Constructing 'A Continent for Peace and Science': Re-examining the Role of the Scientific Committee on Antarctic Research

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Contents

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List of Abbreviations

AAAS	American Association for the Advancement of Science
AAT	Australian Antarctic Territory
AMCAFF	Agreed Measures for the Conservation of Antarctic Flora and Fauna
ASOC	Antarctic and Southern Ocean Coalition
AT	Antarctic Treaty
ATCM	Antarctic Treaty Consultative Meeting
ATCPs	Antarctic Treaty Consultative Parties
ATS	Antarctic Treaty System
BIOMASS	Biological Investigation of the Marine Antarctic Systems and Stocks
CCAMLR	Convention for the Conservation of Antarctic Marine Living Resources
CCAS	Convention for the Conservation of Antarctic Seals
CIA	Central Intelligence Agency
COMNAP	Council of Managers of National Antarctic Programmes
CRAMRA	Convention for the Regulation of Antarctic Mineral Resource Activities
CSAGI	Comité Speciale de L'Année Géophysique Internationale
EAMREA	Environmental Impact Assessment of Mineral Exploration/Exploitation in Antarctica

FIBEX	First International BIOMASS Experiment
IAMAP	International Association of Meteorology and Atmospheric Physics
IAMRC	International Antarctic Meteorological Research Centre
IASC	International Arctic Science Committee
IAAC	International Antarctic Analysis Centre
ICPM	International Commission on Polar Meteorology
ICSU	International Council of Scientific Unions
IGY	International Geophysical Year
IOC	Intergovernmental Oceanographic Commission
IPY	International Polar Year
ITU	International Telecommunications Union
IUGG	International Union for Geophysics and Geodesy
IWC	International Whaling Commission
NATO	North Atlantic Treaty Organisation
NAPD	National Antarctic Programme Directors
PRC	People's Republic of China
RES	Radio Echo-Sounding

SCAR	Scientific Committee on Antarctic Research
SIBEX	Second International BIOMASS Experiment
UK	United Kingdom
UN	United Nations
US	United States of America
USSR	United Soviet Socialist Republic
UNCLOS	United Nations Convention on the Law of the Sea
UNESCO	United Nations Educational, Scientific and Cultural Organisation
WMO	World Meteorological Organisation
WWII	The Second World War
WWW	World Weather Watch

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Abstract

Antarctica is a space that is often subject to narratives of exceptionalism, which paint a picture of Antarctica as a continent for peace and science, or a fragile, pristine environment in need of protection. These narratives have been constructed over time in part due to the activities of the Scientific Committee on Antarctic Research (SCAR), since 1958, when SCAR first began to coordinate international scientific collaboration in Antarctica.

Antarctica is not simply a continent for peace and science, and nor is it simply a fragile environment in need of protection. In applying critical geopolitics approaches, postcolonial theory approaches and in viewing SCAR as a vehicle for science diplomacy in the Antarctic, a version of Antarctica which is not subject to exceptionalist narratives emerges. This is an Antarctic continent which is undergoing constant colonisation. In this ongoing colonisation of Antarctica, science is a form of effective occupation of Antarctic territory, and therefore a tool of colonial ambitions. The instruments of the Antarctic Treaty system, facilitated in part by SCAR, become tools to enact colonial authority by another name on the Antarctic environment, in place of the indigenous population that would be subjugated and controlled in a traditional colony.

The existence and continued activity of the Scientific Committee on Antarctic Research allows for an Antarctic that is simultaneously both being colonised and free from colonialism, both exceptional in its designation as a space for peace and science, and a space where effective occupation takes on a

scientific facade; both a land that belongs to no one and a global commons - a blank space upon which colonial ambitions can be writ large.

Declaration

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Dedication

In memory of my Papaji,

Ali Asghar Choudhry,

whose faith in me knew no limits,

who believed in educating his daughters above all else,

and who taught me everything worth knowing.

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1. Introduction and Theoretical Framework

1.1 Introduction

It is impossible to examine science in Antarctica without also examining colonialism in Antarctica. This thesis establishes the ways in which European colonialism has shaped our narratives about Antarctica, and the role that science, as overseen by the Scientific Committee on Antarctic Research (SCAR) has played in them. This thesis contributes to the growing body of literature which argues in opposition of the dominant narrative suggesting that Antarctica has never been touched by colonialism - arguing instead that the Antarctic has, in fact, been shaped by it. In doing so, this thesis asks that we consider the ways in which Antarctica, a space with no indigenous human population, is subject to colonialism, which by its very definition requires a population to be subjugated by a colonising power. The Antarctic cannot be divorced from past and future colonial ambitions, and this thesis argues that science plays a part in the ongoing efforts to colonise Antarctica. In the Antarctic, since the interwar period, science has been the primary activity on the continent, and since its first meeting in 1958, the majority of scientific activity has been overseen and coordinated by SCAR. This thesis argues that science cannot be divorced from the form that colonialism takes in Antarctica, which in turn cannot be divorced from notions of power and control. This thesis explores the above themes through an examination of SCAR and its history, interrogating the archives of SCAR, which have only recently been made available. By investigating the sixty-year history of SCAR and its activities in the

Antarctic, this thesis aims to elucidate the role that the organisation has played in our understanding of the Antarctic as a space that is subject to colonial ambitions.

SCAR is a non-governmental organisation, and specifically an affiliated body of the International Science Council (formerly the International Council of Scientific Unions, or ICSU, as it is known throughout this thesis).[1] SCAR is also, like many non-governmental organisations, registered as both a company and a charity in the UK, where its secretariat is based.[2] The organisation came into being during the mid-1950s in the planning stages of the International Geophysical Year (IGY), and since then has been the primary body for the coordination of scientific research in, around, and about Antarctica. Much of the literature about SCAR draws a connection between the success of SCAR in coordinating international collaboration in Antarctica during the IGY (1957-1958), and the resulting political goodwill, with influencing the negotiation, signing and ratification of the Antarctic Treaty in 1959.[3] Since the signing of the AT, the signatories have governed the Antarctic through the Antarctic Treaty System (ATS), which over its 60-year history has brought into force several measures and conventions which apply to the Antarctic.[4] Scientists affiliated with SCAR, and working on research overseen by SCAR, have been involved with the creation of these conventions and measures, and since 1987 this shared history has led to SCAR being designated an official observer to the ATS, and its

[1] "Scientific Committee on Antarctic Research (SCAR)", International Science Council, accessed 10 June 2022, https://www.scar.org/. .
[2] "What is SCAR?", SCAR, accessed 08 June 2022, https://www.scar.org/about-us/scar-overview/.
[3] Klaus Dodds, 'Reflecting on the 60th anniversary of the Antarctic Treaty' *Polar Record* 2019 55: 311–316.
[4] Alan D. Hemmings, Klaus Dodds and Peder Roberts. 'Introduction: The Politics of Antarctica' in Klaus Dodds, Alan D. Hemmings and Peder Roberts (Eds.) *Handbook on the Politics of Antarctica.* (Cheltenham, UK: Edward Elgar Publishing, 2017), 2.

annual consultative meetings.[5] Ultimately, SCAR and the Antarctic Treaty - science and politics, - have been overtly intertwined in Antarctica for the last sixty years, and this thesis will draw out the nuances of this relationship between the two through a critical lens.

There is an existing, rather tidy narrative about Antarctica; that it is a continent reserved for peace and science.[6] This narrative tells a rather compelling story about the role of science in the Antarctic, and by extension, the role of SCAR. As narrated by former SCAR President Colin Summerhayes, SCAR was instrumental in coordinating research activities which sixty-seven countries participated in, and this supposedly 'apolitical' undertaking during the IGY 'contributed in no small way to the diplomatic framework for later negotiations leading to such developments as the Antarctic Treaty (1961), the Test Ban Treaty (1963) and the Space Treaty (1967).'[7] It is this contribution by SCAR to the negotiation of the Antarctic Treaty which is touted as a triumph of 'apolitical' science over politics, and a successful example of 'science diplomacy.'[8] Paul Arthur Berkman, a scholar of science diplomacy with a focus on the polar regions, is a vocal advocate of the ATS, referring to it as a gentlemen's agreement 'elegant in its simplicity and profound in its capacity to accommodate the 'interests of all humankind'[9]. He also

[5] David W. H. Walton, Peter D. Clarkson, and Colin P. Summerhayes, *Science in the Snow: Fifty Years of International Collaboration through the Scientific Committee on Antarctic Research*, (Cambridge: Scientific Committee on Antarctic Research, 2011), 7.

[6] Peder Roberts, Adrian Howkins, and Lize-Marié van der Watt, "Antarctica: A Continent for the Humanities," in Peder Roberts , Lize-Marié van der Watt, and Adrian Howkins (eds) *Antarctica and the Humanities* (London: Palgrave Macmillan UK, 2016), 6.

[7] Colin P. Summerhayes, "International Collaboration in Antarctica: The International Polar Years, the International Geophysical Year, and the Scientific Committee on Antarctic Research," *Polar Record* 2008 44(4): 321.

[8] Elzinga, Aant. "Antarctica: The Construction of a Continent by and for Science." in Elisabeth Crawford, Terry Shinn, and Sverker Sörlin (eds) *Denationalizing Science* (Dordrecht: Springer Netherlands, 1993), 73–106.

[9] Paul Arthur Berkman, *Science into Policy: Global Lessons from Antarctica* (San Diego: Academic Press, 2002), 59.

argues that the Antarctic Treaty established a precedent for managing regions or resources that exist beyond national jurisdiction.[10] Berkman embodies the exceptionalist view of the ATS and its relationship to SCAR, which he describes as a 'marriage between the policy-making framework of the Antarctic Treaty and the advisory role of SCAR' and argues that it has 'effectively established an open international system for managing human activities in the Antarctic region.'[11] SCAR's official organisational history *Science in the Snow,* written by the late Antarctic ecologist David Walton, former SCAR President Colin Summerhayes, and former SCAR Executive Secretary Peter Clarkson, echoes Berkman's idealistic comments about the ATS and the role of SCAR within it. This thesis interrogates much of the same primary source material as *Science in the Snow,* in a way that challenges the exceptionalist narrative offered by Walton, Clarkson and Summerhayes.

