importantly, whether displaying a soft or hard face, combined agency is a door opener to science and diplomacy at the Antarctic science and diplomacy interface. In Press' words:

*I thinks it's a hard thing to describe. But it is not diplomats sending diplomatic notes from Embassy to Embassy, and summoning the Ambassador or the Head of Mission. It's more about using the channels that you develop, either through your logistics collaborations, or your scientific collaborations, or the international meetings that you have. Using those channels to engage with people when other forms of engagement might be difficult. It has always easy to engage individually for instance with Russian and Chinese scientists when other tensions might abound in the relationships. Same with British and Argentinian scientists working together in SCAR while their countries are throwing insults at each other over the status of the Falkland Islands. It's a way of keeping channels of communication open while other channels might be fraught and difficult.*²⁵⁸

Copeland considers science diplomacy 'usefully combines international political agency with the scientific method of knowledge production.'²⁵⁹ He situates this working definition at the level of the global interface where science and diplomacy intersect over geopolitics, human advancement and international relations. Despite acknowledging science diplomacy as capable of contributing to diplomacy at the geopolitical level, the definition is an incomplete

²⁵⁸ Tony Press interviewed by Anne Michelle Davis on 14 November 2017.

²⁵⁹ Copeland, Daryl (2016) 'Science Diplomacy', p 629.

fit, constrained by Copeland's acknowledgement of how 'few people have managed to straddle these worlds effectively.'²⁶⁰ The Antarctic science and diplomacy interface offers evidence of a closer fit. The long-standing relationships between scientists and diplomats at that interface enable scientists to interact at the geopolitical, normative and machinery levels of diplomacy. As participants with a foot on all these tracks, Antarctic scientists are then able to ensure representations to their own governments, and those of other treaty parties, incorporate technical aspects of diplomatic challenges that impact the management of Antarctica, without displacing diplomats' delegated authority to negotiate:

There is a higher level of awareness of, they might not even think of it as soft diplomacy, but a higher level of awareness between science and policy—it may even be politics in the Antarctic Treaty System—amongst Antarctic Treaty scientists. ²⁶¹

The high level of awareness between scientists and diplomats has clear historical antecedents. In the contemporary practice of diplomacy at the Antarctic science and diplomacy interface, it manifests as an understanding between scientists and diplomats based around their idea of 'appropriate action zones'. This speaks to a power accommodation that scientists and diplomats have settled among themselves over the long course of Antarctica's combined chronology.²⁶²

Science diplomacy in Antarctica

Scientists' participation in the Antarctic Treaty regime across multiple diplomatic tracks is a balancing act that suggests they extend their efforts beyond interdisciplinary communication. It implies scientists nuance their technical agency to help diplomats to secure political outcomes that take account of expert advice:

²⁶⁰ Copeland, Daryl (2016) 'Science Diplomacy', p 634.

²⁶¹ Tony Press interviewed by Anne Michelle Davis on 14 November 2017.

²⁶² In contrast, scientists such as climate scientists, whose inputs take place in a context where vested interests may strongly influence agenda setting, mining companies for example, are still grappling with this challenge.

*There's a wide range of skills across the scientists. The scientists who understand the inputs, and the essential value of evidence-based decision making, but also understand the broader inputs into policy—the authorising environment and all of the elements of the policy triangle in simple terms. Those scientists bring massive value to the negotiating table because they are bringing an appropriate and informed and **diplomatic voice** to those negotiations.* ²⁶³

Reinforcing this point about nuanced interaction, The Royal Society considers scientific collaboration in Antarctica ‘could provide a blueprint for international diplomacy.’²⁶⁴ The Society’s definition of science diplomacy incorporates the concept of ‘frontier diplomacy’ and cites Antarctica and the Antarctic Treaty as precedents that contribute to a global science and diplomacy interface.²⁶⁵ The Royal Society’s definition encompasses:

- Science in diplomacy—informing foreign policy objectives with scientific advice,
- Diplomacy for science—facilitating international science cooperation, and
- Science for diplomacy—using science cooperation to improve international relations between countries.²⁶⁶

The Society’s more granulated definition presupposes different kinds of agency are required for scientists to make effective inroads into diplomacy. To influence the analogous domains of statecraft, diplomatic problem solving and diplomatic machinery, scientists need a combination of political, technical and diplomatic agency.²⁶⁷ The modern operations of the Antarctic science and diplomacy interface provide examples of all three. There are also examples of combined agency, which are key to understanding how diplomats and scientists integrate their knowledge and skills in the interests of joint problem solving.

²⁶³ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018. Gales’ emphasis.

²⁶⁴ The Royal Society (2010) *New frontiers in science diplomacy*, p 16.

²⁶⁵ The Royal Society (2010) *New frontiers in science diplomacy*, pp 15-18.

²⁶⁶ The Royal Society (2010) *New frontiers in science diplomacy*, pp 5-17.

²⁶⁷ The Royal Society (2010) *New frontiers in science diplomacy*, p 16.

Political agency

In a renowned example of science in diplomacy, Australia and France broke treaty ranks in 1989. Prime Ministers Bob Hawke and Michel Rocard abandoned an agreed regime to mine Antarctica in order to negotiate a replacement to protect the Antarctic environment. Scientific advice provided a rationale for increased environmental protection that enabled the duo to explain to the international community that irreparable damage to Antarctic ecosystems could result should mining proceed.²⁶⁸ Scientists' political agency, deployed as technical advice in support of the revisionist Australian and French diplomatic postures, was instrumental in ensuring the Convention on the Regulation of Antarctic Mineral Resources (CRAMRA) did not come into force.²⁶⁹ Dr Andrew Jackson is Principal Policy Officer, Australian Antarctic Division. Dr Jackson advised the Australian Delegation to the Antarctic Treaty Consultative Meeting throughout the decade of CRAMRA negotiations, and subsequent negotiations to install the Protocol on Environment Protection to the Antarctic Treaty (Madrid Protocol). Dr Jackson recalls:

The story of CRAMRA and the Madrid Protocol, this is a major switch in international policy from a resources view of the Antarctic to an environment view of the Antarctic. There is a snapshot history which says that Bob Hawke said—'No, we're not going to go mining in Antarctica'. And the rest of the world said—'We agree'. And what Hawke did was create a collaborative political approach with France, with Michel Rocard, his counterpart in France. The negotiation of CRAMRA had its evolution over twenty years or so – and Antarctic diplomats had seen this from an embryonic idea right through to a finished, polished, very competent legal regime. And then they are told—'we are now going in a different direction,' They had to then, as government

²⁶⁸ Jackson, Andrew and Peter Boyce (2011) 'Mining and 'World Park Antarctica', 1982-1991' in Marcus Haward and Tom Griffiths (eds) (2011) *Australia and The Antarctic Treaty System: 50 years of influence*, Sydney: University of New South Wales Press, Chapter 11, pp 243-273, pp 254-256, 260-261.

²⁶⁹ Redgwell, Catherine (1990) 'Antarctica', *The International and Comparative Law Quarterly*, Vol. 39, No. 2, April 1990, pp 474-481, p 476.; 'Antarctic Treaty nations divided', *The Canberra Times*, 21 November 1990, p 7.

*diplomats, argue the case against their own work of the previous two decades.*²⁷⁰

Antarctic Treaty parties had negotiated CRAMRA over twenty years and signed up to it the year before.²⁷¹ However, when the science behind the Hawke-Rocard diplomacy made headlines around the world, other signatory treaty parties adjusted their foreign policy postures and diplomacy in response. Professor Hugh White is Emeritus Professor of Strategic Studies at the Australian National University. During the Antarctic diplomatic moment marked by the non-ratification of CRAMRA, he was adviser to Prime Minister Bob Hawke. As White puts it:

*My recollection is that it was more emotive than science in politics. It was the aesthetics or the ethics of it, that is—‘here is this last pristine continent. The only one that humankind hasn’t touched and transformed. We have an obligation to protect it.’ And I think part of that was an obligation to protect it for ‘science’.*²⁷²

Technical agency

Diplomacy for science aptly describes engagement between scientists, diplomats and governments during the Antarctic Treaty negotiations. Today, diplomats and scientists refer to the Treaty as a gold standard for facilitating international science cooperation.²⁷³ When diplomatic efforts to get it underway were ramping up in the 1950s, the success of research programs conducted under the International Geophysical Year 1957-58 gave scientists

²⁷⁰ Andrew Jackson—Principal Policy Officer, Australian Antarctic Division, interviewed by Anne Michelle Davis on 17 November 2017 and 20 November 2017.

²⁷¹ Final Act of the Fourth Special Antarctic Treaty Consultative Meeting, Wellington, New Zealand, 2 May to 2 June 1998. The *Convention on the Regulation of Antarctic Mineral Resources* (CRAMRA) was opened for signature in Wellington on 25 November 1988. CRAMRA did not enter into force, but was replaced by the *Protocol on Environmental Protection to the Antarctic Treaty* (Madrid Protocol) in 1991.

²⁷² Hugh White—Emeritus Professor of Strategic Studies, Australian National University, speaking in his capacity as Adviser to Prime Minister Bob Hawke, interviewed by Anne Michelle Davis on 24 October 2018.

²⁷³ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.; Mortimer, Greg (2021) COSMOS Briefing: ‘Accessing Antarctica, Who gets to go and why?’, 11 June 2021, Royal Institution of Australia, [Cosmos Briefing: Accessing Antarctica - Cosmos Magazine](#)

political leverage on the world stage. The kudos scientists gained as international actors who were able to cooperate with each other at the height of the Cold War, when governments found it hard to do the same, gave Antarctic science a leg up to the same footing as sovereignty and resources at the Antarctic Treaty negotiating table. Using international scientific cooperation as an additional form of diplomatic leverage, diplomats were able to convert three political threats—of territorial conflict, competition for strategic dominance of Antarctica, and ambitions for resource exploitation—into peaceful use, scientific cooperation and exchange, and conservation. In Richard's words:

*There are ways in which science is invaluable to the Treaty. And of course, outside of that science is important in its own right. How can it help with tensions? One reason why originally people collaborated on science was because they saw the outcomes as so important. If we can keep undertaking really high quality scientific research, hopefully, people will realise that that's worth preserving the peaceful Regime in order to get those outcomes.*²⁷⁴

The need to maintain international scientific cooperation in order to stabilise treaty implementation became a stimulus for competing claimants to distinguish between their scientific activities and their diplomatic activities, and to leverage science as a diplomatic currency in their ongoing relations. The technical agency observable in scientists' contributions to annual Antarctic Treaty Consultative Meetings is indebted to the formal status and political currency diplomacy for science afforded Antarctic science during the actual treaty negotiations. Richards puts it thus:

Agenda setting is a perennial issue that dates right back to the Treaty negotiations and the very first Antarctic Treaty Consultative Meeting. There is development of agenda items within the System and outside the System, because people are consulting intersessionally all the time. So for example, from time to time the Head of Australian Antarctic Division, and myself, would phone our counterparts in the UK or the US—see what they were thinking, or what was important for them at the next Meeting, and tell them what we were

²⁷⁴ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

aiming to do. There's all sorts of ad hoc Intersessional Meetings or Sub-Meetings of the Committee on Environmental Protection, or Tourism Working Group. So people would be chatting in the margins at those Meetings. It can be done more formally too. For example, for many years whether Malaysia was going to join the Treaty or not was an issue. And we were in the habit of sending instructions to our High Commission in Kuala Lumpur to go and talk to their Malaysian counterparts. So, that would be diplomats talking to other diplomats. So yes, there is quite a lot of Intersessional contact, and if you're not doing that then you're not really preparing well for the Meeting. ²⁷⁵

Scientists' participation in the Antarctic Treaty System proceeded from a post-negotiation expectation that science would enable Antarctic diplomacy across the sweep of treaty relations from problem solving to consensus building to negotiating. Freshly minted at the negotiating table, the new norm of science coexisting with diplomacy needed an institutional measure so that signatories could track activities at the science and diplomacy interface once the International Geophysical Year ended. As a result, national science programs became a reportable activity in their own right, and scientific activities have been on the agenda and discussed at all Antarctic Treaty Consultative Meetings since the treaty system commenced in 1961.²⁷⁶

Diplomatic agency

Science for diplomacy is part of the diplomatic agency that has seen scientists engage hands-on in treaty relations over the last sixty years. One example of Antarctic science cooperation used to improve international relations between countries stands out in the case of Australia, which claims 42 percent of Antarctica as The Australian Antarctic Territory. In the changing balance of power post-World War II Australia saw its future security 'bound up with the strength of America', a foreign policy stance that heightened the perceived threat America's then rival the USSR posed to Australia's Antarctic interests.²⁷⁷ Pender notes geopolitical

²⁷⁵ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

²⁷⁶ Jackson, Andrew (2012) 'Antarctica without borders', *Australian Antarctic Magazine*—Issue 22: Mawson Centenary Special, 2012, pp 27-28.

²⁷⁷ Greenwood, Gordon (1957) 'Australia's Triangular Foreign Policy', *Foreign Affairs*, Vol. 36, No. 4, July 1957, pp 689-703, pp 690-691.

tensions behind the treaty negotiations where ‘polar science was just one of many seemingly apolitical arenas influenced by East-West tensions during the Cold War.’²⁷⁸ Notwithstanding that Australia and the USSR would become original signatories to the treaty, Collis affirms both countries have a ‘longstanding history of territorially assertive policy’ which, at the time, saw ‘science as a political instrument to be deployed in Antarctica.’²⁷⁹ With treaty diplomacy progressing discretely but urgently in the background, this played out in a race to establish a national presence on the ice prior to the official commencement of the International Geophysical Year, and before formal treaty negotiations sought indicative national commitments.²⁸⁰

Australia started upgrading its existing Mawson station on the East Antarctic coast in 1954. The USSR wedged Australia in a geopolitical countermove. Under the auspices of the IGY, the Soviet Union opened its first station, Mirny, deep within the Australian Antarctic Territory in 1956.²⁸¹ As the start date for the International Geophysical Year approached, the heads of the Australian and Russian expeditions oversaw the in-situ construction and provisioning of their respective Bases to support IGY programs over the coming Antarctic winter. The lead scientists were responsible for communicating with other science programs. Delegation of this diplomatic function established science-to-science visits across Antarctica as national events that required scientists to undertake official representations as part of their duties.²⁸²

Australia’s head IGY scientist, John Béchervaise, hosted Soviet scientists at Mawson Station and recalled these representations were very important. Engagements played out under national flags unfurled to acknowledge visiting scientists as state representatives.²⁸³ Scientists

²⁷⁸ Pender, Keiran (2017) ‘Red scare on ice: Antarctica, Australian–Soviet relations and the International Geophysical Year’, *History Australia*, Vol. 14, No. 4, 2017, pp 645–659, p 646.

²⁷⁹ Collis, Christie (2007) ‘Mawson and Mirny Stations: the spatiality of the Australian Antarctic Territory, 1954-61’, *Australian Geographer*, Vol. 35, No. 2, July 2007, pp 215-231, pp 219, 225-226.

²⁸⁰ Denning, Esler (1960) ‘The Antarctic Treaty’, pp 5-8.

²⁸¹ Collis, Christie (2007) ‘Mawson and Mirny Stations: the spatiality of the Australian Antarctic Territory, 1954-61’, pp 219-221.

²⁸² John Béchervaise and Suzanne Lunney (1976) *John Béchervaise interviewed by Suzanne Lunney*, ORAL TRC 430, 10 June 1976, <http://nla.gov.au/nla.obj-215098992>

²⁸³ John Béchervaise and Suzanne Lunney (1976) ORAL TRC 430, 10 June 1976.

exchanged diplomatic niceties under the flags, cementing national symbolism as a first order of engagement among Antarctic scientists on the ice:

Scientific visits are national events. When a big foreign aircraft comes into view and lands on the sea ice on a prearranged space and bearing, and in a weasel or tractor you go skidding out to meet it and lead it into a pre-prepared anchorage—it's a national event. The flags are waving. ²⁸⁴

According to this reflection on diplomacy as it took place face-to-face on the continent for the first time, scientists deferred to traditional modes of diplomatic conduct initially, but not for long. Béchervaise noted how quickly that inseparable feature of the typology of Antarctic science—the dictates of the Antarctic environment—saw the scientists assert human interaction over diplomatic formalities in the interests of mutual survival:

The big shuddering aircraft steers over the ice, and enters the ice harbour, where you have prepared tie-downs. You certainly welcome them, the visitors. You see them looking down out of the windows at you, as curious as you are. The ladder is lowered and out they come, men from beyond the icebergs on the most distant horizon. If the weather deteriorates during their visit, you may have to look after them for several days. On one such occasion, all our men willingly agreed to give up their quarters to the Russians and sleep communally in the recreation room. ²⁸⁵

Overt references to politics are a noticeable omission from the Béchervaise record, capturing scientists' preference, then and now, for taking political considerations off-line in order to avoid controversy and get to technical exchanges as quickly as possible. An 'Antarctic way' with officialdom that pegged science as common, but neutral, ground emerged as a signature behaviour on the science side of the interface. Confining political issues to discussions behind the scenes, where the larger part of diplomatic activity was already taking place, garnered scientists respect among the diplomatic community for political pragmatism. This development heralded a new level of professional partnership at a time of institutional

²⁸⁴ John Béchervaise and Suzanne Lunney (1976) ORAL TRC 430, 10 June 1976.

²⁸⁵ John Béchervaise and Suzanne Lunney (1976) ORAL TRC 430, 10 June 1976.

change in Antarctic diplomacy. Scientists conducted diplomacy on the ice, and the transition extended the recognition of diplomatic priorities to include engagements between scientists and their fellow scientists as part of everyday diplomatic practice.

The engagement space the scientists created in Antarctic diplomacy, while official, did not replicate the exact political positions governments instructed diplomats to adopt over Antarctica in their representations through traditional channels taking place at the same time back in foreign missions and capitals. The science-led engagement space at the Antarctic diplomatic frontier did, however, mirror what that formal diplomacy was seeking to achieve. On a separate track in the margins of formal Cold War diplomacy, scientists' technical affiliations were a springboard to express national respect in different terms. Antarctic scientists like John Béchervaise gave this other expression a face and a voice, adopting stylised diplomatic courtesies to acquit national interest requirements while staying focused on the mutual benefits to be had from technical exchanges for scientists and for diplomats. A *modus operandi* for science for diplomacy in Antarctica found its feet in this alternative. In Gales' words:

Science is the commonly used 'currency of influence', which is such a commonly used term now, but it is the way in which, and the manner in which we engage, with our counterparts in Antarctica. For some, it's just science being seen, and maybe initially in some instances a little fairly, as an important activity and not necessarily that important in and of itself in terms of what science delivered, more that it was our 'manner', our activity, through which we collaborated. ²⁸⁶

Offered opportunities to act diplomatically, scientists could step into and out of official roles from their technical exchanges aided by perceptions of impartiality that go with the profession of science. Notably, the United States and the USSR also hosted scientists at each

²⁸⁶ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

other's bases during the IGY, validating access by their diplomats to the face-saving leverage and diplomatic agility of international scientific engagement.²⁸⁷

Combined agency

Conducting international engagements ancillary to technical collaboration has allowed scientists to participate in Antarctic treaty relations from the ground up over the sixty years since the treaty came into force. Diplomats have increasingly inclined to entrust other diplomatic functions to scientists over this time for two reasons. The first is that scientists have a greater capacity to generate combined agency by virtue of being the technically expert partners at the science and diplomacy interface. In the examples above, scientists accrue a stock of goodwill when they use technical agency to interact with other scientists on and off the ice. Diplomats can then dispense this science-derived good will in favour of diplomacy in a trade-off that leaves the rest of the field clear for scientists' technical exchanges, their preferred mode of interaction. The second reason is that scientist-to-scientist relationships are a wellspring for replenishing science as a diplomatic currency:

*Formally, diplomats would be talking to other diplomats and there is quite a lot of intersessional contact. And if you're not doing that, then you're not really preparing well for the Meeting. Scientists are doing that too and using science to open doors that later became diplomatic opportunities. I think it's very valuable and you might even call it 'soft diplomacy'.*²⁸⁸

A concomitant feature in the typology of Antarctic science—the fact that it is science with long research horizons—enables career scientists to accumulate a store of political knowledge about what goes on in Antarctica from their ongoing scientist-to-scientist engagements. Under a banner of 'practical diplomacy' rather than outright statecraft,

²⁸⁷ U.S. Department of State (2001), *The Antarctic Treaty*, <https://1997-2001.state.gov/global/arms/treaties/arctic1.html>; National Archives of Australia: Department of External Affairs; NAA A1838, 1496/1/9/4 Part 1, Memorandum to Richard Casey.; Pender, Kieran (2017) 'Red scare on ice', pp 649-650.

²⁸⁸ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

scientists are then able to combine elements of technical knowledge and political savvy to render Antarctic science a tool of soft diplomacy:

Scientific cooperation is the kind of cooperation that doesn't scare people. It's not like military manoeuvres or high-level alliance forming. It's a non-threatening way into establishing a relationship on which you can perhaps later build other things. And conversely, scientific collaboration in Antarctica can feed positively back into bilateral relationships. ²⁸⁹

Scientists' ongoing relationships with diplomats at the Antarctic science and diplomacy interface enable the latter to access and use combined agency derived from science-related activities. Diplomats value their relationships with scientists because having recourse to combined agency extends the limits of their otherwise generalist approaches to problem solving. When political tensions make problem solving difficult for diplomats, combined agency is a soft power reinforcement for the science pillar in the Antarctic Treaty, enabling scientists to act as a bridge for engagement between other actors. As Gales observes:

With countries that we may have difficult interactions with in some spheres, Antarctica can be used for really important 'soft diplomacy' for an area in which we can collaborate really constructively to the benefit of both parties. Antarctic science is a really important tool that can help us seek important engagement with countries that we might, in other areas, struggle because of quite stark differences in view on different topics. So, it's really important. ²⁹⁰

The soft power face of combined agency is useful across the spectrum of traditional diplomatic activities in Antarctica. In that context, combined agency has proven itself as a multiplier for science diplomacy, like when Australia used science for diplomacy by opening its Antarctic programs to Chinese participation.²⁹¹ From the 1960s to the 1980s, the People's Republic of China did not have diplomatic relations with the rest of the World. In the 1980s, Australia dusted off the International Geophysical Year model of international scientific

²⁸⁹ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

²⁹⁰ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

²⁹¹ Bergin, Anthony and Tony Press (2020) *Eyes wide open*, pp 6-9.

cooperation and used Antarctic science to establish a low-stakes pathway to open communication with China. Throughout that decade, Antarctic science became the vehicle for the Australian Government, and its allies, to build relationships with China as diplomatic relations slowly resumed.²⁹² As Allison recalled:

*One of the more interesting things is Australia's had a long history of working with the Chinese in Antarctica starting by the early 1980s. Australia hosted the first Chinese to go to Antarctica, and then over a period of about ten years, having Chinese scientists spend the winter on Australian expeditions and learn things.*²⁹³

Australian and Chinese Antarctic scientists have maintained these channels of communication for over four decades, using them initially to help induct Chinese representatives to Antarctic Treaty Consultative Meetings into the science-oriented norms of treaty diplomacy, and subsequently, to expand Antarctic relations with China through collaborations such as the ICECAP project to map the Antarctic bedrock.²⁹⁴ Notably, when scientists invest in combined agency, they do so with an eye to how their engagements can best support diplomats along the line of sight of 'long term intent'.²⁹⁵ Dr Tas Van Ommen is Senior Principal Research Scientist, Australian Antarctic Division, former Chair of the Australian Academy of Sciences National Committee for Earth Systems Science, and Australian Representative on the SCAR Physical Sciences Committee.²⁹⁶ As Dr Van Ommen puts it:

The example where I have had a little bit more direct contact with diplomatic efforts has been in our interactions with China. We've grown a very effective relationship with China over the years in glaciological studies. And that grew some very good connections—person to person connections. One of the

²⁹² Final Report of the Sixth Antarctic Treaty Consultative Meeting, Tokyo, 19-31 October 1970, Secretariat of the Antarctic Treaty, <https://ats.aq/devAS/Info/FinalReports?lang=e>

²⁹³ Ian Allison interviewed by Anne Michelle Davis on 8 December 2017.

²⁹⁴ Bergin, Anthony and Tony Press (2020) *Eyes wide open*, p 13. ICECAP is the International Collaboration for Exploration of the Cryosphere through Aerogeophysical Profiling, a collaboration between Australia, The United States and China.

²⁹⁵ 'China plans to join Antarctic Treaty', *The Canberra Times*, 18 December 1982, p 1.

²⁹⁶ SCAR is the Scientific Committee on Antarctic Research created in 1958 to initiate, develop and coordinate international scientific research in the Antarctic Region.

benefits of Antarctica as a forum for making these sorts of connections at all levels is that it's quite a small community. And so, once you start to mix in the community over years, you do tend to get to know the prominent figures. And if you've got diplomatic or policy related people that are close to it, you actually get to know them as well. It's the 'small community' effect. We've grown this fairly strong connection at a research level over the years. It probably lapsed a little bit with the natural aging and retirement of scientists in the early 2000s. It's being reinvigorated in the last five to ten years as my generation of scientists have reconnected with what some of my older generation peers had. ²⁹⁷

Combined agency is not always about soft power in Antarctic diplomacy. There is a hard power edge to combined agency that requires scientists to discharge their technical skills with one hand on the banner of statecraft. For example, scientists' technical agency is fundamental to inspections conducted under Article VII of the Antarctic Treaty.²⁹⁸ The purpose of inspections is to assure the Antarctic Treaty Consultative Meeting, and the world at large, that parties are using their stations for the peaceful purposes enshrined in the treaty and not as not de-facto military bases or to host prohibited weapons. Inspections are a first order diplomatic function in Treaty relations. However, until recently, diplomats were infrequent members of inspection parties. Difficulties getting diplomats in and out of Antarctica for short visits, and their lack of specialist technical knowledge, tipped this onus on to scientists with relevant technical skills already stationed on the continent. Scientists perform inspections through the agency of their science, fully aware that when they do so, they are diplomatic actors.

Tacit recognition that science as common ground is sometimes a foil for geopolitics keeps scientists' professional antennae tuned to political sensitives. During inspections, scientists appreciate that the use of diplomatic formalities helps relegate politics to a silent role during their exchanges with other scientists. While these trappings of diplomatic neutrality may

²⁹⁷ Tas Van Ommen—Senior Principal Research Scientist, Australian Antarctic Division, interviewed by Anne Michelle Davis on 1 December 2017.

²⁹⁸ Antarctic Treaty 1959, Article VII.; Turchetti, Simone et al (2008) 'On thick ice', p 360.

seem an unnecessary add-on for practitioners of the scientific discipline with its prerequisite independence and objectivity, scientists in diplomatic mode have come to appreciate that exchanging courtesies offsets political differences and allows them to embed a technical lingua franca in their place:

Certainly, when I've visited – I've been to Zhongshan Station a couple of times and had lunch down there – and been, I guess, frank and honest with them. We have our own issues, other countries seem to have some issues - but we don't necessarily trade questions about that. We try and avoid things like that. So, if I was talking to some of the hierarchy down there, I would just keep it very much at my own experience, or relevance, like talking about the science that we're doing and not engaging in that discussion. ²⁹⁹

By that measure, scientists have a head-start on relationship building, and there are echoes of the 'Antarctic way' that Béchervaise institutionalised in diplomatic relations writ large at Antarctic Treaty Consultative Meetings. Science projects are often longer than diplomatic postings. Scientists end up well-placed to brief incoming diplomats on the background of significant technical issues and the related political history surrounding discussions:

When you visit an Antarctic Treaty Consultative Meeting, there are diplomats, highly skilled, highly experienced diplomats from most of the Foreign Affairs Agencies around the world. Many of the diplomats who have longevity in the treaty are really strongly advised and assisted by scientists, or the scientists end up diplomats. ³⁰⁰

Combined agency commands a diplomatic premium because it is a way for diplomats to capitalise on scientists' corporate knowledge of the Antarctic Treaty System and its participants. To maximise their diplomatic input and impact, diplomats subject to faster turnover because of shorter posting cycles can lean on combined agency that scientists provide:

²⁹⁹ Tony Press interviewed by Anne Michelle Davis on 18 October 2018.

³⁰⁰ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

*Scientists in the Antarctic game don't usually move very fast in terms of going from this career to this career, or this job to this job to that job. There is a big sense of community and a lot of people know a lot of other people. And so that level of awareness of who is doing what where – and also a lot of respect for people who have been around a long time. Collective memory is very important. You can't let corporate history fade with the passing of a particular person into another job. You have to socialise the Antarctic Treaty and Antarctic science with diplomats all the time. It's just something that you do.*³⁰¹

Combined agency is a door opener to diplomacy at Antarctic Treaty Consultative Meetings. Scientists' long-term relationships have been used to bring treaty newcomers up to speed on the norms and established patterns of interaction on the floor of these annual Conferences. As Gales describes it:

*Scientists are significant actors in Antarctic diplomacy. Broadly, that is around engendering positive, trusting relationships with counterparts in other countries and investing genuinely in those because, in the end, those relationships are at the heart of trust. It's easy with countries that we would regard as our 'like-minded countries'—the normal countries with which Australia might find common ground on most issues. When you've got Heads of Programs from countries you interact with much less, and they have very different politics to your own country, then having trusted and functional relationships with those people is at the heart of bringing them into the Antarctic family.*³⁰²

Diplomats and scientists consider combined agency especially useful for supporting consensus building at Antarctic Treaty Consultative Meetings:

You look at the make-up of the delegations that countries bring, and they bring their specialists sitting alongside their diplomats. And you'll see that in the different parts of the Antarctic Treaty System, especially because there's a lot

³⁰¹ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

³⁰² Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

*of subcommittee work that goes in to leading towards the final plenary sessions where decisions are made. The scientists are working incredibly hard in those subcommittees to talk through and try to form a view that can come through in a Subcommittee Report that has really done the preparatory work to enable some sort of consensus decision. You see early in that science interaction where there are divides, and you have an opportunity for scientists, the technical specialists, to try and seek where common ground can be found and to try and bring something through to the plenary. At times, that is a big step that everyone was ready to take, or maybe has been tailored to a slightly more modest step that the diplomats in the broader plenary can then land some sort of agreement on. It's a really important interaction.*³⁰³

For diplomats and scientists to achieve outcomes in their own and each other's interests, combined agency is essential. Evidence of combined agency at the Antarctic science and diplomacy interface is an important element in how diplomats and scientists integrate their knowledge and skills in the interests of joint problem solving. At the machinery level of the Antarctic diplomacy, diplomats rely on combined agency in scientists' hands to keep the wheels of diplomacy turning. This helps to explain what enables scientists to participate hands-on in the diplomacy of the Antarctic Treaty System on a long-term basis.

*They have a corporate knowledge; they have a scientific and diplomatic corporate knowledge. Whereas the diplomats work on postings. They tend to be slightly longer lived in Antarctic diplomacy than other postings, but they post in and out. And, one of the phenomena the scientists have grown into over the years is taking up a lot of the machinery of diplomacy work from the diplomats. You can observe for the Antarctic Treaty, that's completely right.*³⁰⁴

At the Antarctic interface, combined agency points to science diplomacy in action, evidenced where diplomats and scientists adapt techniques specific to their own professions in order to invest in it. These adaptations accommodate a very practical diplomacy that scientists and

³⁰³ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

³⁰⁴ Lynne Goldsworthy interviewed by Anne Michelle Davis on 13 December 2019.

diplomats conduct among themselves. To fully appraise what role the science track in Antarctic diplomacy plays in this, and to assess how combined agency might facilitate international technical management, it is important to understand where this practical diplomacy takes place. It is therefore essential to pin down the foundational and formative characteristics of the interface to identify when in Antarctic diplomacy such adaptations come into view. In Chapter 5, a plausibility probe of select science and diplomacy literature is used to hone in on antecedents for science diplomacy in the combined chronology of Antarctic diplomacy.

5—The Antarctic science and diplomacy interface

Co-evolution of Antarctic diplomacy and science

Chapter 5 investigates science in Antarctica's diplomatic adventure. The way scientists and diplomats adapt their professional practices at the interface is a large part of the story behind what prompts diplomats to sponsor science as a diplomatic currency, and what provokes scientists to perform diplomatic service through the agency of their science. On the lookout for prototype aspects of science diplomacy, and of international technical management in particular, the literature review in this chapter targets evidence about science and scientists in Antarctic diplomacy from the vantage points of history and politics to find out what happens when science and geopolitics converge. The investigation focuses on how scientists and diplomats have engaged in Antarctic diplomacy over centuries at the interface between their two professions. It unearths details about how the Antarctic science and diplomacy interface makes it possible for diplomats as generalists, and scientists as technical experts, to adjust their skills sets, activities and persona to achieve outcomes in their own and each other's interests.

After a brief examination of research relevant to the co-evolution of diplomacy and science, the primary search concentrates on where diplomacy and science intersect in the combined chronology of Antarctic diplomacy to reveal the foundational and formative characteristics of the Antarctic science and diplomacy interface. The subject matter covered encompasses the co-evolution of science and diplomacy in Antarctica from the 1700s to date. Literature that falls within this scope includes accounts of Antarctic discovery voyages, exposés of scientists working behind the scenes with diplomats, and contemporary research into science in the Antarctic Treaty System. Subject matter from the scientific disciplines that have used Antarctica as a laboratory, such as geology, meteorology and climatology, is outside of its scope.

The review critically examines the select body of Antarctic knowledge for plausible examples of hitherto unidentified elements of science diplomacy in the combined chronology of Antarctic diplomacy. Insights about the fledgling practice of science diplomacy, and pathways that permit international technical management to emerge, are carefully extracted using a

plausibility probe. Klotz theorises this method for deriving typologies as ‘comparing one case against an ideal to differentiate forms of a phenomenon.’³⁰⁵ In this case, comparisons are the interests of science in Antarctic diplomacy against diplomacy at large, and international technical management as a science diplomacy technique amongst traditional diplomatic practices.

The probe reveals that discovering Antarctica served political and scientific ambitions from the outset. This means that, in the human history of the continent, scientific and political imperatives are hard to separate. During the foundation of the Antarctic science and diplomacy interface, knowledge acquisition was the impetus for diplomatic ambition. As a result, since the 1700s, joint political advocacy cemented itself as a priority for scientists as well as for diplomats in managing the proximity of science to statecraft. During the formative period that followed actual discovery, support for diplomatic ambitions become the primary means for scientists to realise their scientific ambitions. As the formative period took off in the late 1880s, a focus on political cooperation became a joint priority for managing the impact of science on diplomatic problem solving. Using the probe as a methodological tool, the next sections in this chapter trace science and scientists across two emblematic periods in the development of the Antarctic science and diplomacy interface:

- the role of science in the diplomacy of empire from the 1700s to the late 1800s, and
- the role of scientists in Antarctic diplomacy from the 1880s to the 1950s.

Foundational characteristics

Scientific imperatives

In a reversal of the modern definitional hierarchy of science diplomacy as an emerging subcategory of diplomacy at large, science precipitated Antarctic diplomacy. Scientists sketched the continent on the world map before it was discovered, giving rise to centuries of geographic speculation and geopolitical incentives for empire. Scientists’ ambitions led to

³⁰⁵ Klotz, Audie (2008) ‘Case Selection’ in Audie Klotz and Deepa Prakesh (2008) *Qualitative Methods in International Relations. A Pluralist Guide*, New York: Palgrave Macmillan, Chapter 4, pp 43-60, pp 51-52, 56.

political advocacy that established an enduring national interest connection between Antarctic science and Antarctic politics. Scientific knowledge about Antarctica advantaged the enterprise of imperial expansion, evidenced where diplomats acknowledged links between the drive for scientific knowledge about a supposed Southern Continent, and the political imperatives behind support for discovery efforts.³⁰⁶ The quest to discover Antarctica reveals scientific and military imperatives to reach the seventh continent that connect the professional interests of scientists and diplomats right through from the 1700s to the 1880s. This joint effort forged strong connections between science and politics through military intermediaries.

Early political advocacy

Captain James Cook's account of his voyage across the Southern Ocean from 1772 to 1775 is an example of how such connections came about. The British Admiralty commanded Cook to verify the existence of Antarctica that European navigators alluded to in sightings in the sixteenth, seventeenth and eighteenth centuries. Speculation about a southern continent came back with Portuguese navigator Ferdinand Magellan in 1519, British Naval Captain James Strong in 1689 and French navigator Captain Lozier Bouvet in 1738.³⁰⁷ Cook records his 1772-1775 mission was to replace geographic speculation with facts:

*Whether the unexplored part of the Southern Hemisphere be only an immense mass of water, or contain another continent, as speculative geography seemed to suggest, was a question which had long engaged the attention, not only of learned men, but of most of the maritime powers of Europe. To put an end to all diversity of opinion about a matter so curious and important, was his Majesty's principal motive in directing this voyage to be undertaken.*³⁰⁸

³⁰⁶ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, pp 3-4.

³⁰⁷ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, pp x-xvi. These sightings moved progressively further south from 47 degrees to 67 degrees south latitude.

³⁰⁸ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, p ix.

Cook's reference to Antarctica as a 'question' records a shared scientific and military interest, and his subsequent reference to the Admiralty's 'ready compliance with a request to embark scientists on a voyage that promised such advantage to the republic of letters' is noteworthy advocacy for science from within the military establishment, one of the strongest political lobbies of the day.³⁰⁹

National interest connection between science and politics

In an example of how interconnected science and politics were becoming, Cook had served two masters on his preceding voyage from 1768 to 1771 to observe the transit of Venus from the Southern Hemisphere. For lack of funds, The Royal Society petitioned King George III to back that initiative. The Admiralty appointed Cook to command the ship and The Royal Society appointed Cook, who was himself a talented science practitioner, 'in conjunction with Mr Charles Green, the astronomer, to make the requisite observations on the transit.'³¹⁰ In the twelve months between completing one voyage in 1771 and setting out on the next in 1772, Cook went from command of ship to dual command of ship and science. The fact that The Royal Society lobbied the government to include 'men of science' on both voyages, and that the government paid the scientific personnel both times, indicates an arrangement where the interests of science and state interests coalesced around the common cause of discovering Antarctica.³¹¹

Cook did not find Antarctica on either voyage, but during the second he sailed into what is now known as the Roald Amundsen Sea, far enough south to confirm that his fellow navigators had located Sub-Antarctic Islands.³¹² Landfall in Antarctica had to wait out disruptions to the global order caused by wars in Europe and North America. However, from this point, the ambition to claim Antarctica became a scientific as well as a political focus. The

³⁰⁹ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, p xvii.

³¹⁰ Fogg, Gordon (2000) 'The Royal Society and the Antarctic', *Philosophical Transactions*, Vol. 54, No. 1, January 2000, pp 85-98, p 85-86.; Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, pp xix-xx.

³¹¹ Fogg, Gordon (2000) 'The Royal Society and the Antarctic', p 86.

³¹² Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, pp xxviii, 3-4.

national interest connection between science and politics in Antarctica was made, and remains.

State and military sponsorship

Cook's account affirms state and military sponsorship of Antarctic science as a foundation of the science and diplomacy interface. From this beginning, the Royal Navy went on to become an 'instrument of imperial scientific exploration' for the next two centuries.³¹³ In addition to soliciting military sponsorship, scientists lobbied for state resources to pursue scientific research in Antarctica—otherwise prohibitively expensive or distant—by seeking to draw the Establishment to their cause through representations by science-affiliated bodies with political access such as The Royal Society. Political access afforded scientists a backflow of insights about government views on the geopolitical importance of Antarctica, and an insider's perspective on its significance to the rising maritime powers of Europe.³¹⁴ Scientific and political imperatives began to merge and to look more and more like two sides of the same diplomatic coin:

*It goes from when nobody knew anything all the way up to the time they occupied the continent. All the way through, you see the role of scientists goes back to the mid-nineteenth century when the whole thing was about the south magnetic pole. It was driven by Royal Societies, and governments had to pay a fortune to equip ships, to give them all the magnetic gear, and say –'off you go'. And off they went, and they couldn't get to the pole, there was a continent in the way. That was science driven really from the top, and funded from the top. It was very clear in those days that it was driven from the top.*³¹⁵

The foundation of the Antarctic science and diplomacy interface that started with the discovery voyages of the eighteenth century rests on the strategic value of science to governments of the day. The acquisition of scientific knowledge attracted state and military sponsorship that has ebbed and flowed over the course of Antarctica's combined chronology

³¹³ Atkin, Andrew (2012) 'Failures of the magnetic research on *Discovery* Antarctic expedition 1901-1904, *The Polar Journal*, Vol. 2, No. 2, pp 200-218, p 200.

³¹⁴ Fogg, Gordon (2000) 'The Royal Society and the Antarctic', pp 86-87.

³¹⁵ Patrick Quilty interviewed by Anne Michelle Davis on 20 November 2017.

but never been withdrawn from the enterprise of Antarctic science. Antarctic scientists and diplomats co-mingled the acquisition of knowledge and territory in the definition of 'discovery' they adopted in order to contrive a political rhetoric to which both professions have long since subscribed. The combined rhetoric of knowledge acquisition plus territorial acquisition, each subsidising the other, succeeded in attracting State sponsorship for Antarctic science, elevating it to an activity where scientists' engagement with diplomats assumed political characteristics in response. On these grounds, from their earliest steps towards interdisciplinary engagement in the 1700s, joint political advocacy by diplomats and scientists became essential for managing the proximity of Antarctic science to statecraft.

Political imperatives

Political enterprise and strategic value

From the diplomacy side of the developing interface, Cook's account records for posterity an incisive analysis of the political imperatives underpinning the diplomacy of empire, including Cook's assessment of the political advantages and military costs were Antarctica to become part of the British Empire or be possessed by a competing state.³¹⁶ At stake was the utility of the southern continent to 'navigation, commerce, and the promotion of natural knowledge.'³¹⁷ From these beginnings, scientific knowledge about Antarctica became a product of political enterprise. During Cook's time, scientists' political advocacy got well under way. His insights are a forerunner of what Emilio Sahurie, Alan Hemmings, Donald Rothwell and Karen Scott, and the United States Arms Control and Disarmament Agency affirm are perennial themes in Antarctic diplomacy—the strategic value of the continent and the necessity of science in the rationale for accessing it.³¹⁸

³¹⁶ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, pp 3-4.

³¹⁷ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, p xxiii.

³¹⁸ Sahurie, Emilio (1992) *The International Law of Antarctica*, pp xxii-xxiii, 36-46.; Rothwell, Donald (2012) 'The Antarctic Treaty as a security construct', pp 36-39.; United States Arms Control and Disarmament Agency (1972) *Arms control and disarmament agreements: 1959-1972*, Washington: United States Government Printing Office, p 1.; Royal Institute of International Affairs, 'Antarctic Prospect', Record of General Meeting held at Chatham House on 4 December 1956, RIIA/8/2441, Chatham House, London, 4 December 1956, pp 2-3.

Antarctic scientists as an early epistemic community

There is a final insight embedded in Cook's account. He went to pains to lay out details about the known Antarctic voyages and discoveries of preceding eras. Cook's ability to derive scientific knowledge from others' expeditions brings to mind the modern equivalent, that these navigators were operating akin to an epistemic community.³¹⁹ Back then, the epistemic nature of their advice to governments can be discerned from Cook's political order of priorities for Antarctica. As top priority, Cook's emphasis on navigation reflected the hard power of science and its technical utility to the Military Establishment. As an instrument of executive power, the Military Establishment was the strong arm of geopolitics throughout the foundational period of the interface, and the dominant lever of statecraft. From the encounters between scientific and military personnel that Cook records, it is still possible to discern how hard power tethered Antarctic science to statecraft and the diplomacy conducted in its name at a geopolitical level.