The triumphant narrative of SCAR and the ATS ties into wider exceptionalist narratives about Antarctica, these set Antarctica apart as a place where the normal rules do not apply, be they about science, politics, power or colonialism. Antarctica has been considered exceptional for the majority of its history, until more recently, when a more rigorous approach to Antarctic scholarship started to gain traction in the mid-1980s, an approach spearheaded by historians and geographers applying more critical lenses to the Antarctic.[12] As part of this shift, historians and geographers alike 'traced the historical continuities and discontinuities that influenced contemporary controversies and challenges to the ATS, critically examining how nation states framed Antarctica depending on their political

[10] Berkman, *Science Into Policy,* 59.
[11] Berkman, *Science Into Policy,* 62.
[12] Roberts, Howkins, and van der Watt, "Antarctica: A Continent for the Humanities," 7-8.

goals, goals that often had little to do with the continent itself.'[13] Aant Elzinga's work in particular over the past four decades has shaped the scholarship on the IGY and the ATS, and he is one of the few scholars to write about SCAR. Elzinga is credited with having put forth the argument that the Treaty 'defined a regime where science could be pursued as a continuation of politics by other means. Or, to put it differently, it allowed for political rivalry between nations to be translated into scientific competition (and cooperation).'[14] Antarctic humanities scholars like Alan Hemmings also build on Elzinga's critiques of the Antarctic Treaty, specifically criticising the continued 'reinforcement of an Antarctic creation myth wherein science plays Ulysses in the foundation of the ATS.'[15] Hemmings further problematises the ways in which positive Antarctic outcomes are ascribed to the existence of the AT, and the consistent overstatement of 'the degree to which the underlying territorial sovereignty issues have actually been dealt with.'[16] This thesis aims to apply a similar critical examination, not to national actors and the ATS, but to SCAR instead.

SCAR can tell us something new about Antarctica if we look at its role in science diplomacy. Specifically through the lens of critical geography theoretical approaches and postcolonial and anti-colonial theoretical approaches. Critical geography/geopolitics approaches challenge hegemonic ways of framing and creating space. Therefore, critical geography approaches allow for a deconstruction of the ways in which the Antarctic has been framed and reframed, and the way that

[13] Roberts, Howkins, and van der Watt, "Antarctica: A Continent for the Humanities", 6.
[14] Elzinga, "Antarctica: The Construction of a Continent by and for Science," 76.
[15] Alan D. Hemmings, "After the Party: The Hollowing of the Antarctic Treaty System and the Governance of Antarctica," University of Canterbury, Christchurch, New Zealand: Symposium on Antarctic Politics, 8-9 July 2010, 2-3.
[16] Hemmings, "After the Party," , 5.

SCAR has historically fit in with these varied framings of the Antarctic. Ultimately, critical geography approaches allow this thesis to interrogate the dominant narratives about the Antarctic, and SCAR's role in shaping the Antarctic as a place. As posited by Ania Loomba, whose work has been instrumental in defining postcolonial theory, 'postcolonial studies have managed to make visible the history and legacy of European imperialism.'[17] Postcolonial theory also allows for the elucidation of the continued impact of colonialism and European imperialism. Therefore, using postcolonial approaches and applying these to a study of an Antarctic context and a critical examination of SCAR, allows for the colonial history and legacy in Antarctica to also be made visible. These approaches are applied to inform this thesis' analysis of SCAR's history; to challenge the existing dominant narratives about SCAR's role in the history of science in Antarctica and in the governance of the continent. Postcolonial theory and its application to the case study of SCAR allows us to interrogate the ways in which SCAR has allowed national actors to continue to perform ceremonies of colonial possession in the Antarctic, whilst seeming to forego colonial ambitions under cover of international scientific collaboration.

The relatively new body of science diplomacy literature from the past decade is also central to a study of SCAR's history. This body of literature brings together the recorded practice of diplomacy practitioners, the work of historians of science and the work of international relations scholars, all of which investigate the multiplicity of relationships between science and diplomacy. SCAR's activities during the IGY and the resulting negotiation and creation of the ATS are touted as a case study for

[17] Ania Loomba, *Colonialism/Postcolonialism*, Third edition, New Critical Idiom (London ; New York, NY: Routledge, Taylor & Francis Group, 2015), 23.

successful science diplomacy. This thesis seeks to problematize this narrative, using science diplomacy literature which takes a more critical approach: one used by historians looking at the relationship between science, power and policymaking. In doing so, it places these interactions in a historical context which allows for a more meaningful, post-naive interrogation of the so-called 'successes' of science diplomacy. This thesis ultimately puts forth the argument that science is a tool of what Klaus Dodds and Christy Collis term 'the continuing colonisation of the Antarctic.'[18] Furthermore, this thesis argues that science is either covertly or overtly accepted as a form of 'effective occupation' of Antarctic territory by nation-state actors. Moreover, science is seen as a tool used to govern the Antarctic in place of traditional means of governing a colony, through what Adrian Howkins terms 'the exertion of environmental authority' in the Antarctic.'[19] Given this assessment of the relationship between science and Antarctica, if science is a form of effective occupation of the Antarctic, scientists therefore become complicit instruments of national agendas, whether they are aware of this dimension to their activities or not. A logical extension of this argument suggests that by coordinating international scientific collaboration and transnational science in the Antarctic, SCAR has been a vehicle for the national agendas of its member countries and the colonial ambitions of these nations. The picture becomes even more nuanced and complex when considering the ways in which SCAR-affiliated scientists have involved themselves in the various conservation initiatives for the

[18] Christy Collis, "Australia's Antarctic Turf: Works Cited," *M/C Journal* 2004 7(2): 1; Klaus J. Dodds, "Flag Planting and Finger Pointing: The Law of the Sea, the Arctic and the Political Geographies of the Outer Continental Shelf," *Political Geography* 2010 29(2): 65-66; Klaus J. Dodds, "Sovereignty Watch: Claimant States, Resources, and Territory in Contemporary Antarctica," *Polar Record* 2011 47(3): 234.

[19] Adrian Howkins. *Frozen Empires: An Environmental History of the Antarctic Peninsula*. (New York, NY: Oxford University Press, 2017, 43-44.

Antarctic, occasionally in line with a national agenda which can be elucidated, but also sometimes in contravention of these selfsame agendas. This thesis seeks not only to argue that science is a tool of colonisation in Antarctica, but that the actions of scientists affiliated with SCAR have both furthered national agendas in the Antarctic, and acted in direct opposition to them. In studying the history of these instances of scientists involving themselves in the conservation (and therefore the governance and management) of Antarctica, a more nuanced picture of science, power and colonialism can be drawn in regards to SCAR's history.

This thesis argues that an examination of SCAR's archives from the late 1950s to the early 1990s supports the argument that the existence and continued activity of SCAR allows for competing narratives about the Antarctic and the ATS and its role in geopolitics to be true. SCAR is an organisation whose existence allows for a duality in the way that Antarctica can be framed, allowing competing and diametrically opposing arguments about the Antarctic to be true at the same time. SCAR allows for the assumption that scientific internationalism is the ideology shaping scientific activity, whilst simultaneously allowing for the assumption that the Antarctic is a space where scientific activity is shaped by nationalist agendas, in order to potentially lay claim to a future Antarctic territory. SCAR allows for the argument that Antarctica can be considered a *terra nullius* (a land that belongs to no one) whilst also allowing for the argument that Antarctica is a *terra communis* (a land that belongs to everyone). Therefore Antarctica is both a place claimed by no one and therefore ripe for future territorial claims (which is central to the colonial ambitions of national actors in Antarctica), as well as

a 'global commons' and 'the common heritage of mankind'.[20] SCAR's history of coordinating science in Antarctica supports the argument that the Antarctic is a place where 'soft power' is the dominant political force, whilst also supporting the argument that hard power cannot be divorced from science in Antarctica.[21] SCAR also allows for the framing of the ATS as a system of governance which is open and makes decisions by consensus, giving all members equal weighting. However, conversely, SCAR's existence also allows for a framing which paints the ATS as a 'a vestige of colonialism'[22] and SCAR as a gatekeeping entity to this system of Antarctic governance. Essentially, SCAR's existence allows us to place Antarctica in a narrative version of Schrodinger's experiment.

1.2. Literature Review

1.2.1 Critical Geographies and Critical Geopolitics

The body of literature written by geographers and geopolitics scholars who apply 'critical geography' or 'critical geopolitics' approaches is essential to this thesis and its understanding of the Antarctic as a space, and the ways in which the ATS and SCAR are framed. The tradition of critical geographies and a critical approach to geopolitics discourse began with the work of Simon Dalby, David Livingstone and Gearóid Ó Tuathail. These scholars began to unpack and deconstruct traditions of thought in the field of geopolitics in the late 1980s/early 1990s, and their interrogations of geopolitical discourse led to

[20] Surabhi Ranganathan, 'Global Commons' *The European Journal of International Law* 2016 27(3): 694; Bernard P. Herber, 'The Common Heritage Principle: Antarctica and the Developing Nations' *American Journal of Economics and Sociology*, 1991 50(4): 391.
[21] Joseph S. Nye "Soft Power: The Evolution of a Concept." *Journal of Political Power* 2021 14(1): 196–208.
[22] Peter J. Beck, *The International Politics of Antarctica* (London: Routledge, 1986), 285-286.

the conclusion (among others) that historical context is integral to a critical study of geopolitics.[23] The work of Dalby, Livingstone, Ó Tuathail and their peers was heavily influenced by the ideas of French Philosopher Michel Foucault, and his work on the 'power/knowledge nexus', as it relates to geography. Foucault suggests that knowledge should be studied not through ideologies, but through tactics and structures of power, which could be seen to be 'deployed through the implementations, distributions, demarcations, control of territories and organisation of domains.'[24] Gearóid Ó Tuathail and John A. Agnew applied Foucault's theories about power, knowledge and geography to their shaping of a critical outlook, arguing that 'geography is a social and historical discourse which is always intimately bound up with questions of politics and ideology' and that ultimately, geography is a form of power/knowledge itself.[25] This assumption was at the heart of early critical geography, and Klaus Dodds and James Sidaway, who drew together and defined critical geography and geopolitics as an approach, drew from the work of Dalby, Ó Tuathail and Agnew. Dalby, Ó Tuathail and Agnew argued that, 'by examining the various narratives, concepts, and signifying practices that reside within geopolitical discourses, it would be possible to understand something of the power of those discourses to shape international politics.'[26]

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[23] David N. Livingstone, *The Geographical Tradition: Episodes in the History of a Contested Enterprise* (Oxford: Blackwell, 1993); Gearóid Ó Tuathail. 'The critical reading/writing of geopolitics: Re-reading/writing Wittfogel, Bowman and Lacoste.' *Progress in Human Geography.* 1994 18(3):313-332.

[24] Michel Foucault and Colin Gordon, *Power/Knowledge: Selected Interviews and Other Writings, 1972-1977* (New York: Pantheon Books, 1980), 86.

[25] Gearóid Ó Tuathail, *Geopolitics and Discourse: Practical Geopolitical Reasoning in American Foreign Policy*, 11th ed. (London: Routledge, 1992), 16.

[26] Klaus J. Dodds and James Derrick Sidaway, "Locating Critical Geopolitics," *Environment and Planning D: Society and Space* 1994 12(5): 517-518; Ó Tuathail, *Geopolitics and Discourse*, 190-204; Gearóid Ó Tuathail, *Critical Geopolitics: The Politics of Writing Global Space* (University of Minnesota Press, 1996), 72-73.

Critical geography/critical geopolitics favours an approach which takes into account that spaces cannot be definitively defined, but are changing, and that our representations of them are not self-evident and do not exist separately from our beliefs and biases.[27] Critical geopolitics also explicitly rejects realist accounts of international politics, 'because it is a partial and incomplete account.'[28] Due to this, critical geography/critical geopolitics discourse is considered to challenge mainstream International Relations theory. Critical geography draws on the ideas of Michel Foucault, which explore the relationships between space and spatial metaphors of colonisation.[29] The work of Edward Said pushes Foucault's ideas further. In his seminal work *Orientalism,* Said draws together Foucault's work, and the work of Italian philosopher Antonio Gramsci and argues that a series of 'imaginary geographies' had been created by Western thinkers of 'the Orient', and that these imaginary geographies were influential in shaping western schools of thought about spaces coded as non-Western, and therefore 'Oriental'.[30] Said's ideas have also influenced critical approaches to geography and geopolitics, as he argues that the 'Orientalism' he describes is 'a distribution of geopolitical awareness into aesthetic, scholarly, economic, sociological, historical and philosophical texts.'[31] This definition is the cornerstone of critical geography and geopolitics, which seeks to understand these distributions.[32] As a theoretical approach, critical geography/geopolitics blurs the lines between history, international relations, and interrogations of colonialism and coloniality, therefore making it an appropriate tool for this thesis. As

[27] Klaus Dodds, *Geopolitics in Antarctica: Views from the Southern Oceanic Rim*, Polar Research Series (Chichester: John Wiley & Sons, 1997), 13.
[28] Dodds, *Geopolitics in Antarctica,* 28.
[29] Foucault, *Power/Knowledge*, 86.
[30] Edward Said, *Orientalism* (London: Penguin, 1978), 36.
[31] Said, *Orientalism*, 12.
[32] Dodds, "Locating Critical Geopolitics," 518.

Dodds and Sidaway neatly summarised, critical geography ultimately investigates the hegemonic ways of seeing, siting and citing place.[33] Jeffrey McGee, David Edmiston and Marcus Haward argue that a critical approach to geopolitics in Antarctica is essential, as a classical, empirically-focused approach to Antarctic geopolitics does not allow us to tell the full story.[34]

It is this challenge to the hegemonic ways of seeing Antarctica which is central to applying a critical geography/geopolitics approach. Dodds was one of the first scholars to suggest applying a critical geography framework to geopolitics in Antarctica, using the tools honed by scholars like Dalby and Ó Tuathail to investigate the polar regions.[35] Drawing in part from the work of Maria Manzoni and Paola Pagnini in his resulting 'critical geopolitics' of Antarctica, Dodds offered up five distinct ways of framing Antarctica, which summarised the dominant ways of representing and viewing Antarctica over the course of the twentieth century.[36] These discourses frame Antarctica as: a 'partially-filled space'; as a site of cold war tensions; as 'a continent for peace and science'; as a potential source of mineral wealth, and finally, as a fragile environment in need of protection.[37] Dodds' critical appraisal of these representations of Antarctica expounds not only British colonial ambitions for the Antarctic during the 'heroic era' of Antarctic exploration, but how these ambitions framed Antarctica as needing to be known and understood through scientific activity and expeditions, as well as being politically possessed through annexation.[38]

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[33] Dodds, "Locating Critical Geopolitics," 519-520.
[34] Jeffrey McGee, *The Future of Antarctica: Scenarios from Classical Geopolitics* (London: Springer, 2021), 10-11.
[35] Dodds, *Geopolitics in Antarctica,* 59.
[36] Maria M. Manzoni and Paola Pagnini, "The Symbolic Territory of Antarctica," *Political Geography* 1996 15(5): 361-362.
[37] Dodds, *Geopolitics in Antarctica*, 29-45.
[38] Dodds, *Geopolitics in Antarctica,* 31.

It is the articulation of Antarctica as a continent for peace and science however, which has been problematized most by scholars looking at science in Antarctica. Peder Roberts argues that this articulation as a zone of peace, through a mixture of text and performance, should ultimately be considered an example of what Gearóid Ó Tuathail has described as 'the construction of spaces through geopolitical discourse.'[39] Sanjay Chaturvedi also notes how the narrative of Antarctica as a place free of conflict being enshrined in the founding articles of the AT aimed to effectively banish 'the old geopolitics of formal imperialism and territorial aggrandisement.'[40] This idealistic notion of the designation of Antarctica as a space for science has also been shaped in part by the western scientific community, which wholeheartedly accepted the notion of Antarctica as a continent for peace and science and argued that it was to be 'considered a unique 'laboratory' for science rather than a continent characterised by the selfish pursuit of territorial claims.'[41] From the work of scholars such as Richard Herr and Robert Hall, it becomes clear that 'not all science pursued in the region has been 'science for science's sake'.'[42] This concept is at the heart of the argument this thesis makes, and it becomes apparent that viewing Antarctica through a critical geographies lens allows for the identification, and problematization, of existing dominant narratives about the continent.

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[39] Peder Roberts, *The White (Supremacist) Continent: Antarctica and Fantasies of Nazi Survival* (London, Palgrave Macmillan, 2016), 104; Ó Tuathail, *Critical Geopolitics*, 195.

[40] Sanjay Chaturvedi, *The Polar Regions: A Political Geography*, Polar Research Series (Chichester: John Wiley & Sons, 1996), 81; Sanjay Chaturvedi, *Dawning of Antarctica: A Geopolitical Analysis*. (New Delhi: Segment Books, 1990), 75-76.

[41] John A. Heap, "Cooperation in the Antarctic: A Quarter of a Century's Experience," in Francisco Orrego-Vicuna (eds) *Antarctic Resources Policy* (Cambridge University Press, 1983), 103–108.

[42] Richard A. Herr and H. Robert Hall, "Science as Currency and the Currency of Science," in Richard A. Herr, H. Robert Hall and Marcus G. Hayward (eds) *Antarctica's Future: Continuity or Change?* (Hobart: Tasmanian Government Printing Office,1989), 41.

Applying the approaches of critical geographers to Antarctica also allows us to question established ideas about the Southern Continent, and how it is known and understood, which often feed into the dominant narratives about it. Peder Roberts, Adrian Howkins and Lize-Marie van der Watt posit that exceptionalism is a consistent theme in our conceptions of Antarctica, arguing that 'Antarctica is almost always described as a space defined by its uniqueness.'[43] Uniqueness is a key lens through which Antarctica is seen and understood, and this is a distinct theme in the literature on Antarctica: it is the highest, driest, windiest place on earth; it is the only continent without an indigenous population, it is biologically and geologically distinct - these are all different strands of the exceptionalist narrative that shrouds the Antarctic.[44] Roberts also argues that Antarctica is a space that is known vicariously, given that very few will experience it firsthand, and that 'the Antarctic has therefore come to be understood through a standard set of visual and historical reference markers, from penguins to Scott and Amundsen to the Antarctic Treaty, and climate change research.'[45] These visual markers can also be traced back to the ways in which Antarctica is framed, and often map directly onto Dodds' five framings of Antarctica over the course of the twentieth century.[46]

Furthermore, using the framework of critical geography allows us to question the ways in which Antarctica is constructed as a space and how this relates to power. The work of Christy Collis and Alessandro Antonello questions the painting of Antarctica as a hegemonic space: they both challenge the 'simplification' of Antarctica as a continent which is viewed as a single, 'un-owned' space,

[43] Roberts, Howkins, and van der Watt, "Antarctica: A Continent for the Humanities," 7-8.
[44] Roberts, Howkins, and van der Watt, "Antarctica: A Continent for the Humanities," 7-8.
[45] Roberts, "The White (Supremacist) Continent," 105.
[46] Dodds, *Geopolitics in Antarctica,* 29-45.

earmarked for science and peace.[47] The narrative Collis questions ultimately draws on the language of colonisation and conquest of the Antarctic environment, positing Antarctica as a space primed for colonisation for powers with the technology and military capacity for such an undertaking.[48] The idea of Antarctica as a unified space ties into the way that Antarctica has been written about through generalisations.[49] Historical narratives also describe Antarctica as a 'blank space' at the bottom of the world map and therefore a canvas upon which colonial aspirations could be writ large and as a frontier to be explored and ultimately conquered.[50] Alessandro Antonello also challenges the perception of Antarctica as a fragile environment in need of protection.[51] Antonello's work argues that the construction of this narrative about Antarctica in the latter half of the twentieth century, which he terms the 'Greening of Antarctica', echoes other forms of colonial rhetoric.[52] Antarctica being coded as a feminine environment in need of protection also echoes rhetoric from Heroic-era expeditions to the Antarctic as explored by feminist scholars such as Lisa Bloom, Elena Glasberg and Laura Kay, whose analyses of this language suggests that gendered perceptions of the Antarctic environment as fragile

[47] Christy Collis, "The Proclamation Island Moment: Making Antarctica Australia," *Law Text Culture 2004* 8: 40; Christy Collis, "Territories beyond Possession? Antarctica and Outer Space," *The Polar Journal* 2017 7(2): 289; Alessandro Antonello, "Finding Place in Antarctica," in Peder Roberts, Lize-Marié van der Watt, and Adrian Howkins *Antarctica and the Humanities* (London: Palgrave Macmillan UK, 2016), 188-189.