Cook's next priority was commerce. Commerce linked diplomats' stock-in-trade, that is, negotiation, to geographic certainty about Antarctica as a curtain raiser for future resource exploitation, albeit subject to territorial acquisition. As a fulcrum of sovereign enterprise, commerce established an arc of activity from statecraft to the intricacies of international negotiations. In Cook's time, the influence scientific experts exerted based on their knowledge about the continent heralded the nascent technical power of science in Antarctica's future management. This glimpse into the beginnings of technical power makes it possible to tie knowledge acquisition into diplomatic problem solving. In relation to Antarctic matters, it was scientists who spoke knowledge to those in power.

Cook's third priority, the promotion of natural knowledge, registered the utility of science in Antarctic affairs as an instrument of political persuasion. It announced the soft power of science, as if Cook foresaw that for diplomats and scientists to hold sway in the same political circles, the interests of their professions were best served at the outset by a science *and* diplomacy agenda. The foundations of a hierarchy of technical influence were emerging through connections between Antarctic science and statecraft. In particular, scientists'

³¹⁹ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, pp i-ix.

inclusion in political agenda setting provided scientific knowledge as grist for diplomatic decision making. The upshot of Cook's third priority was that scientists and diplomats conducted a very practical diplomacy among themselves over their convergent interest in the discovery of Antarctica.

In Cook's hierarchy lie the footings of a dual track of Antarctic science and diplomacy, one already facilitating technical inroads into statecraft and diplomatic problem solving, and indicative of scientists' influence in the diplomatic machinery. Reliance on scientists to bring knowledge about Antarctica back to sovereigns for decision making meant diplomats sought them out for this advice. By allowing scientists to advise governments on the basis of a different agency, diplomats planted the institutional seeds for scientific knowledge to grow into a diplomatic currency. This incentive to engage politically made technical advisers out of scientists, and diplomats' willingness to engage scientists injected an element of mutuality to navigating issues through the iterations of government decision making that would ultimately contribute to the longevity of the developing science and diplomacy interface. Scientists' subsequent engagement at the levels of statecraft, diplomatic problem solving and the diplomatic machinery during the foundation of the interface provide the structural basis for a new model typology of Antarctic diplomacy and science.

Formative characteristics

Diplomatic imperatives

Where scientific and geopolitical imperatives underpinned the foundational characteristics of the Antarctic science and diplomacy interface, diplomatic and political imperatives shaped its formative characteristics. In the formative period from the 1880s to the 1950s, scientists set themselves on a path to diplomatic agency. Through the medium of international scientific advocacy, scientists would become fully fledged diplomatic actors by the final stages of the Antarctic Treaty negotiations. Throughout the formative period, scientists and diplomats—but mostly scientists—worked hard to uphold the banner of a shared interest in the continent. Scientists stuck with the combined rhetoric that founded the interface, even as diplomats resorted to the secrecy of traditional diplomatic channels to deal with rising geopolitical tensions that forecast World War I and World War II. Left largely to their own devices, as a

lone voice advocating for Antarctic outreach, scientists' main focus aim during this period was to maintain the salience of Antarctic science on government agendas.

International science advocacy

In the 1890s, John Murray banked on the organised and knowledge-based nature of established political advocacy in the name of Antarctic science in his efforts to bolster the credibility of scientists as a political lobby group. Like Cook 117 years beforehand, Murray too asserted that state sponsorship and backing to advance science, and 'south polar exploration in particular', was necessary in the national interest.³²⁰ Murray exposes a clue about an Antarctic science and diplomacy episteme when joining these dots. According to the theoretical forefathers of epistemic thinking, John Ruggie and Michel Foucault, epistemes 'describe the overarching perspective through which political relationships are visualised and understood during historical eras.'³²¹ Despite the pall of two looming World Wars, the core of the Antarctic episteme making itself known at the turn of the twentieth century encapsulated both the strategic value of the continent and the necessity of science in accessing it, and scientists' shared belief in the strategic value of Antarctic research and the necessity of political support in pursuing it.

In relation to Antarctic science and politics, Murray asserts scientific competitiveness over Antarctica is a political imperative insofar as 'we are often told how much more foreign governments do for science than our own. It is asserted that we are being outstripped by foreigners in the cultivation of almost all departments of scientific work.'³²² In relation to Antarctic politics and science, Murray declares 'within the past few months I have been in communication with geographers and scientific men in many parts of the world and among them there is complete unanimity as to the desirability, nay necessity, for South Polar exploration.'³²³ In the evolving political typology of Antarctica, Murray's observations about

³²⁰ Murray, John (1894) 'The Renewal of Antarctic Exploration', *The Geographical Journal*, Vol. 3, No. 1, pp 1-27, p 23.

³²¹ Ruggie, John (1975) 'International Responses to Technology: Concepts and Trends', *International Organization*, Vol. 29, No. 3, 1975, pp 557-583, pp 569-570.; Foucault, Michel (1973) *The Order of Things*, New York: Vintage Books, pp 206-208, 245-248.

³²² Murray, John (1894) 'The Renewal of Antarctic Exploration', p 26.

³²³ Murray, John (1894) 'The Renewal of Antarctic Exploration', p 23.

the staying power of the national interest connection to Antarctic science affirms scientists' ongoing need to access diplomatic tracks in order to advance their scientific interests.

Political typology of Antarctic science

For Murray, the conjunction of Antarctica, science, and politics is not the sum of separate imperatives but an inter-wined political vision. With this typology, he builds on Cook's cardinal portrayal of the science and diplomacy interface by formulating the appeal of science to politics. Murray's formulation is that science in politics is an appeal to a higher order. It is measured in knowledge rather than political currency, affording science an intrinsic value within the political decision-making process. It attracts collective as opposed to factional support and is therefore unifying. It is 'strategic, investing in results rather than immediate gains', thereby enabling bipartisan support and the application of state-backed diplomacy when required.³²⁴

Higher order science cooperation

Murray was writing on the cusp of the heroic era of Antarctic discovery, a time during which scientists collaborated internationally in the name of keeping science in Antarctica alive. Capacity to extend scientific cooperation beyond national borders would later underpin collaboration between scientists and diplomats during the International Geophysical Year 1957-58 and subsequent treaty negotiations. Murray's insights about the role of science in Antarctica in the decades leading up to the treaty describe how science functioned at the interface between the two professions during a period of geopolitical transformation. Notably, Murray ascribes to the advocates of science in Antarctica the legacy of Antarctica's moral and civic appeal.

International Antarctic science

The prompt for Murray's international advocacy on behalf of Antarctic science was a dearth of Antarctic research Hugh Mill described in 1905 as 'the age of averted interest' and that Fogg attributes to 'selective scientific attention.'³²⁵ Lüdecke notes that receding domestic

³²⁴ Murray, John (1894) 'The Renewal of Antarctic Exploration', p 26.

³²⁵ Mill, Hugh (1905) *The Siege of the South Pole*, London: Alston Rivers, pp 327-343.

interest in research in far-flung places prompted proponents of political intervention, such as Murray, to reach out to like-minded members of the international scientific community. They succeeded when international scientists collaborated to draft common-purpose arguments to trumpet the benefits of knowledge acquisition about Antarctica to governments.³²⁶

The rationale scientists offered for public consumption was that joint scientific efforts ‘would be a desirable foundation for international cooperation for solving difficult geographic problems’, a progenitor of the science and diplomacy tracks in The Royal Society’s definitional line up discussed in Chapter 2.³²⁷ Behind the scenes, scientists had used international forums such as the Sixth International Geographical Congress in London in 1895 as springboards to coordinate the timing and content of representations to their respective governments. For example, Murray and his German counterpart Georg Neumayer concentrated on the gap in knowledge about magnetism and weather—topical because of potential military applications—to lobby the British and German governments to renew dwindling support for scientific investigation of Antarctica.³²⁸ In a survey of the geopolitics surrounding Antarctic science at this time, Lüdecke remarked on the effectiveness of representations by scientific societies on governments competing ‘for the last regions on Earth.’³²⁹ In the wake of this coordinated international effort, the baton of scientific advocacy passed from committed individual ‘gentlemen scientists’ into collective scientific hands.

Scientists’ transition to becoming an international community of scientist-diplomats then leapt past the share point of political engagement based on maintaining a common rhetoric that anchored the foundation of the Antarctic science and diplomacy interface. As discussed in Chapter 2, this episteme kept scientists and diplomats in proximity to each other as a neophyte Antarctic epistemic community over the previous two hundred years. So, the step to science advocacy as the voice of a single discipline was a step away from the proxy of political advocacy. However, when diplomats cottoned on to the capacity for science advocacy to spur political responses without the need for officials to disclose related

³²⁶ Lüdecke, Cornelia (2003) ‘Scientific collaboration in Antarctica (1901-04): A challenge in times of political rivalry’, *Polar Record*, Vol. 39. No. 1, pp 35-48, pp 35-36.

³²⁷ Lüdecke, Cornelia (2003) ‘Scientific collaboration in Antarctica (1901-04)’, p 36.

³²⁸ Lüdecke, Cornelia (2003) ‘Scientific collaboration in Antarctica (1901-04)’, pp 35-36.

³²⁹ Lüdecke, Cornelia (2003) ‘Scientific collaboration in Antarctica (1901-04)’, p 37.

diplomatic initiatives, they ushered select scientists into adjunct roles supporting core elements of traditional diplomacy such as agenda setting and relationship building. Having set themselves on a path towards diplomatic agency as well-organised and knowledgeable political advocates in their own right, scientists now became diplomats' extra eyes and ears on Antarctic matters specifically, and science-related more generally, from within the machinery of diplomacy.

In response, scientists adjusted and readjusted their advocacy as Antarctica first fell, and then rose, in geopolitical salience in the lead up to the Washington Conference convened in 1959 to finalise the Antarctic Treaty. Science hit its own high salience point then, thanks to the efforts of scientists engaged in the Antarctic program of the International Geophysical Year 1957-58. It was the height of the Cold War and Antarctic scientists enjoyed a positive international profile from media coverage of their cooperation across the whole continent, irrespective of nationality.

A leadership role for scientists in alternative international cooperation is a signature characteristic the Antarctic science and diplomacy interface accrued at this time. During preparations for the International Geophysical Year, scientists had established global affiliations that resembled the kind of networks diplomats create. These scientific networks functioned in parallel to traditional diplomatic tracks, and on these science-led tracks, scientists made strategic and operational decisions that impacted Antarctic diplomacy underway separately using diplomats' networks. The network of experts that scientists operated within gave Antarctic science an international profile big enough for a narrative of its own on the geopolitical stage. Antarctica's growing renown as 'a continent for peace and science' afforded scientists a non-traditional voice-piece within hearing-distance of the diplomacy through which governments traditionally make themselves heard.³³⁰ On these grounds, diplomats were prompted to re-prioritise political cooperation with scientists as important, in order to manage the influence of science on diplomatic negotiations.

Antarctic science gained a deal of political currency at this time, recognisable in diplomats' increasingly nuanced engagement with scientists at the interface. For example, in 1936, the

³³⁰ Blumenfeld, Steven (2010) 'For science and peace', pp 30-32.

Australian Department of External Affairs disclosed ‘discussions have taken place during the year as to the possibility of a closer liaison between those engaged in scientific and industrial research throughout the Empire, especially of experts in Britain and Australia.’³³¹ Antarctica was a prominent topic in those discussions. Weaving Antarctic scientific interests into broader, higher-priority conversations of state took personal as well as professional and institutional influence. Prior to 1936, Australia’s official Antarctic discourse benefited from outreach on public tracks by the renowned Antarctic scientist Sir Douglas Mawson. While delivering a series of lectures in London in the 1920s, Mawson’s political counterpart, Richard Casey, facilitated his entrée to diplomatic circles. Casey made access to private channels available in his capacity as the London-based confidential representative of Australian Prime Minister Stanley Bruce.³³² Privileged access to diplomats and diplomatic thinking in the making provided scientists like Mawson a systemic advantage. The advantage was an ability to wear a combined science and diplomacy hat.

Mawson’s public renown drew credibility from the core elements of the scientific discipline—its objectivity and impartiality. Mawson’s private exchanges relied on the core element of communication essential to diplomacy—its discretion. The ability to wear two hats empowered scientists like Mawson to serve diplomacy through the agency of their science. This dual function alleviated conflicts over content versus style in scientists’ engagements with diplomats. This characteristic is a key enabler of science inroads into diplomacy, and a feature of what makes scientists’ role in Antarctic diplomacy effective.

Notably, Mawson would continue his quiet role as a scientist-diplomat in Antarctic affairs for the rest of his career. Casey went on to become Minister for External Affairs responsible for securing Australia’s national interests during the Antarctic Treaty negotiations, bringing with him to that task a deep understanding of Antarctic politics from a scientific perspective accumulated from productive encounters with scientists and reinforced by credible

³³¹ Report of the Department of External Affairs for the Year Ended 31st December 1936, Canberra: The Commonwealth of Australia, June 1937, p 73.

³³² Casey, Richard Gardiner, W. J. Hudson, Jane North and Australia, Department of Foreign Affairs and Trade (1980) *My dear P.M.: R. G. Casey’s letters to S. M. Bruce, 1924-1929*, Department of Foreign Affairs, Canberra: Australian Government Publishing Service, pp 78-79.

diplomatic achievements laid at Mawson's door.³³³ To make interdisciplinary problem solving an institutional reality in the modern operations of the Antarctic science and diplomacy interface, as detailed in Chapter 9, subsequent generations of Australian Antarctic scientists have continued to build similar working relationships with diplomats, and to communicate with them in similar vein.

Before moving on to explore the shift in scientists' role from that of science practitioners to teaming up with diplomats behind the scenes, the academic debates that occupied Murray, Mill and Fogg expose other formative characteristics of the science and diplomacy interface that are important in understanding how scientists have shaped Antarctic diplomacy in other ways. These characteristics are instrumental in profiling Antarctic scientists as diplomatic actors.

Global affiliations in Antarctic science

The first characteristic shaping scientists as diplomatic actors is the continuity of scientists' disciplinary and political affiliation to Antarctica. As science and politics joined forces over Antarctica in the 1700s, the evolutionary pathway of science had not yet committed that discipline to the exclusive practice of the scientific method.³³⁴ Scientists were Cook's 'men of letters' seeking knowledge to explain the natural world. The North Pole in the Arctic and the South Pole in the Antarctic were the hypothetical trophies of that era. Heap's twentieth-century definition of Antarctic scientists as 'natural philosophers' cited in Chapter 3 corroborates how successive generations of Antarctic scientists adopted a discipline-based affiliation indivisible by national politics, but nonetheless closely associated with the track where science sits in proximity to statecraft.³³⁵

³³³ Edwards, Peter (2012) 'The Minister and the Permanent Head: R. G. Casey and Arthur Tange' in Melissa Conley Tyler, John Robbins and Adrian March (eds) and Australian Institute of International Affairs (2012) *R.G. Casey: Minister for External Affairs 1951-60*, pp 81-106, p 100.

³³⁴ Justin Smith interviewed by David Rutledge, ABC Radio National, *The Philosopher's Stone*, Sunday 12 May 2109, discussing Smith, Justin (2019) *Irrationality: A History of the Dark Side of Reason*, Princeton: Princeton University Press.

³³⁵ Heap, John (2003) 'The Scope of Antarctic Science', pp 9-14.

Constrained but undeterred by the ups and downs in Antarctica's geopolitical salience, scientists networked internationally to invest their proposals to access Antarctica for research purposes with a collective authority. This seeded an alternative vision of Antarctica as a scientific as well as a political domain, and differentiated scientists amongst the experts influencing politicians in Antarctic policymaking. As a result, the tracks in Antarctic diplomacy glimpsed earlier started to emerge more distinctly. There was one track for geopolitics, established and consolidated during the foundation of the Antarctic science and diplomacy interface, and now, a second track to accommodate the alternative visions of Antarctica as a scientific and a political domain with the continent itself occupying the common ground. This second track accommodated the activities of scientists and diplomats. On it, scientists had privileged access to diplomatic agendas, and as negotiators trained to prosecute those, diplomats involved in problem solving had ready access to Antarctic specialists with technical expertise.

Antarctic science is global science

The second characteristic shaping scientists as diplomatic actors is how they participate in diplomatic activities at the interface through the agency of their science, and it relates to Fogg's observation about the kind of scientific problems that consistently attract the scientific community to Antarctica. Antarctic scientific problems are global. They relate to phenomena such as geomagnetism and geophysics, areas of knowledge that deal with the earth and its systems as a whole and that require long scientific horizons to realise results. Long horizons mean scientists, individually and collectively, have had to connect and reconnect a rationale for continuing Antarctic research to shifting political priorities. This leads Howkins to conclude that Antarctic science 'has been coproduced with politics of the Southern Continent.'³³⁶ In Howkins estimation, the *raison d'être* of Antarctic science is a 'circularity' where Antarctic research 'contributes to changes in political perceptions and they in turn have shaped the scientific research agenda there.'³³⁷

³³⁶ Howkins, Adrian (2011) 'Melting Empires? Climate Change and Politics in Antarctica since the International Geophysical Year', *Osiris*, Vol. 26, No. 1, pp 180-197, pp 180-183.

³³⁷ Howkins, Adrian (2011) 'Melting Empires?' p 181.

Science leadership

The third characteristic shaping scientists as diplomatic actors is science leadership. By the outbreak of World War II, the activities of Antarctic scientists were bifurcated into publicly championing pure, strategic and applied science, and influencing politics in private behind the scenes. Positioned this close to the everyday conduct of diplomacy, scientists were able to gain insights about Antarctic geopolitics from diplomats on the first track, and to use the dual aspect of the second track to expand the content, and therefore the reach, of diplomatic negotiations to cover scientific issues. International political advocacy by the scientific community as a whole brought these two branches of science leadership together. As Bull foresaw, the need for diplomats to engage technical experts becomes much clearer from this perspective. In response, diplomats adapted the machinery track of Antarctic diplomacy to accommodate the high level of interdependence needed to deal with negotiations over a shared domain. The flow on effect this had in shaping the ability of diplomats and scientists to deal with issues with mixed political and technical features is discussed in detail in Chapter 7 as part a new model typology of Antarctic diplomacy and science.

Antarctic science behind diplomatic scenes

In the meantime, scientists' pursuit of government sponsorship for Antarctic research became an advocacy of diminishing returns amongst shifts in diplomatic emphasis that accompanied Antarctica's geopolitical highs and lows in the eight formative decades of the interface. Once scientists had seized the initiative to take up public advocacy, they had to balance the disparity between the public face they created—science as an international boon for humanity—and the utilitarian incentive of keeping science adjacent to politics to secure transport to Antarctica, logistics and funding. Science found itself publicly oriented towards the nascent multilateral trend in international diplomacy just as resurgent geopolitics intensified governments' reliance on traditional diplomacy to protect their national and security interests in Antarctica. An ability to sustain political influence behind the scenes became indispensable. Scientists, now operating akin to Copeland's description of their role in diplomacy as 'proxies for scientific knowledge, learning and sharing', had to deal with

politicians ‘sensitively and tactfully’ in ways that increasingly reflected the definition of diplomacy’s traditional actors, that is, as diplomats.³³⁸ As Press remarks:

*Engagements between scientists and diplomats sometimes turn into diplomacy across a continuum. I don’t think you can actually have a system, or design something that says—‘well, this is when this matter becomes a diplomatic matter and it’s transitioned from science to diplomacy’. I think there’s a continuum there. It’s when something becomes a subject of diplomatic discussion, whether it’s at the Antarctic Treaty Consultative Meeting or between individual diplomatic players, that scientific something becomes a diplomatic thing. It might be the exact same piece of information that is also being discussed by scientists, so in that realm it’s still scientific and in this realm it’s diplomatic. It’s not necessarily linear. But, the point at which it’s actually drafted into something or becomes the subject of a diplomatic discussion, that’s when the transition ‘has happened’.*³³⁹

Once privy to an inside track in the machinery of traditional diplomacy, more scientists began the transition from pure scientist to scientist-diplomat. However, in keeping with the inherent difficulties of exploring the continent, and despite the notable precedents mentioned above, crossing the diplomacy divide was not easy:

*There’s never a nice clear way of saying that there’s a smooth transition from science into diplomacy. It’s got to depend upon meeting some people – getting a reputation - and people being prepared to call you and ask you a question. And I think that doesn’t happen enough.*³⁴⁰

Romancing Antarctic science

At the turn of the twentieth century, discovery expeditions gave Antarctic science a platform for global recognition. Dian Belanger acknowledges epic tours in the name of territorial and

³³⁸ Copeland, Daryl (2016) ‘Science Diplomacy’, p 629.; Oxford English Dictionary 2023:Online: <https://en.oxforddictionaries.com/definition/diplomat>

³³⁹ Tony Press interviewed by Anne Michelle Davis on 21 November 2017.

³⁴⁰ Patrick Quilty interviewed by Anne Michelle Davis on 20 November 2017.

scientific discovery taking place, forging the legacy of Antarctic science as heroic science.³⁴¹ In Australia, Alan Kerr notes scientists' ongoing involvement in Antarctic exploration and scientific work from 1898 including 'distinguished Australian scientists such as geologist Sir Douglas Mawson.'³⁴² History has privileged the heroic expeditions of this era to the extent that texts and photographs about them comprise the largest segment of research on Antarctica. They are all inspiring, and collectively, they transmit to the science and diplomacy interface another signature characteristic, science as the romance of Antarctic diplomacy.³⁴³

The heroic era of Antarctic discovery symbolised extraordinary human qualities in the face of adversity. Expeditioners required courage and tenacity to survive getting to Antarctica and back, as well as icy inland traverses under sub-zero temperatures and frequent blizzards. Press coverage of the day gave readers stories of human hardship set against stunning icy landscapes. These scenes make the same indelible impression to the modern gaze as they did in the early decades of last century. Romancing Antarctic science threw a hero's mantle over scientists who participated in these expeditions. Kerr considers Mawson epitomises the hero-scientists of this era.³⁴⁴ Mawson participated in Shackelton's expedition of 1907-08, was knighted for his own expedition from 1911-14, and led inter-war expeditions in 1929-30 and 1930-31. The ability to romanticise science as a figurehead of national achievement helped found the idea of Antarctic 'exceptionalism', a concept that scientists then co-opted to enhance the vision of Antarctica as a scientific domain in public consciousness.

For all discovery expeditions did to advance scientific ambitions for Antarctica, the security dictates of two world wars sapped Antarctica's political salience. During the first four decades of the last century, geopolitics outcompeted the influence of science as diplomacy reasserted its traditional prominence in Antarctic politics. This shift in emphasis added impetus for explorers, including Mawson, to step into the political breach.³⁴⁵ A new dance between scientific and political imperatives in Antarctic diplomacy began, and it too remains.

³⁴¹ Belanger, Dian (2010) *Deep Freeze*, pp 32-49.

³⁴² Kerr, Alan (2009) *A federation in these seas*, pp 224-226.

³⁴³ Parliament of Australia, *House Hansard*, 22 March 1930, pp 1747-1748.

³⁴⁴ Kerr, Alan (2009) *A federation in these seas*, pp 224-225.

³⁴⁵ Belanger, Dian (2010) *Deep Freeze*, p 1.

The combined chronology outlined in Chapter 2 shortened the assumed distance between Antarctic science and diplomacy in historical practice, but the political turmoil of the interwar decades posed a new risk. If a gap between scientific and diplomatic priorities in Antarctica opened and got too wide, science risked being permanently relegated to a lower rung of national priority. The challenge in this diplomatic moment lay on the science side of the Antarctic science and diplomacy interface, with scientists. It was for scientists to find an influential voice with which to engage the interests of Antarctic science at the level of the state, without pitching future research initiatives into competition with now elevated security priorities. In this, scientists faced a very diplomatic kind of challenge.

To stay relevant and connected in Antarctic affairs, scientists needed to reorient the influence derived from their share of the combined political rhetoric underpinning the science and diplomacy interface during its foundation, and start to exercise this influence in matters beyond knowledge acquisition. The interface provided key individuals a means to pivot science advocacy towards joint diplomatic problem solving by moving the pretext for scientists' engagement with diplomats beyond the technical reach of the interface itself. Sustaining the concept of Antarctica as a scientific domain came down to maintaining a line of sight between the lever of 'exceptionalism' attached to Antarctic science and the lever of 'exclusivity' still strongly attached to territorial claims, and therefore, to diplomats in their traditional representational role in international negotiations.

The activities of Mawson and Casey in London illustrate how scientists and diplomats drew on the renown of Antarctic science to choreograph engagements that helped scientists cross the diplomacy divide. Mawson lent scientific credibility to Australia's diplomacy from the lectern in a program of international speaking engagements.³⁴⁶ Casey linked these engagements to a series of private ones for which Antarctic science was the draw card and a pretext for other discreet discussions to take place. In this twist in the dance between Antarctic science and diplomacy, mutual engagement afforded scientists in the know the capacity to synchronise their activities across a wide geopolitical field. This inside track

³⁴⁶ Mawson, Douglas and the Royal Institution of Great Britain (1933) *The New Polar Province*, Paper read before the Royal Institution of Great Britain, Weekly Evening Meeting, Friday, March 3, 1933, London: Royal Institution of Great Britain.

reshaped the science side of the interface. It allowed scientists, as diplomatic actors and close observers of diplomatic negotiations in the making, to translate their professional credibility and expert knowledge into influence in overlapping scientific and diplomatic circles.³⁴⁷ It was a two-way street. On the inside track, diplomats benefitted from scientists' competence as experts to observe, and could then report on the Antarctic ambitions of scientifically engaged friends and foe.

Science as the public face of Antarctic diplomacy

Fashioning the Antarctic interface into an effective political interchange between diplomacy and science professionals was key to interdisciplinary cooperation during the heroic era. Kerr researched the Australian parliamentary debates that coincide with this period. His analysis uncovers evidence of Howkins 'circularity' in the way scientists and politicians jointly constructed the now familiar formula of Antarctic diplomacy as 'science at the forefront with other interests not far behind.'³⁴⁸

In Australia, early twentieth century scientists were harbingers of an increasing public resonance with a scientific versus political vision of Antarctica. The Australian government badged Mawson's 1911-1914 expedition as 'purely scientific' and justified tax-payer support on the following grounds:

*...every one of those included in it will again and again stake his life in the hope of serving his country. This should appeal to the country from which they proceed—most members of the expedition are Australians—and this continent must expect to reap the chief benefits of their inquiries.*³⁴⁹

The projected benefits were territory, scientific knowledge and resources in that order. In contrast to science as the public face of Antarctic diplomacy, Kerr affirms the government was alert to Mawson's subsequent 1929-30 and 1930-31 expeditions furthering 'Australian interests in a region that was so close to its shores' and that Mawson's proclamations of

³⁴⁷ Howkins, Adrian (2011) 'Melting Empires?' pp 180-183.

³⁴⁸ Kerr, Alan (2009) *A federation in these seas*, p 227.

³⁴⁹ Commonwealth Parliamentary Debates, House of Representatives, Vol. LXIII, 19 December 1911, pp 4762-63.

territory during these expeditions, as per secret instructions given to Mawson directly, served a primarily diplomatic rather than scientific purpose. That purpose was to enact recommendations of the 1926 Imperial Conference in London intended to reinforce existing British territorial claims.³⁵⁰

Where Cook's coalescence of military and scientific leadership put sovereign power to use to discover Antarctica, thus enhancing the acquisition of scientific knowledge during the foundation of the interface, Mawson's science leadership during Antarctica's ascent to geopolitical contention in the first half of the twentieth century culminated in diplomatic acts conducted under the banner of science but intended to assert Antarctic territorial claims.³⁵¹ The developmental path this shift depicts is one from scientists funded by a state whose political mission is enhanced by the involvement of science and scientists, to scientists operating as agents of diplomacy in the name of a state at diplomatic frontiers that diplomats themselves cannot service by dint of distance or lack of relevant expertise. In the latter scenario, Mawson's profile as a scientist-diplomat established a point of commonality between scientific and national interests at the level of the state, and it set a precedent. Any disparity arising between the priorities of Antarctic science and diplomacy could now be accommodated under the authority of a single representative qualified in one discipline and directed by government to exercise the functions of the other. At the science and diplomacy interface, Mawson coalesced romancing Antarctica and science advocacy into service as a diplomatic actor. An identified diplomatic arena for Antarctic scientists had been established, and it endures in addition to national interest connection between science and politics, and the dance between scientific and political imperatives in Antarctic diplomacy.

Antarctic scientist-diplomats

With the benefit of Kerr's academic hindsight, it is possible to discern a trajectory from political awareness to strategic intent that clearly delineates Mawson as a scientist-diplomat. This tag fits how Mawson kept Australian Antarctic science connected to national and international politics as geopolitical transformations of the twentieth century played out. As

³⁵⁰ Parliament of Australia, *House Hansard*, 4 July 1930, p 3718.

³⁵¹ Parliament of Australia, *House Hansard*, 4 July 1930, p 3718.; Kerr, Alan (2009) *A federation in these seas*, p 232.

Mawson navigated this long science diplomacy moment, he made the most of opportunities to engage with decision makers and fellow scientists. His approach represents a possible touchstone for international technical management.

Mawson's success on diplomatic tracks depended on securing as much influence in political decision making as possible. For this, he leveraged his scientific renown, using it to stretch his established technical agency into political agency, and ultimately, diplomatic agency. For example, in a demonstration of his confidence in a certain level of political agency, Mawson criticised the Australian government in the popular press over scientific and economic opportunities languishing for lack of territorial declarations in Antarctica, all the while exercising diplomatic agency as he quietly pressed Ministers and Department Heads on the issue of sovereignty as their expert insider on Antarctica.³⁵² These count as purposeful acts conducted in the name of science and diplomacy. Importantly, they provide an example of combined agency of the kind international technical management could be expected to embody.

Mawson was undoubtedly a poster scientist for science in diplomacy, putting scientific advice forward to inform foreign policy objectives relating to Antarctica throughout his career. His service to diplomacy, rendered through the agency of his science and as leadership at the Antarctic science and diplomacy interface, merits recognition equal to his scientific and national achievements. Unsung as a scientist-diplomat, Mawson's contribution to the mix of diplomatic and technical problem-solving Bull describes as international technical management is an example of relations between science and diplomacy practitioners at a level of technical, official and personal effectiveness. Mawson's comportment at the science and diplomacy interface, and in the corridors of power, was diplomatic in style. From it, a model for scientists' intervention in modern Antarctic diplomacy emerged. Quietly, the norm at crossover points in the interface became one where scientists assume diplomatic postures when providing expert advice to Ministers and their governments.

³⁵² Kerr, Alan (2009) *A federation in these seas*, pp 225-226.; Parliament of Australia, *House Hansard*, 18 October 1951, pp 894-895.; Parliament of Australia, *House Hansard*, 6 February 1952, pp 19-24.

This chapter looked back to the foundation and formation of the Antarctic science and diplomacy interface to search for evidence of science diplomacy and antecedents of international technical management in Antarctic diplomatic practice. The probe revealed that when Antarctic science and geopolitics converge, it generates a national interest connection between science and politics. The enduring nature of this connection results in a dance between scientific and political imperatives in Antarctic diplomacy, which prompts the normalisation of diplomatic postures when scientists seek to intervene in Antarctic issues for scientific purposes. The probe confirmed that throughout the combined chronology of Antarctic science and diplomacy, the interests of science attracts a level of attention and discussion at the same priority level as political issues. The historical proximity of science to statecraft affirms science diplomacy as a subcategory of Antarctic diplomacy at large. A notable outcome is that scientists and diplomats manage the connection, the dance and the norms that emerged over the course of the Antarctica's combined chronology by deploying everyday diplomatic practices amongst themselves.

The everyday diplomatic practice of Antarctic diplomacy owes its *raison d'être* to the iterative development of 'mutuality' as a signature characteristic that glues scientific and diplomatic activities together at the interface and explains how diplomats and scientists use the interface to attempt initiatives that target both their interests. Mutuality was first identified in Chapter 2 as the driver behind complementary practices in Antarctic diplomacy, those that facilitate crossovers between science and diplomacy. Chapter 3 investigated mutual recognition, mutual reliance and mutual engagement to explain how scientists and diplomats use the interface to achieve their own, and each other's interests, and explored their application in detail. From the geopolitical, leadership and advocacy levels at which Antarctic science is observed to operate during the foundational and formative periods of the Antarctic interface, mutuality attaches to the times when diplomats acknowledge diplomacy in scientists' hands, and the other times when scientists acknowledge that the outcomes of scientific initiatives lie in diplomats' hands. This mutual recognition has been carried forward to the modern science and diplomacy interface. As a result, when scientists work with diplomats at the interface now, they do so on a track where science and diplomacy function in the same problem-solving space.

Along with tracing the signature characteristics of the interface, the probe confirmed early versions of this dual track. This is a notable outcome. On this track, mutuality establishes itself as an overarching attribute in the typology of Antarctic diplomacy, distinctive because it emerges on a shared pathway. Mutuality confirms the presence of a diplomatic perspective in common, irrespective of from which side of the interface, diplomacy or science, an initiative originates. It is the most likely operating space to host science diplomacy practices as well as those that orient traditional diplomacy towards international technical management. These factors affirm that mutuality is a likely precursor for international technical management. The likelihood increases when scientists and diplomats turn to mutual recognition, mutual reliance and mutual engagement as mechanisms through which to pool their separate areas of expertise. The incentive to do so is that subsequent negotiations can cover more content, and therefore more ground. Importantly, the capacity to act together is an approach that admits input to problem solving from both disciplines. As this chapter demonstrates, in practice, mutuality enhances traditional diplomacy by allowing diplomats and scientists to adapt it by degrees so that scientists can perform diplomatic service through the agency of their science.

6—The Antarctic science turn to diplomacy

The critical review of the select body of Antarctic literature continues in this chapter to search for evidence to affirm the argument that the dual track in Antarctic diplomacy is a diplomatic frontier at which states choose to act on science in diplomatic ways. Where science sits in proximity to statecraft, scientists' have been able to influence decision making through political advocacy empowered by a combined rhetoric that diplomats and scientists crafted while participating in an early Antarctic epistemic community. As the previous chapter demonstrated, science made inroads into diplomacy during the diplomacy of empire from the 1700s to the late 1800s, after which scientists played an ever increasing role in Antarctic diplomacy from the 1880s to the 1950s. Throughout these foundational and formative periods of the Antarctic science and diplomacy interface, scientists were able to profile the interests of science despite inconsistent patterns of Antarctic political salience. Scientists' longstanding relationships with diplomats as participants in an early Antarctic epistemic community partly explains this achievement. Another explanation is that scientists' capacity to acquire and use diplomatic knowledge as a result of this participation positioned scientists in Antarctic diplomacy at the level of statecraft and its intersection with the diplomatic machinery that states use to conduct international negotiations.

Scientists' contribution to an early Antarctic epistemic community was to produce expert knowledge about Antarctica. Well ahead of the establishment of the Antarctic Treaty System as a permanent diplomatic conference which would assume many of the features of a multilateral institution, the Antarctic science and diplomacy interface afforded scientists institutional access that enabled them as technical experts to gain the skills of diplomacy needed to work alongside diplomats in negotiations. As Bull acknowledges 'diplomatic knowledge is practical knowledge: it derives from day-to-day personal dealings with the leading political strata in the country to which the diplomatic is accredited.'³⁵³ In the example of the Antarctic interface, the combined rhetoric that diplomats and scientists crafted in support of an early Antarctic epistemic community afforded scientists opportunities to

³⁵³ Bull, Hedley (1977) *The Anarchical Society*, pp 156-177, p 175.

develop diplomatic knowledge through their interactions with diplomats, and for some scientists to emerge as negotiators within this community.

From recent studies of contemporary engagements among technical experts and diplomats in the European Union, Kuus concludes that the production of this kind of diplomatic knowledge, and in this way, 'requires and solidifies an inarticulate sense of the game of diplomacy that is not written or even talked about and yet crucially enables success.'³⁵⁴ Crossing the diplomacy divide in order to participate in the international negotiations that resulted in the Antarctic Treaty 1959 demarcates a turn to diplomacy among Antarctic scientists. The International Geophysical Year 1957-58 and subsequent international negotiations to secure the Antarctic Treaty itself showcase how scientists pressed these acquired skills into the service of science and diplomacy in a contemporary geopolitical setting. This chapter investigates the impact of scientists as diplomatic actors at the Antarctic diplomatic frontier represented by the International Geophysical Year. It focuses on the non-traditional contribution scientists made using traditional methods of diplomatic conduct in the lead up to, and during, the treaty negotiations.

For Bull, the functions of diplomacy and the best means for diplomats to carry these out include advancing state interests while keeping the objective in view, avoiding arguments intended to vent feelings, seeking to reason and persuade, identifying common ground or at least points of consistency across multiple interests, focusing on principles and fostering a framework of shared interests.³⁵⁵ In order to include Antarctic scientists among the ranks of skilled diplomatic negotiators, the scientists involved also needed to demonstrate what Bull refers to as a mode of diplomatic conduct, that is, 'a mode of conduct where diplomats have to convey moods and dispositions as well as information: they not only deliver messages but also judge the language in which the information is couched.'³⁵⁶ To participate effectively in the International Geophysical Year and the Antarctic Treaty negotiations, scientists needed

³⁵⁴ Kuus, Merje (2014) *Geopolitics and Expertise*, p 37.

³⁵⁵ Bull, Hedley (1995) *The Anarchical Society*, pp 165-166.

³⁵⁶ Bull, Hedley (1995) *The Anarchical Society*, p 173.

to be put these functions into action in order to effect 'transfer of the question of Antarctica from the table of diplomacy to the table of science.'³⁵⁷

Antarctic scientists' diplomatic knowledge was heavily influenced by the common rhetoric they co-crafted with diplomats during the discovery period, and is derived in equal measure from scientists' lived experience in pursuit of the common policy enterprise advanced under the banner of 'knowledge and territorial discovery' discussed in Chapter 5. However, what got scientists into the decision making tent in the beginning of the combined science and diplomacy chronology in Antarctica could not be certain to keep them there. Jan Melissen links diplomacy and the diplomatic machinery used to support international negotiations in pursuit of a state's foreign policy objectives together where diplomacy operates as the 'communication system of international society, and its machinery is the communication mechanism of the collectivity of states'.³⁵⁸ As analysis of historic and primary evidence unfolds in this chapter, the critical function of the Antarctic science and diplomacy interface as a machinery of international cooperation becomes apparent as well as its value as an alternative track for communication prior to the multilateral forum of the Antarctic Treaty Consultative Meeting becoming permanent. Notably, Kuus measures the effectiveness of technical experts in decision making institutions by 'their ability to make other actors inside and outside use *their* data and *their* analytical tools.'³⁵⁹ From the perspective of treaty diplomacy, the Antarctic science and diplomacy interface operated as an 'informal' diplomatic machinery at the heart of which scientists' ability to negotiate within the scientific community as well as with the diplomatic community at large helped define what makes the scientists involved 'brilliant' negotiators. The Antarctic science turn to diplomacy took place as the effectiveness of the combined rhetoric of the foundational and formative periods of the interface struggled for legitimacy during the Cold War, during which the nuclear arms race between the United States of America and the Union of Soviet Socialist Republics accelerated the ascent of technical power as leverage in geopolitics. Flow-on effects were felt in

³⁵⁷ Hanassian, John (1960) 'The Antarctic Treaty 1959', *The International and Comparative Law Quarterly*, Vol. 9, No. 3, Cambridge University Press, July 1960, pp 436-480, p 8.

³⁵⁸ Melissen, Jan (ed) (1999) *Innovation in Diplomatic Practice*, p xviii.

³⁵⁹ Kuus, Merje (2014) *Geopolitics and Expertise*, p 2.

Antarctica in the form of tension over who might gain sufficient technology supremacy to dominate Antarctic diplomacy over territory.³⁶⁰

The ascent of technical power challenged Antarctic scientists' core ambitions and priorities, provoking them to reassert a rationale for science in its own right as distinct from the prevailing combined rhetoric. A part of scientists' response to this new tension in the dance between Antarctic diplomacy and science was to append the universal values of science to the combined rhetoric. Assertions of this kind were uncommon practice at the science and diplomacy interface but useful in this instance to counter a perceived risk of political intrusion into research planned as part of a global scientific during the International Geophysical Year to be conducted from 1 January 1957 to 31 December 1958.³⁶¹ Affixing the mantra of 'science cooperation for peaceful purposes and in the interests of all mankind' to IGY research programs launched scientists into full-scale science for diplomacy. The dance then led to a diplomatic response to balance this with diplomats using diplomacy for science, and as a result, on to the unique equivalence between these two legislated in the Antarctic Treaty.

Those provisions ultimately provide the institutional framework needed to uplift Howkins circularity of Antarctic science and politics into the regime that implemented the Treaty.³⁶² Chapter 7 explores the structure of the Antarctic Treaty regime in detail. Ahead of that discussion, this chapter looks at how differentiating science from Antarctic geopolitics helped to institutionalise scientists as influential diplomatic actors at three levels of interaction. The first is the level of proximity discussed above with its attendant mechanism of combined rhetoric. The second is the dual track in Antarctic diplomacy that gives scientists a mechanism to interact with treaty parties over scientific and multiple other interests using this track as single engagement point. Scientists wear two hats on this track in order to accommodate the need to communicate objectively, and discreetly. The third level of interaction is one diplomats initiate. When diplomats call on science to be the public face of Antarctic

³⁶⁰ Dodds, Klaus (2008) 'The Great Game in Antarctica: Britain and the 1959 Antarctic Treaty', *Contemporary British History*, Vol. 22, No. 1, pp 43-66, 2008, pp 47-48.

³⁶¹ Bulkeley, Rip (2009) 'Politics at the First Comité Spécial de l'Année Géophysique Internationale (CSAGI) Antarctic Conference', p 382.; Gould, Laurence (1957) 'The International Geophysical Year', *The American Scholar*, Vol. 26, No. 3, Summer 1957, pp 305-313, p 305.

³⁶² Howkins, Adrian (2011) 'Melting Empires?' p 181.

diplomacy, this approach confers leadership, and scientists' capacity to multi-skill becomes a mechanism through which they act as technical experts and diplomatic actors at the same time. All three levels of interaction provoke an interdisciplinary exchange at the interface that institutionalises the manner in which scientists and diplomats shape both Antarctic political priorities and scientific research agendas.³⁶³

Differentiating science in Antarctic geopolitics

In the wake of Mawson's accomplishments, sustaining science as the public face of Antarctic diplomacy became a strong motivator for scientists to deepen political relationships. They needed to. Peter Beck cites the British War Cabinet decision to take 'all possible steps to strengthen our title to the Antarctic Dependencies of the Falkland Islands against which the Argentines are encroaching.'³⁶⁴ Stephen Martin attests that as governments redirected the cost of Antarctic expeditions to war efforts and post-war recovery, the shift towards sovereignty in Antarctic diplomacy relegated 'scientific work secondary to strengthening sovereignty claims.'³⁶⁵ Beck documents how scientists engineered a rapprochement. To enable research activities to continue, scientists rebranded them as rendering a wartime service so as not to compete with sovereign Antarctic ambitions.