[48] Simone Turchetti, Katrina Dean, Simon Naylor and Martin Siegert, "On Thick Ice: Scientific Internationalism and Antarctic Affairs, 1957–1980," *History and Technology* 2008 24(4): 363–364.

[49] Elizabeth Leane, *Antarctica in Fiction Imaginative Narratives of the Far South* (Cambridge: Cambridge University Press, 2015), 22-23.

[50] Roberts, "The White (Supremacist) Continent," 105; Juan Francisco Salazar, "Antarctica and Outer Space: Relational Trajectories," *The Polar Journal* 2017 7(2): 261-262.

[51] Antonello, "Finding Place in Antarctica", 190.

[52] Alessandro Antonello, *The Greening of Antarctica: Assembling an International Environment* (New York, NY: Oxford University Press, 2019). 79.

and vulnerable are linked to patriarchal and colonial power dynamics.[53] In these assessments of the hegemonic ways of seeing Antarctica, first questioning why it is seen as a 'whole' is central to deconstructing the narratives which rest on this framing.

The designation of Antarctica as a *terra nullius* is another framing of Antarctica which relies on viewing it as a single, hegemonic space.[54] The designation of Antarctica as '*terra communis',* or a global commons also relies on this framing, and whilst considering Antarctica a 'global commons' seems at first to challenge and oppose the framing of the continent as *terra nullius*, Michael Goldman argues that a 'global' commons suggests 'global science' and 'global experts', which due to global inequalities are likely to be concentrated in the Global North, thereby entrenching existing inequalities between national actors.[55] Kathryn Milun builds on Goldman's argument, adding that considering Antarctica a global commons once again hearkens back to the colonial idea that Antarctica is an empty space, which ultimately allows for Antarctica to become a *terra nullius.*[56] Alessandro Antonello draws from the work of these scholars and notes that 'labelling Antarctica as a "global commons" might, in fact, foreclose on democratic, global, and ecological possibilities, rather than creating a structure for allowing such possibilities—an ironic outcome given the political rhetoric.'[57] The use of *terra nullius* in Antarctic geopolitics and the stances on Antarctic sovereignty and jurisdiction favoured by ATS

[53] Lisa E. Bloom, *Gender on Ice: American Ideologies of Polar Expeditions* (Minneapolis: University of Minnesota Press, 1993), 16-17; Lisa Bloom, Elena Glasberg, and Laura Kay, "New Poles, Old Imperialism? S&F Online, 1-6.
[54] Antonello, "Finding Place in Antarctica", 190-191.
[55] Michael Goldman, *Privatizing Nature: Political Struggles for the Global Commons* (London: Pluto Press, 1998), 11-12.
[56] Kathryn Milun, *The Political Uncommons: The Cross-Cultural Logic of the Global Commons* (Ashgate, 2011), 22.
[57] Antonello, "Finding Place in Antarctica," 188-189.

members, and SCAR members alike, is a focus for this thesis, which seeks to investigate the ways in which SCAR-affiliated scientists have contributed to the mechanisms designed to manage an international environment, which have been used by ATS members 'to eke out their own territories and to cultivate places that bear their imprint.'[58]

Critical geography approaches allow us to further look at the 'relational trajectories'[59] of Antarctica, Outer Space, and the High Seas, and the language used to imagine them as spaces ripe for colonising. Cold War histories of science draw parallels between the three spaces, in part due to the creation of the international legal frameworks which govern them (the 1959 Antarctic Treaty; the 1967 Outer Space Treaty and the 1958 United Nations Convention on the Law of the Sea (UNCLOS)) coming into force during the same lull in Cold War tensions between the US and USSR.[60] Ronald Doel argues that the early 1960s gave rise to not only these large-scale international treaties but a reactionary military strategy from the US Government to ensure that the United States' military bodies' operations cover "the entire globe and extend from the depths of the ocean to the far reaches of interplanetary space."[61] Drawing from Hannah Arendt's ideas on the conquest of space, Elizabeth DeLoughrey agrees with Doel and argues that the Antarctic and Outer Space can be drawn together and viewed through the

[58] Antonello, "Finding Place in Antarctica," 191.
[59] Collis, "Territories Beyond Possession?", 289.
[60] Christy Collis, "Critical Legal Geographies of Possession: Antarctica and the International Geophysical Year 1957–1958," *GeoJournal* 2010 75(4): 387-388; Jessica M. Shadian, "Revisiting Politics and Science in the Poles: IPY and the Governance of Science in Post-Westphalia," in Jessica M. Shadian and Monica Tennberg (eds) *Legacies and Change in Polar Sciences* (New York: Routledge, 2009) 38; Ronald E. Doel, "Constituting the Postwar Earth Sciences: The Military's Influence on the Environmental Sciences in the USA after 194," *Social Studies of Science* 2003 33(5): 637; Sam Robinson, 'Scientific imaginaries and science diplomacy: The case of ocean exploitation' *Centaurus* 2021 63: 152.
[61] Doel, "Constituting Postwar Earth Sciences," 635-66.

lens of "a long Cold War history in which militarization and empire were naturalised by appeals to the progress of science."[62]At the same time, scholars such as Simone Turchetti and Simon Naylor have explored the ways in which this scientific progress could still be viewed as an extension of the Cold War tensions between the US and the USSR.[63] Kathryn Yusoff argues that from the IGY onwards, Antarctica was expected to provide a model for 'the geographical spaces beyond terrestrial inhabitation.'[64] Juan Francisco Salazar, an anthropologist whose work draws together ways of seeing and occupying Outer Space and Antarctica, adds to Yusoff's argument, noting that Antarctica has provided 'lessons that are relevant to the governance of other extra-territorial spaces beyond sovereign jurisdictions, including Outer Space.'[65] Relational trajectories open up an alternative way of imagining Antarctica: as a space that is truly international as opposed to being superficially international, as a truly global commons, or what the non-aligned movement at the UN General Assembly termed 'the common heritage of mankind.'[66]

Ultimately, applying the tools developed by critical geography and critical geopolitics scholars allows us to look at the history of SCAR in a new way. By using these theoretical approaches to challenge the dominant narratives about SCAR, it becomes clear that SCAR has acted as a vehicle for national agendas. It can also be viewed as a tool to simultaneously designate Antarctica to be *terra nullius* and

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[62] Elizabeth DeLoughrey, "Satellite Planetarity and the Ends of the Earth," *Public Culture* 26, no. 2 (2014): 257–258.
[63] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 351-76.
[64] Kathryn Yusoff, "Test Landscapes and the "Geographical Gift" of a Continent to Science," Paper presented at the workshop "Polar Field Stations and International Polar Year (IPY) History: Culture, Heritage, Governance (1882–Present)", University of Cambridge, May 3–4, 2007.
[65] Salazar, "Antarctica and Outer Space," 259-69.
[66] Beck, *The International Politics of Antarctica*, 286.

terra communis, both of which can be problematised and linked to the expression of colonial ambitions in the Antarctic. In addition to the use of critical geography/critical geopolitics theory and tradition, the use of postcolonial approaches to the Antarctic shapes this thesis' understanding of the Antarctic, SCAR and the ATS.

1.2.2 Postcolonial/Anti-colonial Approaches to Antarctica

This thesis focuses on the relationship between colonialism and Antarctica. By 'colonialism', this thesis refers specifically to European colonialism following the Scramble for Africa. Scholars of postcolonial theory distinguish between earlier forms of large-scale imperialism (e.g. the Ottoman Empire or the Roman Empire) and the European colonialism beginning in the late 15th Century, which 'ushered in new and different kinds of colonial practices which altered the whole globe in a way that these other colonialisms did not.'[67] Marxist scholars of colonialism, such as Thomas Bottomore, argued that the differentiating factor between European colonialism and former colonialisms is the rise of capitalism and capitalist economies in the Global North.[68] Scholars applying a Marxist-Leninist approach make an effort to differentiate between imperialism and colonialism, arguing that colonialism requires the formation of colonies to be exploited by an imperial metropole, whereas imperialism is divorced from the same structures, whilst still focused on similar forms of economic exploitation.[69] In this thesis, I argue that the relationship between colonising powers and the Antarctic is closer to colonialism than

[67] Loomba, *Colonialism/Postcolonialism*, 8-9.
[68] Tom B. Bottomore, *A Dictionary of Marxist Thought* (Oxford: Blackwell Reference, 1991), 21.
[69] Anne McClintock, "The Angel of Progress: Pitfalls of the Term "Post-Colonialism"," *Social* 1992 31/32: 85-86; Vladimir I. Lenin, *Imperialism, the Highest Stage of Capitalism* (Paris: Foreign Languages Press, 2020).

simply imperialism. By the 1940s, due to European colonialism, approximately 85% of the world was designated either a colony or a former colony[70] and Antarctica was no exception to this, as seven countries had laid formal claim to Antarctic territory by 1943.[71]