The period Martin and Beck scrutinise is replete with heroic era scientists stridently invoking the national interest to argue for continued scientific activities in Antarctica. Mawson's agency, discussed in chapter 5 above, is a relevant example. Scientists' success depended on access to and influence with decision makers, not an easy way to sustain the salience of Antarctic science among political agendas increasingly dominated by national security concerns. Nonetheless, three decades of exploration by Mawson and contemporaries Robert Falcon Scott and Roald Amundsen, and later Eric Larson and Admiral Richard Byrd, captured hearts and minds. They connected Antarctica with national aspirations in their home countries, securing a place at the forefront of domestic political rhetoric and providing fellow

³⁶³ Howkins, Adrian (2011) 'Melting Empires?' p 181.

³⁶⁴ Beck, Peter (1986) *The International Politics of Antarctica*, London: Croom Helm, p 198.

³⁶⁵ Martin, Stephen (1996) *A History of Antarctica*, Sydney: State Library of New South Wales Press, pp 197-198.

scientist-diplomat Sir Ernest Shackleton a platform to proclaim success in terms of 'scientific results of the expedition as apart from new geographical knowledge secured.'³⁶⁶

Up to this point, scientists had concentrated their political enterprise on military cooperation and government sponsorship evidenced in the consistent pattern of engagement and advocacy observable from the time of Cook's voyages. By distinguishing the scientific results of expeditions as separate from geographic knowledge, during the heroic era Shackleton maintained an apolitical voice for science in the rationale for continued engagement with the continent, thereby asserting the salience of pure science amidst the clamour for territorial supremacy over Antarctica. Mawson's prolonged public advocacy takes on a different effect seen in this light, that is, as a distinguishing voice investing in the rationale of science as a vehicle for nationalism in an Antarctica facing down diplomacy overwhelmingly disposed towards geopolitical rivalry.

Shackleton and Mawson's timing are noteworthy in light of Dodds' research into Britain's hegemonic vision for Antarctica based on ambitions 'to annex the entire Antarctic region', ambitions he asserts overarch Antarctica's rise to geopolitical salience during a period of increasing engagement between scientists and diplomats as a result of the ascent of technical power.³⁶⁷ Dodds' research documents important evidence with which to analyse the diplomatic antecedents of international technical management. France, Norway and the United States set international diplomacy in motion to push back on the British strategy to consolidate its geo-power in Antarctica. Dodds' analysis focuses on diplomatic innovations such 'non-recognition' as a forward indicator of the solution to contested territory in Article IV of the Antarctic Treaty, and the bifocalism Haward and Cooper observe as a policy derivative of the Antarctic Treaty that enables claimants and non-claimants to co-govern Antarctica.³⁶⁸ *Science and secret Antarctic diplomacy*

³⁶⁶ Shackleton, Ernest (1909) 'Some Results of the British Antarctic Expedition, 1907-9', *The Geographical Journal*, Vol. 34, No. 5, November 1909, pp 481-500, p 498.

³⁶⁷ Dodds, Klaus (2008) 'The Great Game in Antarctica', pp 46-48.; Belanger, Dian (2010) *Deep Freeze*, p16.

³⁶⁸ Haward, Marcus, and Nicholas Cooper (2014) 'Australian interests, bifocalism, bipartisanship, and the Antarctic Treaty System', *Polar Record*, Vol. 50, No. 252, pp 60-71, p 60.; Dodds, Klaus (2008) 'The Great Game in Antarctica', p 47.

Dodds' overview of Antarctic diplomacy in the decades prior to the treaty negotiations permits two useful insights: that it was secret diplomacy, and that it embodied an ever-increasing tension between imperial competition, and technological and military supremacy. The British approach to control of Antarctica was to secure dominion claims by New Zealand and Australia, and to persuade South Africa to claim an Antarctic sector, while discouraging competitors' claims through strident use of its trans-imperial network.³⁶⁹ The means of diplomacy—secret cables, Imperial Conferences, and unofficial and official approaches between Ministries for Foreign Affairs—affirm a traditional approach to Antarctic diplomacy during this time.³⁷⁰ However, this period coincides with a shift in diplomatic method Nicolson distinguishes as the transition from 'traditional, secret diplomacy towards a conception of common international interests'.³⁷¹ Heavens explains how the United States, Britain and Chile rehearsed this trend while vying for internationalisation under United Nations trusteeship, a condominium with joint sovereignty administered by an Antarctic Commission, or a renewable standstill 'aimed at promoting unfettered scientific collaboration without necessarily anticipating a political settlement.'³⁷² The standstill proposal is known as the Chilean Escudero Declaration of 1948. Kenneth Simmonds states that the importance of the standstill approach lies in the suggestion that 'territorial claims be held in abeyance for five years, during which time international scientific cooperation would be encouraged.'³⁷³ The Escudero Declaration marked the formal appearance within established diplomatic channels of scientific cooperation as a diplomatic counterbalance to sovereignty and geopolitics.

³⁶⁹ Dodds, Klaus (2008) 'The Great Game in Antarctica', pp 47-48.

³⁷⁰ Heavens, Steve (2016) 'Brian Roberts and the origins of the 1959 Antarctic Treaty', in *Polar Record*, Vol. 52, No. 267, pp 717-729, 2016, pp 719-720.

³⁷¹ Nicolson, Harold (1969) *Diplomacy*, pp 28, 36.

³⁷² Berguno, Jorge (2012) 'The search for an organizational framework for Antarctic research (1948-1985)' in Cornelia Lüdecke, Lynn Tipton-Everett and Lynn Lay (eds) (2012) 'National and Trans-National Agendas in Antarctic Research from the 1950s and Beyond', *Proceedings of the 3rd Workshop of the SCAR Action Group on the History of Antarctic Research*, Byrd Polar Research Center Technical Report 2011-01, Byrd Polar Research Centre, Columbus: The Ohio State University, 26-27 October 2007, pp 43-54, pp 35-39.

³⁷³ Simmonds, Kenneth (1993) *The Antarctic Conventions*, London: Simmonds and Hill, p 5.

Science in diplomatic hands

The intimation of science as a currency in post-war diplomacy lends credibility to the idea that, by this stage, the science and diplomacy interface was evolving into an example of regime creation where Nicolson's shift towards international common interests as an expression of multinational stakes can be seen as taking place during the contest for Antarctic sovereignty. A rationale for this lies in Dodds' analysis of new political tensions in Antarctica that challenged the prevailing diplomatic and scientific approaches. On one hand, Dodds notes traditional diplomacy advantaged countries like Britain with territorial stakes, and on the other, he observes a new form of science-based Antarctic territorial competition in the United States' superior technological, military and investment capability, which it deployed via 'substantial programs of Antarctic exploration and research.'³⁷⁴

Imperial competition vs technological supremacy

Martin's research into this period draws an analogous conclusion about the ascendancy of technology-driven competition. Martin delineates pre-treaty diplomacy as concern about a 'hot' contest between Britain and Argentina in the Antarctic over territory, and the United States' Cold War concern to keep the Union of Soviet Socialist Republics out of Antarctic politics and away from Antarctic resources: the first by means of diplomatic exclusion, and, the second by securing a competitive technological and scientific ascendancy in Antarctica itself.³⁷⁵ Traditional diplomacy and the emerging techno-military approach had science in common as a non-traditional centrepiece between imperial competition over who would claim Antarctic land and seas, and the imperative to control who would dominate Antarctica by means of technological supremacy. The role and function of scientists as diplomatic actors now sat halfway across the interface:

Diplomats are very cautious by nature and by instruction. Scientists have a similar track when they are working as scientists. But, when they are working on Antarctic matters that interface between them as scientists and the

³⁷⁴ Dodds, Klaus (2008) 'The Great Game in Antarctica', pp 47-48.

³⁷⁵ Martin, Stephen (1996) *A History of Antarctica*, p 206.

diplomats, my impression is that scientists move further into the diplomatic world than diplomats ever move into the science world. ³⁷⁶

Asher De Sadeleer's structural analysis of the Antarctic Treaty negotiations from 1948 to 1959 affirms the Chilean proposal was instrumental in fostering intermediate gains in diplomacy, whose reliance on traditional techniques risked being outpaced by scientific networks and technical advances during this decade. De Sadeleer's picture of Antarctic diplomacy is that assuming a *modus vivendi* stance, non-action on claims without waiving them, afforded states a way to step around the issue of contested sovereignty, and to open up a role for scientists in bridging this shift in Antarctic politics. Hanassian cites this shift as the 'transfer of the question of Antarctica from the table of diplomacy to the table of science.'³⁷⁷

Science in the machinery of diplomacy

De Sadeleer's analysis yields a vital pointer needed to account for how international scientific cooperation fared at the hands of experienced Antarctic diplomats within established channels at the level of diplomatic machinery.³⁷⁸ When Nicolson discusses the machinery of diplomacy—the case-by-case application of diplomacy in accordance with recognised practices—it is in terms of both 'habitual knowledge about the most efficient ways to conduct international business' and, the 'principles of negotiation common to international discourse.'³⁷⁹ During the Antarctic Treaty negotiations, diplomats became accustomed to science as an intrinsic part of their political knowledge about Antarctica, but they still had to accommodate science in their diplomatic machinery in order to leverage it in negotiations. This meant diplomats had to tread carefully between science as the public beneficiary of otherwise secret diplomacy, and its political role in underwriting declared and undeclared state interests in Antarctic geopolitics. The Declaration's engineer, Chilean diplomat Professor Julio Escudero, first proposed scientific cooperation to facilitate the intermediate goal of setting aside sovereign claims in 1948, and then applied it as leverage during negotiations in

³⁷⁶ Patrick Quilty interviewed by Anne Michelle Davis on 20 November 2017.

³⁷⁷ Hanassian, John (1960) 'The Antarctic Treaty 1959', p 8.; De Sadeleer, Asher (2013) *The Antarctic Treaty, 1948-1959: A Success of International Negotiation in the Cold War*, Louvain: Université Catholique de Louvain, pp 6-9.

³⁷⁸ De Sadeleer, Asher (2013) *The Antarctic Treaty, 1948-1959*, p 13.

³⁷⁹ Nicolson, Harold (1969) *Diplomacy*, pp 4-5.

1958 when Chile 'consented to scientific freedom under the condition of a ban on nuclear activity.'³⁸⁰ Escudero's deft strategy and execution is an example of how diplomats appropriated international scientific cooperation to shape, and then to secure, the settlement proposed in the treaty.

Science diplomacy and the International Geophysical Year

For its part in placing the question of Antarctica on the table of science, international scientific engagement during the International Geophysical Year took up and expanded the model of a 'multinational scientific (not geographic) pursuit in Antarctica.'³⁸¹ Program organisers echoed Shackleton's annexation of science from politics to marshal international scientific collaboration based on the model Murray and Neumayer initiated in 1895. That collaboration also aimed to capitalise on the latest technologies in human survival and traverse capabilities piloted during the Norwegian-British-Swedish Antarctic Expedition of 1949-1952. As the first large-scale international expedition to be organised after the Second World War, this initiative was science-led and was for science purposes only. Martin records it was the only 'truly scientific expedition' ever to be conducted in Antarctica.³⁸² It not only proved that large-scale international scientific cooperation on the continent was viable, it consolidated a track for international scientific engagement alongside traditional diplomacy and close to it in political purpose: future access to and use of Antarctica. Scientists started planning for the International Geophysical Year as soon as this expedition finished.

Antarctic science as a diplomatic strategy

Belanger notes that scientists organising the International Geophysical Year intentionally crafted an international science strategy.³⁸³ In 1950, a group of scientists dining together in Maryland, USA, initiated a plan to coordinate a global scientific effort to study the terrestrial

³⁸⁰ Pinochet De La Barra, Oscar, 'Negociaciones antarcticas de Chile en un mundo cambiante', in *Revista de Estudios Internacionales*, Vol. 20, No. 78, Universidad de Chile, Instituto de Estudios Internacionales :Chile, 1987, pp 210-222, cited in Asher De Sadeleer(2013) *The Antarctic Treaty, 1948-1959: A Success of International Negotiation in the Cold War*, Louvain: Université Catholique de Louvain, p 14.

³⁸¹ Belanger, Dian (2010) *Deep Freeze*, p 2.

³⁸² Martin, Stephen (1996) *A History of Antarctica*, p 206.

³⁸³ Belanger, Dian (2010) *Deep Freeze*, pp 2-3.

effect of maximum sun spot activity predicted to occur from 1957 to 1958. Diners included eminent American space scientist James Van Allen, world-renowned British geophysicist Sydney Chapman and veteran Antarctic radio engineer Lloyd Berkner.³⁸⁴ These scientists exhibited diplomatic savvy in three ways during what followed.

First, Belanger notes they took their concept to the International Council of Scientific Unions, which set up the independent Comité Spécial de l'Année Géophysique Internationale (CSAGI) in 1952 to organise and oversee the global scientific collaboration, using an approach consistent with historical science-led initiatives, including Murray's. This approach was intended to distinguish International Geophysical Year expeditions from the far more numerous dual political and science expeditions that preceded it. Second, like Mawson before them, the cohort of scientists had inside experience of diplomacy.³⁸⁵ Berkner's post-war career was on diplomatic tracks, bringing science to bear on military and security issues. Members of the cohort enjoyed 'exceptional prestige and government access in this shifting political context.'³⁸⁶ The scientists used their personal relationships to access and influence first track diplomacy, a step from which diplomats from their respective parent countries came to rely on ready access to the scientists' collective political and scientific expertise.³⁸⁷ Third, the international cooperative effort was ostensibly apolitical, allowing CSAGI members to emphasise the universal values of independence, shared expertise, and the pursuit of knowledge as their *modus operandi* for international engagement over Antarctica.³⁸⁸ It welded the established combined rhetoric and the distinctive addition of scientific values to the originating tenet of science, the pursuit of knowledge.

Crafting this strategy was key to science for diplomacy at the Antarctic interface. The strategy encouraged scientists to look past the national territorial interests through which they customarily engaged their sponsoring governments, and to view scientific activities through the lens of Antarctica as a world laboratory. As Press put it:

³⁸⁴ Belanger, Dian (2004) 'The international geophysical year in Antarctica', pp 483-484.

³⁸⁵ Parliament of Australia, *House Hansard*, 18 October 1951, pp 894-895.

³⁸⁶ Belanger, Dian (2004) 'The international geophysical year in Antarctica', p 484.

³⁸⁷ Parliament of Australia, *House Hansard*, 6 February 1952, pp 19-24.

³⁸⁸ Bulkeley, Rip (2009) 'Politics at the First Comité Spécial de l'Année Géophysique Internationale (CSAGI) Antarctic Conference', pp 381-383.

*Antarctic scientists are participating as members of a national science program, and there is an interface between the national program and international collaboration. There are two levels to how that looks and feels to scientists on the ice. One is really, in a practical sense, the science itself doesn't have boundaries. In that context, scientists at the science interface on the ground don't actually think that this is necessarily a national activity. They tend to think it's a science activity.*³⁸⁹

CSAGI was the organising hub of the International Geophysical Year. It functioned as a global affiliation of peak national scientific institutions, which meant that scientists could line-up higher order science cooperation at the forefront of CASGI planning. This order of priority was a natural fit with political advocacy in support of Antarctic science at the science and diplomacy interface discussed in Chapter 4 above. Belanger's analysis suggests scientists' awareness of the constraints caused by intractable diplomatic tensions surrounding Antarctic territorial issues prompted them to adjust their plans and manner of execution in order to utilise the science track in Antarctic diplomacy as much as possible. For example, Belanger notes 'savvy science leaders developed their own international and national IGY plans *before* approaching their governments—the only possible patrons.'³⁹⁰ The similarity to Murray's and Mawson's successful models for science as political persuasion is unmissable.

*That doesn't mean that scientists don't understand the politics, or the geopolitical context, that surrounds this. As they see it, they view science as a multilateral activity.*³⁹¹

Scientists as negotiators

The phenomenon of scientists acting in concert was not the only reason the International Geophysical Year was important. According to Bulkeley, the Organising Conference was a significant diplomatic moment because it was the first time representatives of countries with

³⁸⁹ Tony Press interviewed by Anne Michelle Davis on 18 October 2018.

³⁹⁰ Belanger, Dian (2004) 'The international geophysical year in Antarctica', p 488. Belanger's emphasis.

³⁹¹ Tony Press interviewed by Anne Michelle Davis on 18 October 2018.

Antarctic interests ever attended such a meeting, thus ensuring ‘the International Geophysical Year would mark a new phase in international relations respecting Antarctica.’³⁹² That it was a science conference, and that, also for the first time, deliberations on a science track would trigger follow-up diplomatic activities in response, mark CSAGI’s activities as pivotal in the development of the Antarctic interface. In particular, CSAGI proceedings provided ingress for scientific content to be included as a complementary source of advice in traditional diplomatic decision making.

Throughout the evolution of the combined chronology up to this point, the presumptive element in Antarctic diplomacy is skewed towards science as a consort to traditional diplomacy, a resource for information and activities that ultimately support political outcomes. In this developmental pattern, scientists were beneficiaries of political engagement through government-enabled access to the continent, however, it was diplomats who banked the political gains. Those same scientific activities were a means to get hold of territory. In the preceding foundational and formative periods of the interface, scientists accommodated this diplomatic hierarchy. However, from its inception in 1952, CSAGI was instrumental in cultivating scientists as fully fledged diplomatic actors. Dr Desmond Lugg joined ANARE in 1963 as Medical Officer and was Head of Polar Medicine from 1968 to 2001. Dr Lugg observed scientists in many negotiating roles, and captures this as follows:

*Scientists weren’t diplomats first. As scientists who became diplomats, their ‘whatever it is’ was seen by their superiors, and they were left to negotiate. And they were brilliant negotiators.*³⁹³

CSAGI was run as a standing Scientific Conference. At the first plenary, delegates adopted a resolution stating the Conference ‘purposes were exclusively scientific and attempts to introduce political considerations were rejected by the chairman.’³⁹⁴ This procedural twist meant diplomats had to concede a certain authority to scientists for decisions in their stead.

³⁹² Bulkeley, Rip (2009) ‘Politics at the First Comité Spécial de l’Année Géophysique Internationale (CSAGI) Antarctic Conference’, p 381.

³⁹³ Desmond Lugg—Medical Officer (ANARE) 1963, Head of Polar Medicine 1968 to 2001. Interviewed by Anne Michelle Davis on 22 November 2017.

³⁹⁴ Bulkeley, Rip (2009) ‘Politics at the First Comité Spécial de l’Année Géophysique Internationale (CSAGI) Antarctic Conference’, p 381.

This did not prevent Australian diplomats from seeking to be hands-on with the CSAGI delegation. Staff of the Department of External Affairs has primary responsibility for briefing the government, for which information about the Conference agenda was essential and about which Australian scientists were directed to provide updates.³⁹⁵ The Antarctic interface was instrumental in ensuring that crossover points for into exchange were nonetheless in place.

On the international science track CSAGI established, scientists from around the world were empowered to commit expeditions to the manner of conduct of international scientific cooperation in Antarctica during the upcoming International Geophysical Year. Science was the referent for decisions such as the location of research Bases. Scientists concentrated their deliberations about bases on the most suitable locations for data collection, despite diplomats' repeated attempts to exert political pressure to impede site selection within areas claimed by their governments. In the absence of formal recognition of those claims, diplomats had no jurisdiction to insist. Scientists concentrated their deliberations about bases on the most suitable locations for data collection, despite diplomats' repeated attempts to exert political pressure to impeded site selection within areas claimed by their governments. Role reversal in the traditional relationship between scientists and diplomats at CSAGI helped to recast scientists' political agency in diplomatic terms. Just like the diplomatic counterparts, Bulkeley acknowledges, participants in CSAGI science delegations were 'politically instructed, or guided, or at least trusted representatives'.³⁹⁶

As a result, the capacity to sway political decisions steered scientists towards a deliberative role within the machinery of diplomatic practice. For example, at CSAGI conferences, the science and diplomacy interface operated in a way not dissimilar to the traditional machinery of diplomacy. Scientists assembled at CSAGI shared a commitment to universal scientific cooperation and exchange. They became a cohort of scientist-diplomats when they acted on this commitment and purposefully made CSAGI a spearhead to elevate Antarctic science from national platforms to the international stage. By the end of the planning process for IGY

³⁹⁵ National Archives of Australia: Department of External Affairs; A1383, 1495/1/9/7, Antarctic IGY (International Geophysical Year) Paris Conference 1956, Folios 27-28, Outward cablegram to Australian Embassy, Paris.

³⁹⁶ Bulkeley, Rip (2009) 'Politics at the First Comité Spécial de l'Année Géophysique Internationale (CSAGI) Antarctic Conference', p 382.

Antarctic programs, the record of proceedings resembled that of a diplomatic conference, and scientists came to embody the definition of a diplomatic agent by virtue of ‘committing acts of consequence on the environment’—in this case on Antarctic geopolitics.³⁹⁷

To be eligible to participate, delegations to CSAGI had to be led by scientists, a stipulation that deepened the role reversal in the established hierarchy between Antarctic scientists and diplomats at successive conferences, and helped to recast scientists’ diplomatic agency in increasingly technical terms. A lasting ramification of having scientists as head of delegation was formal recognition of science as a political lever. Perhaps because of this, diplomats formally raised concerns about the nature and extent of scientists’ overall political agency ahead of the Antarctic International Geophysical Year Conference held in Paris from 11 to 14 June 1956. Ambassador J. B. Rosetti headed the Chilean CSAGI delegation as a rare political appointee. Archives from the Chilean Ministry for External Affairs record Rosetti’s concern that ‘behind the scientific academies stand always their governments.’³⁹⁸ The concern in kind for scientists was how to treat diplomats at the conferences as sensitively and tactfully as they had learned to do with politicians elsewhere, while at the same time constraining the diplomats’ efforts to appropriate the Antarctic IGY agenda for political purposes.

Science as technical authority in diplomacy

One mechanism CSAGI leaders used to keep diplomats and their politics at bay was to reiterate the conference proceedings ‘were not to be concerned with financial or political matters, but solely with the technical problems of cooperation between the Antarctic expeditions of the International Geophysical Year.’³⁹⁹ This was another signature moment in the development of the Antarctic science and diplomacy interface. It placed science as a diplomatic currency in the hands of scientists, and it demarcated scientists’ tolerance for political intrusion. In regard to the demarcation between scientific and diplomatic problem solving, despite the allure of science as a diplomatic lever, scientists defined themselves in technical terms. They considered themselves actors focused on technical problems in a

³⁹⁷ Adler-Nissen, Rebecca (2016) ‘Diplomatic Agency’, p 93.

³⁹⁸ Bulkeley, Rip (2009) ‘Politics at the First Comité Spécial de l’Année Géophysique Internationale (CSAGI) Antarctic Conference’, p 382.

³⁹⁹ Bulkeley, Rip (2009) ‘Politics at the First Comité Spécial de l’Année Géophysique Internationale (CSAGI) Antarctic Conference’, p 381.

political setting. In relation to Antarctic diplomacy, this self-defining attribution pointed to a baseline of international technical management in the conduct of traditional diplomacy:

*The scientists are well aware of the national interests and national perspectives about activities in Antarctica. They are also well aware of the political context and the geopolitical context that they are working in. And that, actually, in a sense, motivates them to be collaborative because they see collaboration in science as a way of breaking through the political impasses that arise from time to time.*⁴⁰⁰

Science diplomacy during the International Geophysical Year exposed governments, diplomats and scientists to a new diplomatic reference point from which scientists derived diplomatic agency based on technical authority. Simone Turchetti et al present this moment as recognition by diplomats that ‘the cultivation of international scientific projects represented a viable diplomatic instrument to pull together sometimes striking differences between nations who had an interest in Antarctic Affairs.’⁴⁰¹ Organisers upheld the technical posture established at CSAGI throughout the twelve months originally approved to field IGY projects. Extending the Antarctic science program was a fitting pretext when diplomacy needed more time to conclude the Antarctic Treaty negotiations, for which the International Geophysical Year had provided a global foil.⁴⁰²

IGY scientists as international technical managers

Belanger pins the Antarctic science turn to diplomacy early in 1956 when the United States pressed through science channels for a one-year extension of the Antarctic program. Before being able to respond, CSAGI needed to reconcile three different approaches taken by its participants to that request. Scientists were divided between those who approved the extension, those who reserved saying yes pending evidence to confirm the value of Antarctic science to humanity, and those opposed to the request on diplomatic grounds.⁴⁰³ Amongst CSAGI members, the request precipitated a science version of the practical diplomacy

⁴⁰⁰ Tony Press interviewed by Anne Michelle Davis on 18 October 2018.

⁴⁰¹ Turchetti, Simone et al (2008) ‘On thick ice’, p 352.

⁴⁰² Parliament of Australia, *House Hansard*, 23 April 1958, p 1129.

⁴⁰³ Belanger, Dian (2010) *Deep Freeze*, pp 355-357.

characteristic of the Antarctic interface. Scientists' IGY-led masterclass in diplomacy fused their role as proxy diplomats on the continent, their emerging function as full-time technical actors on the science track in Antarctic diplomacy, and a novel experience of acting as diplomats with each other. In scientists' hands, the response to the extension request is an example of science in diplomacy, science for diplomacy, and a scientist-to-scientist version of diplomacy for science.⁴⁰⁴ As a stepping stone in the direction of international technical management, and in the same vein as Chile's complaint at CSAGI that governments shadowed their scientists too closely, Bulkeley asserts scientists' response to the extension request was 'indiscernible from the policies of the superpowers and the national diplomacy of countries involved.'⁴⁰⁵

This vertical integration of science and diplomacy reveals the International Geophysical Year as a diplomatic frontier. In frontier fashion, the Antarctic science and diplomacy interface provided a testing ground for using science cooperation to improve international relations between countries when the USSR usurped control of the Antarctic scientific and political agenda by unilaterally declaring an extension to their IGY program, and making Soviet bases in Antarctica permanent.⁴⁰⁶ By asserting an undeclared territorial claim through scientific occupation, the Soviets also recast the conception of Antarctic science from an expedition-to-expedition activity to a continuous, strategic activity.⁴⁰⁷

The implied equivalency between science and traditional diplomacy in the Antarctic Treaty can be traced to this diplomatic moment. Christie Collis notes the treaty is an 'artefact of the IGY' that preserves Antarctica as 'a non-militarised continent for peaceful science in which scientists and scientific information could circulate freely.'⁴⁰⁸ As a result of freezing the legal geography of Antarctica according to the IGY model, the intersection of the interests of science—now separately articulated—with diplomacy in Antarctic affairs, allowed science to assume a position at once mutually enabling and constraining:

⁴⁰⁴ The Royal Society (2010) *New frontiers in science diplomacy*, pp v-vi, 1, 15-18.

⁴⁰⁵ Bulkeley, Rip (2009) 'Politics at the First Comité Spécial de l'Année Géophysique Internationale (CSAGI) Antarctic Conference', p 382.

⁴⁰⁶ Belanger, Dian (2010) *Deep Freeze*, p 327.

⁴⁰⁷ Peterson, M. J. (1988) *Managing the Frozen South*, p 41.

⁴⁰⁸ Collis, Christie (2010) 'Critical legal geographies of possession', pp 392-393.

IGY was interesting wasn't it. The scientists wanted to do this thing and they all cooperated do it. It was done at a time when America was about to put in a claim for an unclaimed chunk. But they didn't. They held off. Was that the Government and diplomats? It was an interesting time. Then it moved on the treaty and it was the Americans I think principally saying—'gosh, this is an amazing thing. We all worked together down there. If only we could continue it.' That's a diplomat and not a scientist. It's a diplomat trying to settle things in Antarctica, and then using science as a way of doing it, because it was a territorial thing rather than a scientific thing. Then, coming into the treaty, well then again, it had to be science. ⁴⁰⁹

As politics and science alternatively swung to the forefront of Antarctic diplomacy as the federated chronology unfolded, different commonalities between diplomats and scientists emerged at the science and diplomacy interface. When they traversed the traditional diplomacy of empire that founded the interface, diplomats and scientists had the continent in common. During the continent's patchy rise to political salience during the formative phase of the interface, states engaged in Antarctic politics had the fact that they all relied on scientists to achieve their territorial ambitions in common. After the International Geophysical Year, states, scientists and diplomats had Antarctic diplomacy in common, along with the mutual challenge of determining what kind of territory Antarctica should be. At stake were the alternative visions of Antarctica as a scientific as well as a political domain.⁴¹⁰

Faced with an abrupt end to international scientific collaboration and the research track made possible only by worldwide data collection and dissemination modelled during the International Geophysical Year, scientists sided with the International Council of Science Unions—CSAGI's parent institution—to set up the Special Committee on Antarctic Research (SCAR). SCAR comprised permanent delegates from countries that manned research efforts during the International Geophysical Year and was tasked to 'formulate and coordinate post-International Geophysical Year polar science programs.'⁴¹¹ Scientists banked this as a political

⁴⁰⁹ Knowles Kerry interviewed by Anne Michelle Davis on 18 September 2018.

⁴¹⁰ Parliament of Australia, *House Hansard*, 7 August 1958, p. 144.

⁴¹¹ Belanger, Dian (2010) *Deep Freeze*, p 356.

commitment to Antarctic science as a permanent branch of science in its own right, and a leap forward in their long-held ambition of Antarctica as a world laboratory.⁴¹²

Crossover points at the science and diplomacy interface were instrumental in ensuring that the combined chronology of Antarctic diplomacy and science did not unravel when the need for mutual engagement accelerated along with the momentum of treaty diplomacy towards the end of the IGY. Geopolitics, diplomacy and science were all in play when Moscow hosted the CSAGI Meeting in 1958. That meeting committed the international scientific community to 'prolong the International Geophysical Year ideal' and committed diplomats to 'continue respective national efforts for one year, at a level of each country's choosing.'⁴¹³ Diplomatic success took the form of a name. The title of 'International Geophysical Cooperation 1959' was suggestive of scientific and diplomatic continuity despite the impending nationalisation of Antarctic science programs.⁴¹⁴

Complementary practices at the post-IGY interface

Copeland's difficulty conceptualising a global science and diplomacy interface is about how few people have managed to straddle the worlds of science and diplomacy effectively.⁴¹⁵ The CSAGI experience put Antarctic scientists in the frame as practitioners who do straddle both worlds, thanks to the joint problem solving characteristics they personified at the Antarctic science and diplomacy interface during the post-IGY period of structural transition. In the margins of CSAGI, diplomats' concern over progress to negotiate a treaty meant they could not repudiate scientists' voice on Antarctic matters, first differentiated by Shackleton and Mawson then reinforced by the internationally acclaimed example of scientific exchange and knowledge sharing promulgated during the International Geophysical Year. Bulkeley and

⁴¹² 'Annals of the International Geophysical Year', Volume 10, pp 1-446, Paris: Pergamon Press, pp 245-257.; Sullivan, Walter (1959) 'The International Geophysical Year', *International Conciliation*, Issue 32, 1959, pp iii-338. p 327.

⁴¹³ Belanger, Dian (2010) *Deep Freeze*, p 387.

⁴¹⁴ 'International Council of Scientific Unions: Special Committee on Antarctic Research' (1958) *Polar Record*, Vol. 9, No. 6, pp 268-269.

⁴¹⁵ Copeland, Daryl (2016) 'Science Diplomacy', p 634.

Turchetti affirm that, as a result of the juxtaposition of science and diplomacy agendas at CSAGI, scientists and diplomats ended up with a foot in each other's camp.⁴¹⁶

Science became indispensable to Antarctic diplomats at the point in Treaty negotiations where enunciating common interests was essential for regime building, but missing until then in the geopolitical diplomacy. Anthony Parsons notes that science as a technical authority on Antarctica was able to assume and hold the neutral centre-ground of international public opinion, unlike the divisive national interests traditional diplomacy was left to convey.⁴¹⁷ This interdependence between diplomacy and science cemented the interface as a political artefact of the International Geophysical Year, and paved the way for the development of complementary technical and diplomatic practices as it continued to evolve post-IGY.

In the wake of the International Geophysical Year, Myhre reassesses the science tracks in Antarctic diplomacy as either science, or science conducted to support diplomacy in the same tenor as the International Geophysical Year.⁴¹⁸ Two kinds of science are involved: science as an instrument of hard power, that is, technological advances supporting state supremacy, and science as soft power in the form of scientists' ability to influence, persuade and legitimise the scientific use of Antarctica in the face of geopolitical division.⁴¹⁹ At the post-IGY interface, the hard science track continued to attract government support for science and to dictate technical expertise as a proviso for scientists to acquire it. There is evidence for this in the technical underpinning of Heap's 'severely practical' science linking it to logistics and frontier engineering discussed in Chapter 3, and in Martin's recognition that Antarctic research directly links scientific knowledge to military capability. Martin attests 'there is, and always has been, a close connection between military activity and scientific activity in Antarctica.'⁴²⁰ He cites 'experience from the Discovery expeditions confirmed the possibilities of expeditions with both political and scientific objectives', and that 'meteorological and other data gathered

⁴¹⁶ Bulkeley, Rip (2010) 'The Political Origins of the Antarctic Treaty', pp 9-11.; Turchetti, Simone et al (2008) 'On thick ice', p 352.

⁴¹⁷ Parsons, Anthony (1987) *Antarctica The Next Decade*, pp 4-5.

⁴¹⁸ Myhre, Jeffrey D. (1986) *The Antarctic Treaty system*, pp 47-48.

⁴¹⁹ Nye, Joseph (2009) *Soft Power: The Means to Success in World Politics*, New York: Public Affairs, pp 1-8.; Copeland, Daryl (2016) 'Science Diplomacy', p 629.

⁴²⁰ Heap, John (2003) 'The Scope of Antarctic Science', pp 9-14.; Martin, Stephen (1996) *A History of Antarctica*, p 197.

by Operation Tabarin was quickly diverted to shipping use, particularly naval operations.’⁴²¹ Haward has highlighted this process:

Now science becomes even more important during the end of the Second World War when so much more development in science took place in radio, radar, upper atmosphere physics, concerns about magnetic waves, and the poles became a particularly important place for physical science research. ⁴²²

The soft science track fostered relationships among scientists, and between scientists and diplomats. Scientists used the international scientific cooperation institutionalised by the International Geophysical Year as the means to pursue these. For example, John Béchervaise reflects in relation to International Geophysical Year politics that ‘no project has yielded more benefit to one nation than another. Great nations have expended more in time, manpower and equipment than others, but all they have earned, in observed fact and scientific discovery, has been the shared property of all.’⁴²³ The International Geophysical Year conferred soft power legitimacy on science by demonstrating what Béchervaise describes as ‘the way nations have worked together in the search for knowledge and shared scientific discovery in lieu of wartime pressure and money to fast-track research.’⁴²⁴

The post-IGY rationale of continuing international research as a public good legitimised a way forward for negotiations over the future of Antarctica. Scientific cooperation made the common interest in the continent that founded the Antarctic interface, and scientists’ technical agency in the joint problem solving approach that formed it, a pathway to include scientists in Antarctic affairs. The founding theorist of soft power, Joseph Nye, proclaims soft power is apparent when subscribers or actors participate because they believe in the legitimacy of the objectives.⁴²⁵ The more scientific cooperation and knowledge sharing emerged as a unifying norm for Antarctica, the more diplomacy was impelled to shift the

⁴²¹ Martin, Stephen (1996) *A History of Antarctica*, p 197.

⁴²² Marcus Haward interviewed by Anne Michelle Davis on 15 November 2017.

⁴²³ Béchervaise, John (1978) *Science: Men on Ice in Antarctica*, pp 15-16.

⁴²⁴ Béchervaise, John (1978) *Science: Men on Ice in Antarctica*, p 95.

⁴²⁵ Nye, Joseph (2009) *Soft Power: The Means to Success in World Politics*, p 2.

referent in Antarctic Treaty negotiations from territorial stakes to accommodating Antarctic science.

At this juncture, post-IGY Antarctic science can be characterised as international science mobilised in the interests of answering complex questions on a global scale. Chalmers' definition of science as knowledge production is met where the International Geophysical Year elevated Antarctic science to a complex social activity on an international scale. Antarctic science surpasses Chalmer's definition where the science and diplomacy interface confirms it is a complex social and political activity that takes place at the interface between the professions of science and diplomacy in Antarctica.⁴²⁶ Its political bona fides are exemplified in scientists' use of Antarctic science as an international strategy, aided by scientists' display of diplomatic skills at CSAGI, a combination which lent their sponsorship of the IGY a para-diplomatic status. These two points provide an important insight into what drives the science and diplomacy interface from the inside: Antarctic scientists are scientists who must collaborate in politics for their scientific activities to be viable. They cannot attempt solutions to the scientific problems they encounter at a whole-of-earth level, for which they Antarctica as a laboratory, without the assistance of their diplomatic colleagues. As a result, Antarctic scientists' engagement with diplomats is crucial in getting states to collaborate on technical issues that impact multiple Earth systems at once, including political systems.

With the question of Antarctica firmly on the table of science, the puzzle set out in Chapter 2 comes into clearer focus. Some repetition is merited here. At the very start of this investigation, it was puzzling how, when it comes to influencing Antarctic affairs, science anchors diplomacy in the treaty structure in a way that confers equivalency between the conduct of science and traditional diplomatic practices. The scientific activities undertaken during the International Geophysical Year epitomise scientists acting under the banners of 'science in diplomacy' and 'science for diplomacy'. Diplomats' responses to these activities can be characterised as 'diplomacy for science', and complete the bigger picture of science diplomacy in Antarctica begun in Chapter 4. When translated into the provisions of the Antarctic Treaty, how scientists put science diplomacy to work at this pivotal diplomatic moment accounts for the narrative behind the provisions that make science a pillar of

⁴²⁶ Chalmers, Alan (1976) *What is this Thing Called Science?* pp 104-105.

diplomatic engagement, not just an advisory function. This shared experience enabled scientists to establish themselves on a science track with its own rationale for engaging diplomacy. Scientists operate in Antarctica on the basis of what that track means for science *and* diplomacy. As a result, scientists interpret the Treaty as a prototype for joint problem solving because of the way it treats science:

Having a treaty that signifies science as a fundamental element is empowering to scientists. And it actually gives them a context that they don't have in other fields of science. It is certainly empowering and it contextualises them and their work. The other elements of the treaty, such as exchange of information provisions, and the traditional, I suppose the imploring of collaboration, means that people actually think about collaborating a bit more than they might in other contexts. Those elements define a way that science can be done, and this is, through information sharing, through collaboration and big questions, and through international integration of scientific effort. And, it also facilitates the interpretation of that science into a global context, and that is really important. ⁴²⁷

It is evident that scientific activity is a diplomatic constant throughout the combined chronology of Antarctic diplomacy. At the science and diplomacy interface, diplomats inhabit a mutual problem solving space where they readily acknowledge scientists as fellow participants in everyday diplomatic practices. While scientists' primary focus is science, it is not surprising that, as trained observers, from the science track in Antarctic diplomacy they note diplomats and politics at work around them on other tracks. Scientists sustain an unbroken line of sight on such activities, a vantage point from which the Antarctic Treaty Regime itself might offer further clues as to whether what diplomats and scientists do there could enhance joint problem solving elsewhere. Chapter 7 tackles one aspect of this challenge by presenting a model typology of Antarctic diplomacy and science that could prove useful for progressing discussions to enhance interactions at the global interface. Chapter 8 goes on to detail how the model typology facilitates the emergence of international technical management as a diplomatic technique based on a structural analysis.

⁴²⁷ Tony Press interviewed by Anne Michelle Davis on 18 October 2018.

7—The science and diplomacy interface in Antarctic regime creation

The science and diplomacy interface in Antarctica is the backbone of an international regime in which the traditional leverage of sovereignty is constrained and states trade in an unconventional currency—science. In such a regime, scientists are actors who play a crucial role in forming interdisciplinary norms that enable diplomats to act on technical expertise as a centrepiece of diplomacy. The previous chapter revealed science as a constant in the combined chronology of Antarctic diplomacy and science, and demonstrated how scientific activities benefited from proximity to politics when scientists interacted with diplomats over the continent. The commensurate pattern of diplomatic interest in Antarctica is different.

M. J. Petersen describes the salience pattern of Antarctic diplomacy as long periods of obscurity contrasted with intense political attention when Antarctic issues posed a risk to national interests or national security. Issues became diplomatic moments, attracting diplomatic action, when this political tension peaked. The Washington Conference convened in 1959 to finalise the future of Antarctica is one such tension point. This chapter picks up that point in the combined chronology and uses it to launch a deep dive into the systemic footings that support science diplomacy in the Antarctic Treaty Regime.⁴²⁸

The characteristics of the interface identified in Chapter 5 and Chapter 6 are cross-examined in this one to identify what propelled scientific objectives into the negotiations that founded a treaty regime dependent for implementation on diplomats and scientists working side by side. This is the next step in answering the outstanding question about whether what diplomats and scientists do at the Antarctic interface could enhance joint problem solving elsewhere. The examination seeks to test Peterson's assertion that the Antarctic Treaty Regime is a paramount example of an international regime.⁴²⁹ This is necessary to confront the counterargument, raised in Chapter 2, that diplomatic techniques adapted at the Antarctic science and diplomacy interface may not be transferable to joint problem solving settings under other regimes.

⁴²⁸ Peterson, M. J. (1988) *Managing the Frozen South*, p 3.

⁴²⁹ Peterson, M. J. (1988) *Managing the Frozen South*, p 3.