The concept of *terra nullius* is central to European colonialism. A land termed *terra nullius* is ripe for colonisation by a civilising European power - historians have explored the ways in which designating Australia and Africa as *terra nullius* in need of civilisation was central to the justification of European powers in colonising territories in both, and effectively claiming otherwise 'unowned' land.[72] The tools used by European powers to claim 'unowned' lands are varied and disparate. Much of the literature agrees that the 1884 Berlin Conference between European powers set out rules for which forms of occupation of a hitherto 'unowned' territory were considered 'effective' and therefore not open to contestation, and which were considered 'symbolic', and therefore contestable.[73]

There are clear examples of the application of these colonial logics in the Arctic. As argued in the early 1960s by Robert Jennings, European empires developed complex interpretations of sovereignty in order to to deal with different geographical and geopolitical realities.[74] In the Arctic region, space has

[70] David K. Fieldhouse. *The Colonial Empires: A Comparative Survey from the Eighteenth Century*, (London: Macmillan, 1966), 138; Loomba, *Colonialism/Postcolonialism,* 8-9.
[71] Klaus Dodds, *The Antarctic: A Very Short Introduction* (Oxford: Oxford University Press, 2012), 6-7.
[72] Bruce Buchan and Mary Heath, "Savagery and Civilization: From Terra Nullius to the "Tide of History", *Ethnicities* 2006 6(1): 5-26; Asafa Jalata, "The Impacts of English Colonial Terrorism and Genocide on Indigenous/Black Australians," *SAGE Open* 2013 3(3); Andrew Fitzmaurice, *Sovereignty, Property and Empire, 1500–2000* (Cambridge: Cambridge University Press, 2014) 277-279.
[73] Matthew Craven, "Between Law and History: The Berlin Conference of 1884-1885 and the Logic of Free Trade," *London Review of International Law* 2015 3(1): 55-56.
[74] Robert Y. Jennings and Marcelo Kohen, *The Acquisition of Territory in International Law: With a New Introduction by Marcelo G. Kohen*, (Manchester: Manchester University Press, 2017). 2.

long been subject to John Agnew and Stuart Corbridge's 'nation-state ontology' - the belief that land should and must be divided into state-owned units.[75] Imperial incursions into Arctic lands occupied by the indigenous peoples of the high north made use of traditional doctrines of discovery, cession, occupation and conquest, and applied these to the territories that imperial actors wished to claim.[76] Andrew Fitzmaurice's work interrogates the ways in which these traditional notions of discovery, conquest and occupation are open to reinterpretation, and the ways in which this reinterpretation has allowed for conquest of polar territories by state actors.[77] Donald Rothwell also adds that in the polar regions, colonial powers did not place an emphasis on the physical occupation of remote territories, noting that 'there was no immediate intent to colonise as distinct from acquire.'[78] Peter Kikkert's PhD thesis explored the ways in which sovereignty and the occupation of Arctic territory was negotiated in the first half of the twentieth century through a series of Arctic-specific methods such as the Hughes Doctrine and the sector principle.[79] Kikkert's work also explores the reasons why these principles, which allowed state actors to effectively occupy and colonise the Arctic, could not be transposed directly onto the Antarctic, therefore requiring a different approach to both occupation and colonisation.[80] The literature interrogating colonialism in the Arctic agrees that it is a colonised space, and that it is colonised through reinterpreted doctrines of occupation.

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[75]John A. Agnew and Stuart Corbridge, *Mastering Space: Hegemony, Territory and International Political Economy* (London ; New York: Routledge, 1995), 61-62; Collis, "Australia's Antarctic Turf,", 7

[76] Andrew Fitzmaurice, *Discovery, Conquest, and Occupation of Territory* (Oxford University Press, 2012), 840.

[77] Fitzmaurice, *Discovery*, *Conquest, and Occupation of Territory,* 840.

[78] Donald Rothwell, *The Polar Regions and the Development of International Law* (Cambridge University Press, 1996), 2.

[79] Peter Kikkert, "Grasping for the Ends of the Earth: Framing and Contesting Polar Sovereignty, 1900-1955," Unpublished PhD Thesis, Western University (2005), 38-39.

[80] Kikkert, "Grasping for the Ends of the Earth", 38-39.

Antarctica can also therefore be considered a colonised space. Christy Collis' work on the construction of Antarctic spaces, specifically her work which describes the ways in which Antarctica has been designated a 'colonised' space, is essential to the argument of this thesis. Collis argues that during the 'Heroic Era' expeditions to Antarctica by Scott and Shackleton and their peers, the Antarctic became the stage upon which performances of imperial masculinity were performed and alongside these performances, the Antarctic was being constructed as a potential territorial possession.[81] By the late 1920s, it can be argued that John Agnew and Stuart Corbridge's 'nation-state ontology' was being applied to Antarctica as well as the Arctic.[82] Antarctica was constructed as a potential territorial possession through actions aimed at proving occupation of Antarctica, described by historian Patricia Seed as 'ceremonies of possession', which included (but were not limited to): creating maps of the territory in question; planting and raising the claimant nation's flag; naming territory for important national figures or landmarks; and settling on the claimed land.[83] The increased interest in Antarctic exploration in the interwar years was made possible by the advent of new technologies, as well as the meticulously documented expeditions by explorers such as Australian explorer Mawson and renowned American explorer and naval officer Rear Admiral Richard E. Byrd, also coincides with this interest in claiming Antarctic territory. Mawson was adamant that his expeditions should also be used to claim territory going as far as to perform a ceremony in which he filmed himself raising the Australian flag, and reading a proclamation of possession, and in doing so, asserting that Antarctica was *terra nullius*

[81] Collis, "Australia's Antarctic Turf,", 7.
[82] Agnew, *Mastering Space*, 62, Collis, "Australia's Antarctic Turf," 7-8.;
[83] Patricia Seed, *Ceremonies of Possession in Europe's Conquest of the New World* (Cambridge University Press, 1995).

to be claimed, and that he would be the one to claim it on behalf of Australia.[84] Dian Olson Belanger's work investigates the multiple expeditions to Antarctica spearheaded by Byrd, and the political agendas which underpinned them.[85] Byrd was a particularly vocal advocate of his exploration and his scientific activity in Antarctica being used by the US Government to justify laying claim to Antarctic territory.[86] It became clear during what is termed the 'mechanic era' of Antarctic exploration, that science had become the most important activity on the continent, and because of this, it had become a ceremony of possession in itself in Antarctica.[87] For other governments and actors, completely different ceremonies of possession have been enacted, such as the Chilean tactic of occupying Antarctica by flying in pregnant Chilean women - military wives to husbands working in Chilean stations in Antarctica - in the hope of creating the first 'native Antarcticans', with a claim to the Antarctic by dint of their birth.[88] Klaus Dodds and Christy Collis refer to these, and other ceremonies of possession in Antarctica as 'sovereignty performances', and note that 'such performances have been an important element in the continuing colonisation of the Antarctic and Southern Ocean, especially in the last hundred years.'[89]

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[84] Collis, "Australia's Antarctic Turf," 7-8; Philip Ayres, *Mawson: A Life*, (Carlton South: Miegunyah Press, 1999), 153.

[85] Dian Olson Belanger, *Deep Freeze: The United States, the International Geophysical Year, and the Origins of Antarctica's Age of Science* (Boulder, Colo.: University Press of Colorado, 2010), 18-19.

[86] Belanger, *Deep Freeze,* 39.

[87] Belanger, *Deep Freeze,* 39.

[88] Adrian Howkins, "Appropriating Space: Antarctic Imperialism and the Mentality of Settler Colonialism," in Tracey B. Mar and Penelope Edmonds (eds) *Making Settler Colonial Space: Perspectives on Race, Place and Identity* (London: Palgrave Macmillan, 2010), 29–52.

[89] Collis, "Australia's Antarctic Turf,", 7-8; Klaus Dodds, *Pink Ice: Britain and the South Atlantic Empire*, (London: I.B.Tauris & Co Ltd., 2002); Dodds, "Flag Planting and Finger Pointing:", 66; Dodds, "Sovereignty Watch," 231-43.

Antarctica is colonised, therefore. Or at the very least, there is evidence of it being colonised in traditional ways. If we accept this premise, it raises several questions. Firstly - if Antarctica is colonised in the traditional sense, what form does this colonisation take, given the absence of a human population to exploit and subjugate? This thesis aims to pose an answer to this question, suggesting that colonisation and colonialism in Antarctica is distinct from settler colonialism elsewhere due to the unique nature of the Antarctic as the sole environment without an indigenous population. Although existing exceptionalist narratives are challenged by this thesis, it asks that we introduce a newer exceptionalist narrative about Antarctica, which allows us to designate it as a territory which is subject to historical and ongoing colonisation for the purposes of this work.

How then does one approach Antarctica with postcolonial theory? There are many definitions of 'post-colonial', and therefore a definition and an approach must be selected and explained, to inform the specific postcolonial theoretical framework of this thesis. At face value, the term 'post-colonial' refers to the period after colonisation and decolonisation have occurred[90], but for the purposes of this thesis, the definition used is the one put forth by Bill Ashcroft, Gareth Griffiths and Helen Tiffin in their book *The Empire Writes Back: Theory and Practise in Post-Colonial Literatures*, which states that the term covers 'all the culture affected by the imperial process from the moment of colonisation to the present day'[91], a definition which takes into account the 'continuity of preoccupation throughout the historical process initiated by European imperial aggression.'[92] Stephen Slemon also poses another

[90] Peter Childs and Patrick Williams. *An Introduction to Post-Colonial Theory.* (London: Taylor and Francis, 1996), 1-3.
[91] Bill Ashcroft, Gareth Griffiths, and Helen Tiffin, *The Empire Writes Back: Theory and Practice in Post-Colonial Literatures* (London; New York: Routledge, 2002), 17-19.
[92] Ashcroft, Griffiths and Tiffin, *The Empire Writes Back*, 18.

useful definition which views the post-colonial as 'a specifically anti- or post-colonial discursive purchase in culture, one which begins in the moment that colonial power inscribes itself onto the body and space of its Others and which continues as an often occulted tradition into the modern theatre of neocolonialist international relations.'[93] Postcolonial theory seeks to interrogate the ways in which colonialism (primarily European, but often also US imperialism) and the resulting systems of colonial domination persist in the contemporary era; the forms that they may still take; and the effects they continue to have.[94] This thesis combines these definitions from traditional postcolonial theory, and applies them to the study of SCAR, the ATS and Antarctica as a colonised space. In Antarctica, where there are no Others for colonial powers to inscribe itself onto the body of, space then becomes paramount. Drawing on the work of scholars who have already interrogated the ways in which colonial ambitions have been enacted upon the Antarctic, and the ways in which they are continually enacted on Antarctica, this thesis pushes for an expansion of our understanding of colonialism, in order to better understand how a territory without people to subjugate can still be subjugated.

Many of the critiques which have been levelled at the ATS and by extension, SCAR, linking it to colonialism, have taken postcolonial approaches. Although not overtly taking a postcolonial approach, Peter J Beck's painstaking work in documenting the relationship between formerly colonised nations at the UN General Assembly, and the former colonising European powers at the heart of the ATS over decades, is essential to this thesis. Beck argues that the ATS is an inherently colonial structure, and that

[93] Stephen Slemon, "Past the Last Post: Theorizing Post-Colonialism and Post-Modernism," *Choice Reviews Online* 1992 29(5): 30-31.
[94] Loomba, *Colonialism/Postcolonialism*, 8-9; Edward Said, *Orientalism* (Penguin, 1978), 36; Edward Said, *Out Of Place* (New York, Verso, 2001).

it has been defined by its detractors at the UN General Assembly as a 'vestige of colonialism' and 'an old boys club.'[95] Beck's work interrogates the agendas of the ATS and of the members of the ATS, and the ways in which the 'Question of Antarctica' at the UN challenged the nature of the ATS.[96] Aant Elzinga's work also applies a critical approach to Antarctic science and the political agendas it serves. Elzinga is credited as having first put forth the argument that the Antarctic Treaty "defined a regime where science could be pursued as a continuation of politics by other means. To put it differently, it allowed for political rivalry between nations to be translated into scientific competition (and cooperation)."[97] Elzinga also argues that the Antarctic is effectively constructed through science, and that the ATS and its associated rhetoric of a type of internationalism championed by former colonial powers does not allow for an internationalised space in Antarctica, but rather a transnational collectivism at best.[98] He also posits that other rhetorics of internationalism exist for Antarctica, but have been discarded in favour of a regime of governance which favours nations who are consultative parties to the ATS.[99] Jessica M. Shadian, a researcher whose work brings together science and governance in the polar regions, agrees with Elzinga, and further argues that polar science programmes are under-studied by scholars who look at the shifting nature of global politics and the role of

[95] Beck, *The International Politics of Antarctica,* 285-286.
[96] Beck, *The International Politics of Antarctica,* 285-293; Peter J. Beck, 'Antarctica: A Case For The UN?' *The World Today* 1984 40(4): 169; Peter J. Beck, 'Twenty years on: The UN and the 'Question of Antarctica,' 1983-2003' *Polar Record* 2004 40(3):205-212.
[97] Elzinga, "Antarctica: The Construction of a Continent by and for Science,", 76.
[98] Elzinga, "Antarctica: The Construction of a Continent by and for Science," 77-78.
[99] Elzinga, "Antarctica: The Construction of a Continent,", 78.

'non-state actors as formal participants' in them.[100] The work of Beck and Elzinga has been a cornerstone of interrogations of the ATS which do use postcolonial approaches.

In a recent contribution to *The Routledge Handbook of Science and Empire,* Pratik Chakrabarti notes that scientific endeavour and imperial expeditions are concurrent events, and should be jointly examined by historians of science.[101] Until recently, scholars focusing on Antarctica have most often focused on the imperial expeditions of the 'heroic era' of Antarctic exploration. Similarly, many historians of science investigating scientific research in Antarctica have focused their efforts on the scientific enquiries of the International Polar Years (IPYs) and the introduction of specific technologies to the Antarctic (e.g. the introduction of radio echo-sounding technology and its impact on the study of Antarctic ice sheets[102]). Scholars such as Sanjay Chaturvedi began to apply a postcolonial approach to their study of Antarctica, and in doing so, linked 'the penetration of the polar regions' to European colonialism elsewhere.[103] In 2006, Klaus Dodds suggested that Antarctic scholarship would benefit from post-colonial engagement, laying out avenues for this engagement, such as: understanding postcolonial challenges to the Antarctic Treaty system documented by Peter Beck; postcolonial and ontological investigation into 'Antarctica's representation in imperial and post-imperial terms as the white continent;'[104] and the ways in which newer members of the ATS have engaged with the Antarctic.

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[100] Shadian, "Revisiting Politics and Science," 35.
[101] Pratik Chakrabarti, 'Situating the Empire in History of Science' in Andrew Goss *The Routledge Handbook of Science and Empire* (London; Routledge, 2021), 10-11.
[102] Turchetti, Dean, Naylor and Siegert "On Thick Ice," 351-76.
[103] Chaturvedi, *Polar Regions*, 39.
[104] Klaus J. Dodds, "Post-Colonial Antarctica: An Emerging Engagement," *Polar Record* 2006 42(1): 59-70.

The three avenues for post-colonial engagement with Antarctica have been explored by Antarctic humanities scholars. Alejandra Mancilla has drawn together and critiqued the way that 'whiteness' has manifested in narratives about Antarctica.[105] There is also a growing body of literature drawn upon throughout this thesis which examines scientific endeavour in Antarctica from national perspectives. Examples include: Adrian Howkins' investigation of Chilean and Argentinian Antarctic agendas and the ways in which ceremonies of possession differ in Latin American contexts;[106] Anne-Marie Brady's work on these often territorial agendas from a Chinese perspective, arguing that Chinese politicians link science in Antarctica with the possibility of resource exploitation;[107] Lize-Marie van der Watt's research on South African agendas;[108] Sanjay Chaturvedi and Indian approaches to Antarctica[109] and more recent research from Daniela Liggett and her colleagues, which interrogates the ways in which living in Antarctic 'gateway cities' shapes approaches to Antarctica.[110] Much of the literature which applies a postcolonial lens to Antarctica touches on themes of nationalism and the ways it can be enacted in the Antarctic in both overt and 'banal' expressions of nationalism.[111] A 2015 paper by Alan Hemmings, Sanjay Chaturvedi, Elizabeth Leane, Daniela Liggett and Juan Francisco Salazar explores

[105] Alejandra Mancilla, "A continent of and for whiteness?: "White" colonialism and the 1959 Antarctic Treaty" *Polar Record* 2019 55(5): 317-319.
[106] Howkins, *Frozen Empires,* 32-33.
[107] Anne-Marie Brady, *China as a Polar Great Power* (Cambridge: Cambridge University Press, 2017) 30-32.
[108] Lize-Marie van der Watt and Sandra Swart, 'The Whiteness of Antarctica: Race and South Africa's Antarctic History' in Peder Roberts, Adrian Howkins and Lize-Marie van der Watt (eds) *Antarctica and the Humanities* (London: Palgrave Macmillan, 2016), 125-156
[109] Sanjay Chaturvedi, "India and Antarctica: Towards Post-Colonial Engagement?," in Anne-Marie Brady (ed) *The Emerging Politics of Antarctica* (London: Routledge, 2012), 50-75.
[110] "Antarctic Cities and the Global Commons: Rethinking the Gateways", Western Sydney University, accessed 9 March 2022, https://www.westernsydney.edu.au/ics/projects/past_ics_projects/antarctic_cities_and_the_global_commons_rethinking_the_gateways
[111] Michael Billig, *Banal Nationalism* (London: SAGE Publications Ltd, 2010), 5.

this, arguing that 'a more muscular nationalism has been able to flourish in Antarctica.'[112] They contend that this uniquely Antarctic strand of nationalism had not previously been explored, given that 'the idea that nationalism might be at play in Antarctica has to overcome much instinctive resistance, as well as the tactical opposition of the keepers of the present political arrangements.'[113] The authors also argued that Antarctic nationalism did not have to present the extremes found elsewhere to be recognised as nationalism, but must be deconstructed, and posited a list of eleven bases for nationalism in Antarctica, which included, but was not limited to: historic and cultural associations with Antarctica; National pride in, and mobilisation through, National Antarctic Programmes; and infrastructure or logistics arrangements.[114] Many of these bases of nationalism put forward in this paper are continuing themes which crop up in SCAR's history, and are discussed throughout this thesis.

Elena Glasberg's book *Antarctica as Cultural Critique* draws together nationalism in Antarctica and interrogates the various activities, scientific, political and cultural, which take place in Antarctica. Glasberg's work is seminal in that it marries critiques of Antarctic discourse with feminist interrogations of Antarctica as a space, exploring the work of Lisa Bloom and the fiction of writers like Ursula K Le Guin to criticise the gendering of Antarctic space and the way this framing echoes imperial rhetoric[115], and the ways in which feminist discourse has viewed Antarctica.[116] Glasberg's ideas

[112] Alan D. Hemmings et al., "Nationalism in Today's Antarctic," *The Yearbook of Polar Law Online* 2015 7(1): 531.
[113] Hemmings, "Nationalism in Today's Antarctic," 533.
[114] Hemmings, "Nationalism in Today's Antarctic," 533.
[115] Elena Glasberg, *Antarctica as Cultural Critique: The Gendered Politics of Scientific Exploration and Climate Change*, Critical Studies in Gender, Sexuality, and Culture (New York: Palgrave Macmillan, 2012), 129.
[116] Glasberg, *Antarctica as Cultural Critique*, 31.

on antarctic imagined futures, or 'imaginaries' of future colonisation are influential and have been used by others examining the relationship between Antarctic activities like artist programmes and scientific research. She argues that the ATS 'functions as a way of suspending national claims while deferring the very logic of territory'[117] and that the ATS allows for the holding of Antarctica 'in suspension for a future nationalism.'[118] This notion is central to the argument of this thesis, which posits that SCAR allows this assessment to hold true alongside the argument that the Antarctic has effectively become an internationalist utopia.