Model typology of Antarctic diplomacy and science

In order to accommodate science in proximity to politics after the International Geophysical Year, negotiators had to strike a balance in the conduct of Antarctic diplomacy between the interests of science and diplomacy's traditional interests of sovereignty. As Bulkeley's caution in Chapter 2 made clear, disrupting the established order of diplomatic priorities within the international system of relations between states was never in the frame.⁴³⁰ To complicate negotiations, treaty negotiators faced the novel challenge of having to deal with scientific activities reaching a peak international salience point at the same time as Antarctic geopolitics reached peak diplomatic salience. Proponents of the Antarctic regime needed to move forward with the diplomatic accommodation scientists consolidated for them during the IGY in order to retain science as a form of leverage for mutually-assured control among treaty parties. However, they needed to do so without imposing constraints on the future exercise of diplomacy. The results led Klaus Dodds, Alan Hemmings and Peder Roberts to declare that 'science and scientists were written into the DNA of the Antarctic Treaty System.'⁴³¹

The Antarctic Treaty captured the proximity between the professions of diplomacy and science at the interface in a way that enhances the practice of both disciplines without constraining either. The model typology in Figure 1 accounts for the circular nature of the interconnected geopolitical, normative and machinery activities that permit scientists to perform diplomatic service through the agency of their science in the Antarctic Treaty System. The model translates the combined chronology of Antarctic science and diplomacy into a framework to explain how diplomats and scientists cooperate as generalists and technical experts in a single regime. According to the model, the basis for that cooperation is a mutual calculation that science compounds traditional diplomatic leverage, something highlighted by Sir Guy Green:

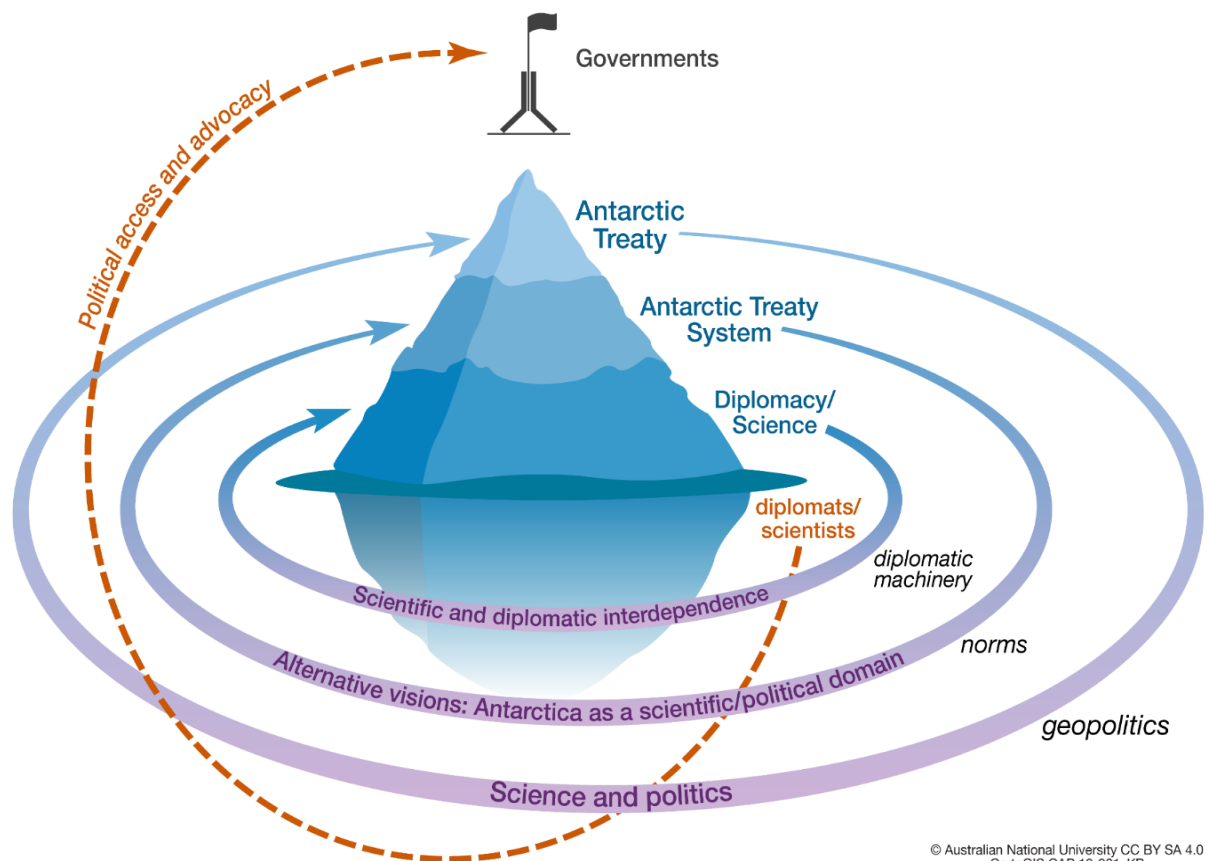
There are some points in common between what scientists do under the Treaty for science and what diplomats do at international law. Whether they

⁴³⁰ Bulkeley, Rip (2010) 'The Political Origins of the Antarctic Treaty', pp 9-11.

⁴³¹ Dodds, Klaus, Alan Hemmings and Peder Roberts (2017) *Handbook on the Politics of Antarctica*, p 3.

expressly recognise this to themselves, what they've got in common is a shared perception of the Antarctic sphere as different, and a shared commitment to the Antarctic sphere, and a shared perception of the Antarctic sphere as different. That's sort of a Venn diagram, and that's the bit that connects them. It's a shared ethos. They all speak the same language. ⁴³²

Figure 1 Model Typology of Antarctic Diplomacy and Science



Antarctic diplomacy and science operating as a whole system:

Geopolitics—Circle of science and politics (Howkins 2011)

Norms—Circle of alternative visions of Antarctica as a scientific and a political domain (Peterson 1988)

Diplomatic machinery—Circle of scientific and diplomacy interdependence (Davis 2023)

⁴³² Sir Guy Green interviewed by Anne Michelle Davis on 5 December 2017.

Science diplomacy norms in treaty diplomacy

Peterson asserts that the role scientific collaboration played at CSAGI and during the International Geophysical Year in articulating new norms was instrumental in the eventual creation of the Antarctic Treaty regime. Diplomats failed to secure a negotiated outcome when they relied on traditional norms, despite a decade of intense government-to-government engagement. Peterson puts the diplomatic impasses down to 'questions of regime norms, rules and procedures' that were impossible to overcome while ever 'participating governments could not agree to divide the Antarctic landmass or treat it as a common area.'⁴³³ The scientific collaboration demonstrated during the International Geophysical Year gave diplomats a timely pretext for moving forward, and a credible fall-back position.

The fall-back to science was not a sudden diplomatic manoeuvre. It could be described as an iteration of the pre-existing relationships between scientists and diplomats that had evolved at the science and diplomacy interface over the course of Antarctica's combine chronology. Belanger notes how the step to a science track did not really veer far from Antarctic relations conducted in traditional mode. In her analysis, pressing geopolitical considerations of the Cold War made the fall-back an expedient step, and decades-long efforts by the United States defence and diplomatic establishments to link scientific activities in Antarctica to security and strategic interests made it a short one.⁴³⁴

For military leaders and diplomats of the immediate post-war era the 'facade of cooperative science' promulgated in support of the International Geophysical Year barely held at bay 'gut-felt fears that the Russians would pre-empt the south polar continent if the Free World did not act "fast" before the IGY concluded.'⁴³⁵ David Day portrays the prevailing official sentiment surrounding the International Geophysical Year in like vein. In the International Geophysical Year that Day portrays, the science and diplomacy interface is a utilitarian relationship where science is subservient to the political imperative of territorial competition.

⁴³³ Peterson, M. J. (1988) *Managing the Frozen South*, pp 50, 67.

⁴³⁴ Belanger, Dian (2010) *Deep Freeze*, p 3.; Needall, Allan (2010) 'Lloyd Berkner and the International Geophysical Year Proposal in Context', p 206.

⁴³⁵ Belanger, Dian (2010) *Deep Freeze*, p 3.

Its function is to choreograph the hierarchy of actions diplomats and scientists undertake in ways that preserve, in fact and appearance, the final say in Antarctic affairs for diplomacy. Day airs the grinding nature of diplomacy, where diplomats had to work hard behind the scenes to navigate deep political divides in the unfinished contest for Antarctic territory. Only scientists stick to the aspirational messaging of cooperation, thereby rendering Antarctic science a diplomatic means to an end in this contest.⁴³⁶ Day's analysis corroborates the prevailing views that Michael Stoddard and Marcus Haward attribute to the pre-IGY period of Australian scientific involvement in the Antarctic, that such involvement 'served the interests of sovereignty and not science.'⁴³⁷

This interpretation has weight when viewed as the legacy of the combined rhetoric that scientists and diplomats co-crafted and deployed to mutual advantage throughout the development of the Antarctic science and diplomacy interface. Day, Stoddard and Haward bolster the concept of science in Antarctic diplomacy as a cover for territorial claims, a buttress against a permanent problem for which the diplomatic innovation of suspending sovereignty under Article IV of the treaty, and mutually-assured control by consultative parties under Article IX, is a temporary solution.⁴³⁸ The fall-back to science as a diplomatic approach is then consistent with the traditional diplomatic rationale of pursuing national interests by whatever means available.⁴³⁹ These debates characterise the constancy of science as a diplomatic consort in Antarctic diplomacy, not an authoritative imperative in its own right. However, in terms of science in Antarctic regime creation, it is clear from the interviews conducted for this project that, while Australian scientists agree that diplomacy is paramount, so too do diplomats insist that Antarctic scientists are essential in upholding the

⁴³⁶ Day, David (2012) *Antarctica: A Biography*, North Sydney: Random House Australia, pp 493-499.

⁴³⁷ Stoddard, Michael and Marcus Haward (2011) 'Science', in Marcus Haward and Tom Griffiths (eds) (2011) *Australia and the Antarctic Treaty: 50 Years of Influence*, Sydney: University of New South Wales Press, Chapter 6, pp 138-168, p 147.

⁴³⁸ 'Mutually assured control' is the author's term, used here to highlight the function the Antarctic Treaty served as a foil for 'mutually assured destruction' that provided the centrepiece of Cold War diplomatic activity over nuclear disarmament.

⁴³⁹ Bull, Hedley (1977) *The Anarchical Society*, p 164.

Antarctic Treaty System. Respect for the regime can be counted as a contribution scientists make as diplomatic actors:

The universal scientific values enshrined in the Treaty influence how Antarctic issues are dealt with. One is that it is those principles of collaboration. But also, the outcome of that collaboration is important. And there are two sides to this coin. It is often said that science is the currency of influence in the Antarctic Treaty System. And that is true. It's those parties who join subsequently that want to become Antarctic Treaty Consultative Parties that go through the hoop of having to demonstrate a substantial scientific effort in order to get voting rights in the Antarctic Treaty System.

So, there is a view of science as an activity that leads to status, and also that allows countries to influence, either directly through leading scientific programs, or indirectly through having the standing to influence political decisions in the Antarctic Treaty. The corollary of that, which is just as important, is that science becomes a platform that allows collaboration and political influence in environments where it might be difficult to do so otherwise. ⁴⁴⁰

Science inroads into diplomacy and regime readiness

There is a noticeable congruence linking past and present practices at the Antarctic interface which establishes a precedent for scientists' diplomatic agency, and that is their role as technical experts and technical advisers. Added to this, the International Geophysical Year afforded scientists hands-on experience that habitualised them to diplomatic language and approaches. Those Antarctic science programs rejuvenated a foundational principle of the interface, that seeking knowledge at remote frontiers is as valuable as political control of them. While organising, coordinating and wrapping up the IGY initiative, scientists became adept at articulating scientific values in diplomatic terms, an approach echoed by their contemporaries:

⁴⁴⁰ Tony Press interviewed by Anne Michelle Davis on 14 November 2017.

While we might have these viewpoints, the way we'd approach it really is to try and understand their viewpoint first rather than trying to put our viewpoint on them. Science is often referred to as a diplomatic currency in the Antarctic Treaty System, so it has a material value in a range of different forums. Scientists are aware of that. Science does have that currency, and yes, is relevant in that diplomatic viewpoint. I think part of 'representing the work you do in a certain way', relates to that. ⁴⁴¹

The international renown the popular IGY science programs accrued put the means for diplomatic intervention at scientists' disposal during treaty negotiations. From the point of view of long-serving diplomats, the way scientists were able to reinforce the relevance of the frontier nature of Antarctic science to twentieth century diplomacy has endured beyond that diplomatic moment. As Green puts it:

There is this notion of what's different, and what's different in practice under the treaty. When the Antarctic Treaty is implemented as a System, and then it comes down to the ice, people talk about a camaraderie and a collaboration that is very relationship specific. That relationship is not nation to nation, it is human to human. It is intensely global in its orientation. Traditionally in diplomacy, the relationships that are influential, the relationships that provide information and currency for solutions, they're anchored in the Department of Foreign Affairs, or they're anchored with the Minister. In discussions around Antarctica, the anchor for those relationships, it's in a different place. It's with individuals, operating individually and collectively with the norms of the Antarctic Treaty Systems very much at the forefront of their mind. ⁴⁴²

At the Antarctic interface, it made sense for scientists to stay closely involved in Antarctic politics to secure scientific objectives. As a result, scientists were instrumental diplomatic actors during the creation of the Antarctic Treaty regime.

⁴⁴¹ Andrew Klekociuk interviewed by Anne Michelle Davis on 24 November 2017.

⁴⁴² Sir Guy Green interviewed by Anne Michelle Davis on 5 December 2017.

Science cooperation as a mechanism in regime creation

Peterson asserts that 'regime creation depends not only on perceiving a common concern but on having a notion of how to deal with it.'⁴⁴³ The upshot of the International Geophysical Year was that Antarctic scientists had a notion that the solution to the 'problem of Antarctica' was science. Like Day, and Stoddard and Haward, Peterson considers 'security concerns have always been prominent in participants' thinking about Antarctic cooperation.'⁴⁴⁴ These, of course, can change over time, as also can Antarctic's relevance to particular security concerns. However, Peterson acknowledges that from the scientists' perspective, 'the experience of scientific cooperation in the International Geophysical Year of 1957-58 heightened common concern and pointed the way toward a common solution.'⁴⁴⁵ In Press's words:

*Science is very trans-boundary. Scientists are usually not prone to saying 'well, I am not going to collaborate with you because you're from Russia. I mean that is not the kind of way that scientists do things. It's a deeply embedded international tradition.'*⁴⁴⁶

The careful elevation of scientific collaboration as leverage in the pre-conference stages of negotiating the treaty secured scientists political input and an airing not ordinarily afforded them within established diplomatic channels. The trade-off was scientists furnished the negotiations an apolitical and uncontested stock of international goodwill. Their alternative vision of Antarctica as a place for the peaceful pursuit of science acted as an enabling concept for claimants and other signatories seeking to avert militarisation, prohibit nuclear weapons and forestall unregulated resource exploitation:

Scientists share those universal scientific values. I think they are a bit hard to pin down, but there is an ethic among scientists that science crosses political boundaries. And that, for instance, was the foundation for the International

⁴⁴³ Peterson, M. J. (1988) *Managing the Frozen South*, p 29.

⁴⁴⁴ Peterson, M. J. (1988) *Managing the Frozen South*, p 3.

⁴⁴⁵ Peterson, M. J. (1988) *Managing the Frozen South*, p 6.

⁴⁴⁶ Tony Press interviewed by Anne Michelle Davis on 14 November 2017.

*Geophysical Year, and for the collaboration in Antarctica in the International Geophysical Year in '57-58, that has endured despite political machinations.*⁴⁴⁷

Evidence supporting scientists' intervention as an influential addition to traditional diplomacy includes Fogg's pronouncement that the 'Antarctic Treaty arose out of the needs of scientific research.'⁴⁴⁸ Steven Heavens and Rip Bulkeley reinforce this contribution with evidence about the way diplomats, such as Escudero, appropriated international scientific cooperation into the machinery of diplomacy.⁴⁴⁹ Peterson advances this discussion when he states that the Antarctic Treaty 'transformed a continent and its surrounding ocean from a field for superpower and other conflict into a non-militarized, nuclear-weapons free, joint scientific laboratory.'⁴⁵⁰

At a theoretical level, Peterson considers the Antarctic treaty regime a paramount example of an international regime because it was among the first to extend regime theory from economic and legal issues to security concerns in practice.⁴⁵¹ As the geopolitical salience of Antarctica peaked in the post-war period, the key motivation behind Antarctic regime building was clearly states' security-driven needs. Richards puts it thus:

From the point of view of a Foreign Ministry, the Antarctic Treaty is all about territory. It's a delimitation Treaty, in effect, about where a country's borders are. Historically, it was getting to the point where more and more countries were sending expeditions to Antarctica and there was tension and pressures building. It was realised that we would need to do something to sort that out before it got into a very nasty situation. And science opened the door to find a really unusual and creative way to solve tensions. Science is of course,

⁴⁴⁷ Tony Press interviewed by Anne Michelle Davis on 14 November 2017.

⁴⁴⁸ Fogg, Gordon (1992) *A History of Antarctic science*, p 2.

⁴⁴⁹ Heavens, Steve (2016) 'Brian Roberts and the origins of the 1959 Antarctic Treaty', pp 719-720.; Bulkeley, Rip (2009) 'Politics at the First Comité Spécial de l'Année Géophysique Internationale (CSAGI) Antarctic Conference', pp 381-383.

⁴⁵⁰ Peterson, M. J. (1988) *Managing the Frozen South*, p 1.

⁴⁵¹ Peterson, M. J. (1988) *Managing the Frozen South*, p 3.

inherently important in itself—but that was the key to unlocking a way to solve those territorial tensions. ⁴⁵²

Where science and diplomacy meet and interact at the Antarctic science and diplomacy interface, however, Peterson's analysis of the Antarctic regime provides a different perspective. By paying particular attention to cooperative mechanisms between states and science, Peterson's approach opens the issue of science cooperation to scrutiny as an additional mechanism for regime creation. This is the case when scientific activities intersect diplomatic concerns about geopolitics and security in Antarctica. The result is a mutual expectation, held by scientists and by diplomats alike, that acting in each other's interests best serves their own.

The Antarctic interface in regime creation

Oren Young defines a regime as a social institution governing the actions of those interested in specific activities, or accepted sets of activities. He defines international regimes as those pertaining to activities of interest to members of the international system. Young suggests that the rise of regimes, and their related behavioural conventions, constitute a response to problems or situations in which the pursuit of interests defined in narrow individual terms characteristically lead to socially undesirable outcomes.⁴⁵³ Young's formulation provides a theoretical counterpart for the values-based international engagement model prescribed under the Antarctic Treaty, and therefore a useful anchor for the human behaviours identified in Chapter 3 as part of the standard for updating typologies. That standard included the need to account for commonalities and comparative structural characteristics, which Peterson's formulation addresses comprehensively in the discussion below.

Peterson defines an international regime as 'a set of principles, norms, rules, and procedures resting on mutual expectations and commitments that govern relations among states (and, where relevant, other actors), on some matter of common concern usually relating to a

⁴⁵² Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

⁴⁵³ Young, Oren (1983) 'Regime Dynamics: the rise and fall of international regimes' in Stephen Krasner (ed) (1983) *International Regimes*, Ithaca: Cornell University Press, pp 93-114, pp 93, 97.

geographic area where states pursue their interests through an intergovernmental organisation.⁴⁵⁴ During the creation of the Antarctic regime, scientists are relevant ‘other actors’.

In his analysis of the treaty regime, Peterson focuses on high salience points in Antarctic diplomacy, those requiring diplomatic intervention. There is a correlation between Peterson’s phases of regime creation, these diplomatic moments, and the progressive development of the science and diplomacy interface. Detailed analysis is merited in regard to what this correlation reveals about how the treaty regime dealt with the dual tracks of traditional diplomacy and Antarctic science.

In the conceptual framework Peterson outlined in 1988, he deliberates on the presence of constituent elements that give rise to regime creation and the political situations in which they occur. Peterson’s elements are: a common concern, mutual expectations, a set of common rules and goals, and an intergovernmental organisation with a mandate to deal with particular issues or a geographic area.⁴⁵⁵ Regime creation requires all four of the elements that Peterson lists. Strikingly, Peterson’s elements are quite like the features of Haas’ epistemic communities, those that allowed scientists to practise alongside their diplomatic colleagues during the development of the Antarctic science and diplomacy interface discussed in Chapter 3.

Table 2 Epistemic and institutional elements in the combined chronology⁴⁵⁶

Epistemic antecedents—complementary practices in Antarctic diplomacy (Haas)	Institutional elements—science in Antarctic regime creation (Peterson)
Shared principled beliefs	Common concern
Shared profession judgement	Mutual expectations
Common criteria for validating knowledge	A set of common rules and goals
Common policy enterprise	International organisation mandated to deal with a particular issue or region

⁴⁵⁴ Peterson, M. J. (1988) *Managing the Frozen South*, pp 3-4.

⁴⁵⁵ Peterson, M. J. (1988) *Managing the Frozen South*, pp 3-13.

⁴⁵⁶ Haas, Peter (2011) ‘Epistemic Communities’, p 788.; Peterson, M. J. (1988) *Managing the Frozen South*, pp 3-4.

In the discussion in Chapter 3, points of commonality in the historical activities between scientists and diplomats—those based on shared principled beliefs, shared professional judgement and a common policy enterprise—allowed scientists and diplomats to identify when they were dealing with a political moment relevant to a common interest, and to work together to maximise their separate and joint influence in that moment. Those same points of commonality supported the development of complementary practices in Antarctic diplomacy, which act as a boon to communication between scientists and diplomats at a diplomatic level. The working relationship between scientists and diplomats that emerged on the back of these exchanges is strongly influenced by mutual recognition, mutual reliance and mutual engagement, the presence of which also act as preconditions for international technical management.

Peterson's inclusion of 'mutual expectations' in the list of elements used to institutionalise the Antarctic Treaty regime (highlighted above) is a pointer that the science track in Antarctic diplomacy headed in the direction of international technical management. With the foundations of an Antarctic epistemic community and combined practices in place before the regime to implement the Antarctic Treaty got underway, it is not too far a stretch to keep following this evolutionary thread to see if the structural development of the Antarctic Treaty regime continued to support science diplomacy, and the emergence of international technical management as diplomatic technique in particular.

Science as a diplomatic blueprint

Peterson sets out five political situations in which mutual expectations are central to regime development, and four of these are directly relevant to Antarctic regime building. Peterson's fifth political situation does not apply in the Antarctic context. It occurs when the existence of a common concern and an intergovernmental organisation are not backed up by mutual expectations, common goals or common rules. The terms of the Antarctic Treaty make this particular situation redundant.⁴⁵⁷ Each of the other four political situations has a connection to the combined chronology of Antarctic science and diplomacy.

⁴⁵⁷ Peterson, M. J. (1988) *Managing the Frozen South*, p 5.

The first political situation arises where governments discern no common concerns and so 'make no effort to explore the shape of mutual expectations or of the rules and organisations that might be created to assure their fulfilment.'⁴⁵⁸ This description fits science in Antarctic diplomacy during the diplomacy of empire from the 1700s to the late 1800s. Discovering Antarctica was a national priority among imperial competitors, a means to political ends that generated military and scientific cooperation, but not regime creation. Instead, interdisciplinary cooperation led diplomacy and scientists into the pattern of engagement discussed in Chapter 3. Mutual recognition, mutual reliance, and mutual engagement came to characterise the foundation of the Antarctic science and diplomacy interface as scientists and diplomats pursued their own and each other's interests.

In Peterson's second situation, governments may identify an area of common concern but share no common expectations, rules, or goals in relation to resolving it.⁴⁵⁹ Scientists faced this situation during Antarctica's rise in geopolitical salience from the late-1800s to the 1950s, generating the impetus for them to participate as members of an Antarctic epistemic community. This outcome supported the rise of science advocacy in Antarctic diplomacy, but perversely, constrained regime building because the multiplier effect of shared rules and goals could only be applied to the scientific exploration of Antarctica. This one-sided multiplier effect had an impact on the science agenda. It languished for lack of political incentives while politicians continued to benefit from knowledge produced by Antarctic science without having to modify their own order of priorities, including by abandoning the pursuit of territory. This is reflected in the nature of the dance between the priorities of science and diplomacy that characterises the interaction between scientists and diplomats at the Antarctic interface.

The third political situation involves 'a common concern, a set of mutual expectations and a set of common rules, but no intergovernmental organisation.'⁴⁶⁰ This is the experience of scientists and diplomats in the decade of Antarctic diplomacy that led to the temporary science-led Antarctic regime under the International Geophysical Year. Heading into the IGY,

⁴⁵⁸ Peterson, M. J. (1988) *Managing the Frozen South*, pp 3-13.

⁴⁵⁹ Peterson, M. J. (1988) *Managing the Frozen South*, p 4.

⁴⁶⁰ Peterson, M. J. (1988) *Managing the Frozen South*, p 4.

the scientific and diplomatic communities had different but not-incompatible goals. Members of the scientific community shared the goal of more big science using Antarctica as a world laboratory. The International Geophysical Year provided scientists' first big data experience, and they united behind the imperative of sustaining the international collaboration that had delivered it. For this collaboration to keep going, scientists needed permanent access to the continent. Amongst the diplomatic community, the shared goal was to settle Antarctic claims without territorial concession. Diplomats were unified by the need to act quickly to prevent nations participating in the International Geophysical Year from using their scientific footprint as grounds to enlarge existing claims or to stake new ones.

Heading out of the International Geophysical Year, scientists and diplomats had a common concern to keep Antarctica peaceful. They had mutual expectations based on the presumption that both wanted to maintain a permanent foothold in Antarctica after the IGY ended. In the case of the scientists, these expectations were reasonably held, given that the common set of rules for participation in the International Geophysical Year, in place for the duration, were based on international scientific cooperation and exchange. Whether or not they represented claimant countries, scientists closely adhered to these rules, which permitted their scientific cooperation to assume the level of a proxy diplomatic arrangement. Although unusual, the arrangement was nonetheless congruent with the hierarchy of mutuality that sustained interdisciplinary relationships at the Antarctic science and diplomacy interface. Thus, the common concern of a peaceful Antarctica was supported by an existing set of mutual expectations, and a set of common rules heavily influenced through scientific rather than a diplomatic intervention. This effect generated support beyond the scientific community for continuing this model of international engagement.

According to Peterson, the third political situation typically applies where continuous interaction is not needed to resolve an issue, one reason why intergovernmental organisations do not always emerge from this step. However, in the Antarctic context, the IGY's organising committee—the Comité Spécial de l'Année Géophysique Internationale—fulfilled Peterson's prescription for an international organisation at this stage of regime creation, but with a twist.

CSAGI comprised representatives from the National Science Academies of the states participating in Antarctic IGY science programs.⁴⁶¹ Although never intended to be a permanent intergovernmental organisation, it fulfilled the role a permanent organisation would have. CSAGI established a cooperative mechanism among Antarctic claimant states and other territorial contenders fronting as participants in the International Geophysical Year science programs. It presided over a network of scientists with whom the diplomats negotiating possible territorial settlements kept in close contact. Scientists from states participating in the IGY accumulated experience as proxy diplomats, especially those encouraged to talk with fellow scientists as a work around for the tensions constraining diplomatic communications at the time. This constellation of interconnected scientific and diplomatic communications enabled CSAGI to cement scientists' inclusion in the machinery of diplomacy by resolving Peterson's 'questions of regime norms, rules and procedures' in favour of international scientific collaboration.⁴⁶² When the time came to wind up the organisation, the CSAGI experience bequeathed the negotiations that followed a science-led diplomatic blueprint.

The regime that governs Antarctica today was established during formal treaty negotiations conducted in the wake of the International Geophysical Year. The period of regime creation that followed the signing of the Antarctic Treaty in 1959 matched with Peterson's fourth political situation, in which the identification of a 'common concern, mutual expectation and agreement on common rules and goals leads to the creation of the intergovernmental organisation subsequently charged with managing continuous interaction among parties.'⁴⁶³ A science-led regime was the lived experience in Antarctica. As diplomats worked towards an agreed treaty regime through diplomatic channels, they could not ignore the legacy structures CSAGI had created. By the end of the IGY, science was the public face of Antarctic diplomacy, and scientists were recognised as the custodial voice of an international vision for Antarctica.

⁴⁶¹ Bulkeley, Rip (2009) 'Politics at the First Comité Spécial de l'Année Géophysique Internationale (CSAGI) Antarctic Conference', pp 381-383.

⁴⁶² Peterson, M. J. (1988) *Managing the Frozen South*, pp 41-42.

⁴⁶³ Peterson, M. J. (1988) *Managing the Frozen South*, p 5.

The CSAGI model embedded practices hybridising science as a political enterprise. These practices included the institutionalised management of science advocacy and strategic partnerships, coupled with an organisational platform tailor-made for the exercise of technical authority in international engagements. For these reasons too, diplomats could not ignore science as a mechanism in Antarctic regime creation. Here, the science and diplomacy interface both confounded traditional diplomacy and offered a solution. Diplomats could not expose science as an instrument of state power in Antarctica in case it cost the regime initiative its international prestige. Scientists were active within diplomatic channels alongside career diplomats, but for them publicly to own their activities on this track, even those that had science as a primary objective, would have cost scientists the bona fides of their influence in Antarctic politics. Just like their diplomatic counterparts, scientists could not afford to tarnish the badge of independence that Antarctic science wore.

At this point in the creation of the Antarctic Treaty regime, the tightrope usually reserved as a political test for diplomats stretched from diplomacy to science and back again. The treaty negotiations sanctioned discussion about Antarctic science, and actively used the rhetoric of 'science as legitimate peaceful use of Antarctica' to encircle the geopolitics of Antarctic science diplomatically. This normalised science in Antarctic diplomacy as a support for alternative visions of Antarctica as a political as well as a scientific domain. It also consolidated the interdependence between scientists and diplomats at the diplomatic machinery level. As outlined in Chapter 4, all three levels are required to enable diplomats and scientists to bring elements of the international systems of diplomacy and science into sufficient proximity to operate as a whole.

The next section in this chapter discusses the model typology of Antarctic diplomacy in detail to explain what proximity between geopolitics, the norms that facilitate interdisciplinary approaches to problem solving, and interdependencies between scientific and diplomatic activities at the machinery level, look like at the Antarctic interface. These details are key to understanding the practical diplomacy that scientists and diplomats conduct among themselves. Such prototype elements are especially valuable to discussions beyond this thesis about the potential for international technical management to facilitate joint problem solving at the global science and diplomacy interface.

Circular nature of Antarctic science and diplomacy

Howkin's focus on the circular nature of Antarctic science, what he termed the 'circularity of Antarctic science and diplomacy', first came to attention in Chapter 5 as the mechanism by which Antarctic science contributes to political perceptions, and they in turn shape the scientific research agenda in Antarctica.⁴⁶⁴ The diplomacy on show during the International Geophysical Year, and the eventual terms of the Treaty itself are concrete examples of what scientists and diplomats need to solve problems with mixed political and technical features. The updated typology below models three tracks in Antarctic diplomacy that institutionalised the engagement practices evident between scientists and diplomats at the Antarctic interface. The model correlates these geopolitical, normative and machinery tracks of diplomacy with signature phases in Antarctica's combined chronology, and defines these correlations according to their function of managing proximity, supporting a shared vision, and facilitating professional interdependence:

- geopolitics—the proximity of Antarctic science to statecraft, and the capacity on this track for scientists to speak knowledge to power,
- norms—the alternative visions of Antarctica as a scientific as well as a political domain, and the necessity on this track to keep the priorities of science close to those of diplomacy, and in the orbit of statecraft, and
- diplomatic machinery—the interdependence needed to deploy science as a diplomatic currency and for scientists to act as diplomatic agents within Antarctic diplomacy at large.

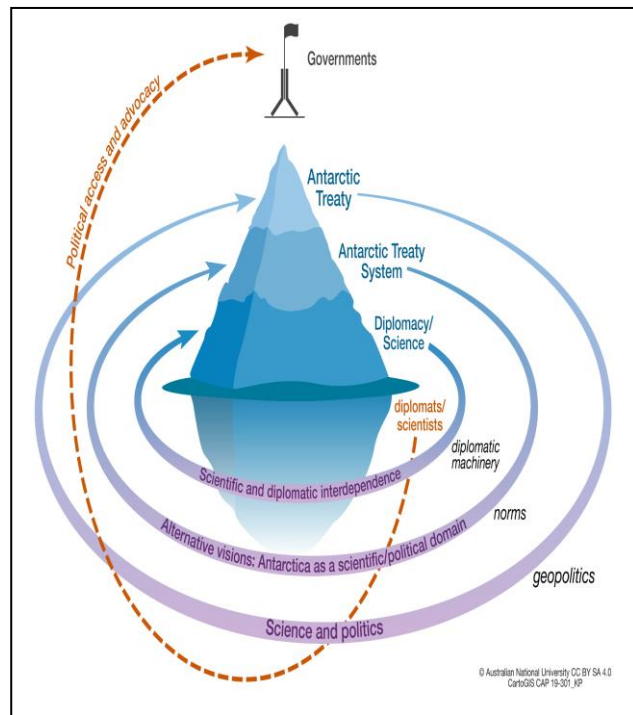
In the contemporary Antarctic setting, a key finding is that solving problems with mixed political and technical features comes down to institutional tolerance, institutional agility and purposeful cooperation in the machinery of diplomacy. To support this, the accompanying discussion takes into account how diplomats and scientists translated the core elements of

⁴⁶⁴ Howkins, Adrian (2011) 'Melting Empires?', pp 180-183.

their combined practice, the mutual recognition, mutual reliance and mutual engagement identified in Chapters 3 to 6, into the modern operations of the Antarctic interface.

What kind of territory is Antarctica?

The outer circle of the model typology is the interface between science and diplomacy in geopolitics where the interests of science and the interests of diplomacy intersect, allowing scientists and diplomats to operate in proximity to decision makers. Common interests are paramount to sustaining proximity, so this track links the science contribution to the peaceful use of Antarctica—scientific exchange and cooperation—to the common interests of the treaty regime. Scientists and diplomats encountered



each other's interests on this track from Cook's time to the International Geophysical Year. As a result, this track institutionalises use of the interdisciplinary tolerance that emerged iteratively over the course of Antarctica's combined chronology, and the mutual recognition that this tolerance fostered.

Antarctica may have made a mark on the geopolitical map early, but it was charted on the world's geophysical map late in the combined chronology of Antarctic science and diplomacy. Collis suggest that the long drawn-out global spatial negotiations and struggles that stretched from the fifteenth to the twentieth centuries impeded the concept of a regional regime for Antarctica, noting it was 'only at the end of World War Two that the Earth's geographic space was finally and thoroughly fixed and defined.'⁴⁶⁵ The Antarctic continent was the last piece of this terrestrial jigsaw.

⁴⁶⁵ Collis, Christie (2010) 'Critical legal geographies of possession', p 387.

Settlement of Antarctica's territory was incomplete as the Cold War played out during the 1950s. Antarctica in 1959 was an 'unstable legal and geopolitical composite' straddling contradictory geographies in competition politically and legally. Claimant states competed politically over territorial claims based on traditional grounds of discovery. Non-claimant states countered legally by asserting Antarctica was either *terra nullius* and therefore owned by no-one, or *terra communis*, amounting to land unowned but jointly managed by all states. Complicating twentieth century Antarctic diplomacy further, post-war superpowers the United States and the Union of Soviet Socialist Republics both maintained a 'basis of claim' while not recognising any.⁴⁶⁶

As the International Geophysical Year drew to a close, the unsettled status of Antarctic territory left diplomats suspended between a known challenge based on imperial competition being wrestled using a template for international relations they were familiar with, and a new challenge dictated by the drive for technological and military supremacy over Antarctica, and the need for technical advice and skills they could not furnish from within the ranks of the diplomatic corps with members traditionally schooled as generalists.⁴⁶⁷ In the midst of these countervailing positions, diplomats confronted a definitional challenge. Post-IGY, Collis asserts that in Antarctica 'the conventional global mode of territory—state possession—was no longer dominant.'⁴⁶⁸ Non-claimants countered claimants' traditional grounds for asserting territorial control based on discovery, exploration, inheritance or occupation, arguing they should not apply to an Antarctica demonstrably internationalised through IGY cooperation.⁴⁶⁹ This quandary reinforced Antarctica's status as a diplomatic frontier in a contemporary and technically-oriented setting.

The International Geophysical Year experience raised and sustained a prototype regime based on an uncommon diplomatic centrepiece, a continent without borders.⁴⁷⁰ As claimant states such as Australia prepared to revert to a state of indeterminate borders were treaty

⁴⁶⁶ Secretariat of the Antarctic Treaty, <https://www.ats.aq/e/ats.htm>

⁴⁶⁷ Dodds, Klaus (2008) 'The Great Game in Antarctica', pp 47-48.; Martin, Stephen (1996) *A History of Antarctica*, pp 196-223.

⁴⁶⁸ Collis, Christie (2010) 'Critical legal geographies of possession', p 389.

⁴⁶⁹ Collis, Christie (2010) 'Critical legal geographies of possession', p 387.

⁴⁷⁰ Triggs, Gillian, 'Australian Sovereignty in Antarctica, Part 1', p 158.

diplomacy to fail, thereby positioning diplomacy to have another go another day, scientists conceived the borderless Antarctica begun during the International Geophysical Year as an end state for scientific cooperation. Complicating diplomacy further, Peterson notes how diplomats' initial insistence on determinative approaches to the sovereignty issue during negotiations had the opposite effect. With science carrying its own political weight in the mix, he posits a 'suggestive norm' emerged to jockey for leverage with sovereignty, hastening acceptance of a shift towards redefining territory in the process.⁴⁷¹ A value for science as a diplomatic currency can be measured from the point where Antarctic treaty parties 'leave sovereignty alone while they cooperate on matters where they can agree.'⁴⁷² The diplomatic innovation that resulted is what the Antarctic Treaty is renowned for, it makes no pronouncement on territorial sovereignty. In Richard's words:

It's a unique Treaty, a special Treaty, because of the way it deals with territorial claims. Typically, you would have to determine a boundary and there would be straight lines, and then they would be set in concrete until someone invaded someone else. But, of course, where you have a number of overlapping claims it's very difficult to get that agreement and most countries in the world, or many countries in the world, still have un-delimited boundaries. Boundary delimitations are notoriously difficult. The more so when it's a multilateral negotiation. So, this formula, which I haven't seen anywhere else, whereby claims are 'frozen' to use the shorthand term—you can't extend your claim, other people can't make claims—it was a wonderful way of just taking the heat and the tension out of it. ⁴⁷³

Mindful of this categorisation, Collis submits that as an artefact of the International Geophysical Year, Antarctica's unique legal geography had to include science.⁴⁷⁴ The Head of the Australian Delegation to the Antarctic Treaty Consultative Meeting, Penelope Richards, considers science an equal contributor to this geography:

⁴⁷¹ Peterson, M. J. (1988) *Managing the Frozen South*, p 42.

⁴⁷² Peterson, M. J. (1988) *Managing the Frozen South*, p 42.

⁴⁷³ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

⁴⁷⁴ Collis, Christie (2010) 'Critical legal geographies of possession', p 394.

I think science is important to Treaty. How can it help with tensions? One reason why originally people collaborated on science was because they saw the outcomes as so important. If we can keep undertaking really high-quality scientific research, hopefully, people will realise that that's worth preserving the peaceful regime in order to get those outcomes. ⁴⁷⁵

When the Antarctic Treaty came into force in 1961, the conduct of Antarctic diplomacy lay in interdisciplinary hands. The three overarching principles expressed in the Antarctic Treaty represented issues the twelve states party to the Washington Conference convened in 1959 to negotiate the future of Antarctica could agree. Treaty parties were claimant states Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom, and International Geophysical Year participants Belgium, Japan, South Africa, the Union of Soviet Socialist Republics and the United States.⁴⁷⁶ The parties could not agree on territory, but they could agree on ensuring peaceful use, preventing militarisation (including nuclear weapons inspections) and continuing international scientific collaboration.

At this point, the outer circularity of the model typology—science and politics—emerges as a testament to science diplomacy; ‘Antarctica remains the only land on Earth which is not the clear possession of specific states and the only land on Earth in which scientific data is the main resource extracted.’⁴⁷⁷ While-ever territorial claims are effectively frozen, the Antarctic science and diplomacy interface has a role to play in tying scientific exchange to the peaceful use of Antarctica as a common interest. In terms of institutionalising scientists’ diplomatic agency within the Antarctic Treaty regime, when scientists used the CSAGI connections to Antarctic diplomacy in order to serve the interests of science, they made good an example of adding science to the assets Slaughter and Ross list at states disposal. In doing so, they bear out the hypothesis Antarctic scientists are diplomatic actors capable of influencing Antarctic affairs.⁴⁷⁸ As a result, post-treaty Antarctic diplomacy carried forward two science-enabled features: a unique legal geography incorporating science into what defines a continent, and

⁴⁷⁵ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

⁴⁷⁶ Secretariat of the Antarctic Treaty, <https://www.ats.aq/e/ats.htm>

⁴⁷⁷ Collis, Christie (2010) ‘Critical legal geographies of possession’, p 394.

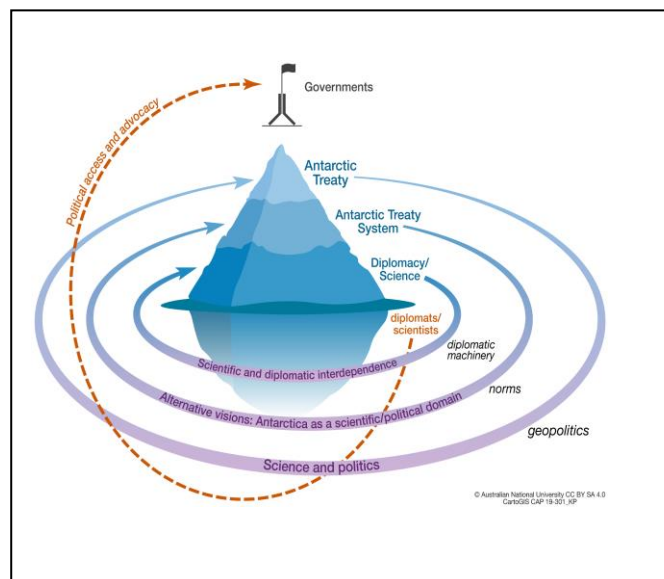
⁴⁷⁸ Slaughter, Anne-Marie (2017) *The Chessboard and the Web*, p 73.; Ross, Dennis (2007) *Statecraft: And how to Restore America’s Standing in the World*, p 4.

a fully-operational science and diplomacy interface in Antarctica where scientists have a role as diplomatic actors.

What kind of diplomacy is Antarctic diplomacy?

The inner circle of the model typology is the interface between scientific and diplomatic priorities in Antarctica where the agendas of two epistemic communities intersect to create a mutually inhabited problem solving space. First identified in Chapter 2, this track is science-enabled and normative by virtue of affording scientists, and diplomats, access to alternative visions of Antarctica as a scientific as well as a political domain. In the Treaty regime, this inner track permits scientists and diplomats to service an area of interdisciplinary activity within Howkin's broader 'circularity of Antarctic science and politics' by investing systemic resilience in overlapping domain and expert activities. For example, it allows diplomats and scientists to act as an 'Antarctic community.'⁴⁷⁹ In that mode, and by using a joint agenda, diplomats and

scientists can adapt traditional diplomacy by degrees of difference to work up solutions to problems with mixed political and technical features, rather than having to think inside the constraints of their own silos. The inner track relies on interdisciplinary agility, which long-standing relationships between scientists and diplomats at the Antarctic interface enables. Those relationships are themselves the product of the mutual



reliance forged during joint political interventions observed in Chapter 5 during the formative phase of the interface. Peterson's assessment that 'the Antarctic Treaty is a principles-based framework for cooperation' substantiates this point.⁴⁸⁰

This inner track became a permanent home for the combined chronology's dual science and diplomacy track by focusing on the ideals that scientists contributed to the Antarctic regime.

⁴⁷⁹ Peterson, M. J. (1988) *Managing the Frozen South*, p 41.

⁴⁸⁰ Peterson, M. J. (1988) *Managing the Frozen South*, p 41.

As discussed in Chapter 4, The Royal Society's more granulated definition of science diplomacy enabled the differentiation of political, technical, diplomatic and combined agency in Antarctic diplomacy. There is further evidence this inner track is normative in the way that Peterson acknowledges the regime's architects translated the prevailing issues—sovereignty, science and security—into the three treaty principles expressed as 'an Antarctic community', 'scientific cooperation' and 'peaceful use of Antarctica.'⁴⁸¹ These principles underpin the diplomatic practices of the Antarctic Treaty System, and the inner track supports scientists' ability to keep a foot in science and diplomacy camps at the modern Antarctic interface. As Haward has put it:

*In fact, you'll often find Antarctic scientists will say 'well, we the scientists led this and the diplomats followed.' I think this is superficial, and it's attractive because there's some evidence that the science was important. But in fact, some follow on with a corollary that's saying 'if we were left alone, we would have sorted all our problems, and the diplomacy and politicians got in the way'. Now it's not necessarily true, because in the end, the way the Antarctic Treaty was negotiated and its content, it's actually a peace Treaty, it's a security instrument. And peace and science—peace is of first importance and science is in there. The deep norms in that document are peace and science, international collaboration, demilitarisation. So, where did that come from? That came from the recognition that science was something that was critically important to understanding this.*⁴⁸²

Peterson refers to the first treaty principle as implied rather than directly stated. Nonetheless, it overarches the regime's political approach to open access, peaceful use and joint management as the engagement model for Antarctic diplomacy. Peterson spells this out when he notes 'there is an Antarctic community that should share the continent and its governance.'⁴⁸³ Acknowledgement of this contemporary Antarctic community underscores the normative nature of the interdisciplinary relationship that scientists and diplomats

⁴⁸¹ Peterson, M. J. (1988) *Managing the Frozen South*, p 41.

⁴⁸² Marcus Haward interviewed by Anne Michelle Davis on 15 November 2017.

⁴⁸³ Peterson, M. J. (1988) *Managing the Frozen South*, p 41.

nurtured during the development of the interface. Post-regime creation, this community functions as a unifying element, attracting diplomatic support at the representational level of diplomacy short decades later. Green puts it thus:

*As Governor of Tasmania, I came to realise that the Antarctic sphere was one of those spheres where Tasmania was arguably the most significant centre in the world. I thought this was a field where the Office could serve a purpose by encouraging an understanding of Tasmania's standing in the field, and, encouraging an understanding that there was a need for everybody in Tasmania—and this really applies to the whole Country—involved in all aspects of Antarctic endeavour, science, political, foreign affairs, diplomatic, to regard themselves as members of a single community; one community, an Antarctic community.*⁴⁸⁴

The second principle actuates 'scientific cooperation as a major purpose of the regime.'⁴⁸⁵ It is the organising principle for joint management in the Treaty System and a wellspring for science as a diplomatic currency. Requisites for common use in the treaty comprise scientific cooperation, freedom of scientific research and an obligation to cooperate in scientific endeavour. The centrality of science to this principle reflects the turn to science during the diplomacy invested to convene a treaty conference, and underscores the difficulty diplomats encountered in resolving the sovereignty issue without science to attenuate national positions:

*In regard to the formation and leadership of the Antarctic Treaty, the diplomats were very much in control of this process. But science was important as a way of easing tension—there were shared values.*⁴⁸⁶

The third principle addresses security issues by prescribing Antarctica should be used only for peaceful purposes. As Steven Blumenfeld, Klaus Dodds and Simone Turchetti remind us, were

⁴⁸⁴ Sir Guy Green interviewed by Anne Michelle Davis on 5 December 2017.

⁴⁸⁵ Peterson, M. J. (1988) *Managing the Frozen South*, p 41.

⁴⁸⁶ Marcus Haward interviewed by Anne Michelle Davis on 15 November 2017, citing colleague Robert Hall.

regime creation to fail and a determinative approach to territory prevail, Antarctica's most likely future would involve military enforcement of national claims and a regional arms race.⁴⁸⁷ It is debatable what value Antarctic could offer as a location of weaponry. The environment is harsh and the benefits of pre-emptive strike low. However, Peterson pins the strategic imperative behind the third principle to the urgency attached to negotiating 'some more enduring arrangement than the International Geophysical Year understandings to avert Antarctica becoming a new venue for the cold war.'⁴⁸⁸ He articulates the prototypical challenge behind this diplomatic problem as 'the unacceptability of using military force against peaceful scientific research.'⁴⁸⁹ Haward's assessment of this challenge runs as follows:

*The resolution of the Antarctic problem, more in fact the setting aside of the Antarctic problem, came out of scientists work towards the International Geophysical Year. And this is coming back to why science is important. A Chilean diplomat, Escudero, suggested what's called a 'stand still'. The stand still provision in fact said, 'let's let everything just stop still for the International Geophysical Year. Nothing people do in the Antarctic during these two polar summers should be seen to be doing anything to change the current status of claims. Nothing that the claimant states do can extend or diminish those. So, let's just stand still. Let everything settle and see. Let the science go.' And, in fact, because of the science, there was remarkable work done in the mid-1950s and the International Geophysical Year.*⁴⁹⁰

The circular nature of the inner track may best be defined as a contributory track for that supports science to operate within the geopolitics of Antarctic diplomacy at large, one that coalesces the activities of the scientific and diplomatic communities into those of an Antarctic epistemic community:

⁴⁸⁷ Blumenfeld, Steven (2010) 'For science and peace', p 34.; Dodds, Klaus (2008) 'The Great Game in Antarctica', p 59.; Turchetti, Simone et al (2008) 'On thick ice', p 352.

⁴⁸⁸ Peterson, M. J. (1988) *Managing the Frozen South*, p 68.

⁴⁸⁹ Peterson, M. J. (1988) *Managing the Frozen South*, p 68.

⁴⁹⁰ Marcus Haward interviewed by Anne Michelle Davis on 15 November 2017.

*So where has Antarctic science come from? It's a deep, deep and founding norm in the Antarctic Treaty. It predates the Treaty. It was one of the arguments, and one of the things, that brought people together.*⁴⁹¹

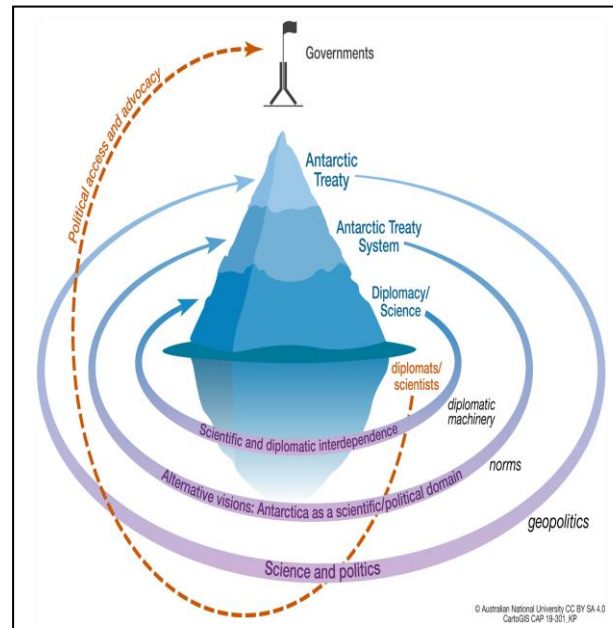
In the model typology, the inner track is an institutional fit for the interdisciplinary relationships that evolved over the course of Antarctic's combined chronology to support diplomats and scientists in their common enterprise of engineering viable responses to challenges with mixed political and technical features in a mutually inhabited problem-solving space. In contrast to the outer track of the model, which attests to science in diplomacy by institutionalising a pathway for scientific advice to support foreign policy objectives, the circular nature of the inner track acts as the systemic footing for diplomacy for science. As CSAGI scientist-diplomats had hoped, this dual track facilitates the continuation of international scientific cooperation in Antarctica.

The inner track provides scientists with the institutional backing they need to involve themselves as expert advisers in diplomatic problem solving, including negotiations. This track is where diplomats and scientists accrue the political, technical, diplomatic and combined agency to respond to interdisciplinary challenges within the Antarctic Treaty System as a whole. In-house recourse to both general and technical skills, embodied in one or many members of the Treaty's 'Antarctic community', means that those tackling problems with mixed features can get around the silo constraints of technical versus generalist carriage of solutions at the expense of one, or the other. The circular nature of the inner track affords scientists and diplomats access to a non-traditional *modus operandi*, that is, the capacity for scientists to provide expert technical advice to support Antarctic diplomacy at large, when, and where, it can be most influential.

⁴⁹¹ Marcus Haward interviewed by Anne Michelle Davis on 15 November 2017.

What kind of leverage is science?

The innermost track of the model typology is the interface between diplomats and scientists, and their purposeful cooperation in the machinery of diplomacy. This track is a crucial link between what scientists do for science, and their support for the politics and norms of the Antarctic Treaty System. The innermost track provokes scientists to perform diplomatic service through the agency of their science by enabling diplomats to work with them face-to-face



within the machinery of diplomacy, for example, at Antarctic Treaty Consultative Meetings. The circular nature of the innermost track generates a need for interdisciplinary efficiency, which this track is able to accommodate on the back of the mutual engagement between scientists and diplomats that peaked during the Antarctic Treaty negotiations. As highlighted in Chapter 4, the innermost track owes that efficiency to the flexible operating space scientists created on the ice, and the international scientific collaboration they led during the International Geophysical Year. Post-negotiation, scientists assumed a role as regime enablers through their willingness to engage in the machinery of diplomacy at Treaty conferences, and through an intergenerational transfer of diplomatic skills scientists accumulated through lived experience. As the Director of the Australian Antarctic Division and adept scientist-diplomat, Dr Nick Gales, acknowledged in Chapter 4 as well, ‘being an appropriate, informed and diplomatic voice’ is a starting point for evidence-based diplomacy in Antarctic affairs.⁴⁹²

The Antarctic Treaty negotiations were the pinnacle of mutual engagement between diplomats and scientists and an important anchor as Antarctic regime creation got underway. To negotiators working to shape a treaty from the mid-1940s on, the need to avert a hot territorial contest over Antarctic territory meant proscribing military activities for which the

⁴⁹² Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

International Geophysical Year banner of 'peaceful use' provided a pretext. To scientists who conceived a borderless Antarctica as the beginning and end state for science to flourish unimpeded by political boundaries, advocacy in support of peaceful use advanced science diplomacy on Myhre's hard and soft science tracks discussed in Chapter 6.

The Treaty negotiations took place in Washington in 1959 over several months from October to December that year. The invitation to participate in the Washington Conference was extended the year before, on 3 May 1958, by the President of the United States to the 11 other countries participating in the International Geophysical Year. The timing of that Note was carefully planned to arrive before IGY science delegates attended the Fifth CSAGI General Assembly held in Moscow from 30 July to 9 August 1958. The wording of the Note pointed to scientists' efforts on dual science and diplomacy tracks.⁴⁹³ The Treaty picked up the following formulation almost word for word:

It is the opinion of the my Government that the interests of mankind would best be served, in consonance with the high ideals of the Charter of the United Nations, if the countries which have a direct interest in Antarctica were to join together in the conclusion of the treaty which would have the following peaceful purposes:

- a) Freedom of scientific investigation throughout Antarctica by citizens, organisations, and governments of all countries; and a continuation of the international scientific cooperation which is being carried out so successfully during the current International Geophysical Year.*
- b) International agreement to ensure that Antarctic be used for peaceful purposes only.*
- c) Any other peaceful purposes not inconsistent with the Charter of the United Nations.*

⁴⁹³ 'Proposed International Antarctic Conference', *Polar Record*, Vol. 9, No. 61, 1959, pp 353-355.; Spencer, Nelson (1958) Papers presented at CSAGI Meeting, Moscow, Russia, 30 July-9 August 1958, Scientific Report No. ES-2, The University of Michigan Research Institute, Ann Arbor, Michigan.

Myhre's tracks account for the hard edges of Antarctic science as an instrument of power when exercised in state interests, and its soft edges as an instrument of influence and treaty legitimisation when used to support diplomacy.⁴⁹⁴ The Antarctic Treaty dulled the hard edge by proscribing militarisation of the continent and prohibiting nuclear weapons under the terms of Article I, Article II and Article III. Instead, Article IX empowers the subsidiary organs of the Antarctic Treaty Consultative Meeting to formulate measures for subsequent recommendation to participating governments. Stuart Kaye, Michael Johnson and Rachel Baird define this mechanism as 'delegated legislation' under the auspices of the Treaty, which at an institutional level, carried forward the necessity for 'science to support diplomacy in the same tenor as the International Geophysical Year.'⁴⁹⁵

The formula established for dealing with territorial claims in the Treaty reduces the number of state-level issues requiring diplomatic support.⁴⁹⁶ This has meant that diplomats and scientists engaged in Antarctic activities have been able to take advantage of the permissive nature of the Treaty to pursue 'peaceful use' as a common interest, without having to create too many political overheads.⁴⁹⁷ Limited overheads, along with sponsorship from one or more strong states in an environment of legislative autonomy, fit squarely within the criteria that Petersen stipulates for effective international regime building.⁴⁹⁸ Combined, these formulations paved the way for diplomats and scientists to develop the Antarctic Treaty System decision-by-decision, and action-by-action. In particular, the innermost track allows diplomats and scientists to move about this business end of the Treaty at a level within the regime where the prescribed peaceful use of Antarctica manifests predominantly as relationships between diplomats and scientists, and between diplomats, scientists and the

⁴⁹⁴ Myhre, Jeffrey (1986) *The Antarctic Treaty System*, pp 47-48.

⁴⁹⁵ Kaye, Stuart, Michael Johnson and Rachel Baird (2011) 'Law' in Marcus Haward and Tom Griffiths (eds) (2011) *Australia and the Antarctic Treaty: 50 Years of Influence*, Sydney: University of New South Wales Press, Chapter 4, pp 97-117, p 100.; Myhre, Jeffrey (1986) *The Antarctic Treaty System*, pp 47-48.

⁴⁹⁶ Hall, Robert and Marie Kawaja (2011) 'Australia and the negotiation of the Antarctic Treaty' in Marcus Haward and Tom Griffiths (eds) (2011) *Australia and The Antarctic Treaty System: 50 years of influence*, Sydney: University of New South Wales Press, Chapter 3, pp 68-96, pp 78-82.

⁴⁹⁷ Hall, Robert and Marie Kawaja (2011) 'Australia and the negotiation of the Antarctic Treaty', p 82.

⁴⁹⁸ Peterson, M. J. (1988) *Managing the Frozen South*, p 3.

rest of the world. As result, the machinery norms of the regime flow along functional lines as well as hierarchical ones. This expands the scope of what defines science diplomacy in the Treaty system, which leads into the detailed discussion about the features of international technical management observed at the Antarctic interface in Chapter 8.

Before introducing international technical management to the updated typology, there are several addition points it is important to note about the circular nature of this third track in Antarctic diplomacy. It also functions as the track on which diplomats deploy science as a diplomatic currency as readily as scientists do. For example, by teaming up at Antarctic Treaty Consultative Meetings, diplomats can use science to compound their available negotiating leverage. This is effective as well as efficient because the mutual engagement between diplomats and scientists takes place largely at an interpersonal level. Peter Boyce and Tony Press consider this interdisciplinary cooperation the paramount feature in rendering public disputation within the Antarctic Treaty System a rarity.⁴⁹⁹ Rowe puts it thus:

*In certain contexts in the Antarctic Treaty System, science operates as a diplomatic lever. Very definitely! I have no doubt of that, and that applies in other areas as well. States take account of the science and use it in diplomacy to try to gain support for their positions. So yes, science can definitely be a lever in diplomacy.*⁵⁰⁰

The innermost track anchors both the geopolitical track that provides opportunities for scientists to speak knowledge to power about Antarctic issues, and the normative track that enables scientists to keep the priorities of science close to those of diplomacy and in the orbit of statecraft. The third track accommodates scientific and diplomatic interdependencies within the existing machinery of traditional diplomacy. Given the importance that Chapter 5 ascribed to the practical diplomacy that diplomats and scientists conduct amongst themselves in order to manage shared agendas, the scientific and diplomatic interdependence evident on this track is what enables diplomats and scientists to bring the general and technical

⁴⁹⁹ Boyce, Peter and Tony Press (2011) 'Diplomacy' in Marcus Haward and Tom Griffiths (eds) (2011) *Australia and The Antarctic Treaty System: 50 years of influence*, Sydney: University of New South Wales Press, Chapter 12, pp 274-299, pp 275-276.

⁵⁰⁰ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

practices of their disciplines into sufficient proximity to function effectively as an Antarctic epistemic community.

In the updated typology of Antarctic diplomacy, crossovers between all three tracks represent the modern iteration of the combined chronology of Antarctic science and diplomacy. This point reinforces how the relationships between Antarctic scientists and diplomats have a distinct character of their own. As Chapter 3 pointed out, during the foundational and formative phases of the Antarctic interface, interdisciplinary interactions across these tracks helped scientists and diplomats navigate the twists and turns of shifting political and scientific priorities in Antarctic diplomacy. At the modern Antarctic interface, these relationships have become an interdisciplinary asset deployable in the interests of diplomacy and the interests of science, which explains why practitioners go to great lengths to nurture them. The model depicts this function as a clear line of political access and influence.

The model is one way of accounting for what has enabled scientists to fulfil the ‘science for diplomacy’ function implicit in the Antarctic Treaty in its forward attribution of ‘the tenor of IGY diplomacy’ mentioned above. Via quiet but continuous scientific collaborations, Australian Antarctic scientists continue ‘science for diplomacy’ efforts with the same IGY endpoint in mind.⁵⁰¹ Improving international relations between Antarctic countries continues through face-to-face engagements among scientists continues, as Dr Van Ommen reflects on below.

The example where there is perhaps a little bit more direct contact with diplomatic efforts has been in our interactions with China. We’ve grown a very effective relationship with China over the years in glaciological studies. In fact, China first got their experience in glaciology by having people winter with us and join our Program back in the 1980s. And that grew some very good connections, again person to person connections. One of the benefits of Antarctica as a forum for making these sorts of connections at all levels – is that it’s quite a small community. Once you start to mix in the community over years you do tend to get to know the prominent figures. And if you’ve got

⁵⁰¹ The Royal Society (2010) *New frontiers in science diplomacy*, pp v-vi, 1, 15-18.

diplomatic or policy related people that are close to it you actually get to know them as well. So, it's the 'small community' effect. ⁵⁰²

In the lead up to the Treaty negotiations, scientists were pivotal in pre-empting and responding to issues that required diplomatic support or intervention. During the International Geophysical Year, the science and diplomacy interface became the primary means for diplomats and scientists to work together when political issues touched on their separate Antarctic interests and concerns. Now, the innermost track of Antarctic diplomacy is where the highest volume of such joint approaches takes place:

And so, now, we're quite closely cooperating on air-borne survey work with China. I talk to my counterparts in China who I know are quite closely connected to the policy people there. We also have a connection that really is a tripartite connection. It's us, China and the US Research Group. And that collaboration is, I think, very effective at demonstrating that scientific cooperation can generate a certain amount of comfort in working together on a shared problem that is almost independent of the tensions you might see articulated at policy levels – whether it be South China Sea issues or whatever. We don't see any direct effect at the science-to-science level. Those cooperations, I think, have the function of creating a spirit of good will and cooperation because we're generally interested in addressing the same scientific uncertainties and questions. ⁵⁰³

The model typology discussed in this chapter delineates the crossovers observed in the combined chronology of Antarctic science and diplomacy as they were translated into the Antarctic Treaty regime. The geopolitical, normative and machinery tracks of the updated typology account for the interdisciplinary tolerance, interdisciplinary agility and interdisciplinary cooperation that the combined chronology fostered between diplomats and scientists. A key outcome of the analysis in this chapter is a clearer structural understanding of how these relationship characteristics enable diplomats to support the scientific objectives

⁵⁰² Tas Van Ommen interviewed by Anne Michelle Davis on 1 December 2017.

⁵⁰³ Tas Van Ommen interviewed by Anne Michelle Davis on 1 December 2017.

of the Treaty Regime, and how these same characteristics give scientists an incentive to accommodate diplomacy alongside the needs and priorities of their scientific practice. In Antarctic diplomacy, the convergent interests that Bull looks for in order to prompt joint diplomatic and scientific problem solving are enshrined within the functional scope of the Antarctic science and diplomacy interface. Table 3 sets out the functional scope of the Antarctic science and diplomacy interface.

Table 3 Functional scope of the Antarctic science and diplomacy interface

Antarctic diplomacy	Science diplomacy	Model typology of Antarctic science and diplomacy (mutual expectations)	Combined chronology of Antarctic science and diplomacy	Science and diplomacy relationship characteristics
Geopolitics	Science in diplomacy Informing foreign policy objectives with scientific advice	Outer circle Science and politics	Mutual recognition	Interdisciplinary tolerance
Norms	Diplomacy for science Facilitating international science cooperation	Inner circle Alternative visions of Antarctica as a scientific and political domain	Mutual reliance	Interdisciplinary agility
Machinery of diplomacy	Science for diplomacy Using science cooperation to improve international relations between countries	Innermost circle Scientific and diplomatic interdependence	Mutual engagement	Interdisciplinary cooperation

Antarctic science diplomacy—bridging past and future

Peterson scrutinised the Antarctic Treaty regime while it was still under construction during the early decades of its implementation. That scrutiny was bookended between how the Treaty proscribes states' heavy-hitting levers such as military intervention, and the permissive intent of 'peaceful use' that prescribes scientific activities as the lawful use of Antarctica. In Chapter 2, that tension invoked consideration of Bull's concept of international technical management to help wrestle with the puzzle of science in Antarctic diplomacy. Now, the well-trodden path of scientists participating in diplomacy on an ongoing rather than a needs basis can be seen clearly in the updated typology of Antarctic science and diplomacy. Factors captured in the updated typology account for the interdisciplinary norms that enable diplomats to act on technical expertise as a centrepiece of their Antarctic diplomacy:

The practice of scientific advisers, it's not unusual. The Antarctic is actually one where this practice is now fairly widely used. And, it's a two-way benefit. What it does do is for the Australian Government, it opens up expertise. ⁵⁰⁴

The science diplomacy track that evolved as the Antarctic science and diplomacy interface emerged was instrumental in enabling scientists and diplomats to frame the boundaries of the political challenges they faced and to evolve processes of political entrepreneurship and creative compromise to manage the overlap between the objectives of science and the objectives of diplomacy in management of Antarctica. Kate O'Neill observes that 'framing processes help draw the boundaries of a given problem, outlining its causes, and most importantly, what can and needs to be done to solve it, and who should do it.'⁵⁰⁵ The advance of Antarctic science into the legislative arm of international relations, a diplomatic innovation of the Antarctic Treaty, has nurtured the evolution of evidence-based diplomacy in other branches of diplomacy, including environmental diplomacy. Lawrence Susskind cites the Antarctic Treaty as among the first global environmental treaties. Susskind singles out the environmental diplomacy credentials of the Treaty in its dictate for 'undertaking scientific

⁵⁰⁴ Marcus Haward interviewed by Anne Michelle Davis on 23 November 2017.

⁵⁰⁵ O'Neill, Kate (2009) *The Environment and International Relations*, Cambridge: Cambridge University Press, p 31.

research without damaging the Antarctic environment, and in a spirit of cooperative endeavour between contracting parties.’⁵⁰⁶

Antarctic diplomacy of the International Geophysical Year anticipated environmental diplomacy, even though the definition of environmental diplomacy, like that of science diplomacy at the time of the Treaty negotiations, was not yet formalised to the extent that negotiators used that term. Terminology notwithstanding, Berkman et al consider that the scientists and diplomats involved those negotiations foresaw ‘the need for measures with respect to the preservation and conservation of living resources in Antarctica.’⁵⁰⁷ According to Berkman et al, the Antarctic Treaty ‘foreshadowed a development within the treaty system with respect to environmental protection, transparency, information sharing and the role of international organisations.’⁵⁰⁸ Starting at the First Antarctic Treaty Consultative Meeting in 1961, consultative parties set to addressing the need to legislate measures that would lead to a suite of Conventions under the Antarctic Treaty, each sustaining science-based diplomatic innovations in the spirit of the International Geophysical Year.⁵⁰⁹ Innovations that support the further emergence of international technical management as a science diplomacy technique include the Convention on the Conservation of Antarctic Marine Living Resources, which legislated the world’s first eco-border, and the Protocol on Environmental Protection to the Antarctic Treaty which formalises links between the provision of expert advice and the necessity for decision-makers to consider that advice. Peter Haas acknowledges that ‘because environmental issues are linked to other issues, by starting with the environment decision-makers move towards governing causally coupled issues also.’⁵¹⁰ The science and diplomacy interface that paved the way for science inroads into diplomacy also enabled scientists and diplomats to accommodate gradual normative changes in their diplomatic and scientific

⁵⁰⁶ Susskind, Lawrence (1994) *Environmental Diplomacy: Negotiating More Effective Global Agreements*, Oxford: Oxford University Press, pp 152-157.

⁵⁰⁷ Berkmann, Paul, Michael Lang, David Walton, Oran Young (eds) (2011) *Antarctica, Science, and the Governance of International Spaces*, Washington: Smithsonian Institution Scholarly Press, pp 7-8.

⁵⁰⁸ Berkmann, Paul, Michael Lang, David Walton, Oran Young (eds) (2011) *Antarctica, Science, and the Governance of International Spaces*, pp 7-8.

⁵⁰⁹ Berkmann, Paul, Michael Lang, David Walton, Oran Young (eds) (2011) *Antarctica, Science, and the Governance of International Spaces*, pp 43-45.

⁵¹⁰ Haas, Peter (2016) *Epistemic Communities, Constructivism, and International Environmental Politics*, London: Routledge, p xvi.

practices. The environmental diplomacy emphasis in the contemporary legislative agenda of the Antarctic Treaty System helps to confront the counterargument raised in Chapter 2. The counterargument was that diplomatic techniques adapted at the Antarctic science and diplomacy interface may not be transferable to the joint problem settings of other regimes. This chapter examined the structural elements of the Antarctic regime in detail. The links to environmental diplomacy discussed above permit the analysis to cautiously conclude that the science diplomacy techniques observable in Antarctic diplomacy might be applied elsewhere. Chapter 8 explores this prospect further using evidence from the field about how scientists and diplomats adapt their practices in order to make room for scientists to deploy their technical agency on diplomatic pathways. That chapter investigates the exact nature of those adaptations and their impact on overlapping scientific and diplomatic agendas to show-case scientists as international technical managers.

In examining the bona fides of the Antarctic regime, the analysis in this chapter provided some evidence with which to make two other relevant observations. The Antarctic Treaty is considered a counterfactual more often than a prototype. Individually, other international regimes have taken up Antarctic Treaty innovations, such as non-militarisation and weapons inspections and its approach to governing unoccupied territory. Two important examples for which the Antarctic Treaty is a partial blueprint are the *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT), and the *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies* (Outer Space Treaty).⁵¹¹ However, no other regime has followed the Antarctic Treaty example in full and legislated for science in diplomacy, diplomacy for science, and science for diplomacy in the same way. For this reason, the concern at the outset, that Antarctic-derived science and diplomacy practices would turn out to be a prototype with nowhere to go, remains.

The updated typology maps how the crossovers between science and diplomacy observed in the combined chronology of Antarctic diplomacy were translated into the Antarctic Treaty

⁵¹¹ *Treaty on the Non-Proliferation of Nuclear Weapons* (NPT) opened for signature on 1 July 1968 and entered into force on 5 March 1970.; *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies* (Outer Space Treaty), opened for signature on 27 January 1967 and entered into force on 10 October 1967.

regime. These crossovers are a significant aspect of Antarctica's diplomatic geography. The current study does not go beyond the example of the Antarctic Treaty and its historical antecedents, but what can be said is that the institutional footings exposed in the model typology make good the calculation that science compounds traditional diplomatic leverage. This is the crux of what enables scientists and diplomats to use the machinery of Antarctic diplomacy to solve problems together. With this in mind, the adaptive practices evident at the Antarctic science and diplomacy interface may still have some utility for joint problem solving elsewhere.

There are three reasons to persist in that endeavour. In the Antarctic example, the first reason is the need for diplomats to anchor joint problem solving to Antarctic-specific issues. Compound diplomatic leverage, the effect achieved by using expert technical advice in diplomatic forums, is transferable to other regime settings if the underpinning science itself is relevant, or of concern there. Climate change and the related diplomatic and scientific efforts to address it as a whole-of-earth challenge provide a current example on the international stage for which exporting the focus on interdisciplinary tolerance, agility and cooperation that Antarctic diplomats and scientists apply could be one way forward. Further research into the interdisciplinary underpinnings of other regimes merits attention for its value in expanding discussion of international technical management as a diplomatic technique.

The second reason is that the salience pattern of Antarctic diplomacy typically combines peaks of political attention with long periods of obscurity. Over the course of Antarctica's combined chronology, scientists have traditionally stepped in to diplomatic roles to bridge these highs and lows. Other regimes have different salience patterns, which does impact the consideration of whether scientists could as readily and usefully assume diplomatic roles there. Nonetheless, the Antarctic case study has provided evidence to add science to the assets that Slaughter lists as statecraft essentials for the joint enterprise of political planning and execution. How potent the influence of science and scientists was validates Antarctic diplomacy as a prototype for 'science *and* diplomacy' at the contemporary global science and diplomacy interface. This a difference in terminology for which Chapter 8 makes a case. That case supports approaching other science and diplomacy interfaces as frontiers of 'science' and 'diplomacy' to extend discussion of Bull's concept of international technical management to regimes outside Antarctica.

The third reason is that international technical management appears more likely to emerge within the bounds of a regime rather than on its own. There is an element in the revised typology of Antarctic diplomacy that helps to characterise Antarctic scientists as international technical managers. The historical body of knowledge records mostly joint, rarely separate, political and scientific assertions over Antarctica. Antarctic scientists consistently define their role within this as technical experts. The science and diplomacy interface accommodates this definition diplomatically and the Antarctic Treaty regime enables it structurally. As a result, the Antarctic science and diplomacy interface can be said to have nurtured a neophyte example of Bull's international technical management.

Finally, on the subject of the counterargument, Chapter 2 also reported that Antarctic diplomats, and scientists, practise their disciplines with caution. Risk aversion is a hallmark of how both disciplines are practised on the ground; diplomats so as not to offend their counterparts and scientists so as not to overextend their data. Notably, the risk averse diplomacy common to Antarctic diplomats and scientists also meant that no issue early in regime building triggered the tension behind suspended territorial claims that could have resulted in governments instructing their diplomats to reassert traditional styles of diplomacy in lieu of joint problem solving. Instead, by working together on all the tracks in the Antarctic regime, diplomats and scientists have aided the evolution of the complementary practices identified in Chapter 3. In addition, Peterson's regime-creating mutual expectations discussed above provide an overarching element to frame the hierarchy of mutuality (recognition, reliance and engagement) discussed in Chapter 5. As a result, the long-standing relationships between Antarctic scientists and diplomats land back in the frame of analysis. Diplomats are trained to find common ground and become skilled in fostering it. Scientists are trained and skilled in collaborating:

Scientists are incredibly good at collaborating. They do it every single day. That is a core part of their job. They're very good at translating data, translating information into different forms. ⁵¹²

⁵¹² Tom Remenyi interviewed by Anne Michelle Davis on 23 November 2017.

When diplomats and scientists focus on common interests, the gap between their professions and the problems they are trying to solve is not too big to cross. However, the uniqueness of the Antarctic Treaty continues to present barriers to scientists and diplomats taking up the adaptive techniques evident in its regime and applying them in others. These impediments and how scientist-diplomats effectively work around them are discussed in the next chapter.

8—International technical management as a diplomatic technique

In the absence of a completely settled definition of science diplomacy, Copeland recommends further study to establish the practice of it as a ‘diplomatic technique.’⁵¹³ Working definitions of science diplomacy discussed in Chapter two point to an awareness that, in Antarctic scientists’ hands, combined agency and international technical management are connected. Bull observed that by the mid twentieth century—coinciding with the Antarctic Treaty and its implementation—diplomats’ traditional role in international conciliation and negotiation had already ‘given ground to technical experts’.⁵¹⁴ This provides the rationale to look for international technical management as a science diplomacy technique practised at the Antarctic interface in this chapter.

Antecedents for international technical management in the co-evolution of Antarctic diplomacy and science shorten the distance between diplomatic and scientific approaches to international engagement in the Antarctic setting enough to adopt Bull’s description of international technical management as a preliminary definition. To recap, Bull conceived international technical management as a means to assure the effectiveness of diplomacy on global challenges that demand expert technical input. Bull identified scientists as among the cohort of international technical managers with whom diplomats would need to engage at the level of the state to be able to extend traditional negotiations beyond state interests and resolve problems that impact the planet and humanity as whole. Bull cited ecology and the environment as probable examples of the interests for which the adoption of international technical management could be useful.⁵¹⁵ Multifaceted international problems like these push the kind of solutions required past the grasp of diplomats’ generalist skills. The discussion of science in the Antarctic Treaty in Chapter two, and of science diplomacy in Antarctica in Chapter four, bring scientists’ roles as diplomatic actors in managing the Antarctic continent and its environment into the frame for further discussion here. Closer inspection of the Antarctic interface in this chapter reveals evidence of international technical management where crossovers between science and diplomacy reinforce a need for diplomats and

⁵¹³ Copeland, Daryl (2016) ‘Science Diplomacy’, p 629.

⁵¹⁴ Bull, Hedley (1977) *The Anarchical Society*, p 170.

⁵¹⁵ Bull, Hedley (1977) *The Anarchical Society*, pp 170-171.; Bull, Hedley (circa 1978) ‘Resources Diplomacy’, unpublished essay.

scientists to work together with a common understanding that, while not all these problems have political origins, they need to find a way to engage with the political challenges that accompany them.

Science and diplomacy crossovers

A level of historical interdependence has kept Antarctic science in proximity to politics at geopolitical and policy levels as well as at operational and machinery levels.⁵¹⁶ The Royal Society was among the earliest sponsors of Antarctic science three hundred years ago.⁵¹⁷ Based on its own *longue durée* view, The Society adopts a ‘continuum of scientific activities’ to line up science with politics. The continuum covers pure science, strategic science and applied research.⁵¹⁸ It is a useful reference for delineating crossover points, the most likely places to discover practices, actors and structures in common between scientific and diplomatic activities at the Antarctic interface.

In the Antarctic context, these crossovers are gateways connecting pure science to geopolitics, strategic science to diplomatic problem solving, and applied science to the machinery of diplomacy. Scientists and diplomats meet and interact through these gates, giving rise to characteristics that affirm that the working definitions of science diplomacy discussed in Chapter 2 can accommodate international technical management as a diplomatic technique the way it emerges in Antarctic diplomacy.

Pure science and geopolitics

At one end of the continuum, pure science embodies the principle of discovery that lies at the core of the scientific discipline. Antarctic science has produced knowledge about the Earth and helped discover a continent and its resources. Scientific discoveries became the rationale behind scientists’ regard for Antarctica as a world laboratory. Geographic discoveries gave states an incentive to compete over territory and for control over Antarctica’s living and mineral resources. There is recognition of this in the Preamble of the Antarctic Treaty. The

⁵¹⁶ Davis, Anne Michelle (2021) *Resurgent geopolitics in Antarctica*, pp 3-5.

⁵¹⁷ Cook, Captain James (1777) *A Voyage Towards the South Pole and Round the World*, pp xix –xx.

⁵¹⁸ The Royal Society (1985) *The Public Understanding of Science*, Report of a Royal Society *ad hoc* Group endorsed by the Council of the Royal Society, The Royal Society, London: Luton, p7.

Preamble seats discovery science at a geopolitical level, an affirmation of Copeland's headline that 'science diplomacy involves state interests.'⁵¹⁹ By means of the Preamble, the objectives and interests of Antarctic science and politics converge and Antarctic science gains a foothold as an adjunct to state politics. This extends science into the arena of statecraft, requiring diplomats to adjust their approaches to international problem solving.

In a diplomatic first, the Preamble states the 'continuation and development of international cooperation in scientific investigation in Antarctica accords with the interests of science and the progress of all mankind.'⁵²⁰ With this geopolitical foothold Antarctic diplomacy signposts Bull's 'common interests of humanity'.⁵²¹ State interests that focus exclusively on sovereign power and wealth look narrow in comparison to the interests of Antarctic science expressed as a service to humanity. For diplomacy to engage science at the level of geopolitics, an additional type of information is needed for problem solving. In international relations, treaties provide structural evidence of political intent. Legislating for international scientific cooperation required Antarctic treaty parties to conceptualise science in political terms and to benchmark scientific knowledge against other diplomatic norms and types of information such as intelligence and economic data. As a result, the 'interests of science' emerge as standard bearers for collaboration in Antarctic problem solving. This norm necessitates a shift towards a technical orientation in international engagement—a precursor to moving international technical management from concept to practice.⁵²²

Strategic science and diplomatic problem solving

Strategic science operates in the centre-ground of The Royal Society's continuum, distinguished from pure science at the one end and applied science at the other by 'the timescales involved, the dynamics of the system for financing research and the influence of science in the decision-making process.'⁵²³ The Treaty establishes a foothold for scientific expertise in diplomatic problem solving in Article II which legislates for 'freedom of scientific

⁵¹⁹ Copeland, Daryl (2016) 'Science Diplomacy', p 630.

⁵²⁰ The Antarctic Treaty 1959, Preamble.

⁵²¹ Bull, Hedley (1977) *The Anarchical Society*, p 170.

⁵²² Fogg, Gordon (1992) *A History of Antarctic Science*, pp 4-6.; Copeland, Daryl (2016) 'Science Diplomacy', pp 634-636.

⁵²³ The Royal Society (1985) *The Public Understanding of Science*, pp 8-9.

investigation and cooperation to that end.’⁵²⁴ This innovation places science within the ambit of diplomatic activities, requiring scientists to adjust their approaches to international engagement whenever solutions to technical problems need the support of political decision makers to progress.

The freedom to which Article II refers is unconstrained access to any part of the continent for scientific exploration and research, and for scientists to have a say in what scientific investigations take place and where. These terms are an open pass for scientific activities. States can conduct scientific activities wherever they choose but cannot object to scientific activities other states pursue within existing Antarctic territorial claims. At a diplomatic level, treaty parties cannot constrain the scientific activities of other parties, or leverage scientific activities in or out of Antarctic affairs to advantage their own national interest.

Bull emphasises ‘the central concern of international technical management is collaborating to maximise a common interest not conciliating different state interests.’⁵²⁵ Article II puts scientific cooperation on a diplomatic track, consolidating a side-step to scientific activities as a non-traditional way for diplomats to achieve state interests. Scientific cooperation, a global strategic technical effort in effect, facilitates diplomats’ representations at a geopolitical level to encourage states to surpass national interests in their responses to Antarctic issues.⁵²⁶

The open-ended nature of the Treaty advantages scientific collaboration as a diplomatic practice that complements the efforts and focus of traditional diplomacy. The Treaty has no fixed period of operation. It could operate in perpetuity so long as parties do not seek a review under Article XII. This legal condition facilitates cooperation between scientists on long-range investigations, giving diplomats time to deflect or accommodate prevailing geopolitics through the medium of scientific activities.⁵²⁷

In Antarctic diplomacy, strategic science furnishes scientists and diplomats a joint operating zone where scientists exercise technical expertise and diplomats their relationship skills in proximity to each other and to decision makers. As diplomats well understand, proximity

⁵²⁴ The Antarctic Treaty 1959, Article II.

⁵²⁵ Bull, Hedley (1977) *The Anarchical Society*, p 168.

⁵²⁶ Berguno, Jorge and Aant Elzinga (2010) ‘The Achievements of the IGY’, pp 259-261.

⁵²⁷ Berguno, Jorge and Aant Elzinga (2010) ‘The Achievements of the IGY’, pp 268-269.

facilitates mutual understanding. When scientific and diplomatic skill sets are brought to bear on problem solving at the same time and within the same political context, scientists and diplomats are able to invest their separate leverage in a common 'currency of influence'.⁵²⁸

Diplomats can expend science as a currency to ensure the management of Antarctica stays treaty-bound, a geopolitical reward for making science the centrepiece of their diplomatic engagement efforts. This outcome rewards scientists too. Science as a currency of influence extends scientists' political reach. As a result, the strategic science track becomes an interchange where the national interests of treaty parties, scientific advocacy for interests beyond those, and the prospect that scientific cooperation can bolster collective political results come together. At the Antarctic science and diplomacy interface, strategic science is an enabler for consensus building.

Combined agency has a home on the strategic science track where it reinforces scientists' diplomatic foothold, acting as a point of cohesion and allowing scientists to communicate with diplomats at and in between official Antarctic Treaty Consultative Meetings. On this track, diplomats have access to a 'scientific posture' on Antarctic issues. As technical advisers in a diplomatic domain, scientists can then join forces with diplomats to encourage states to act on science in diplomatic ways. The latter activity necessitates scientists adopting a diplomatic orientation when they provide expert advice—an adjustment needed to operationalise international technical management.

Applied science and diplomatic machinery

At the far end of the continuum, applied science is represented by a plethora of research programs looking into living and mineral resources, Antarctic ecosystems, the Antarctic environment and the continent's role in global weather systems. The treaty establishes a technical foothold for science in the machinery of Antarctic diplomacy by requiring that the results of scientific activities be shared. Article III specifies 'scientific observations and results from Antarctica shall be exchanged and made freely available.'⁵²⁹ The practicalities of

⁵²⁸ Stoddart, Michael and Marcus Haward (2011) 'Science' in Marcus Haward and Tom Griffiths (2011) *Australia and the Antarctic Treaty: 50 Years of Influence*, Sydney: University of New South Wales Press, Chapter 6, pp 138-168, p 147.

⁵²⁹ The Antarctic Treaty 1959, Article III.

international engagement at this level dictate professional adjustments by both scientists and diplomats.

Science is an independent practice in the main and diplomacy a secret one. In Antarctic science, sharing scientific results creates a stock of evidence scientists can use to help diplomats understand where common human interests lie, such as protecting ecosystems that sustain life on the continent and in its oceans.⁵³⁰ As Bull contends, the problem international technical management can then help tackle is 'not the political one of reconciling different interests or demands but the technical one of finding the most efficient means of achieving a given goal.'⁵³¹ In this effort, shared scientific results are a resource for diplomats similar to intelligence and economic data. Scientists share this resource through diplomatic channels at a machinery level, for example, as agenda papers for Antarctic Treaty Consultative Meetings and as recommendations of the Committee on Environmental Protection. This requires scientists to interact with diplomats on their home turf, including building relationships with representatives from other countries to ensure the manner of exchanging technical data that is essential to support scientific recommendations under discussion does not ruffle treaty diplomacy at large.⁵³² Dr Ewan McIvor is Senior Policy Adviser at the Australian Antarctic Division and Chair of the Committee for Environmental Protection that convenes as an organ of the Antarctic Treaty Consultative Meeting. As Chair, Dr McIvor advises the ATCM and works with the scientific organs of the Antarctic Treaty System in the process he describes below:

If diplomats stick around in the Antarctic space for some time, they get to understand the technical language of Antarctic science and that helps bridge the science and diplomacy divide. But, I think it's also recognised that you can't necessarily expect all scientists to be able to convey their knowledge in a way that will make sense to a general audience of diplomats. So, there are mechanisms in place that are supported by the rest of the Antarctic diplomatic community, such as through the Scientific Committee on Antarctic Research and a Sub-Group of the Scientific Committee called the Standing Committee on the Antarctic Treaty System. Its role is to facilitate the exchange of

⁵³⁰ Berguno, Jorge and Aant Elzinga (2010) 'The Achievements of the IGY', pp 260-268.

⁵³¹ Bull, Hedley (1977) *The Anarchical Society*, p 170.

⁵³² Boyce, Peter and Tony Press (2011) 'Diplomacy', pp 291-296.

information between the Science Community and the Policy and Diplomatic Community. So there's actually a sort of a filtering if you like. Its role is to take the information available from the broad catchment of the Antarctic Science Community, distil it, and present it in a way that is relevant to the issues that the Treaty Parties are discussing, and to their priorities, but in a language that is digestible to a general audience as well. That has been quite useful and effective for some time. I think if the diplomats were just to cast out generally to the Science Community for advice, the interaction would probably be a fair bit less effective than it is through the Antarctic mechanism that's been established. ⁵³³

When the interdisciplinary relationships between scientists and diplomats needed to effect this exchange are in place, sharing scientific results supplements the knowledge scientists speak to power and increases the scope diplomats have to take expert technical advice into account in representations to their governments. This is a foundation for evidence-based diplomacy in contemporary practice, one scientists as technical advisers are competent to provide. It necessitates an evidence orientation to diplomatic problem solving—a mutual adjustment by diplomats and scientists essential to put international technical management into practice.