1.2.3 Science Diplomacy

To understand the tools used by science diplomacy scholars applied throughout this thesis, it is first essential to discuss Joseph S. Nye's concept of 'soft power'. Nye introduced the concept of 'soft power' into the scholarly lexicon in 1990. Using a definition of power as 'the capacity to do things, but more specifically in social situations, the ability to affect others to get the outcomes one wants.'[119] Nye defined 'soft power' as a form of power that aimed to co-opt rather than coerce; an alternative to 'hard' power, which he defines as the use of military might and economic means as a means to an end.[120] Soft power, as defined by Nye, is generated by resources which broadly fall into the three categories of culture, policies and political values.[121] Nye also argued that soft power is generated by policies, but it is

[117] Glasberg, *Antarctica as Cultural Critique*, 6.
[118] Glasberg, *Antarctica as Cultural Critique*, 6.
[119] Joseph S. Nye, "Soft Power: The Evolution of a Concept," *Journal of Political Power* 2021 4(1): 196–208.
[120] Joseph S. Nye, *Bound to Lead: The Changing Nature of American Power* (Basic Books, 1990); Joseph S. Nye, *Soft Power: The Means to Success in World Politics* (Public Affairs, 2004).
[121] Nye, *Soft Power: The means to success* (2004), 117; Joseph S. Nye, *The Future of Power.* (New York: Public Affairs, 2011), 12.

also generated by cultural institutions largely out of a government's control, such as universities.[122] Nye's more recent work also argues that soft power cannot be manufactured, but that it is earned over time, and not subject to short-term changes.[123] Furthermore, in his 2011 book, *The Future of Power,* Nye argued that soft power and hard power could be combined into effective political strategy, which he called 'smart power'.[124] Nye's concepts of hard, soft and smart power have been incredibly influential in the ways that science diplomacy literature examines power, and is also present in the literature about SCAR, the ATS and Antarctica. This thesis applies Nye's ideas about power to interrogate the relationships between science, power and colonialism in Antarctica, and the role that SCAR plays in these relationships.

The relatively new field of science diplomacy studies examines the ways in which science interacts, and has historically interacted with politics and diplomatic relations between nation states. To understand science diplomacy discourse, we must first define science diplomacy. 'Science diplomacy' is often defined using the definition presented by the American Association for the Advancement of Science (AAAS) and the Royal Society in their 2010 publication *New frontiers in science diplomacy: Navigating the changing balance of power.*[125] In the report, science diplomacy is split into three types of relationship between science and diplomacy, detailing three overarching ways in which science and policy interact. The first of these is 'science in diplomacy', a relationship between the two in which

[122] Nye, *Soft Power: The means to success* (2004), 117.
[123] Nye, *Soft Power: The means to success* (2004), 117-118.
[124] Nye, "Soft Power: The Evolution of a Concept", 196-208.
[125] AAAS and Royal Society. "New Frontiers in Science Diplomacy: Navigating the Changing Balance of Power." AAAS. Accessed June 18 2022. https://www.aaas.org/sites/default/files/New_Frontiers.pdf.

science and scientific evidence are used to underpin policy and diplomatic negotiations.[126] The second of these is 'science for diplomacy', where science and scientific collaboration can be used to further diplomatic relations between countries.[127] Lastly, 'diplomacy for science' describes the use of diplomatic ties between countries being used to further scientific collaboration on a transnational or international level.[128] The report lists several case studies of 'successful' science diplomacy, one of which is the example of the negotiation of the Antarctic Treaty, and the way that the current governance of Antarctica 'sets a precedent for how the soft power of science can help to strike a balance between national and common interests, and could offer lessons for the peaceful governance of other international spaces and transnational resources', whilst also warning against the dangers of mixing science and diplomacy: notably, that science might be used 'for political ends', or being unable to be clear when science ends and policy begins.[129] The ideas of Jeff Hughes, an influential historian of science, who argued the need for history of science scholars to contribute to policy studies, has influenced this thesis' approach to science diplomacy studies, which also benefit from the methods Hughes was a passionate proponent for, namely contextualising the practises and spaces of science to reveal historical contingencies, which allow for new narratives to be explored.[130] Hughes' ideas, when

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[126] AAAS and Royal Society. "New Frontiers in Science Diplomacy: Navigating the Changing Balance of Power." AAAS. Accessed June 18 2022. https://www.aaas.org/sites/default/files/New_Frontiers.pdf.

[127] AAAS and Royal Society. "New Frontiers in Science Diplomacy: Navigating the Changing Balance of Power." AAAS. Accessed June 18 2022. https://www.aaas.org/sites/default/files/New_Frontiers.pdf.

[128] AAAS and Royal Society. "New Frontiers in Science Diplomacy: Navigating the Changing Balance of Power." AAAS. Accessed June 18 2022. https://www.aaas.org/sites/default/files/New_Frontiers.pdf.

[129] AAAS and Royal Society. "New Frontiers in Science Diplomacy: Navigating the Changing Balance of Power." AAAS. Accessed June 18 2022. https://www.aaas.org/sites/default/files/New_Frontiers.pdf.

[130] Jeff Hughes, "The History of Science, the Public, and the "Problem" of Policy," in Karl Grandin, Nina Wormbs, and Sven Widmalm (eds)*The Science-Industry Nexus: History, Policy, Implications* (Stockholm: Science History Publications, 2004): 365–86.

applied to this body of science diplomacy literature, are essential for the theoretical framework applied in this thesis.

Before examining science diplomacy in Antarctica, it is important to problematize this basic definition of science diplomacy, using the work of scholars studying it. Vaughn C. Turekian, a former science and technology adviser to the US Secretary of State approaches science diplomacy as a policy practitioner, is a passionate proponent of it[131]. He argues, alongside others, that science diplomacy has long been practised without being referred to as such, and that to consider it a modern phenomenon is therefore reductive.[132] Turekian's ideas on science diplomacy have been influential in the field, as he offers an insider's perspective alongside colleagues such as Peter D. Gluckman (the president-elect of the International Science Council), whilst also suggesting that 'important elements of science diplomacy simply do not fit within the traditional tripartite framing.'[133] The tripartite framing of science

[131] Kristin M. Lord and Vaughan C. Turekian, "Time for a New Era of Science Diplomacy," *Science* 2007 315(5813): 769–70; Vaughan C. Turekian, "Science and Technology Advising in Today's Foreign Policy," *Science and Diplomacy*, 2017, 1-5.; Vaughan C. Turekian, "The Evolution of Science Diplomacy," *Global Policy* 2018 9: 5-7.

[132] Vaughan C. Turekian, Sarah Macindow, Daryl Copeland, Lloyd S. Davis, Robert G. Patman and Maria Pozza, "The Emergence of Science Diplomacy," in Lloyd S. Davis and Robert G. Patman (eds.), *Science Diplomacy: New Day or False Dawn?* (Singapore: World Scientific Publishing, 2015), 3–24; Andrew F. Cooper and Jérémie Cornut, *The Changing Nature of Diplomacy* (Oxford: Oxford University Press, 2016) 35–53; Tim Flink, "The Current State of the Art of Science Diplomacy," in Dagmar Simon, Stefan Kuhlmann, Julia Stamm, and Weert Canzler (eds) *Handbook on Science and Public Policy* (Cheltenham: Edward Elgar Publishing, 2019), 104–21.

[133] Vaughan C. Turekian, Peter D. Gluckman, Teruo Kishi, and Robin W. Grimes, "Science Diplomacy: A Pragmatic Perspective from the Inside," Science and Diplomacy, accessed 12 January 2022, https://www.sciencediplomacy.org/article/2018/pragmatic-perspective; Turekian, "Evolution of Science Diplomacy," 5-7.

diplomacy has been criticised roundly by many scholars for its lack of nuance.[134] Matthew Adamson and Roberto Lalli also argue that the boundaries between the three kinds of science diplomacy as given here are 'quite blurred—so blurred that the definition itself is problematic.'[135] Pierre-Bruno Ruffini argues that this is because the primary method of understanding science diplomacy has been through the approaches of foreign policy practitioners like Turekian.[136] Carolin Kaltofen and Michele Acuto build on this and note that without 'much upfront theoretical grounding' science diplomacy has become synonymous with the state-centric aspects of the science-politics interface, whilst also arguing that science diplomacy presents a boundary problem for scholars.[137] Adamson and Lalli concur with this assessment, noting that practitioners claim that science diplomacy, like international relations, is both a phenomenon, and the field of study of that phenomenon, but that a field of study is not yet established, and a historical approach to science diplomacy is also still in its infancy, without an established methodological framework.[138] Charlotte Ringius, Tim Flink and Alexander Degelsegger-Márquez draw together critiques of the tripartite definition of science diplomacy, which

[134] Daryl Copeland, "Science Diplomacy," in Costas M. Constantinou, Pauline Kerr, and Paul Sharp (eds) *The SAGE Handbook of Diplomacy* (London SAGE Publications Ltd, 2016), 628–40; Flink, "Current State of Science Diplomacy", 104-21; J. Penca, "The Rhetoric of "Science Diplomacy": Innovation for the EU's Scientific Cooperation?," accessed 11 December 2021, http://aei.pitt.edu/102624/; Frank L. Smith, "Advancing Science Diplomacy: Indonesia and the US Naval Medical Research Unit," *Social Studies of Science* 2014 44(6): 825–47;Tim Flink and Ulrich Schreiterer, "Science Diplomacy at the Intersection of S&T Policies and Foreign Affairs: Toward a Typology of National Approaches," *Science and Public Policy* 2010 37(9): 665–77; Elisabeth Epping, "Lifting the Smokescreen of Science Diplomacy: Comparing the Political Instrumentation of Science and Innovation Centres," *Humanities and Social Sciences Communications* 2009 7(1): 111.