Signature characteristics of international technical management

The crossovers between Antarctic science and diplomacy at geopolitical, strategic and machinery levels testify to the validity of Cornago's thesis that diplomatic and scientific practices co-evolve. Gateways in the science and diplomacy interface that project science into politics at the level of the state, diplomacy into technical expert areas, and scientists into a role in international engagement as diplomatic actors, suggest what happens there also meets the relevance test Berridge and James posit for diplomacy in modern practice. To be relevant

⁵³³ Ewan Mclvor—Chair of the Committee for Environmental Protection of the Antarctic Treaty Consultative Meeting, Senior Policy Adviser Australian Antarctic Division, interviewed by Anne Michelle Davis on 5 December 2017.

now, Berridge and James consider that state representation needs to account for expert-dependent technical dimensions beyond the political confines of traditional diplomacy.⁵³⁴

The Antarctic science and diplomacy interface affords diplomats and scientists access to science as a diplomatic currency. Combined political, technical and diplomatic agency provides members of both professions means to deploy this currency, adding an interdisciplinary lever to their respective diplomatic and scientific toolkits. In terms of practices and actors in common, the dominant push-pull factors demanding attention in the dance of Antarctic diplomacy at any given time—geopolitics, building consensus or smoothing scientific information into the Antarctic diplomacy machinery—are considerations to which diplomats and scientists turn a collective mind. Gill Slocum is Manager of Territories, Environment and Treaties in the Australian Antarctic Division, and the officer responsible for the administration of the Australian Antarctic Territory and the Territory of Heard and McDonald Islands. As Slocum describes it:

*One of the unique things about the Antarctic Treaty was that it was all about putting aside military issues, sovereignty issues, and making Antarctica a place for 'peace and science'. And so it's always seen that scientists is the core of Antarctica and at the core of cooperation in Antarctica. A lot of cooperation that happens between countries, happens first and foremost through science. And you can build cooperation on the back of science, and in some cases logistics cooperation as well. It is quite amazing that you can have quite a tense relationship with another country—say in CCAMLR negotiations—but then you go down to Antarctica and you talk to people from that country and you all talk about exactly what you're doing and you're open and transparent about it. So yes, scientists play a really key role. A term you will hear a million times is that 'science is a currency of influence in Antarctica.'*⁵³⁵

Commensurate with Bull's vision of the realm of the technical in diplomatic practice, both Antarctic diplomats and Antarctic scientists chalk up activities to international technical

⁵³⁴ Berridge, Geoff and Alan James (2001) *A Dictionary of Diplomacy*, pp 62-63.

⁵³⁵ Gill Slocum—Manager of Territories, Environment and Treaties, Australian Antarctic Division, interviewed by Anne Michelle Davis on 6 December 2017.

management, in theory. However, to be practicable, international technical management as a diplomatic technique requires evidence of structural adaptation beyond what is contained in the legalities of the Antarctic Treaty. There is some evidence scientists and diplomats call on international technical management as a diplomatic technique to support annual Antarctic Treaty Consultative Meetings and the deliberations of the Commission on the Conservation of Antarctic Marine Living Resources (CCAMLR). In line with the practice Berridge and James extoll, scientists and diplomats regularly synchronise their preparatory activities for these conferences. Synchronisation throws scientists' role as diplomatic actors into relief. It underscores practical adjustments within Antarctic diplomatic norms that make international technical management feasible. These normative adjustments are:

- A technical orientation to international engagement,
- A diplomatic orientation to the provision of technical advice, and
- An evidence orientation to diplomatic problem-solving.

Each adjustment requires scientists and diplomats to shift their roles slightly. At Antarctic Treaty Consultative Meetings scientists are political advocates and technical advisers. Their expert advice establishes scientific postures that afford diplomats an alternative avenue for consensus building and provide the evidence base needed to ensure scientific positions stay the course during protracted diplomatic negotiations. As Slocum observes:

There are a lot of scientists, in CCAMLR for example, and in the Treaty System more broadly, who have been engaged in the Treaty System for so long that they're actually also very good diplomats and understand policy better than a lot of policy makers, because, they've needed to understand the context of where their work fits in to be able to 'get the edge' in a way and make sure that their science stays relevant. So really, some of the best negotiators that you see around the Table these days are scientists. ⁵³⁶

The role shifts required are slight but significant. For example, a technical orientation to international engagement requires a diplomatic adjustment to accommodate science advocacy in the practice of statecraft. Scientists succeed as political actors in Antarctica

⁵³⁶ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

because, when they seek out state sponsorship—essential to offset research costs and logistics—they are careful to do so under a national interest banner. From these nuanced rather than strictly technical approaches, scientists gain access to and influence with diplomats and political decision makers beyond the confines of what they can advocate in terms of individual science projects. Press puts it thus:

There has been an impetus in Australia to have not just bottom-up science, but top-down science combined with bottom-up science. The transition was, rather than having individual projects that were based or approved or funded on the basis of just their 'pure scientific brilliance', to have the science set around priorities for the government. The embedding of national priorities in scientific programs in Antarctica from a domestic point of view has been really important. It's led to better use of government money and the scarce resources that are available for science. But it has also allowed for an emphasis on long term collaborations with other countries as well. If you know that understanding the role of Antarctica in the global climate system is embedded in your research priorities for the next ten years, then you are able to go out and draw upon the expertise of Institutions in other countries, and funding from other countries, to build a sustainable science program. ⁵³⁷

A diplomatic orientation to the provision of technical advice, needed for expert technical advice to fit in with the purposes of diplomacy, is a scientific adjustment. Diplomats measure whether or not to include scientific postures in political agendas by how they add to, subtract from or balance competing positions. Scientists cannot adjust facts to facilitate diplomatic compatibility among treaty parties. As the human face of Antarctic science though, they can accommodate treaty audiences by assuming a diplomatic demeanour in relation to their scientific work and its results. The adjustment is not to evidence per se but the timing and manner of delivery, whereby scientists respect diplomats' need to signal and socialise content, both political and technical, via diplomatic channels for best effect. Press also observed:

⁵³⁷ Tony Press interviewed by Anne Michelle Davis on 21 November 2017.

Scientists are quite cognisant of what kinds of advice they should be giving and how that advice should be framed so that it makes it easier for policy makers to interpret that advice and come to a decision. So, what's negotiable is not the science itself, but how that advice might be framed and how it might be put into sets of expressions that have policy relevance. ⁵³⁸

Antarctic scientists have mastered this adjustment by teaching each other when, where and how to present evidence in the sensitive and tactful way that defines a diplomat. In Slocum's formulation:

One of the greatest challenges we have from time to time is how do you refer to the CCAMLR area, for example. Because you're talking about a marine environment and you can't refer to it as 'High Seas'. You can't refer to it as 'areas beyond national jurisdiction'. You can't refer to it as 'having EEZs.' So now and again a country will try to insert 'High Seas' or whatever. And someone will just go up and whisper to them—'no, get rid of that language.' But you never have an overt discussion about it across the Floor because you don't want to necessarily raise it and have an overt conversation about those things because you never know where that conversation might go.

You've always got to come up with unique and special ways to talk about those areas without referring to them as national fisheries or what have you. There's a couple of us who have enough corporate knowledge and have been involved enough that we know the secret language and we know the formulation of words that everyone will be happy with. And you use those and move on. ⁵³⁹

An evidence orientation to diplomatic problem-solving is a mutual adjustment. Diplomats' access to evidence-based diplomacy enhances consensus building. The objective dialogue scientists can have facilitates this outcome by highlighting facts-based common ground amongst Antarctic Treaty consultative parties who may harbour historical or current political differences. The flip side is that scientists need to be cognisant of those differences and the

⁵³⁸ Tony Press interviewed by Anne Michelle Davis on 21 November 2017.

⁵³⁹ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

political interests that drive them. Prevailing politics may still command diplomatic action over and above, or instead of, what the scientific evidence discloses about the cause, effect and consequences of problems to hand. This order of priorities motivates scientists to support diplomatic efforts to de-conflict politics before technical evidence hits diplomatic tracks. Mindful of this, Australian Antarctic scientists focus their engagement efforts at the strategic and applied science gateways in the interface, while supporting diplomats to take the lead at the geopolitical gate.⁵⁴⁰

*We lead Australia's engagement in the Commission on the Conservation of Antarctic Marine Living Resource and in the Committee on Environmental Protection. DAFT lead Australia's engagement in the Antarctic Treaty Consultative Meeting, but we play a key role and provide a lot of continuity and corporate knowledge, and we lead on issues of science and operations in the Treaty.*⁵⁴¹

Further proof of Bull's concept of international technical management lies in the involvement of scientists in everyday diplomatic practices of the Antarctic Treaty, confirmed by participants inside and by observers outside the Antarctic Treaty System. For example, according to Jessica O'Reilly, Antarctic experts must cultivate and sustain their expertise and implement and mobilise it for specific audiences. O'Reilly cites how 'Antarctic experts dedicate considerable effort to making their scientific contributions legible to, even inherent within, international environmental policy.'⁵⁴² This 'professional vision' demands serious perception, classification and interpretation. The key to an expert's success in Antarctic diplomacy is therefore 'an ability to keep many nuanced details in mind at once and hold a high-level conversation about those details.'⁵⁴³ O'Reilly's observation describes what scientists do at the science and diplomacy interface in terms equivalent to what diplomats do in everyday diplomatic practice.

At Antarctic Treaty Consultative Meetings, Australian scientists engage in everyday diplomatic practices that Brian Barder refers to as 'a stream of expressing views, making

⁵⁴⁰ Boyce, Peter and Tony Press (2011) 'Diplomacy', pp 276-277.

⁵⁴¹ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

⁵⁴² O'Reilly, Jessica (2017) *The Technocratic Antarctic*, p 7.

⁵⁴³ O'Reilly, Jessica (2017) *The Technocratic Antarctic*, p 7.

recommendations, arguing for or against proposals by bringing to bear an understanding of foreign policy objectives and shifts that impact national interests.⁵⁴⁴ The diplomatic machinery of the Antarctic Treaty Consultative Meeting is supported by everyday diplomatic practices that comprise preparing, distributing, editing and redrafting policy papers prior to negotiations on contentious parts of the final report. As O'Reilly records, 'how these papers are received is not left to the whims of delegates at the moment of formal presentation. Authors of papers circulate their ideas and drafts to other delegates, coordinating a formal response from the sidelines of the Meeting.'⁵⁴⁵ As participants in everyday diplomacy at the Antarctic science and diplomacy interface, the scientists interviewed for this project go to considerable lengths to frame the scientific side of these conversations in diplomatic terms. As Press recalls:

A huge amount of the business that the Antarctic Treaty Consultative Meeting actually deals with is the Report of the Committee for Environmental Protection. And that's where most of the really critical stuff happens. And so, the Chair of that Committee, and the Committee itself, effectively does that integrating and that negotiation by the way that they write their Report and present their finding—present their advice to the Antarctic Treaty Consultative Meeting.

*The Chair, as an individual, has a great deal of responsibility for taking that Report and explaining its importance to the Antarctic Treaty Consultative Meeting itself. There is a direct involvement there and you often find in those negotiations that individual scientists or elected officials from the Scientific Committee are there in the discussions of the Commission itself to explain the scientific advice but also to explain what happens if decision 'x' is made as opposed to decision 'y'.*⁵⁴⁶

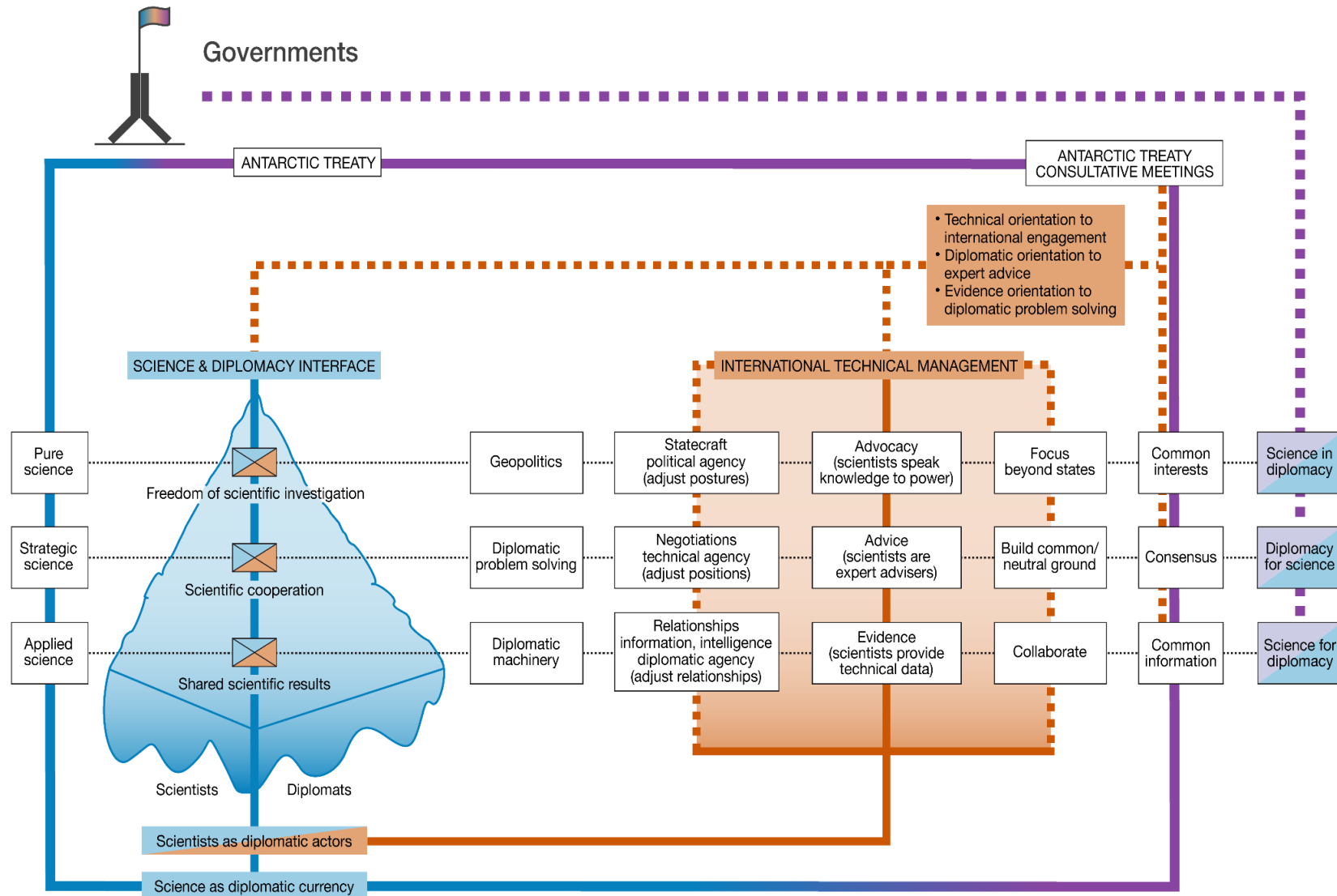
⁵⁴⁴ Barder, Brian (2014) *What Diplomats Do: The Life and Work of Diplomats*, Lanham : Rowman & Littlefield Publishers, p 2.

⁵⁴⁵ O'Reilly, Jessica (2017) *The Technocratic Antarctic*, pp 113-114.

⁵⁴⁶ Tony Press interviewed by Anne Michelle Davis on 21 November 2017.

Figure 2 below depicts how the Antarctic science and diplomacy interface institutionalises an influential voice for scientists relating to matters of technical complexity in Antarctic diplomacy. Scientists' key contribution, working separately or together with diplomats, is explaining the science behind political initiatives.

Figure 2 International technical management at the Antarctic science and diplomacy interface



As Figure 2 demonstrates, the Antarctic science and diplomacy interface creates a setting for diplomats to come at problems that require a technical response and that would otherwise end up in a separate ‘too-hard’ basket. This brings an element of Antarctic diplomacy into closer orbit with the bigger science diplomacy picture. As Sharp, Bull and Copeland contend, elsewhere, interdisciplinary solutions to problems that impact the Earth as opposed to a state or states stall because the shifts in diplomatic and scientific orientations needed to accommodate them are still in their infancy.⁵⁴⁷ In the Antarctic setting, diplomats do not have to go far out of their way to access technical advice, and solving problems at a systems level is seen to be in the common interest. Technical support is a reliable ‘go to’ because the science and diplomacy interface facilitates ongoing engagement between scientists and diplomats.

Since the treaty came into force, ongoing engagement between scientists and diplomats has become a significant science diplomacy enabler. In contrast to the traditional norm where diplomats tend to resolve issues among themselves, as expert participants at the Antarctic science and diplomacy interface, scientists are able to ensure governments receive representations on technical aspects of diplomatic challenges through the voice-piece of diplomats, or as reports exchanged via collaborative international science projects. This kind of international problem-solving gives scientists multiple access points from which to shape diplomatic thinking, and allows them to more fully engage the diplomatic machinery. As trusted insiders, scientists can speak knowledge to power with the aim of motivating problem solvers not to exclude solutions beyond the political domain. As Press puts it:

One of the most common conversations between diplomats and scientists often starts with—‘you are telling me this stuff but what does it mean, and why should we do anything about it? Why is that important and what would happen if we completely ignored you?’ And then scientists say—‘well, your only alternative is to do this, this and this.’ So, there can be a discussion. If a scientist comes up and says—‘do this’ and the diplomat says—‘whoa, that’s not going to float’, then there will be discussion about—‘okay, what’s Plan B?’⁵⁴⁸

⁵⁴⁷ Sharp, Paul (2019) *Diplomacy in the 21st Century*, p 634.

⁵⁴⁸ Tony Press interviewed by Anne Michelle Davis on 21 November 2017.

These engagements become an international technical intervention when scientists prevail on diplomats to face down problems that are not wholly political in nature or resolution. As The Royal Society contemplated back in Chapter two, the Antarctic science and diplomacy interface does indeed provide a 'blueprint for international diplomacy.'⁵⁴⁹ Its contribution to the development of diplomatic practices lies in the way the interface enables members of both professions to keep an eye on interests in common as they tackle overlapping scientific and political priorities. International technical management makes an appearance at the interface in how scientists and diplomats adapt their respective practices to suit:

*Diplomats are now facing a lot of problems that they have to work together at the government level to solve but borders get in the way. You only have to look at the major global issues confronting humankind. You've got water security, you've got food security, you've got physical security regardless of what the physical threat to an individual might be. Integration of scientific endeavour gives scientists greater reach than diplomats ever had dealing with these problems because diplomats are constrained at the level of sovereignty to working for their national interest. And when you are in that situation, scientists can actually act as your 'agents of change' while diplomats are quietly dealing with domestic challenges.*⁵⁵⁰

Crossover points at the Antarctic science and diplomacy interface enable scientists and diplomats to turn their engagement with each other into action. From the diplomacy side of the interface, in traditional mode, diplomats cover political elements in international engagement best described as seeking out interests in common. At a geopolitical level, interests in common are obvious touchstones for political players in dispute to focus on. In the absence of visible common ground, relationships are key to making progress, so diplomats use the barest discussion of commonality to start, and keep, working together. Rowe captures it thus:

⁵⁴⁹ The Royal Society (2010) *New frontiers in science diplomacy*, p 16.

⁵⁵⁰ Tony Press interviewed by Anne Michelle Davis on 21 November 2017.

What diplomats have most in common with scientists in the Antarctic context is, I would say, enormous respect and appreciation of the specialist contribution they can make as scientists to sustaining and promoting, where necessary, the integrity of the Antarctic Treaty System. And contributing advice based on their scientific knowledge on particular proposals that may have a broad application in terms of something we identify as being worthwhile doing to enhance the respect for that System and the security of that System. ⁵⁵¹

From the science side, in collaborative mode, scientists cover factual elements in international engagement best described as articulating problems in common. Problems in common are obvious starting points for joint problem solving. The more information scientists share with diplomats, the more diplomats can come to understand the technical language of Antarctic science, and help to bridge the science and diplomacy divide in the way Dr Ewan McIvor described above. If problems with mixed political and technical features are to be made more amenable to interdisciplinary solutions, those such as diplomats and scientists encounter with climate change for example, then sharing technical expertise as a cornerstone of relationships between scientists and diplomats may prove useful. Antarctic scientists use this exchange to initiate and sustain relationships with diplomats. The commonality of purpose so far seemingly essential to international technical management can then be more readily identified. For Antarctic scientists, the intention behind these exchanges is to shore up negotiations within the Antarctic Treaty System that have recourse to science. Press captures this:

It's a two-way street. What I have always done is to keep engaging with diplomats, saying—'here, look at this, this is really interesting.' Or, 'you should be interested in this.' Or, 'I have had this conversation with these scientists.' Or, 'I have been invited over to Shanghai to give a talk on this, you might be interested.' Networking with science contacts and with diplomats is part of the collective memory, and collective memory is very important. You have to

⁵⁵¹ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

socialise the Antarctic Treaty and Antarctic science with diplomats all the time.

It's just something that you do'.⁵⁵²

At this point, recognition of international technical management as a diplomatic technique in Antarctic diplomacy is feasible. The Antarctic science and diplomacy interface allows diplomats and specialists to engage over diplomacy, policy, science, operations and non-government and commercial activities such as tourism and fisheries. The breadth and continuity of engagement mean that Antarctic experts accumulate corporate knowledge outside of diplomatic pathways. In Slocum's words:

There's a real breadth of subject matters that get addressed in the Treaty System. And with that it means that you have a breadth of people involved and you often get experts and people with a lot of corporate knowledge and continuity to continue to come to the Meetings and to be able to really engage in a robust and effective way on those particular subject matters.⁵⁵³

This dual-purpose engagement is best showcased as international technical management where scientists invest in a wide range of relationships over long periods of time, and as a result, come to understand the diplomatic as well as the scientific benefits those relationships bring. Gales describes it thus:

I think, if I was to characterise the one area of Antarctic diplomacy I feel particularly good about, it's a broader one. It's around engendering really positive, trusting relationships with counterparts in other countries and investing, I hope very genuinely, in those relationships, because the relationships, in the end, are at the heart of that trust. It's easy with countries that we would regard as our 'like-minded countries'—the countries with which Australia might find common ground on most issues. It's a straightforward relationship and you can forge them really quickly. But when you've got Heads of Programs from countries that you interact with much less, and they have very different politics to your own country, then having trusting and functional

⁵⁵² Tony Press interviewed by Anne Michelle Davis on 14 November 2017.

⁵⁵³ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

relationships with those people is at the heart of bringing them into that Antarctic family—letting them feel that the original claimant countries are not some exclusive separate group. ⁵⁵⁴

The extended periods during which experts other than diplomats engage with each other over Antarctic issues at the interface undoubtedly acts as a crucible for international technical management. Specialists from different fields bring that knowledge to the conduct of Antarctic diplomacy as, and when, priorities and opportunities dictate. In Gales' formulation:

The side of the diplomacy, working with those other countries, and quite genuinely being interested in their programs and looking for opportunities to work with them, characterises something broader than Antarctic diplomatic moments. Rather than the space being characterised as individual, it's—'we got someone over the line on this issue or that issue.' ⁵⁵⁵

An important note in terms of diplomatic practice is that, in the Antarctic context, continuity of engagement between diplomats and subject matter experts is a core rationale for international technical management. The Antarctic science and diplomacy interface can be regarded as defining a mode for interdisciplinary relationships based on continuity of engagement between experts from different Antarctic countries on subject matters like the environment, before those issues become political, and at a level where diplomats can contemplate solutions based on the best available science. Diplomats in particular value robust discussions at a level of information exchange that can lead to compromises and concessions on the way to doing things, and that therefore sometimes results in more effective ways to achieve outcomes. Slocum argues that:

It's always seen that science is at the core of Antarctica and at the core of cooperation in Antarctica. So a lot of the cooperation that happens between countries, happens first and foremost through science. And you can build relationships and build cooperation on the back of science, and in some cases logistics cooperation as well. In the case of the Treaty System, I'd argue that

⁵⁵⁴ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

⁵⁵⁵ Nick Gales interviewed by Anne Michelle Davis on 25 September 2018.

*familiarity and corporate knowledge actually brings leadership and strength in the Treaty System. We're privileged in the way that Australia's System is set up where we have our scientists embedded in the same Organisation as some of our key policy people. At any time, we can walk down the corridor and speak to an expert fisheries biologist, or a glaciologist, and have within minutes the answer to a complex science question that might need to help inform policy.*⁵⁵⁶

The breadth of subject matter under discussion, the availability of resident expertise, and the continuity of engagement available at the interface create a broad pathway for decision making, and the slower turnover of technical experts in the Antarctic Treaty System compared to diplomats' shorter diplomatic posting cycles helps to reinforce a norm whereby participants—diplomats and experts alike—treat the identification of approaches to achieving outcomes as an outcome in its own right. This can be seen in action at gateways in the interface between the plenary session of the annual Treaty conference hosted by the Antarctic Treaty Consultative Meeting and the Treaty's scientific organs such as the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) and the Committee on Environmental Protection (CEP).⁵⁵⁷

*I think one of the really great things about CCAMLR is that there is quite a lot of continuity of people in CCAMLR, so you actually build relationships, personal relationships, with individuals. There is rotation from time to time and some Delegations rotate more than others. But what makes it easy to collaboration for a lot of the key countries is there is continuity so you can build relationships, and from those relationships you can actually have robust discussions that you may not be able to have when you don't necessarily know the people.*⁵⁵⁸

More people than just diplomats are involved in consensus making in the Antarctic Treaty System. When the diplomatic machinery turns slowly, one clear benefit is that there is less

⁵⁵⁶ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

⁵⁵⁷ Boyce, Peter and Tony Press (2011) 'Diplomacy', pp 295-297.

⁵⁵⁸ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

need for decision makers to press diplomatic levers early in the process. Richards and Slocum capture this:

*And so, in that sense, a scientist might talk to a fellow scientist in another Delegation because there was always that established relationship. It may be about some science angle, or maybe it wasn't, but in that sense everybody went into their specialist field, talked to their counterparts, and then came back and contributed to—'okay, what does this mean for us as Australia.'*⁵⁵⁹

*In the case of the Treaty System – I'd argue – and this is one thing we always say – that familiarity and corporate knowledge actually brings leadership and strength in the Treaty System.*⁵⁶⁰

As signposted in the very beginning in the Introduction, scientists are drawn into the nerve of decision making at annual Treaty conferences. It is clear now that an important feature of scientists' participation in Antarctic diplomacy is to facilitate the best fit between scientific information and the diplomatic machinery of the Antarctic Treaty Consultative Meeting. As part of that process, diplomats consider scientists' role as diplomatic actors includes helping diplomats to get across specialised information quickly. In practice, this calls for teamwork in which diplomats and scientists create a pool of corporate knowledge by sharing generalist skills and technical expertise back and forth between the two professions, a function Bull envisaged as within the scope of international technical management. As Richards recalled:

Usually, you'd have more than one Delegation member in the relevant Meeting. You'd have, for example, the scientist who was very familiar with the operational issues and the scientific principles at stake sitting cheek by jowl with the lawyer, for example, who would assist with wording for the appropriate resolution or explain the legal principles behind how the Treaty documents interacted with each other. But I like to think that the scientists, just because they're scientists, doesn't mean that they don't know anything about those things. The longer you work in the Antarctic Treaty System the

⁵⁵⁹ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

⁵⁶⁰ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

*more knowledge you pick up. So, the scientists would understand the legal principles. The legal people would listen to the scientists and form teamwork.*⁵⁶¹

A key difference to note between the diplomacy of science at large and the practice of it at the Antarctic science and diplomacy interface is the way the latter shifts the onus of diplomacy on to creating a joint operating space within the diplomatic machinery so that diplomats can make better use of science as a diplomatic currency. International technical management as a form of compound diplomatic leverage is then observable in diplomats' ability to pursue higher order political outcomes. Richards also observed:

*To me the Treaty has always been about territory, and Australia claims forty-two percent of the Continent, and that's a lot. I just wish more people understood its importance in that sense. I think it's under-recognised as a disarmament Treaty, but I thoroughly agree with the proposition that science is inescapably an important contributor to the success of the Antarctic Treaty System.*⁵⁶²

Teamwork plus knowledge and skill sharing are two competency elements that can be observed when international technical management is taking place. As decision making at Antarctic Treaty Consultative Meetings draws science into its nerve centre through the provision of scientific advice on agenda items that require it, scientists need to ensure that their advice is diplomatically competent so that their counterparts can deploy it. First-generation Australian scientists did this by keeping abreast of the political motivations behind the Antarctic science:

In the early days of the expeditions, the motivation to go back to Antarctica was very strong and it was directed towards the study of the regions to be visited—mapping of the country and scientific study in the various areas. And everybody involved knew that was what these expeditions existed for. That was what the 'R' in the name of ANARE represented. Everyone including the

⁵⁶¹ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

⁵⁶² Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

scientists acknowledge that there was an overriding—above all of this—there was a political motivation, a political purpose. The scientists were not so naïve as to imagine that the scientific work would have been supported if the Government didn't see political merit in it. ⁵⁶³

To be actors with agency in this political mix, current scientists prioritise establishing the credibility of science as a diplomatic information set. The signature of international technical management at the Antarctic science and diplomacy interface then comes down to the care scientists take to express technical content in ways that are coded to work around contentious political issues and personalities, and how they normalise this approach by taking equal care in their long-term relationships. The current generation of Australian Antarctic scientists and policy officers express a high level of awareness that, when it comes to managing the Antarctic Treaty System, some science things are very sensitive and better progressed using a diplomatic formulation. Press draws this out:

Diplomats seek me out about—‘well, if you are having these conversations maybe you want to discuss these things’. Or, they might ask me—‘who is the most important person to talk to about this’. If there is a diplomatic issue that needs to be explored between Australia and another country then they might want to know—‘well, who are the players in here that might be able to influence internally this country’s response to this discussion we’re about to have’. So that’s understanding and influencing externally someone else’s internal system. But a lot of the time it’s about—‘I want to understand and be able to frame a conversation if I don’t know what is going on there, so what are the scientists doing?’ There is that kind of approach. ⁵⁶⁴

⁵⁶³ Jacka, Fred and Daniel Connell (1987) *Fred Jacka interviewed by Daniel Connell in the Australian Antarctic Division Oral History Collection*, ORAL TRC 7000/55, National Library of Australia.

⁵⁶⁴ Tony Press interviewed by Anne Michelle Davis on 14 November 2017.

Scientists absorb themselves in the development and nurturing of long-term relationships so that those relationships are capable of surviving inevitably robust discussions. Slocum describes the process thus:

*We know it's in our personal interests in terms of the work that we do to expend time helping diplomats understand the issues and giving them briefings, and making sure that they have all the information they need to do their job, which then helps us do our job and helps further Australia's interests. So, I can say this for myself and my team, and the scientists as well, and DFAT, we all invest a lot of time in developing relationships between each other. We all know that it's in our interests to work together. And so, we do that.*⁵⁶⁵

These examples show that scientists are cognisant of the need to influence diplomats, and through them the governments they represent, if those decision makers are to act on technical information and decide in favour of outcomes that take scientific as well as political priorities into account.

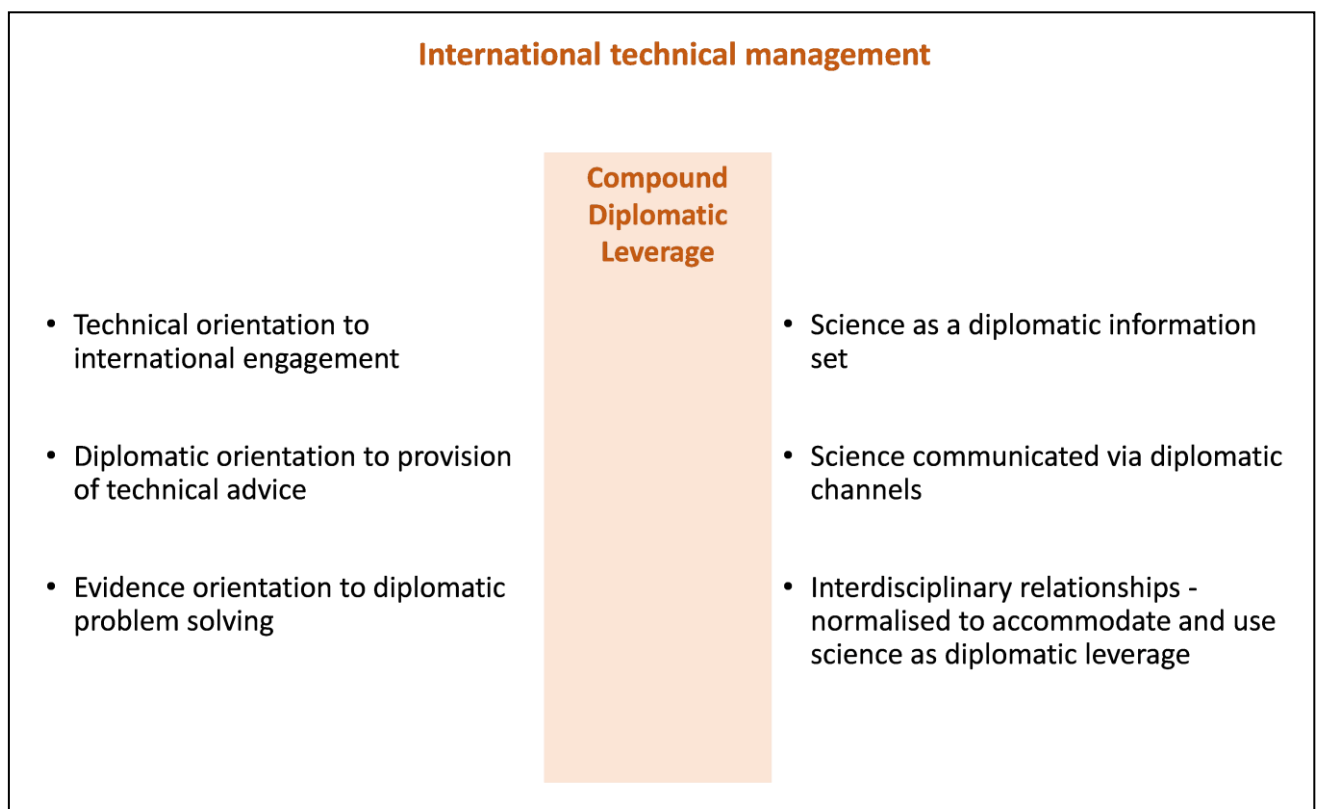
The normative changes diplomats and scientists make in order to inculcate a technical orientation to international engagement, a diplomatic orientation to the provision of technical advice and an evidence orientation to diplomatic problem-solving make joint problem solving feasible. However, the capacity for diplomats and scientists to explore problem solving approaches, and to use the interdisciplinary exchange they have established between the diplomacy and science tracks in Antarctic diplomacy in order to time diplomatic interventions to best advantage, requires more than the teamwork based on knowledge and skill sharing already identified. At the Antarctic science and diplomacy interface, international technical management has something more to say in answer to how diplomats and scientists use the Antarctic science and diplomacy interface to make science count in diplomatic problem solving. The additional contribution is that science as compound diplomatic leverage has a marked typological effect. The adjustments in diplomatic orientation required to facilitate the emergence of international technical management also require a series of functional

⁵⁶⁵ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

innovations, observable at the Antarctic science and diplomacy interface as listed in Figure 3 below.

For a technical orientation to international engagement to lead to practical action, science as a diplomatic information-set is a must. For a diplomatic orientation to the provision of technical advice to shift a prevailing political mindset, scientists best bet is to communicate their advice via diplomatic channels. And, for an evidence orientation to empower diplomatic problem solving, diplomats and scientists must first recognise science as diplomatic leverage and empower their respective representatives to use it. These functional shifts are achieved at the Antarctic science and diplomacy interface through interdisciplinary knowledge and skill sharing.

Figure 3 Functional elements of international technical management



The Antarctic science and diplomacy interface, and the emergence of international technical management as a diplomatic technique, speak to the broader discussion about science diplomacy, with a caveat. Chapter four commented on how Antarctic diplomacy turns slowly between periods of peak political attention and is sustained during these periods by scientists through their relationships with diplomats. When it comes to international technical management, the slower pace of Antarctic diplomacy provides diplomats and scientists time to expose, consider and discuss technical elements of issues that need political attention. Antarctic scientists and diplomats manage this slow turn through interdisciplinary relationships. The pace of Antarctic diplomacy allows them to structure their relationships to accommodate a flow of evidence from scientists, the intention being that that evidence will support diplomatic activities on a par with intelligence and economic data. A key takeout from this chapter is the observation that for international technical management to be effective in practice, and perhaps for joint problem solving to work as an amalgam between the generalist skills of diplomats and the specialist skills of scientists at the global science and diplomacy interface, it may be that this slower turn is essential.

This chapter set out to analyse international technical management critically as a diplomatic technique. It answers how diplomats and scientists use the Antarctic science and diplomacy interface to adjust their skill sets, activities and persona to achieve outcomes in their own and each other's interests. When diplomats and scientists adjust their interactions to accommodate the technical, the professional interaction between them resembles the mix of diplomatic and technical problem-solving Bull styles as international technical management. Increasingly, international technical management looks to offer a way to describe the kind of diplomatic actors Antarctic scientists have turned out to be. The next chapter explores the specific case of Australian Antarctic scientists as international technical managers.

9—Australian scientists as international technical managers

The case study in this chapter investigates the diplomatic knowledge and experience of three generations of Australian scientists using qualitative analysis to trace their footprints in the typology of Antarctic diplomacy. According to Cameron Thies, qualitative analysis relies on observations of a variable of interest over time, then connects them in a narrative to explain what causes the bigger picture.⁵⁶⁶ I searched records in the Australian National Archives to profile the diplomatic lineage of Australian Antarctic scientists, and then conducted elite interviews with 34 scientists, diplomats, policy advisers and statutory office holders to tell the story about what these scientists did and do in Antarctic diplomacy.⁵⁶⁷ Those interviews provided new information to add to Australia's oral history of Antarctica. They are the source of primary evidence used to update the typology of Antarctic diplomacy in Chapter 7, and they are the basis of fresh insights in this chapter about what prompts diplomats to sponsor science as a diplomatic currency, and scientists to perform diplomatic service through the agency of their technical expertise.

From an academic perspective, updating a typology is an opportunity to consider the viability of the less well-trodden path of quantitative analysis in diplomacy studies. I did consider this, but chose not to proceed on the ground that, in the case of science and scientists in Antarctic diplomacy, quantitative analysis was unlikely to establish a narrative compelling enough to substantiate the adaptations in diplomatic practice observed at the Antarctic science and diplomacy interface that are profiled in Chapter 8. Quantitative analysis 'measures the degree to which an attribute is present, usually based on a statistical analysis of a number of cases coded on a variety of attributes.'⁵⁶⁸ The Antarctic science and diplomacy interface relates to a defined geographic area and a unique treaty. It does not meet the number criterion despite the utility that analysing a variety of diplomatic attributes might otherwise offer.⁵⁶⁹ For

⁵⁶⁶ Thies, Cameron (2002) 'A pragmatic guide to qualitative historical analysis in the study of international relations', *International Studies Perspectives* Vol. 3, No. 4, November 2002, pp 351-372, p 352.

⁵⁶⁷ *Research Protocol 2017/453*, Australian National University, 23 June 2017.

⁵⁶⁸ Thies, Cameron (2002) 'A pragmatic guide to qualitative historical analysis in the study of international relations', p 353.

⁵⁶⁹ Thies, Cameron (2002) 'A pragmatic guide to qualitative historical analysis in the study of international relations', p 353.

example, the study could have documented a comparison of the frequency and type of political engagements both scientists and diplomats undertake to identify overlaps. Attributes classified as similar, adaptive or new would still expand the typology by highlighting interconnected practices. However, the narrative needs to account for: the context in which scientists participate in Antarctic diplomacy, why their participation comes about, and how the science and diplomacy interface facilitates this outcome. Qualitative analysis offers a better fit. With this in mind, it is time to turn to what Antarctic scientists and diplomats themselves say.

Science inroads into diplomacy

Today, Australian Antarctic scientists are keenly aware their work has diplomatic overtones. They possess a repertoire of diplomatic techniques and a stock of corporate knowledge that helps to normalise their engagement with diplomats in the way already best described as mutual recognition, mutual reliance and mutual engagement. Rowe and Rothwell have highlighted this process:

Diplomats or Foreign Affairs representatives and legal advisers have had to be, from their side, very conscious and aware of the scientific dimensions and the different areas of Antarctic science both on the landmass and in the waters. But equally, while the diplomats had to be aware, the scientists had to be very conscious that they were involved, in those early days of the treaty particularly, in contributing to an international framework and agreement that would enable them and states to pursue their activities. ⁵⁷⁰

Ultimately, continuity in the Antarctic Treaty System rests with governments, and it rests with the relevant bureaucracies within government that respect and have an understanding of the historical connection that they have with Antarctica and the influence—to a degree the responsibility—that comes with that. So, notwithstanding the posting in and out of diplomats within DFAT for

⁵⁷⁰ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

example, that is counterbalanced by the expertise that exists within the Antarctic Division in Australia. ⁵⁷¹

Detailed analysis of the combined chronology of Antarctic diplomacy and science in Chapter 3, and of the Antarctic science and diplomacy interface in Chapter 5, confirms there is a long history of interaction between scientists and diplomats at, and between, moments of peak political interest in Antarctica. They collaborated over Antarctic discovery in the eighteenth century and teamed up to negotiate science into the Antarctic Treaty in the 1950s. Their close interaction continued throughout the 1970s and 1980s during subsequent negotiations to add conventions to the Treaty governing Antarctic living and mineral resources and to protect the Antarctic environment.⁵⁷² Insofar as Australian Antarctic scientists and their colleagues from the Department of Foreign Affairs and Trade are concerned, their work has never been far apart:

There has always been that relationship between scientists and diplomacy. There's always been, I would suggest, an awareness of that diplomacy dimension. ⁵⁷³

Scientists from the Australian Antarctic Division continue to work with diplomats to promote the scientific attributes of proposals put up for formal consideration at annual Treaty conferences:

For example, if a particular case is put forward for Protected Areas, that has to be negotiated in a way. And sure, the case is made on the basis of the science and the need, but states and other scientific representatives have to be brought

⁵⁷¹ Donald Rothwell interviewed by Anne Michelle Davis on 13 August 2018.

⁵⁷² Simmonds, Kenneth (1993) *The Antarctic Conventions*, pp 47, 63, 83, 91, 124, 226.; Secretariat of the Antarctic Treaty, *Compilation of key documents of the Antarctic Treaty System*, 5th Edition, Buenos Aires: Secretariat of the Antarctic Treaty, 2021, pp 29-152. The Conventions are: *The Convention for the Conservation of Antarctic Seals* (CCAS, London, 1972), *The Convention on the Conservation of Antarctic Marine Living Resources* (CCAMLR, Canberra, 1980), *The Convention on the Regulation of Antarctic Mineral Resources* (CRAMRA, Wellington, 1988), and *The Protocol on Environmental Protection to the Antarctic Treaty* (Madrid Protocol, 1991).

⁵⁷³ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

on board and have to appreciate the science. And so, there's always the need to engage scientists in an advocacy, a convincing, a representative type of role from what I call a broad diplomatic perspective. ⁵⁷⁴

The relationships and activities scientists and diplomats share at political, professional and administrative levels are relevant for another reason. Australia claims forty-two percent of Antarctica.⁵⁷⁵ From a foreign policy perspective, what scientists contribute to the treaty regime takes on a proportionately higher stake in Australian diplomatic engagements as a result.⁵⁷⁶

The principal argument that one tended to hear was that Australia's primary interest was in preserving our influence in the Treaty Regime, and in particular, preserving the credibility of our sovereignty claims, should in the future things change to the point where they were no longer in suspension. ⁵⁷⁷

Three generations of Australian Antarctic scientists

The case study covers the period from 1961 to 2021. 1961 was the year the Antarctic Treaty came into force. During the sixty years since, three generations of Australian scientists have gained hands-on experience in the diplomacy of the treaty regime. This repertoire of diplomatic techniques and corporate knowledge is analysed using examples from existing and new oral history records. The trailblazing work of first generation Australian scientist-diplomat Sir Douglas Mawson is expanded with examples of how his diplomatic activities bridged all three of the geopolitical, normative and machinery tracks of the updated typology. As detailed in Chapter 5, Mawson's participation in Antarctic diplomacy was steeped in traditional practices. Having effectively established science inroads into decision making and founded the Australian National Antarctic Research Expedition (ANARE), Mawson's approach paved the way for Dr Phillip Law to make further inroads into Antarctic policy. Both as Australia's science

⁵⁷⁴ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

⁵⁷⁵ Foreign Affairs, Defence and Trade References Committee, *Australia's future activities and responsibilities in the Southern Ocean and Antarctic waters*, Canberra: Commonwealth of Australia, October 2014, pp 2-4.

⁵⁷⁶ Rothwell, Donald and Andrew Jackson (2011) 'Sovereignty', pp 49-51.

⁵⁷⁷ Hugh White interviewed by Anne Michelle Davis on 24 October 2018.

lead for the International Geophysical Year and as a behind the scenes diplomat entrusted to help develop Australia's position in the lead-up to the 1959 Treaty negotiations in Washington. For Law, Antarctica's escalating territorial contest dominated the prevailing diplomatic scene, and his role as a scientist-diplomat was predicated on balancing scientific gains against science diplomacy as a cover for national ambitions.

Mawson and Law represent the first generation of Australian Antarctic scientists with their hands-on diplomatic experience across the geopolitical, normative and machinery tracks of the updated typology. Both accommodated political priorities while steadily institutionalising a platform for science within the machinery of diplomacy using their close engagement with Ministers and diplomats. From the primary evidence provided through interviews with subsequent generations of Australian Antarctic scientists, a fresh picture emerges of how scientists and diplomats work together to bring technical expertise to the forefront of problem solving.

In addition to adding to the annals of Australia's Antarctic Oral History, these interviews provide a critical mass of evidence to help overcome a perennial methodological challenge attached to Antarctic studies. Not that many diplomatic and technical specialists are involved in Antarctic affairs. Dr Van Ommen's reflection in Chapter 7 on the 'small community effect' is therefore another potential barrier to getting past the counterargument that science diplomacy techniques emerging at the Antarctic science and diplomacy interface may not be transferable to other settings. This begs the question—can such a small number of practitioners justify the research questions and affirm observations about international technical management at the interface between their professions? Fortunately, there are solid grounds for a small-N, within-case study.⁵⁷⁸

It was Mawson who provided an institutional anchor for international technical management through his contribution to the *modus operandi* of science diplomacy, through the diplomatic

⁵⁷⁸ Bennett, Andrew and Jeffrey Checkel (2014) 'Process Tracing: from philosophical roots to best practice' in Andrew Bennett and Jeffrey Checkel (eds) (2014) *Process Tracing: From Metaphor to Analytic Tool*, Cambridge: Cambridge University Press, Chapter 1, pp 3-37, pp 4-8.

lane, of the Antarctic interface. Mawson established his credentials as an Antarctic scientist leading two expeditions in particular: the Australasian Antarctic Expedition (AAE) from 1911-1914, and the British, Australian and New Zealand Antarctic Research Expedition (BANZARE) over two summers from 1929 to 1931.⁵⁷⁹ At home in Australia, as well as abroad, Mawson's public appeal was due in large part to his celebrity as an Antarctic expedition leader. That same celebrity made him indispensable to diplomatic efforts to affirm British and Australian territorial claims over East Antarctica.⁵⁸⁰ The two legs of Mawson's BANZARE expedition bookended a diplomatic tussle between Britain and France over the boundaries of Adelie Land and what was later to become the Australian Antarctic Territory.

Mawson proclaimed land between 45 degrees and 160 degrees East longitude, and below 60 degrees South latitude, for Britain in 1913 as part of his Australasian Antarctic Expedition. He communicated the proclamation promptly through formal diplomatic channels, only to find out later that the British Government had neglected to table it in Parliament.⁵⁸¹ When France sought to slice the territory now recognised as Adelie Land from this much larger claim, Mawson became instrumental as a diplomatic actor when the Department of External Affairs, then a unit under the direct authority of the Australian Prime Minister, asked him on behalf of the British Government to help counter France's territorial assertions.⁵⁸²

The French claim asserted prior discovery based on sightings of the Antarctic coastline between 136° and 142° east longitude recorded by Captain Dumont D'Urville during his expedition of 1837-1840. The French Captain publicised his discoveries, including the presentation of a paper read to the Society of Sciences and Arts in Batavia that was republished in Australia. The geographic coordinates were repeated in subsequent articles, gaining public awareness through repetition and creating a publicly available chronology.⁵⁸³

⁵⁷⁹ Australian Antarctic Division, *The Australasian Antarctic Expedition*, 'The Home of the Blizzard', <https://mawsonshuts.antarctica.gov.au/preparation/introduction/>

⁵⁸⁰ Kerr, Alan (2009) *A federation in these seas*, pp 894-895.

⁵⁸¹ Kerr, Alan (2009) *A federation in these seas*, pp 224-226.

⁵⁸² National Archives of Australia: Department of External Affairs; A1383, 1494/3/4/1 Part 2, Antarctica—Executive Planning Committee, 1948-1955, pp 8-10, 205-206.

⁵⁸³ 'The French Expedition of Discovery', *Supplement to the Sydney Herald*, 6 January 1840, p1.; 'French Expedition to the South Pole', *Tasmanian Weekly Dispatch*, Hobart Town, 3 April 1840, p 6.; 'The Antarctic Expedition', *The Hobart Town Advertiser*, 28 Sept 1841, p 4.

Back in France in November of that year, D'Urville published charts of his expedition, and an atlas in 1847.⁵⁸⁴ Later, when the British Parliament failed to endorse Mawson's claim in a timely way, the foundation of the British claim was called into question. French diplomats leveraged the historical media articles to extend the French claim by hundreds of kilometres to 147° degrees west. In response, the British Foreign Office reached back through formal diplomatic channels to Mawson for help. Their initial request was for official and personal records to reinstate the original coordinates from Mawson's 1911-1914 expedition. This request was quickly followed by another which reset the political aims for the upcoming second leg of Mawson's BANZARE expedition to achieve this outcome.⁵⁸⁵

The Australian Commonwealth operated as an autonomous dominion within the British Empire at this time, so, from a position in direct line of sight of the geopolitics, Mawson's reply, sent to the then Secretary of the Department of External Affairs, W. R Hodgson, is evidence of access to and influence in the top echelons of decision-making.⁵⁸⁶ In addition, expedition leaders, including Mawson, were in the habit of announcing their achievements to the press themselves, and the new technology of radio gave Mawson an uninterrupted channel of communication from the ice. In fact, Mawson had set a precedent for the use of this technology in the national interest when, with clear political motivation to the fore, he radioed the following transmission from Adelie Land in 1913 during the Australian Antarctic Expedition:

The French Explorer D'Urville holds precedence in sighting Adelie Land. The Australians of this expedition, however, are the first people who have set foot

⁵⁸⁴ D'Urville, Jules Dumont (1790-1842) (2009), National Library of Australia, Trove, <https://nla.gov.au/nla.party-1214702>

⁵⁸⁵ National Archives of Australia: Department of External Affairs; A1383, 1494/3/4/1 Part 2, Antarctica—Executive Planning Committee, 1948-1955, pp 8-11.; Casey, Richard Gardiner and W. J. Hudson et al (1980) *My dear P.M.*, pp 518-519.

⁵⁸⁶ Bennett, Scott (2004) *Australia's Constitutional Milestones—Chronology*, Parliament of Australia, Parliamentary Library: https://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/Publications_Archive/online/Milestones; National Archives of Australia: Department of External Affairs; A1383, 1494/3/4/1 Part 2, Antarctica—Executive Planning Committee, 1948-1955, p 3.

on the mainland, as the French navigator landed only on one small rocky island off the coast. ⁵⁸⁷

Three decades later, in response to breaking news the French Government had annexed Adelie Land, Mawson quickly assumed the role of spokesperson to assert the primacy of the British claim made during his earlier expedition.⁵⁸⁸ Mawson went public to contend that D'Urville did not go ashore in Adelie Land, but simply sighted it and coasted it for two days.⁵⁸⁹ The British and Australian governments welcomed Mawson's public diplomacy. His statements carried weight and were timed to paper over an evidence gap diplomats working on the contested territory issue were struggling to fill. In and of itself, Mawson's support for the British and Australian governments' foreign policy objectives is an example of science in diplomacy enabled through his relationships with diplomatic personnel. In the typology of Antarctic diplomacy, Mawson's science is the anchor for his diplomatic agency, putting his technical agency in the frame as a boon to the traditional conduct of statecraft. However, administrative control issues emerged alongside Mawson's national advocacy role. Lag times between scientists' announcements in the media and official communications had disadvantaged diplomatic processes in the past, and now, increasingly, presented control risks for diplomats trying to work up government negotiating positions in secret.

When Mawson headed back on the second leg of BANZARE in 1930, Casey had to race to synchronise official and science-led tracks in Antarctic diplomacy as territorial tensions ramped up between Britain and France. In an example of instructions that recognise scientists as diplomatic actors, Casey cabled from London on 8 October 1930:

It is assumed here that BANZARE will not act respecting Adelie Land in way embarrassing to British Government, which has recognised French claim. ⁵⁹⁰

⁵⁸⁷ 'The Icy South', *The Daily Telegraph*, Sydney, 9 April 1913, p 11.

⁵⁸⁸ 'Land South of Australia Annexed by France', *The Register*, Adelaide, 13 February 1925, p 9.

⁵⁸⁹ 'Adelie Land. Asking France For It', *The Sun*, Sydney, 14 February 1925, p 3.

⁵⁹⁰ National Archives of Australia: Department of External Affairs; A1383, 1494/3/4/1 Part 2, Antarctica—Executive Planning Committee, 1948-1955, p 206.

British recognition of Adelie Land post-dated the last information Mawson had received from diplomats and ran counter to secret instructions he had received from them. Mawson's instructions were to 'retrace steps and affirm the AAT claim in entirety.'⁵⁹¹ Mawson had pre-drafted a press release for this purpose and taken it south with him. Discomfort over the prospect of a scientific voice with delegated authority contradicting a diplomatic agreement prompted Casey's reference to Mawson's planned press activities in a subsequent cablegram on 10 December 1930:

Reference to Mawson Press telegram 3rd December re visiting Adelie Land. French claim Adelie Land admitted by British Government and suggest advisability of avoiding it and working towards the west in limited time available. Suggest that Mawson now slow down on Press telegrams to one or two weekly until new exploratory work begins. ⁵⁹²

The Department of External Affairs radioed these instructions to Mawson in Antarctica on 12 December 1930. The noticeably short relay from London to the Antarctic shows how far diplomatic inroads into Antarctic science were advancing in kind. The speed of the intervention shows that diplomats had no hesitation expediting diplomatic activities in the national interest by moving in behind the front-facing rationale of scientific activities in Antarctica.

The capacity for dual-purpose engagement features in the combined technical and diplomatic agency that scientists attract at the Antarctic science and diplomacy interface. When scientists commit to share an agenda with diplomats, a discernible compounding effect comes about: the latter reciprocate and join forces with scientists in the achievement of aims that both practitioners adjudge as not too dissimilar in scope. Shared agendas act as markers for international technical management by furnishing a diplomatically-relevant reason for the international systems of diplomacy and science to pass information and evidence across the two disciplines. For example, the public faces of scientific exploration and political control of

⁵⁹¹ National Archives of Australia: Department of External Affairs; A1383, 1494/3/4/1 Part 2, Antarctica—Executive Planning Committee, 1948-1955, p 206.

⁵⁹² National Archives of Australia: Department of External Affairs; A1383, 1494/3/4/1 Part 2, Antarctica—Executive Planning Committee, 1948-1955, p 205.

Antarctica in Mawson and Casey's day differed in rhetoric but were focused on the same outcome—securing access to the continent while keeping political strife at bay. Ultimately, the treaty was the way to get this, but Mawson was able to provide the traditional conduct of statecraft a science mainstay until diplomats could progress those negotiations.

Mawson rendered this diplomatic service through the agency of his public connections with scientists and his private ones with diplomats like Casey. This makes his technical expertise more significant than first meets the eye. Between them, Mawson and Casey demonstrated that mutually reinforcing the common elements of a shared agenda is an effective way for science to steady political attention among competing geopolitical messaging.⁵⁹³ In this aspect, Mawson was not only a scientist-diplomat; he was also instrumental as a technical intermediary.

The problem Mawson and Casey faced down was primarily geopolitical, and evidence for international technical management is observable in Mawson's attention to diplomatic problem solving. With the benefit of hindsight, Mawson's technical expertise as a problem solving approach emerges as a way for Mawson to speak knowledge to power. Mawson stayed focused on scientific priorities, but let them take a back seat in his face-to-face engagements and communications with the Department of External Affairs in order not to complicate the diplomatic moment. Mawson's hierarchy of choices preserved his crucial working relationship with Casey.⁵⁹⁴ Bull's consideration of international technical management as essential to the future practice of diplomacy is evidenced through this expansion of the hierarchy of choices available to diplomats on traditional tracks. As Mawson demonstrated, adding science diplomacy to the assets that states have at their disposal is a very useful way to expand problem-solving opportunities.

Mawson would continue advising Australian Ministers and the Cabinet on Antarctic-related matters behind the scenes for the rest of his career.⁵⁹⁵ By lending his technical agency to

⁵⁹³ Casey, Richard Gardiner and W. J. Hudson et al (1980) *My dear P.M.*, pp 480-481.

⁵⁹⁴ Casey, Richard Gardiner and W. J. Hudson et al (1980) *My dear P.M.*, pp 457-458.

⁵⁹⁵ Kerr, Alan (2009) *A federation in these seas*, pp 224-226.; Parliament of Australia, *House Hansard*, 18 October 1951, pp 894-895.; *Treaty of Peace with Japan, 1951*, September 8, 1951, San Francisco, California, USA. Article 2 (e)—'Japan renounces any right or title to or interest

political problem solving, Mawson succeeded in using science to support diplomacy to a remarkable degree. So much so that in 1951, Casey, by then Minister for External Affairs, recalled Mawson from Antarctica to sit on the Advisory Committee for the negotiation of the Japan Peace Treaty convened by the United States. Japan renounced its Antarctic territorial claims during these negotiations. Mawson's knowledge about Antarctica, its scientific potential, and its political contenders, was instrumental in the success of Australia's geopolitical diplomacy alongside its soon to be Antarctic allies.

Mawson straddled the informal tracks of scientific outreach and the formal tracks associated with political engagement by applying a scientist's objective voice to public relations and a diplomat's discretion in his expert advice to government. He fitted into the bigger diplomacy picture as a discrete expert adviser trusted to act on diplomatic tracks. He connected with high-level decision makers using a similitude of the diplomatic protocols of the day. Through this modus operandi, Mawson bequeathed a significant legacy to the next generations of Australian scientists. As John Béchervaise recalled:

There is a sort of apostolic succession in as much as Cook's principal botanist, of course, was Joseph Banks, and he certainly knew John Ross. And then there was a brilliant young scientist, Joseph Hooker, with Ross. Hooker lived to be ninety. And he survived both Shackleton and Scott. And then of course, Shackleton and Scott had contact with Mawson and J. K. Davis, and through Mawson and J. K. Davis we had Law and Stuart Campbell. And so, all of us in a way, you feel that this sort of link still persists. Personal contact with any such succession, if you can call it such, may be immensely helpful. There are certain things which are not normally communicated in the printed word: details of behaviour in the Antarctic, how to cope with certain situations, and practical details which are important. ⁵⁹⁶

in connection with any part of the Antarctic region, whether deriving from the activities of Japanese nationals or otherwise.'

⁵⁹⁶ Béchervaise, John and Tim Bowden (1987), *John Béchervaise interviewed by Tim Bowden in the Australian Antarctic Division Oral History Collection*, ORAL TRC 7000/8, National Library of Australia.

Group Captain Stuart Campbell became the Director of the Australian National Antarctic Research Expedition (ANARE) when it was established in 1947 before passing the Directorship to Dr Phillip Law in 1948.⁵⁹⁷ Law acknowledged that Mawson's standing as a scientist-diplomat was crucial in securing ANARE as an institutional advancement:

*His main contribution was influence on the Government. I think he was the only one who could have talked them into doing this. He had tremendous prestige in the Country and there's no doubt he prevailed on the Government to set up the Australian National Antarctic Research Expedition (ANARE).*⁵⁹⁸

The partnership between Mawson and Casey is a prototypical example of the relationships observed between successive generations of scientists and diplomats at the modern Antarctic science and diplomacy interface. In terms of an emergent practice of international technical management, one element is missing in this example. Mawson and Casey were focused on state interests, not beyond them. Bull's working definition of international technical management classifies the capacity to look beyond state interests as a key incentive for diplomats to reach out to technical experts. However, Casey would fill this gap in the very near future to lay the groundwork necessary for diplomats to accommodate international technical management within traditional diplomatic practice.

Problem solving alongside a politically astute scientist like Mawson gave Casey a foretaste of what approaches did, and did not, work when it came to finessing Antarctic issues to a level that attracted the exercise of statecraft on its behalf. When superpower geopolitics put contested Antarctic territory back in the front row of diplomacy during the International Geophysical Year, Casey was able to make good use of the science inroads Mawson made into diplomatic problem solving. As Minister for External Affairs for the decade from 1951 to 1960, Casey was in the driver's seat for the International Geophysical Year 1957-58, and Head of the Australian Delegation to the Washington Conference that delivered the Antarctic Treaty in

⁵⁹⁷ Conley Tyler, Melissa, John Robbins and Adrian March (eds) and Australian Institute of International Affairs (2012) *R.G. Casey: Minister for External Affairs 1951-60*, pp 93-94.

⁵⁹⁸ Law, Phillip and Tim Bowden (1993) *Phillip Law interviewed by Tim Bowden in the Australian Antarctic Division Oral History Collection*, ORAL TRC 7000/69, National Library of Australia.

1959. In his Head of Delegation Report, Casey emphasised the implications of the Treaty for future international relations:

*An obvious field in which the precedents of the Antarctic might have relevance is outer space. It might be possible to establish the principle that outer space should be used for 'peaceful purposes' only and to institute an inspection system to ensure that this was upheld. The possibility is perhaps still remote that problems of territorial claims and jurisdictions will arise in space, but, if and when they do, the Antarctic Treaty might provide useful precedents even in these fields.*⁵⁹⁹

In this glimpse into the future of Antarctic diplomacy, Casey looked beyond state interests to articulate an ongoing role for science at other diplomatic frontiers. Casey acknowledged in his report that diplomats at Conferences benefit from the presence of technical experts, a vision he instilled in the scientists in his own Department.⁶⁰⁰ During his ministerial tenure, Casey oversaw the professionalisation of Australia's then fledgling Diplomatic Service. Scientists of the Australian Antarctic Division serving the Australian National Antarctic Research Expedition (ANARE) were exposed to this reform as fellow employees of the Department of External Affairs.⁶⁰¹ Casey's formulation of diplomatic practice drew the work of professional diplomats and expert scientists under the banner of a single public service code, where the provision of technical advice was rather like diplomacy by association.⁶⁰² In addition to the provision of expert advice, Casey considered the development and exercise of an effective foreign policy

⁵⁹⁹ U. S. Congress Committee on Foreign Affairs, *The Political Legacy of the International Geophysical Year*, US Government Printing Office, Washington DC, 1973, pp 25-26, 38-39. The Soviet Union launched the World's first artificial Earth satellite under the IGY Science Program on 4 October 1958, which prompted an idea that the international scientific cooperation in Antarctica might be a suitable model for managing that emerging diplomatic frontier.

⁶⁰⁰ Casey, Richard and The Australian Institute of International Affairs (1952) 'The Conduct of Australian Foreign Policy', by the Rt. Hon. R. G. Casey, C.H., D.S.O., M.C, M.P., Minister for External Affairs, Third Roy Milne Lecture, Brisbane, September 25th, 1952, p 4.

⁶⁰¹ Australian Antarctic Division, *Establishment of the Antarctic Division*, <https://www.antarctica.gov.au/about-antarctica/history/exploration-and-expeditions/establishment-of-the-antarctic-division/>

⁶⁰² Boyce, Peter and Tony Press (2011) 'Diplomacy', p 276.

necessitated 'information derived from a variety of sources, mainly of a kind gathered by our own representatives on the spot.'⁶⁰³ He continued:

*As trained observers, they must provide a flow of accurate and up-to-date reports, and they must be able to anticipate the response which the governments to which they are accredited will make to any action by the Australian government. A body of experienced diplomatic representatives, sensitive to the feel of any given situation, is essential to the conduct of foreign relations.*⁶⁰⁴

The sources Casey was referring to included scientists by dint of the fact that diplomats in the Department of External Affairs, and scientists in ANARE, were both subject to this direction. It was observed in Chapter 6 that, in Antarctic affairs, diplomats carry out their traditional functions such as negotiation, representation, communication, reporting and observing, with scientists working alongside. Casey's formulation seats the first generation of Australian Antarctic scientists at a crossover between scientists' recognised support for geopolitics through science in diplomacy and Australia's claims to the Australian Antarctic Territory. It considerably shortens the institutional distance between the functions Australian diplomats and scientists typically carry out. While scientists' primary focus was science, Casey's formulation acknowledges that, in a diplomatic setting, the job of Australian Antarctic scientists was not just to note diplomats and the politics at work around them. The functions of a departmental scientist in the 1950s included observing, reporting and communicating about those other tracks as well.

During Casey's tenure as Minister for External Affairs, the distance between scientists as technical experts and scientists as diplomatic actors was short and could be crossed via direct communication with the Minister. Law and the scientists reporting to him played roles in the international relations between Antarctic claimant states before, during, and after Antarctic Treaty negotiations. The representational and negotiation roles entrusted to them confirm an accommodation in Australian Antarctic diplomacy transitioning science diplomacy towards a

⁶⁰³ Casey, Richard and the Australian Institute of International Affairs (1952) 'The Conduct of Australian Foreign Policy', p 4.

⁶⁰⁴ Casey, Richard and The Australian Institute of International Affairs (1952) 'The Conduct of Australian Foreign Policy', p 4.

track of its own. The updated typology in Chapter 7 identifies this as the inner track that supports alternative visions of Antarctica as a scientific as well as a political domain.⁶⁰⁵

First generation scientists: the political power of technical intermediaries

The work of government, especially external affairs and foreign policy, was different in Casey's day to the parliamentary model practised today. These areas were central government business, largely secret and practised behind closed doors. Access to Ministers in order to influence decision-making was reserved for trusted insiders.⁶⁰⁶ To be a diplomatic actor within the system, scientists had to be influential, that is, be able to persuade government representatives to receive information, and then to act on it in preferred ways. Law emulated Mawson's *modus operandi* and was careful to maintain the strong focus on dual political and scientific aims that Mawson entrenched:

*Well, the first reason to keep going of course was to drive a few more nails to secure Australia's claim to its Antarctic territory. Everyone realised that if we didn't get down there and do something, the Australian claim would wither on the vine, particularly in view of the fact that the Norwegians in the 1930s had done more than Mawson in Australia's Antarctic Territory.*⁶⁰⁷

As mentioned above, the Department of External Affairs had carriage of Antarctic diplomacy in the lead-up to the Treaty negotiations. In his capacity as ANARE Director, Law was responsible for the Australian Antarctic science program of the International Geophysical Year and became the front person for it while deputising as a diplomat.⁶⁰⁸ In this science for diplomacy role, Law had to juggle the role of expert scientific adviser to the Australian government on IGY matters, and lead Australia's scientific collaboration with the 12 countries active in Antarctica.⁶⁰⁹ Unlike Mawson, whose engagements with diplomats took place

⁶⁰⁵ The Royal Society (2010) *New frontiers in science diplomacy*, pp v-vi, 1, 15-18.

⁶⁰⁶ Law, Phillip and John Béchervaise (1957) *ANARE: Australia's Antarctic Outposts*, Melbourne: Oxford University Press, p xxii.

⁶⁰⁷ Law, Phillip and Tim Bowden (1993) ORAL TRC 7000/69, National Library of Australia.

⁶⁰⁸ Law, Phillip and Tim Bowden (1993) ORAL TRC 7000/69, National Library of Australia.

⁶⁰⁹ Summerhayes, Colin (2008) 'International Collaboration in Antarctica: The International Polar Years, the International Geophysical Year, and the Scientific Committee on Antarctic

between the guardrails of established diplomatic protocols, Law's service as a scientist-diplomat straddled established international science tracks and the need to engage fellow scientists on those in an increasingly diplomatic way.

The normative track in Antarctic science and diplomacy, the inner circle in the updated typology, provided an effective crossover point for Law's diplomatic outreach under scientific cover. While on official business to Paris, London, Cambridge, New York and San Francisco in 1952, Law delivered a series of lectures on Antarctica in keeping with the public-facing mode of science in diplomacy with which Australian diplomats had become familiar, thanks to Mawson. However, throughout the trip, Law's real work on behalf of the Australian government was to sound out commitment among IGY science partners for the treaty negotiations being progressed through diplomatic channels at the same time.⁶¹⁰ The round of formal and informal scientific representations started out in Paris, where Law was met and hosted by Australian Ambassador Keith Officer.⁶¹¹ Embassy staff facilitated formal visits with the French Ministry for Foreign Affairs so that Law could meet 'the men on the American Desk of the French Foreign Office who are responsible for Antarctica and the Kerguelen Island area.' The Expéditions Polaires Françaises, the Division in the French Foreign Office equivalent to the Department of External Affairs' Antarctic Division, also invited Law to spend time with top French scientific representatives.⁶¹²

Law's private diary entries about these scientific engagements record that he and his French counterparts observed 'instructions from their governments', which in practice meant taking the issues that the scientists discussed, such as joint expeditions, expenditure and shared

Research', *Polar Record*, Vol. 44, No. 4, 2008, pp 321-32, p 327.; Secretariat of the Antarctic Treaty, 'Science and Operations', <https://ats.aq/e/science.html>

⁶¹⁰ Law, P. G. *Papers of Phillip Law, 1870-1010* (manuscript), National Library of Australia, Manuscript Collection, MS 9458/7/14, Box 21, 'Report by Director, Antarctic Division, On His Visit Overseas, July-August 1952.' Law went to Paris, London, Cambridge, New York, Washington and San Francisco. He met with fellow Antarctic scientists and officers from the French Ministry for Foreign affairs and the United States Department of State arranged through the Australian Embassy in each location.; Parliament of Australia, *House Hansard*, 14 May 1958, p 1760.

⁶¹¹ Sir Keith Officer served as Ambassador to France from 1950 to 1955.

⁶¹² *Diaries of Phillip Law*, NLA MS 9458, Box 21, File 7/14, ANARE. Law reported he spent a day in discussion with the Chief of the American Desk, Monsieur Boissenger, and two staffers, Messieurs Nicolaye and Censsou.

resources, back to the Australian and French Embassies respectively for consideration through formal channels before they could commit scientific resources to them.⁶¹³ In this regard, the scientists were operating as diplomatic agents by regulating their conduct according to the same precepts that apply to engagements between diplomats. As Victor Camilleri asserts, 'diplomats are agents not principals in setting objectives to represent their countries abroad, and therefore have little leeway to allow persuasion to alter or even redefine the instructions under which they operate.'⁶¹⁴ Law's notes are evidence that scientists conducting 'scientific business' sought to comply with this fundamental criterion of diplomatic practice. The matters Law discussed with his French diplomatic and scientific counterparts shine a light on a joint political and scientific agenda. Law notes the French raised sharing meteorological reports with Australia relating to the Kerguelen Island area. The issue of an airfield at Kerguelen Island also came up. Law raised the issue of mapping and reciprocal foreign names policy. Department of External Affairs records confirm the naming issue as of utmost importance in the geopolitical jostling to gain recognition or existing claims.⁶¹⁵

It is not entirely clear if the scientists' compliance with diplomatic protocol was directed by their parent departments or self-regulating. For example, after raising several issues informally, Law and his French colleague, Monsieur Sicaud, along with the Director of the Institute of Geophysics, Professor Colombo, went on to agree several matters of a science diplomacy nature among themselves. Only these three participants are named in attendance, so the authority under which the scientists signed up to the science agreements is not obvious. What is clear is that those agreements relate to the proposed IGY, including a commitment to scientific information sharing and to prioritising close liaison between scientists during IGY preparations:

⁶¹³ *Diaries of Phillip Law*, NLA MS 9458, Box 21, File 7/14, ANARE.

⁶¹⁴ Camilleri, Victor (2013) 'Persuasion as the step towards convergence in negotiations' in Jovan Kurbalija (ed) *Persuasion, the essence of diplomacy*, Diplomacy Foundation and MEDAC, pp 91-97.

⁶¹⁵ 'New Antarctic Maps' (1940) *Polar Record*, Vol. 3, No. 20, pp 332-333.

*Item (e) IGY: 'In general, for both expeditions to interchange scientific information and to maintain the closest possible liaison in regard to preparations for the International Geophysical Year 1957-58.'*⁶¹⁶

Law kept the IGY reference low key in the minutes, but he noted its attachment to a push from the French to persuade Australia to back French interests in 'meteorological information that could be obtained from a line of stations comprising Amsterdam, Kerguelen (and perhaps the Crozets), Heard Island and Enderby Land.' Law was attentive to the fact that, in an attempt to sway Australian decision makers, Sicaud 'also stressed the value of this meteorological study in relation to his plans for creating an airfield at Kerguelen as a half-way stop between South Africa and Australia.' The pieces of this jigsaw fell into place in the United States on the last leg of his trip. Law logged that the Americans used 'the need to find out if an airstrip could be a viable staging station' in their separate diplomatic representations through Law's science channel pushing for Antarctic expeditions.⁶¹⁷ Consistent with this trail of evidence comes Law's own counsel that scientific engagements offer opportunities for 'the closest possible liaison between scientists and Antarctic administrators.'⁶¹⁸

As demonstrated throughout the combined chronology of Antarctic science and diplomacy, liaison is a mechanism in traditional diplomatic practice that supports the identification of convergent interests. Victor Camilleri reinforces why scientists and diplomats might choose this path. He maintains that 'policy lines cannot be defined or changed within a negotiation context', and goes to define 'the search for convergence as the essence of diplomacy.' Camilleri's next words are worth reading in full. 'The most fruitful diplomacy in effect mostly resolves itself into an exercise where the contending parties seek points of convergence where the key elements of their respective positions can somehow be accommodated.'⁶¹⁹ From Law's record of events, it is clear he soon realised that the scientists with whom he discussed Antarctic issues were in lockstep with him on a dual science and diplomacy track. Law accessed this track as an official representative, so in order to act as a technical intermediary, his version

⁶¹⁶ *Diaries of Phillip Law*, NLA MS 9458, Box 21, File 7/14.

⁶¹⁷ *Diaries of Phillip Law*, NLA MS 9458, Box 21, File 7/14.

⁶¹⁸ *Diaries of Phillip Law*, NLA MS 9458, Box 21, File 7/14.

⁶¹⁹ Camilleri, Victor (2013) 'Persuasion as the step towards convergence in negotiations', pp 91-97.

of science for diplomacy also needed to take into account those aspects of diplomatic practice that allowed him to be received with credibility as a diplomatic actor. In the examples above, Law's technical agency is moderated by his compliance with diplomatic protocols. However, at the same time, his role as a technical intermediary was key to enhancing Australian diplomats' ability to respond to developments on the ground during the International Geophysical Year, Law used this crossover to cement the interests of science among Australia's Antarctic diplomatic priorities.

Law had official standing as a Departmental representative, which meant he could not be the Australian delegate to the IGY organising committee. It fell to senior first-generation scientists to lead Australia's delegation to the Committee. The Department considered John Béchervaise bureaucratically distant enough not to offend CSAGI's declaration of the Organising Committee's independence. Béchervaise and others involved in IGY preparations when quickly delivered a crash course in political pragmatism when IGY science programs intersected with geopolitics over access to Antarctica.⁶²⁰

Officially known as the Comité Spécial de l'Année Géophysique Internationale, with France hosting the committee, CSAGI formally set politics aside to adopt terms of reference prioritising Antarctic scientific cooperation. This approach accorded Antarctic science a rare elevation to a common interest that surpassed national interests in the attention and goodwill it generated—the ultimate blueprint for the Antarctic Treaty Preamble. Science leaders from around the world used CSAGI as a vehicle to excise geopolitics and diplomatic constraints from their Antarctic programming. The intersection of scientific and diplomatic priorities put scientists in the centre-ground of politics. Participating at CSAGI and reporting back to the Department of External Affairs, John Béchervaise and his colleagues had opportunities to observe treaty negotiations close hand. Australian scientists advocated for the science-based innovations in the treaty from inside and outside the diplomatic establishment.

At the height of the negotiations, with Law accessing formal channels, and scientists like John Béchervaise in independent scientific roles very close to those diplomatic channels, Australia

⁶²⁰ Bulkeley, Rip (2009) 'Politics at the First Comité Spécial de l'Année Géophysique Internationale (CSAGI) Antarctic Conference', p 381.

was able to leverage engagement with the international scientific community to help position the collective weight of this wide support base behind diplomats' treaty making efforts.⁶²¹ Negotiators were flanked by scientists with access to, and influence in, the international scientific community, which had swung into action with the aim of securing the interests of science in Antarctica. In this endeavour, first generation scientists made recognisable contributions to statecraft as technical intermediaries through the medium of international advocacy.

Second generation scientists: the prowess of technical enablers

Once the treaty was signed, diplomacy shifted its emphasis from geopolitics to regime building in Antarctic affairs over the next three decades. The internationalism that pervaded global engagement for much of the 1970s and 1980s reached as far as Antarctica where second generation Australian scientists added collaboration to the bank of advocacy, representation and negotiation skills acquired by the first.

Second generation scientists joined the diplomatic line-up as career scientists while the Department of External Affairs still hosted Antarctic science in the foreign affairs portfolio and Law was Director. These scientists were instrumental in treaty implementation. On the diplomatic stage, they became standing members of the Australian delegation to Antarctic Treaty Consultative Meetings authorised to provide expert input to negotiations over ground-breaking conventions to regulate Antarctic fisheries and mining.⁶²² In Antarctica itself, scientists in this generation were entrusted to initiate diplomatic collaborations under a science banner. As Press recalled:

Scientists were sometimes encouraged, directly or indirectly to collaborate for a disclosed or undisclosed diplomatic purpose. All the time. I myself might have suggested that we should do more collaboration with country 'x' or country 'y', because we've got all these difficulties here and it would be much better if we were working together on this stuff so that their scientists and our scientists could agree on what was important. That could be then translated into advice

⁶²¹ Summerhayes, Colin (2008) 'International Collaboration in Antarctica', p 327.

⁶²² Boyce, Peter and Tony Press (2011) 'Diplomacy', pp 292-294.

*to each other's National leaders. There's nothing Machiavellian about it. It's a way of overcoming difficult issues with competing views of the world. If your scientists can agree on what the big issues are, it's going to be easier for your diplomats to agree on what the big issues are.*⁶²³

Second generation Antarctic scientists progressed Australia's foreign policy interests by opening the doors of science for national diplomacy and trade to step through. For example, the Australian government used scientific exchange in Antarctica as a pretext to engage China, a country that had neither an established presence there nor formal diplomatic relations with much of the wider world at the time.⁶²⁴ The benefits of opening doors first with science then with diplomacy had a global spin off. It consolidated the bona fides of using an expert technical track to solve political problems—a diplomatic outreach to science further along the inroads Mawson, Law and first generation scientists cemented. Atmospheric ozone depletion is an example of this. In 1985, scientists discovered a hole in the ozone layer over Antarctica big enough to destabilise the planetary ecosystem if unchecked and linked it to human use of chlorofluorocarbons (CFCs) in aerosols and fridges.⁶²⁵ In response, the Antarctic scientific community—Australians included—energised a global diplomatic initiative to ban ozone-depleting substances reminiscent of scientists' efforts during the International Geophysical Year and Antarctic Treaty negotiations.⁶²⁶

The Vienna Convention for the Protection of the Ozone Layer (1985) prohibits CFCs and establishes an international regulatory regime. *The Montreal Protocol on Substances that Deplete the Ozone Layer (1987)* sets out global control and compliance measures.⁶²⁷ The

⁶²³ Tony Press interviewed by Anne Michelle Davis on 21 November 2017.

⁶²⁴ Bergin Anthony and Tony Press (2020) *Eyes wide open*, pp 13-15.

⁶²⁵ Solomon, Susan, Roland Garcia, Rowland Sherwood and Donald Wuebbles (1986) 'On the depletion of Antarctic ozone', *Nature*, Vol. 321, June 1986, pp 755-758.

⁶²⁶ Stoddart, Michael and Marcus Haward (2011) 'Science', p 156.

⁶²⁷ *Handbook for the Vienna Convention for the Protection of the Ozone Layer* (2019) The Secretariat for the Vienna Convention for the Protection of the Ozone Layer and for the Montreal Protocol on Substances that Deplete the Ozone Layer, United Nations Environment Programme, Nairobi, Kenya: Ozone Secretariat, 2019, pp v, 2-6.; *Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer* (2020) 14th Edition, The Secretariat for the Vienna Convention for the Protection of the Ozone Layer and for the Montreal Protocol on Substances that Deplete the Ozone Layer, United Nations Environment Programme, Nairobi, Kenya: Ozone Secretariat, 2020, p xv, pp 3-35.

Convention and the Protocol were negotiated as international instruments on the back of scientific evidence from Antarctic research. As another example of science inroads into diplomacy, Antarctic scientists' collaboration with diplomats as technical experts helped to make this happen.⁶²⁸ In 2009, 'The Protocol, along with the Vienna Convention, achieved universal participation – the first treaties of any kind in the history of the United Nations system to achieve that aspiration.'⁶²⁹ This development demonstrates international technical management in combination with traditional diplomatic techniques can find applications outside the Antarctic Treaty System.

Second generation scientists were key technical advisers in the endeavour to buttress a solution to an international problem with Antarctic science. Their scientific skills were essential in capturing evidence to define the extent of the problem. It was a common threat to humanity beyond the effectiveness of any single country's response. Second generation Australian scientists emulated their predecessors, providing in-house briefings to the Australian government, explaining the evidence to decision makers then rallying the international scientific community behind diplomats efforts to secure multilateral action.⁶³⁰ A Klekociuk recalled:

We study the ozone hole as part of Australia's obligations under the Montreal Protocol. That's the Protocol that is controlling ozone depleting substances. In that work, the ozone hole is a phenomenon that covers all of Antarctica. It's in the upper part of the atmosphere, something that we can't get to easily or can't measure easily. And one country can't possibly hope to answer all the questions because this phenomenon is so large. So, the only way to do that really is through collaboration and the Treaty System in particular - and the

⁶²⁸ Solomon, Susan (2019) 'The discovery of the Antarctic ozone hole', *Nature*, 575, 46-47, November 2019, p 46.

⁶²⁹ *Handbook for the Montreal Protocol on Substances that Deplete the Ozone Layer*, p xv.

⁶³⁰ Farman, Joseph, Brian Gardiner and Jonathan Shanklin (1985) 'Large losses of total ozone in Antarctica reveal seasonal ClO_x/NO_x interaction' *Nature*, Vol. 316, pp 207-210.; Solomon, Susan (2010) 'The discovery of the Antarctic ozone hole', p 47.

fact that there is this ozone depletion problem - provides us with an imperative to come together and understand the ozone hole. ⁶³¹

Second generation scientists' willingness to work as part of the diplomatic process at large enabled diplomats to take up and emphasise specialised scientific knowledge in their pursuit of international political buy-in for the necessary science-based solutions. In Quilty's words:

You get people in that area who are really dedicated to the knowledge they generate as part of their employment. It is that scientific dedication to the truth in the answer to some question. And that knowledge becomes important in another context. When talking to politicians, that was where knowledge points to the importance of that particular thing. It wasn't the diplomatic community but it's a political community hearing this story. ⁶³²

Already versed in a growing number of diplomatic skills, second generation Australian scientists' exposure to joint scientific and multilateral diplomatic problem solving required they develop another one—policy advice. Coincidentally, multiple machinery of government changes at home helped hone this generation's policy skills. They accompanied Director Law and his successors through a maze of administrative reshuffles from foreign affairs to the science portfolio, and ultimately, the Department of the Environment from the 1990s on.⁶³³

Portfolio administrative arrangements are a snapshot of political access and influence. The status accorded to Antarctica affairs is reflected in these moves—as a matter of state, a scientific enterprise of national importance, and an environment in need of international protection at a whole-of-earth level. An obvious question is whether moving administratively from Foreign Affairs led to any erosion of the relationship between diplomats and scientists. Dr Desmond Lugg joined ANARE in 1963 as Medical Officer and was Head of Polar Medicine from 1968 to 2001. Dr Lugg worked closely with Law and his successors for over 32 years. Lugg recalls an initial distancing, followed by a complete 360, which speaks to the robustness of the

⁶³¹ Andrew Klekociuk interviewed by Anne Michelle Davis on 24 November 2017.

⁶³² Patrick Quilty interviewed by Anne Michelle Davis on 20 November 2017.

⁶³³ Richardson, Graham and Tim Bowden (1996) *Graham Richardson interviewed by Tim Bowden in the Australia Antarctic Division Oral History Collection*, ORAL TRC 7000/99, National Library of Australia.

confluence of interests that brought the scientists and diplomats together. Lugg notes this as follows:

The Department of External Affairs people said –‘now Phil if you want to maintain your credibility with the scientists you don’t want to dirty your fingers too much with the political pool. If you’re going to be a member of the Scientific Committee on Antarctic Research, and Head of the Australian Delegation to SCAR following the International Geophysical Year, and such things as that, we suggest you don’t attend any Treaty Meetings.’ So after 1961, Law didn’t attend any Treaty Meetings’.

*Now it’s quite the reverse, as Tony Press will tell you. The Director goes to the Treaty Meetings. So even though Tony’s a scientist, he got more and more involved in the political aspects. So it’s done a total 360 from the original concept of where the scientists got in, set it up, then the scientists moved off into the political realms of the Treaty. And now it’s changed again in the sense that the scientists have not become diplomats, they stay in their roles as ‘so called scientists’, but they’re going to the Meetings.*⁶³⁴

With freshly honed policy skills and located in portfolios reflective of political shifts in Antarctic priorities, second generation scientists contributed to statecraft by expanding the government’s wherewithal to conduct diplomacy over complex technical problems. Third generation Australian Antarctic scientists are the beneficiaries of this expanded professional scope.

Third generation scientists: the persuasiveness of technical partners

The third generation of Australian Antarctic scientists is the current one. Their participation in diplomacy parallels the politicisation of Antarctic science for which the ozone problem proved a forerunner. In the 1990s, an international focus on environmental issues embedded itself in global diplomacy.⁶³⁵ Diplomats faced increasing numbers of problems that crossed national

⁶³⁴ Desmond Lugg interviewed by Anne Michelle Davis on 22 November 2017.

⁶³⁵ Elliott, Lorraine (2004) *The Global Politics of the Environment*, pp 29-30.

borders enabling scientists to suggest science-led rather than strictly politically driven solutions.⁶³⁶ Antarctica, the only continent in the world without borders, became a crucible for science-based political problem solving. Third generation scientists and diplomats encountered each other often on the floor of Antarctic Treaty Consultative Meetings over cutting-edge problems like regulating whole ecosystems. Dr Andrew Constable has been active in CCAMLR since 1986 and Program Leader at the Australian Antarctic Division Antarctic Climate and Ecosystems Collaborative Research Center (ACE-CRC) since 2005. Dr Constable notes:

*Things changed in the 1990s where there were decision rules decided and agreed about the use of science in decision-making in CCAMLR – not in the Treaty – but in CCAMLR, which meant that with the acquisition of particular kinds of data there would almost be automatic catch limits set for fisheries. And so there was quite a long period where the advice from the Scientific Committee was easily achieved to be a consensus and the Commission would automatically receive that and apply those catch limits that were recommended.*⁶³⁷

The Antarctic science turn to diplomacy discussed in Chapter 6 has a corollary, an Antarctic diplomacy turn to science during implementation of the Treaty regime, evident in negotiations to strike the key conventions to the Antarctic Treaty that make up the Antarctic Treaty System. The *Convention on the Conservation of Antarctic Marine Living Resources* legislates a natural border—the Antarctic Convergence—as the legal boundary governing the management of Antarctic bio-resources such as fish, krill and birds.⁶³⁸ The *Protocol on Environmental Protection to the Antarctic Treaty*—the Madrid Protocol—establishes primacy of environmental management over mining in Antarctica. During the negotiations, third generation scientists redoubled efforts to steer diplomacy in the direction of science using

⁶³⁶ Ozone depletion in the atmosphere is a keystone example.

⁶³⁷ Andrew Constable—Program Leader, Australian Antarctic Division and the Antarctic Climate and Ecosystems Collaborative Research Centre (ACE-CRC), Institute for Marine and Antarctic Studies (IMAS), Hobart, interviewed by Anne Michelle Davis on 28 November 2017.

⁶³⁸ Commission for the Conservation of Antarctic Marine Living Resources, *CCAMLR and its links to the Antarctic Treaty*, report by the Commission for the Conservation of Antarctic Marine Living Resources, p 4.

their technical agency to compound the political leverage derived from Antarctic research to support these innovations. In this process, scientific evidence became a resource for diplomats similar to intelligence and economic data. Providing this resource requires third generation scientists to support diplomats at a level between statecraft and research, establishing them as technical partners in treaty governance.

Technical partnership is integral to how third generation scientists approach their work. They have come to consider diplomatic priorities and solving scientific problems as inseparable. Key to this joint problem-solving mindset is an institutional awareness of diplomacy among scientists, and an experience-based lexicon scientists and diplomats understand and share. This mindset and shared lexicon, plus legacy skills passed on by the previous two generations, equip the current cohort to build consensus on technical matters at Antarctic Treaty Consultative Meetings. As Goldsworthy puts it:

In the Antarctic arena, to Antarctic policy makers, the scientists would be up at a high influence factor of nine, even ten out ten. Australia would rarely make a decision or a proposal based on a fisheries management thing, for example, that did not have a scientific basis. ⁶³⁹

Australian scientists at the Antarctic science and diplomacy interface

The experience of all three generations of Australian Antarctic scientists indicates Antarctica has been a proving ground for scientific inroads into diplomacy. Scientists transfer knowledge gained from their close working relationships with diplomats from one scientific generation to the next. Institutional awareness of diplomacy enables them to design and conduct scientific activities to support common and national interests, and to achieve scientific outcomes. Notably, provision of expert technical advice is common across all scientific generations and diplomatic functions in the Antarctic Treaty System. Antarctic diplomats consistently take up and use this advice, allowing scientists to emerge as technical intermediaries, technical enablers and technical partners who enhance their diplomatic skill set with each adaptation.

⁶³⁹ Lynne Goldsworthy interviewed by Anne Michelle Davis on 13 December 2019.

Each adaptation highlights that international technical management has a signature in Antarctic diplomacy. The science and diplomacy interface itself is a diplomatic frontier that enables scientists to position expert advice into proximity to diplomatic decision makers. Evidence of scientists as diplomatic actors emerges where scientific evidence is used to scope the extent of possible solutions to political problems. The value of science as a diplomatic currency can be measured at the interface through the uptake of scientific evidence as a diplomatic resource similar to intelligence and economic data. At the Antarctic interface, both scientists and diplomats have come to rely on mutual engagement at a level between statecraft and science where these elements of international technical management can be applied.

A final update to the typology of Antarctic diplomacy is needed here. By virtue of the track that supports the emergence of international technical management as a characteristic of Antarctic diplomacy, scientists too can step beyond the traditional bounds of their discipline to endorse 'diplomacy' as an activity in the common interest. This observation explains the equivalence between the conduct of science and traditional diplomatic practices that holds the puzzle of the Antarctic Treaty; the question at the heart of this investigation.

Where do scientist-diplomats operate? What defines a scientist-diplomat?

Answers to the puzzle of the science pillar in Antarctic diplomacy lie in the technical antecedents of science diplomacy that are revealed at crossover points in its combined chronology. Generations of diplomats and scientists have engaged each other at these points in the Antarctic science and diplomacy interface. As a result, they have been able to admit science into the diplomatic problem-solving mix by adapting traditional diplomacy by degrees to extend its scope. The inroads science has made into Antarctic diplomacy go a long way. So, where exactly do scientist-diplomats operate now? According to Allan Needall, in the sensitive liaison roles between the world of science and the national security state.⁶⁴⁰ In Antarctica, that world is defined under terms in the Antarctic Treaty that deems there has to be scientific

⁶⁴⁰ Needall, Allan (2010) 'Lloyd Berkner and the International Geophysical Year Proposal in Context', p 206.

activity on the continent for participating nations to fulfil their treaty obligations and be Antarctic decision makers.⁶⁴¹

At the time the Antarctic Treaty was struck, the interface between their professions enabled diplomats and scientists to host the overlapping political and scientific agendas that underpinned the diplomatic innovations of suspending territorial claims and dedicating the continent to peaceful use and scientific research. In terms of science diplomacy, scientists of the IGY generation deployed every skill and insight they had accumulated through exposure to diplomacy, to articulate the challenges they considered crucial to scientific advancement. In the contemporary operations of the Antarctic Treaty System, scientists were influential officials behind the scenes, and public masters of the technicalities.⁶⁴²

First, second and third generation Australian Antarctic scientists have fulfilled their roles in this same way. Where states wish to assert the authority of diplomacy as an arbiter in international relations with mixed technical and political features, the part of their combined legacy most relevant to the convergence of political and technical challenges in the twenty-first century can be found in Needall's accompanying observation of IGY scientists in action as diplomats. These scientists built up a critical mass of diplomatic currency, motivated 'by the presumption that the goals of the American scientific, military and international establishments closely overlapped with the interests of scientists and people throughout the globe.'⁶⁴³ This observation accords with the *modus operandi* of Antarctic scientists as a professional cohort.

The professional relationship between diplomats and scientists continuously evident over the ensuing 60 years of treaty implementation endows Bull's foresight about a place for the technical expert within traditional diplomacy with a practical footing.⁶⁴⁴ The place diplomats have given to scientists in Antarctic diplomacy is not a concession on their part, nor an intrusion by scientists into a professional realm not their usual just to influence political

⁶⁴¹ Parsons, Anthony (1987) *Antarctica The Next Decade*, p 9.

⁶⁴² Needall, Allan (2010) 'Lloyd Berkner and the International Geophysical Year Proposal in Context', pp 216-217.

⁶⁴³ Needall, Allan (2010) 'Lloyd Berkner and the International Geophysical Year Proposal in Context', p 220.

⁶⁴⁴ Bull, Hedley (1977) *The Anarchical Society*, p 170.

decision making. The place is an extended diplomatic track, one by means of which diplomats seek to connect with technical problems and to establish relationships with subject matter experts in order to master the proprieties of solving them. This, in particular, motivates Australian Antarctic scientists to keep making inroads into traditional diplomacy. Importantly, the Antarctic science and diplomacy interface is a co-evolution of scientific and diplomatic conduct, and it bears hallmarks of being shaped by diplomats too. The signature features of mutual recognition and mutual engagement owe much to diplomats' own core expertise working with other people to resolve issues. The course of Antarctica's combined chronology has led diplomats to adduce the necessity of incorporating technical expertise from international systems, such as science, to solve problems that start in non-political systems and end up in political ones because that is where diplomacy takes place. The need to protect the Antarctic environment is a case in point. Add scientists' expertise in making sense of facts to diplomats' perennial challenge of working up resolutions through other people, and the other hallmark feature of mutual reliance emerges.

Mutual reliance is a point of comparison between Antarctic science diplomacy and science diplomacy at large. Burton sums it up this way. 'Solutions are discovered by research and thought. The search for solutions reveals complexity and can be disappointing and frustrating. Solutions, once found, usually require a consensual support before they can be incorporated into policy.'⁶⁴⁵ In the joint operating space the Antarctic science and diplomacy interface enables, Bull's working definition of international technical management authenticates the voice of technical expertise in Antarctic diplomacy.

Diplomats are now facing a lot of problems that they need to work together at the Government level to solve but borders get in the way. From their Antarctic experience, scientists and science have something to share with diplomats, if only a 'rule of thumb' guidance for how they might solve those kinds of problems better?

⁶⁴⁵ Burton, John (1965) *International Relations: A General Theory*, Cambridge: Cambridge University Press. John Wear Burton was Secretary of the Department of External Affairs from 1947-1950.

You only have to look at the major global issues confronting humankind. You've got water security, you've got food security, you've got physical security regardless of what the physical threat to an individual might be. Then you've got climate acting separately from all of that, but as an accelerant to all of those things. And none of those issues are going to be resolved by confining your science to being contained within your own national boundaries. They're international issues and no one country has the ability to solve any of those on their own. So that sort of globalisation of scientific endeavour and the integration of scientific endeavour is necessary.

Which by one analysis, gives scientists greater reach than diplomats have ever had dealing with global problems because they're constrained at the level of sovereignty to working for their national interest using their national capabilities and military power among other things. And in a sense when you are in that situation scientists can actually act as your 'agents of change' while you're quietly dealing with your domestic challenges. ⁶⁴⁶

The Antarctic interface allows scientists to operate in sensitive liaison roles between the world of science and the national security state but it does not always require them to be scientist-diplomats to do so.⁶⁴⁷ Nonetheless, the voice of technical expertise in historical and contemporary Antarctic diplomacy goes to the core of what defines a scientist-diplomat. To be a scientist-diplomat 'requires a subtle form of leadership and entails greater professional risk' than being a scientist alone.⁶⁴⁸ Australian scientists mitigate this risk through the adjustments they make to their roles that allow them to cast their advice using the diplomatic, technical or evidence orientation best suited to the individual diplomats who are handling of issues of concern. Scientists' interventions are more agile and better respected as a result. The repeated success of scientific agendas at Antarctic Treaty Consultative Meetings can be laid, in large part, at the door of scientists as international technical managers.

⁶⁴⁶ Tony Press interviewed by Anne Michelle Davis on 21 November 2017.

⁶⁴⁷ Needall, Allan (2010) 'Lloyd Berkner and the International Geophysical Year Proposal in Context', p 206.

⁶⁴⁸ Cooper, Andrew et al (2013) 'Introduction: The Challenges of the 21st Century', p 8.

Table 3 below sets out the inroads Antarctic science and scientists have made into traditional diplomacy that support the emergence of international technical management as an adaptive technique in Antarctic diplomacy.

Table 4 Scientists at the Antarctic science and diplomacy interface—1880 to 2021

Scientific Generation (Australian)	Timeframes	Chronology of Antarctic Diplomacy	Diplomatic Mode	Scientists' Diplomatic Function	Diplomacy Skills	Antarctic Science and Diplomacy Interface	Technical Function*	Foundations of International Technical Management
First Generation	1880—1961 Antarctic Treaty	Geopolitics Territory and sovereignty (D) Discovery and knowledge acquisition (S)	Traditional Diplomacy	Integral to Treaty negotiations	Advocacy Representation Negotiation	Diplomatic frontier	Technical Intermediaries	Scientists position expert advice in proximity to decision makers
Second Generation	1961—1991 Antarctic Treaty Conventions	Regime Building Resource mgt (D) Conservation (S)	Multilateral Diplomacy	Instrumental in Treaty implementation	International collaboration Policy advice	Scientists as diplomatic actors	Technical Enablers	Scientific evidence used to scope the extent of political problems
Third Generation	1991—2021 Antarctic Treaty Consultative Meetings	Treaty Machinery Governance (D) Monitoring and compliance (S)	Institutional Diplomacy	Influential in Treaty compliance	Joint problem solving Consensus building	Science as a diplomatic currency	Technical Partners	Scientific evidence is a diplomatic resource similar to intelligence and economic data
(D)—Diplomacy priorities (S)—Science priorities * Provision of expert technical advice is common across all scientific generations and diplomatic functions								

Building diplomacy practice

After exhaustive investigation, the narrative that Antarctic diplomacy adds to the field of diplomacy, and to science diplomacy in particular, is a long exposé of how diplomats and scientists deal with complex issues. Those complex issues include negotiating state interests alongside the interests of science, and governing a continent by attending to human interests as a convergence of political, scientific and environmental needs. At the Antarctic science and diplomacy interface, the diplomatic approach to these issues includes a recognition by diplomats and scientists that the other is trained to deal with different elements of this bigger picture, but need to work together to deal with all of them. Rather than adhering rigidly to the traditional political hierarchy behind international problem solving, historical and contemporary practitioners of Antarctic diplomacy have accommodated diplomacy performed through the agency of science, diplomats and scientists have adapted the techniques they use in order to admit technical advice into their problem-solving mix.

The Australian case study speaks volumes at a time when diplomatic practice is facing accelerating change. Question marks hang over the established diplomatic order of prioritising state over human interests. Natural phenomena are generating a new kind of international conflict over geophysical upheavals such as climate change. The trend is for political decision makers to seek input from technical experts to mitigate the impact of these new disruptors. Contemplation of Bull's concept of international technical management is timely. Shifts in the main game are challenging acceptance of states as principal diplomatic players. Alongside states and the diplomats who represent them, a range of actors are stepping up to offer expertise and expand the reach of diplomacy into areas that require specialist knowledge.⁶⁴⁹ Like Bull, Cornago recognises effective responses to contemporary shifts in the diplomatic centre of gravity depend on the respective expertise of diplomats and technicians including scientists.⁶⁵⁰

⁶⁴⁹ Wiseman, Geoffrey (2020), 'Diplomacy', p 1194.

⁶⁵⁰ Cornago, Noé (2016) 'Diplomatic Knowledge', pp 134-136.

The Antarctic interface is evidence of diplomats and scientists acting together on technical expertise as a centrepiece of their diplomacy, enhancing the practice of both disciplines rather than constraining either. With this comes a relationship scientists and diplomats both invest in, one that has a shared experience base at its core. This draws attention to points in common and crossovers between the two disciplines that facilitate science inroads into diplomacy. The characteristics of international technical management identified in this case study of Australian Antarctic scientists apply equally well to diplomats. As converging political and technical challenges of the twenty-first century call the respective expertise of diplomats and scientists into joint global practice, there is an opportunity for those who think international technical management may be an approach worth developing to consider what the Antarctic example offers.⁶⁵¹

The Antarctic science and diplomacy interface offers milestones for practitioners to target. Scientists and diplomats who work at the interface acknowledge it as a diplomatic frontier. This alleviates the presumption that traditional diplomatic priorities associated with state interests must take precedence. In Antarctic diplomacy, scientific advice already informs foreign policy objectives, facilitates international science cooperation, and improves international relations between countries through science cooperation.⁶⁵² In essence, the emerging practice of international technical management at the interface is science *and* diplomacy, deployed as equivalent problem-solving instruments when problems manifest with mixed political and technical features. The emerging technique of International technical management demonstrated by Australian scientists and diplomats enhances the likelihood that diplomacy will be effective in non-traditional settings where knowledge or technology are part of the solution.

⁶⁵¹ Cornago, Noé (2016) 'Diplomatic Knowledge', pp 134-136.

⁶⁵² The Royal Society (2010) *New frontiers in science diplomacy*, pp v-vi, 1, 15-18.

10—Conclusion

This thesis set out to explore how scientists and diplomats created an enduring science and diplomacy interface in Antarctica, and how they use it to make science count in diplomatic problem solving. The incentive behind this exploration came from Hedley Bull, who mid-last century contemplated how diplomatic practice might need to change in order to keep pace with the rapid technological advances he observed encroaching on the traditional decision-making priorities of diplomacy. Short of asking diplomats to cross-train as scientists, or training scientists in diplomacy, Bull put forward a concept of international technical management as one way for diplomats and scientists to approach solving problems with mixed political and technical features. Over the course of nine chapters, this thesis tested Hedley Bull's concept. Core findings from a longitudinal examination of science in Antarctic diplomacy, and a case study of three generations of Australian Antarctic scientists are summarised below.

The Antarctic science and diplomacy interface is an example of science diplomacy in action, including emerging techniques such as international technical management that expand the hierarchy of choices scientists' and diplomats' have at their disposal to tackle problems with mixed political and technical features. This thesis demonstrated that such adaptive techniques complement traditional diplomatic practices. In particular, international technical management has proven useful in enabling Antarctic scientists and diplomats to prioritise when to tackle political challenges, or to work on challenges arising from the results of Antarctic research, or both at the same time.

International technical management manifests through adjustments to the respective practices of science and diplomacy that enable: a technical orientation to international engagement, a diplomatic orientation to the provision of technical advice, and an evidence orientation to diplomatic problem solving. In Antarctica, international technical management is the foundation for a form of practical diplomacy that diplomats and scientists conduct among themselves. It takes place in settings where specialised knowledge is required to understand a problem, or to find a solution to that problem, as part of an overarching political agenda. This working definition of international technical management is a starting point for further research to ascertain where it might best be applied in that practice of diplomacy at large.

The case for international technical management started in Chapter 2 with a puzzle about how scientists negotiated the interests of science into a Treaty aimed primarily at averting a territorial conflict over who owned what parts of Antarctica. Chapters 3 and 4 resolved the puzzle by answering the research question about how the Antarctic science and diplomacy interface came about. Chapter 3 found that, as the evolutionary chronologies of Antarctic diplomacy and Antarctic science crossed and recrossed during the history of Antarctica's discovery and rise to geopolitical salience, those crossover points created opportunities for scientists to interact with diplomats. Scientists observed the diplomatic practices in use around them, and over time, took up some of these practices and put them to use in negotiations.

Chapter 4 found that the political technical, diplomatic and combined agency that scientists accrued at the interface was instrumental in shaping a combined chronology of Antarctic diplomacy and science. Examples of The Royal Society's definition of science diplomacy were identified throughout the combined chronology. New evidence to support that Antarctic scientists and diplomats practised science in diplomacy, diplomacy for science, and science for diplomacy much earlier than previously assumed advanced the case for answering 'yes' to the primary research question—could what diplomats and scientists do at the Antarctic science and diplomacy interface enhance joint problem solving elsewhere?

Chapter 5 took the evidence of the longitudinal evolution of science diplomacy from Chapter 4 and applied it to specify the foundational and formative characteristics of the Antarctic science and diplomacy interface. This analysis contributed fresh information to the body of knowledge about Antarctic diplomacy. In itself, that evidence advances research into the nature and scope of science diplomacy as a discipline within diplomacy. Another advance came through the identification of combined agency. Combined agency is an amalgam of technical expertise and goodwill generated through scientist-to-scientist relationships, which when applied as part of a diplomatic agenda, acts as a wellspring for science as a diplomatic currency. Combined agency is essential for scientists to conduct international engagements ancillary to their technical collaborations. In relation to the case for international technical management, combined agency is an essential component in scientists' ability to influence diplomats.

The focus of Chapter 6 was to search for evidence of science inroads into diplomacy. A key finding was that crossover points between science and diplomacy at the Antarctic science and

diplomacy interface enable scientists and diplomats to forge relationships based on mutual recognition, mutual reliance and mutual engagement. This finding was the basis for specifying what activities are conducted on the dual pathway of science and diplomacy observed in the combined chronology. That dual pathway was the avenue scientists used to participate in the Antarctic Treaty negotiations in 1959.

Chapter 7 modelled a new typology of Antarctic diplomacy and science. The updated model accounted for how the architects of the Antarctic regime institutionalised the inroads that science made into the geopolitics and machinery of traditional diplomacy in the Antarctic Treaty System. The modelling advanced a normative track within Antarctic diplomacy that enables scientists to support diplomacy through the agency of their technical expertise. The model advanced the case for international technical management by defining the epistemic and institutional elements that make up science diplomacy in Antarctica. In the Antarctic example, scientists' ability to participate in problem solving at the geopolitical and machinery levels of diplomacy depends on this dual track.

These findings confirmed that international technical management is an adaptive practice that complements traditional diplomacy. They also qualified the answer to the primary research question. Quintessentially, the Antarctic science and diplomacy interface is a problem-solving space where diplomats who undertake the traditional activities of diplomacy, and scientists who contribute technical expertise, agitate politics in equal measure. The headlines of the updated typology are that traditional diplomatic techniques and international technical management are complementary practices. The updated typology confirmed certain exclusive elements in the operating context of the Antarctic Treaty regime. Those elements include the fact that the Antarctic Treaty is still unique. Treaty innovations such as the suspension of territorial claims and enshrining international scientific cooperation as an engagement model for diplomacy have not been replicated elsewhere.

The presence or absence of these elements alone does not completely prevent the transfer of adaptive techniques like international technical management to other settings. However, the spheres of cooperation identified between scientists and diplomats in the Antarctic example are state-based and depend on the disposition of states to act in certain ways in order to insulate science in the way the Antarctic Treaty does. The inwards-focused problem-solving

environment of the Antarctic regime supports a relationship status quo between scientists and diplomats based on their long-term associations. Mutual recognition, mutual reliance and mutual engagement over Antarctic problem solving are products of this status quo. Therefore, this finding has implications for obvious areas for cooperation that might benefit from international technical management, such as climate change.

The kinds of interests that might mobilise to block climate science in diplomacy are very different to Antarctic science. Those interests include vested interests, for example, fuel companies or governments that rely on the global oil-based economy. Additional research to identify whether a relationship status quo similar to the Antarctic example has been established is needed to progress the argument of transferability. Such future research efforts would also benefit from investigation into other examples, in other settings, where diplomats and scientists have successfully concluded treaties, conventions or regulations. The aim of investigating those cases would be to identify if normative science diplomacy practices have also emerged there.

The fact that the current research endeavour did not surmount the counterargument does not mean that Antarctic Treaty-derived practices are a prototype with nowhere to go. For example, the Australian Antarctic scientists who participated in elite interviews for this project demonstrated their credentials as scientist-diplomats when concern over the scientific discovery of the ozone hole became a global problem that clearly exhibited mixed political and technical features. As a contrasting example of international technical management in action between scientists and diplomats, Hugh White recalled the example of negotiations to secure the Chemical Weapons Convention. Those negotiations were under way at the same time as negotiations on the Antarctic Protocol on Environmental Protection. White described it thus:

We did the Chemical Weapons Convention at the same time as the Antarctic Environment Protocol. The thing with the Chemical Weapons Convention is that everyone agreed that we should ban chemical weapons. What was striking about it is, the problem there was a technical one, that is, nobody could work out how you could establish a credible regime that would allow you to monitor chemical production in signatory states to see whether they were in violation, because chemical weapons and their precursors are so much like ordinary

chemicals. And, the answer there was a technical one. It was a technical problem, there was a technical answer—‘okay, we can solve this problem as follows.’

Now it involved some big politics. It involved very intrusive inspections of commercial establishments, which people at the outset had regarded as impossible. But, that only came on to the table because they'd recognised that if you did get that, if you satisfied that political condition, then there were technical means available to make verification regimes stick. There was a very important scientific input to that, that was, you really needed to understand the chemistry to build the argument in support of the verification regime that was embedded in the CWC Regime, and which produced a Treaty and produced the Chemical Weapons Convention we have today, and the whole machinery that goes round it. ⁶⁵³

Implicit in White's formulation is the need for an awareness about which parts of a proposed solution are technical, and which parts are political. The updated typology has something to add on this point. It demonstrated that diplomats and scientists contribute to Antarctic diplomacy even when their political and scientific interests are not entirely convergent. The point about close but not entirely convergent interests is significant. Camilleri contends that 'the most fruitful diplomacy in effect mostly resolves itself into an exercise where the contending parties seek points of convergence where the key elements of their respective positions can somehow be accommodated.'⁶⁵⁴ In response, Antarctic scientists and diplomats concentrate on crafting **solutions** with mixed political and technical features.

Another contribution this research has made is to advance Bull's concept of international technical management towards classification as a diplomatic technique. Chapter 8

⁶⁵³ High White interviewed by Anne Michelle Davis on 24 October 2018. The Chemical Weapons Convention (CWC), formally The Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction. The Convention was adopted on 3 September 1992, opened for signature on 13 January 1993 and entered into force on 29 April 1997.

⁶⁵⁴ Camilleri, Victor (2013) 'Persuasion as the step towards convergence in negotiations', pp 91-97.

demonstrated how Australian Antarctic diplomats and scientists adjust their professional practices in ways that make international technical management feasible. As listed above, those adjustments are: a technical orientation to international engagement, a diplomatic orientation to the provision of technical advice, and an evidence orientation to diplomatic problem solving. The findings of Chapter 9 confirmed that international technical management is in use at the Antarctic science and diplomacy interface, where Australian scientists support diplomacy in roles as technical intermediaries, technical enablers and technical partners.

A finding common to both Chapter 8 and Chapter 9 is that international technical management can be measured by:

- the time diplomats devote to scientists during forward planning for annual Antarctic Treaty Consultative Meetings,
- the effort scientists make to include diplomats in consensus-building for resource management deliberations under the Convention for the Conservation of Antarctic Marine Living Resources, and
- the mutual recognition, mutual reliance and mutual engagement evident in joint efforts scientists and diplomats make in negotiations under the Convention on Environmental Protection to the Antarctic Treaty.

In the example of the Antarctic science and diplomacy interface, diplomats and scientists benefitted from time spent together before, during and in between diplomatic engagements. Sufficient time and access has meant that 'the relationship and the balance between scientists, diplomats, and policy makers is quite settled for many countries who participate in the Antarctic Treaty System.'⁶⁵⁵ This poses an additional, but not insurmountable, challenge to practitioners at other interfaces seeking to enhance joint problem solving through international technical management where time may not be on their side. However, reasons for those practitioners to keep looking in Bull's direction are set out in the following final reflections.

⁶⁵⁵ Gill Slocum interviewed by Anne Michelle Davis on 6 December 2017.

Antarctica and the global science and diplomacy interface

Australian scientists' take on the last hundred years of Antarctic diplomacy is that it has supported science in ways traditional diplomacy had not sought to accommodate before. The Antarctic variation on the usual order of priority enables scientists to provide evidence to support decision making:

Science is absolutely critical and should be foremost in the minds of people who want to form some sort of diplomatic process, not control, to administer what happens on the continent of Antarctica. Science is the basis around which diplomacy should be developed in the understanding and preservation of that last continent we have, that we can learn so much from. ⁶⁵⁶

The existence of the science pillar in the Antarctic Treaty demonstrates that such support for non-traditional approaches to international engagement is not only possible, but that diplomatic engagement through science adds valuable compounding leverage to the pursuit of political interests, even those more traditionally focused on territory and resources. There is political protection in the way the science pillar in the Antarctic Treaty finesses the traditional order of diplomatic priorities within its diplomatic machinery. Important as this is to the Antarctic Treaty System, three generations of Australian Antarctic scientists would like to think that their participation in that machinery as technical experts and diplomatic actors adds another layer to the protection the treaty extends to Antarctica:

Science is all part of the diplomacy that was going on at the time. If Australia lays claim to about 42% of the Antarctic continent, and if they want to continue to lay claim to that, whatever that means, then they have to be seen to be supporting science in Antarctica. ⁶⁵⁷

The fact that the Treaty has operated for sixty years with extensions to its governance and environmental protection mechanisms but unchallenged by any call for formal review is evidence of this. The overarching protective effect scientists and diplomats refer to as a feature

⁶⁵⁶ Ian Allison interviewed by Anne Michelle Davis on 12 October 2018.

⁶⁵⁷ Ian Allison interviewed by Anne Michelle Davis on 12 October 2018.

of the contemporary Antarctic science and diplomacy interface derives as much from the science diplomacy Antarctic scientists undertook before, during and after treaty negotiations as from the legislative innovations in the Treaty itself. However, it was the accompanying evolution in science diplomacy techniques that enabled diplomats and scientists to act on Bull's 'convergent interests of humanity' and steer problem solving at the geopolitical level beyond the confines of pre-existing political expectations. Traditional diplomacy still dominates the geopolitical arena. Nevertheless, science diplomacy is encroaching into that decision making heartland as the use of evidence normalises in the practice of Antarctic diplomacy. In this respect, Bull's forecast about the future of diplomatic practice turns out to be right, and the Antarctic Treaty System has useful lessons to share:

I think I'd have to say the Antarctic Treaty and the Antarctic Treaty System bequeaths us the notion that there are principles, there are values that should be seen to transcend national values and principles, that they're transcendent. It's like the idea of Magna Carta. You have a King, but you also have Barons with their own fiefdoms and virtually their own laws and authority. And then you have Magna Carta which made the King subject to an overarching law and created a Country. Well, we're now internationally in the same sort of situation. The Antarctic principle should encourage us to recognise that there's something beyond conventional international politics, that we, in our next era of human progress, should involve a recognition that there are values that are beyond our own particular national interests. ⁶⁵⁸

The science and diplomacy interface that exists in Antarctica is based on long-term relationships between diplomats and scientists that scaffold traditional practices in both disciplines. Once the Antarctic Treaty came into effect, diplomats' continued close engagement with scientists within the Antarctic Treaty regime makes good Bull's forecast about international technical management and reinforces Copeland's sense that, in practice, science diplomacy nurtures diplomatic techniques of its own. At the Antarctic interface, international technical

⁶⁵⁸ Sir Guy Green interviewed by Anne Michelle Davis on 5 December 2017.

management indeed defines the kind of diplomatic actors Antarctic scientists have turned out to be.

The emerging adaptive technique of international technical management is a key finding. As practised at the Antarctic interface, international technical management strays into categorisation as a science diplomacy technique because of its utility in articulating new facets of the still-evolving definition of science diplomacy itself. However, at this stage, it is not appropriate to type-cast it this way because international technical management entails reorientation by diplomats as well as scientists. When professionals in either discipline deploy it as a technique, international technical management enables diplomats and scientists to engage each other fully at the interface between their professions. The mutual benefit of preserving Antarctica as a peaceful place—an aspirational outcome contemporary diplomats and scientists strive to sustain for motives that hark back to their historical reasons for originally exploring there—means Antarctica is still a world laboratory with untapped scientific knowledge, and still the only unpossessed continent on Earth.

From all angles of Antarctic diplomacy, an acute appreciation of convergence rather than leverage in negotiations defines the diplomatic ethos of the Antarctic Treaty System. It is an ethos diplomats and scientists share. The presence or absence of a shared ethos has the potential to enable, or constrain, the uptake of international technical management elsewhere. However, diplomats and scientists who want to enhance joint problem solving could look to start at that point. Outside the Antarctic context, scientists carry the burden of initiative. It is scientists' willingness to engage in the machinery of Antarctic diplomacy that supports diplomats when they step beyond the traditional bounds of that profession to bring scientists' technical expertise to bear on political solutions. For scientists at the global science and diplomacy interface, this is an additional action to implement. Another look at the reorientations discussed in Chapter 8 could support this. Rowe's words bear emphasising:

You can't, in any way, sustain the integrity of the ATS without the contribution of science in its different forms, and without the scientists and Foreign Affairs people in particular, maintaining an absolutely linked up relationship. It would be impossible. There needs to be that very close cooperation and mutually supporting cooperation really, because quite often the scientists may not be

able to achieve a scientific objective on a big issue like a Marine Protected Area without the Foreign Affairs support. And that's where both are mutually supportive, when necessary. ⁶⁵⁹

It remains to be seen if the emergence of international technical management is specific to the Antarctic context. This project has taken a first step by investigating and documenting practices at the working science and diplomacy interface in Antarctica. Those practices, and the relationships between scientists and diplomats they sponsor, reinforce the Antarctic interface as a prototype for how diplomacy might continue to evolve. More research using other case studies involving political problems with mixed political and technical features would be needed to confirm the presence and viability of international technical management in the practice of diplomacy at large, and its contribution to the evolution of science diplomacy in particular.

Any avenue to extend research into Bull's working definition beyond the Antarctic interface is worth further effort. However, one merits immediate attention. As the Antarctic regime heads towards the end of the next thirty-year treaty cycle in 2051, and parties figure out their position on whether or not to call for a review under Article XII, the current focus on climate change in Antarctic research is already enjoining diplomats and scientists in a larger debate at the global science and diplomacy interface:

Once again, I would hope that as science advances, particularly when it comes to the understanding of global climate change, that Antarctica is such an important repository of information that I'm sure there is lots of work that can be done in the area of climate science. Baseline data can still be collected in Antarctica and hopefully the diplomacy will come from a lot of that work in influencing other nations about climate change and climate science for the future preservation and survival of Planet Earth. Because we don't have to go too much further than where we are at the moment to put it over the tipping point. ⁶⁶⁰

⁶⁵⁹ Richard Rowe interviewed by Anne Michelle Davis on 6 December 2018.

⁶⁶⁰ Ian Allison interviewed by Anne Michelle Davis on 12 October 2018.

That larger debate is over how to manage the long-term viability of the Earth's ecosystems. With the benefit of evidence about how international technical management enhances joint problem solving in the Antarctic context, including examples of science as a diplomatic currency and scientists as diplomatic actors to hand, there is value in assessing whether the Antarctic iteration of Bull's concept of international technical management could help diplomats and scientists at the global science and diplomacy interface avoid the pitfalls that have so far set politics against climate change science in that international discussion.

The global science and diplomacy interface is itself a diplomatic frontier, which brings home the point that the Antarctic interface is a useful precedent. The Antarctic interface is a working example of the effective use of scientific content in diplomacy, necessary to deliver outcomes when issues on the negotiating table require specialised technical redress. Richard Falk concludes the value of the Antarctic example as a prototype is that 'it has succeeded as an international model, it has achieved its major observations, it has sustained a cooperative spirit, it has avoided disputes, it has brought together this very diverse group of states in a framework where they seem to be able to cooperate, and it provides a kind of model.'⁶⁶¹ This diplomatic recognition says it all:

The importance of Antarctica in the identification and solution of global change issues may present the system with a real opportunity to exercise itself on a wider plane. Planners of global change programmes should be encouraged to include an Antarctic element in their schemes. ⁶⁶²

Antarctic scientists describe their use of science to support diplomacy in the Antarctic Treaty System as a pitch for solutions at a scale of complexity that is hugely challenging for states operating alone, and represents a new political arena for states attempting collective problem-solving over issues with bottom lines in evidence-based diplomacy. At the Antarctic interface, scientists are the arbiters of scientific content in diplomacy, in contrast to diplomats who

⁶⁶¹ Falk, Richard (1986) in Joyner, Christopher et al., 'Antarctica in the United Nations: Rethinking the Problems and Prospects', *Proceedings of the Annual Meeting (American Society of International Law)*, Volume 80, April 9-12, 1986, pp 269-285.

⁶⁶² Report from Mr David Evans, Deputy High Commissioner, Australian High Commission, London: Antarctic Treaty System—Ditchley Park Conference, 1988, NAA B87/10, pp 9, 89-130.

continue to wield the authority vested in diplomacy by governments, the key state arbiters in international relations. Allowing diplomacy and science practitioners alike to develop an awareness of how to deal with scientific content in diplomacy, and the skills needed to bring it into effective action, is what the Antarctic science and diplomacy interface does best:

A diplomat should try and find out as much about the scientific programs and issues as he or she can. You can get away with not knowing much about it but won't have as much respect and influence. So, yes, I think in Antarctica but also elsewhere, that negotiators who have a broad and deep knowledge about the subject matter they're negotiating will be more successful than those who don't. ⁶⁶³

International technical management is an emerging diplomatic technique with the potential to come of age in our times. As practised at the Antarctic interface, it is a technique that encapsulates the pragmatic heart of diplomacy and the adaptive nature of the scientific discipline observable when scientists accompany diplomats to the blue edge of diplomatic frontiers:

We need, as Foreign Affairs players and representatives in the Antarctic world, to really understand what Australia's scientific objectives are so that we can take account of those in relation to just generally interacting with other Parties, but also in relation to the larger strategic national interest dimension. And equally, the scientists need to as well. ⁶⁶⁴

In conclusion, this research can perhaps best be regarded as a pathfinder for the important endeavour of encouraging diplomats and scientists to look in Bull's direction in furtherance of the global science and diplomacy interface. However, final words belong to the scientists. In one of the last interviews he gave, Dr Patrick Quilty invoked the ethos of generations of Australian Antarctic scientists whose quest for knowledge took them to the blue edge in Antarctica as both scientists and diplomats in the service of humanity. According to Patrick and his colleagues, 'science takes people there, Antarctica does the rest.'⁶⁶⁵

⁶⁶³ Penelope Richards interviewed by Anne Michelle Davis on 21 August 2018.

⁶⁶⁴ Richard Rowe interviewed by Anne Michelle Davis on 3 August 2018.

⁶⁶⁵ Patrick Quilty interviewed by Anne Michelle Davis on 20 November 2017.

Appendix A

Interviews (*Research Protocol 2017/453*)

Andrew Constable—Program Leader, Australian Antarctic Division and the Antarctic Climate and Ecosystems Collaborative Research Centre (ACE-CRC), Institute for Marine and Antarctic Studies (IMAS), Hobart, interviewed on 28 November 2017

Andrew Jackson—Principal Policy Officer, Australian Antarctic Division, interviewed on 17 November 2017 and 20 November 2017

Andrew Klekociuk—Principal Research Scientist, Future Climate and Sea Level Group, Antarctic and Global Systems Program, Antarctic Climate and Ecosystems Collaborative Research Centre (ACE-CRC), Institute for Marine and Antarctic Studies (IMAS), Hobart, interviewed on 24 November 2017

Bill Lawson—Founder, Tasmanian Polar Network, interviewed on 1 December 2017

Desmond Lugg—Medical Officer (ANARE) 1963, Head of Polar Medicine 1968 to 2001. Interviewed by Anne Michelle Davis on 22 November 2017

Donald Rothwell—Professor of International Law, College of Law, Australian National University, interviewed on 13 August 2018

Drew Clarke—Secretary of the Department of Resources, Energy and Tourism (DRET), Chief of Staff to Prime Minister Malcolm Turnbull (2015-2017), Antarctic expeditioner, interviewed on 12 October 2019

Ewan McIvor—Chair of the Committee for Environmental Protection of the Antarctic Treaty Consultative Meeting, Senior Policy Adviser Australian Antarctic Division, interviewed on 5 December 2017

Gill Slocum—Manager of Territories, Environment and Treaties, Australian Antarctic Division, interviewed on 6 December 2017

Hugh White—Emeritus Professor of Strategic Studies, Australian National University, speaking in his capacity as Adviser to Prime Minister Bob Hawke, interviewed on 24 October 2018

Ian Allison—Senior Principal Research Scientist and Field Glaciologist, Institute for Marine and Antarctic Studies (IMAS), University of Tasmania, interviewed on 8 December 2017

Jim Neale—Engineer, Australian Antarctic Division, interviewed on 12 October 2018

Karen Rees—Antarctic Expeditioner, interviewed on 21 November 2021

Knowles Kerry—Head Antarctic Biology, Member of the Australian Delegation to the Antarctic Treaty Consultative Meeting, Technical Adviser to the Drafting Committee for the Convention on the Conservation of Antarctic Marine Living Resources (CCAMPR), interviewed on 18 September 2018

Laurence Clarke—Antarctic Scientist, Australian Antarctic Division, interviewed on 30 November 2017

Desmond Lugg – Medical Officer, Australian Antarctic Division, interviewed on 22 November 2017

Marcus Haward—Professor of Ocean and Antarctic Governance, Ocean and Cryosphere Centre, Antarctic Climate and Ecosystems Collaborative Research Centre (ACE-CRC) and Institute for Marine and Antarctic Studies (IMAS), interviewed on 15 November 2017 and 23 November 2017

Mark Hunt—Antarctic Station Leader, 2011-2013, Casey Station Antarctica, interviewed on 29 November 2017

Mark Kelleher—Chief Executive Officer, Antarctic Climate and Ecosystems Collaborative Research Centre (ACE-CRC), interviewed on 1 December 2017

Michael Stoddart—Chief Scientist (1998-2008), Australian Antarctic Division, interviewed on 4 December 2017

Nick Gales—Director, Australian Antarctic Division (2015-2018), interviewed on 25 September 2018

Patrick Quilty—Principal Research Scientist, Antarctic Biology, Australian Antarctic Division, interviewed on 20 November 2017

Paul Keal—Colleague and former PhD student of Hedley Bull, interviewed on 5 December 2019

Penelope Richards—Senior Legal Adviser, International Organisations and Legal Division, Department of Foreign Affairs and Trade, Head of the Australian Delegation to the Antarctic Treaty Consultative Meeting, interviewed on 21 August 2018.

Richard Fader—Chair, Tasmanian Polar Network, interviewed on 28 November 2017

Richard Rowe—First Assistant Secretary, Legal and Treaty Division, Department of Foreign Affairs and Trade, Head of the Australian Delegation to the Antarctic Treaty Consultative Meeting, interviewed on 3 August 2018 and 6 December 2018.

Rob Clifton—Antarctic Station Leader, 2017-2018, Davis Station Antarctica, interviewed on 4 December 2017

Sir Guy Green—Governor of Tasmania (1995-2003), Antarctic Ambassador (2003 to date), interviewed on 5 December 2017

So Kawaguchi—Krill Ecologist, Australian Antarctic Division, interviewed on 6 December 2017

Tas Van Ommen—Senior Principal Research Scientist, Australian Antarctic Division, interviewed on 1 December 2017

Tony Press—Director Australian Antarctic Division (1998-2009), Chair Committee for Environmental Protection (*The Protocol on Environmental Protection to the Antarctic Treaty—Madrid Protocol*) and Australian Delegation Member to the Antarctic Treaty Consultative Meeting, interviewed on 14 November 2017, 21 November 2017 and 10 October 2018

Tom Remenyi—Adjunct Professor, Antarctic Climate and Ecosystems Collaborative Research Centre (ACE-CRC), Institute for Marine and Antarctic Studies (IMAS), Hobart, interviewed on 23 November 2017

Phil Tracey—Senior Policy Officer, Australian Antarctic Division, interviewed on 4 December 2017

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