[135] Matthew Adamson and Roberto Lalli, "Global Perspectives on Science Diplomacy: Exploring the Diplomacy-Knowledge Nexus in Contemporary Histories of Science," *Centaurus* 2021 63(1): 1–16.

[136] Pierre-Bruno Ruffini, "Conceptualizing Science Diplomacy in the Practitioner-Driven Literature: A Critical Review," *Humanities and Social Sciences Communications* 2020 7(1): 124.

[137] Carolin Kaltofen and Michele Acuto, "Science Diplomacy: Introduction to a Boundary Problem," *Global Policy* 2018 9: 8–14.

[138] Adamson and Lalli, "Global Perspectives on Science Diplomacy," 9-10.

ultimately argue that much of the discourse using this definition depicts science as a symbolic good, and echoes the idea that science is 'well-intended, apolitical, non-normative and universal.'[139] The solution for this issue in science diplomacy discourse suggested by Adamson and Lalli, and by Cold War historian Audra J. Wolfe, is to apply a historical scholarship that de-idealizes science diplomacy, and allows for the consultation of new primary source material.[140] Simone Turchetti, Nestor Herran and Soraya Boudia argue that such scholarship should also take into account the transnational nature of scientific knowledge.[141] John Krige, whose work focuses on knowledge-sharing, furthermore encourages an approach to science diplomacy which looks at the advantages of, and the impediments to, transnational sharing of knowledge[142], an approach this thesis aims to employ.

It is essential to examine which of the focuses of science diplomacy scholars and practitioners is useful when applied to Antarctica. The first theme from the science diplomacy discourse which applies is the transnational sharing of knowledge. John Krige notes that it is essential to avoid the pitfalls that come with examining transnational actors such as scientist-diplomats, whose knowledge is an asset that can be deployed to reconfigure existing spaces.[143] Krige's ideas link closely to the work of Pierre-Bruno

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[139] Charlotte Rungius, Tim Flink and Alexander Degelsegger-Márquez, "State-of-the-Art Report: Summarizing Literature on Science Diplomacy Cases and Concepts," *S4D4C*, accessed 10 February 2022, https://www.s4d4c.eu/wp-content/uploads/2018/08/S4D4C_State-of-the-Art_Report_DZHW.pdf.

[140] Adamson and Lalli "Global Perspectives on Science Diplomacy," 9; Audra J. Wolfe, *Freedom's Laboratory: The Cold War Struggle for the Soul of Science* (Johns Hopkins University Press, 2018), 88.

[141] Simone Turchetti, Néstor Herran, and Soraya Boudia, "Introduction: Have We Ever Been "Transnational"? Towards a History of Science across and beyond Borders," *The British Journal for the History of Science* 2012 45(3): 320-321.

[142] John Krige, *How Knowledge Moves: Writing the Transnational History of Science and Technology* (Chicago: The University of Chicago Press, 2019), 30-31.

[143] Krige, *How Knowledge Moves,* 1-31

Ruffini, whose work explores the 'science-diplomacy nexus'[144], an interplay between science, politics and power, in which science can be wielded as a source of cultural and economic power.[145] Another important theme drawn from this literature is the argument put forth by Adamson and Lalli that science diplomacy 'is historically a mediating factor in the production of global inequalities'[146], drawing from the work of several scholars who have linked a study of science diplomacy with the histories of development, globalisation and decolonisation.[147] Furthermore, in applying Joseph Nye's work to science diplomacy literature, it becomes clear that science diplomacy is often seen as a stand-in for soft power. Adamson and Lalli argue that the fact that science diplomacy was initially defined by, and continuously touted as a focus for, foreign policy practitioners has led to a tendency to equate science diplomacy with soft power approaches in international relations, an equivalency which is not borne out in all cases of science diplomacy.[148] Science diplomacy is often seen as bringing hard and soft power together, in the same way that Nye's idea of 'smart power'[149] does, and this bringing together of hard

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[144] Pierre-Bruno Ruffini, "The Intergovernmental Panel on Climate Change and the Science-Diplomacy Nexus," *Global Policy* 9 (2018): 73–77.

[145] Pierre-Bruno Ruffini, *Science and Diplomacy: A New Dimension of International Relations* (Springer, 2017), 99-100.

[146] Adamson and Lalli, "Global Perspectives on Science Diplomacy," 11.

[147] Stephen Brain, "The Appeal of Appearing Green: Soviet-American Ideological Competition and Cold War Environmental Diplomacy," *Cold War History* 2016 16(4): 459-461; J. Brooks Flippen, "Richard Nixon, Russell Train, and the Birth of Modern American Environmental Diplomacy," *Diplomatic History* 2008 32(4): 613–38; Wilfrid L Kohl, *French Nuclear Diplomacy*, (Princeton: Princeton University Press, 2015); John Krige and Kai-Henrik Barth, "Introduction: Science, Technology, and International Affairs," *Osiris* 2006 21(1): 1–21; Joseph Manzione, "'Amusing and Amazing and Practical and Military': The Legacy of Scientific Internationalism in American Foreign Policy, 1945–1963," *Diplomatic History* 2000 24(1): 21–55; Jason M. Colby, "Conscripting Leviathan: Science, Cetaceans, and the Cold War," *Diplomatic History* 2020 44(3): 466–78; Nadin Heé, "Negotiating Migratory Tuna: Territorialization of the Oceans, Trans-War Knowledge and Fisheries Diplomacy," *Diplomatic History* 2020 44(3): 413–27; Giulia Rispoli and Doubravka Olšáková, "Science and Diplomacy around the Earth," *Historical Studies in the Natural Sciences* 2020 50(4): 456–81.

[148] Adamson and Lalli, "Global Perspectives on Science Diplomacy," 12.

[149] Nye, "Soft Power: The Evolution of a Concept,"196-198.

and soft power is essential to our application of science diplomacy discourse to the case of Antarctica and its history.

The case study of Antarctica requires us to apply a science diplomacy lens to the initiatives for international science cooperation spearheaded by SCAR. Several scholars view international science cooperation and science diplomacy to be overlapping endeavours, arguing that they are related, yet analytically separate.[150] They argue that international science cooperation is 'mainly concerned with the advancement of scientific discovery, while the central purpose of science diplomacy is often to use science to promote a state's foreign policy goals or inter-state interests.'[151] In other words, international science cooperation tends to be driven by individuals and groups, whereas science diplomacy often involves a state-led initiative, therefore suggesting that international science cooperation may or may not encompass science diplomacy.'[152] SCAR, which is the body in charge of coordinating international science cooperation in Antarctica, is an organisation that blurs these lines between international science cooperation and science diplomacy - between what is science diplomacy, and what is not. There are conflicting ideas about how SCAR fits into the science diplomacy discourse. Practitioners of science diplomacy have defined SCAR's role in instigating the creation of the ATS as a triumph of science diplomacy, arguing that the AntarcticTreaty 'in many ways, represents the apex of post–World War II science diplomacy.'[153] This picture painted of SCAR has led to its activities being held up as

[150] Turekian, "Emergence of Science Diplomacy," 3-24.
[151] Turekian, "Emergence of Science Diplomacy," 3-24.
[152] Turekian, "Emergence of Science Diplomacy," 3-24.
[153] AAAS and Royal Society. "New Frontiers in Science Diplomacy: Navigating the Changing Balance of Power." AAAS. Accessed June 18 2022. https://www.aaas.org/sites/default/files/New_Frontiers.pdf.; Turekian, "Emergence of Science Diplomacy," 3-24.

evidence in calling for more 'diplomacy for science' in the Antarctic.[154] Conversely, it has also been considered a case study in which the accepted definition of science diplomacy does not work.[155] This thesis problematizes the narrative which suggests that SCAR and the ATS represent a triumph of science diplomacy, whilst also examining the ways in which SCAR's efforts to foster and coordinate international scientific collaboration in Antarctica can be considered representations of successful and unsuccessful science diplomacy initiatives.

Ultimately, this thesis draws together these varying theories about science diplomacy and soft power in Antarctica. As Nye states, non-state actors are also capable of competing in the realm of soft power.[156] Put simply, 'NGOs can often do what governments cannot' in the realm of science diplomacy.[157] These non-state actors, like SCAR, can then, through a combination of existing soft power and 'public diplomacy' initiatives to create more soft power, compete alongside state actors on the international stage.[158] 'Public diplomacy' refers to the seemingly open nature of a governance or policy process, strategically used to communicate certain messages about the process in order to gain support for it, which can often be done by developing a relationship between a public audience and the non-state actor over time. This thesis argues that in Antarctica, the existence of SCAR allows for the illusion that

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[154] Gary Wilson, "Antarctic Science: A Case for Extending Diplomacy for Science," in Lloyd S. Davis and Robert G. Patman, *Science Diplomacy: New Day or False Dawn?* (Singapore: World Scientific Publishing, 2015), 69–71.
[155] Vaughan C. Turekian, Peter D. Gluckman, Teruo Kishi, and Robin W. Grimes, "Science Diplomacy: A Pragmatic Perspective from the Inside," Science and Diplomacy, accessed 12 January 2022, https://www.sciencediplomacy.org/article/2018/pragmatic-perspective;
[156] Nye, "Soft Power," 7-20.
[157] Vaughan C. Turekian and Norman P. Neureiter, "Science and Diplomacy: The Past as Prologue," *Science Diplomacy,* accessed 9 January 2022, https://www.sciencediplomacy.org/sites/default/files/science_and_diplomacy.pdf
[158] Eytan Gilboa, "Public Diplomacy," in Gianpetro Mazzoleni (ed) *The International Encyclopedia of Political Communication*, (London: John Wiley & Sons, 2016), 1–9; Nye, "Soft Power," 7-20.

soft power is the only active type of power at play, despite the indisputable fact that sources of 'hard power' (e.g. money and military infrastructure and personnel) are needed for a country to be able to participate in scientific activity in Antarctica. Therefore, it argues that the soft power generated by the ATS and the actions of SCAR alike is not genuine soft power as defined by Joseph Nye, but manufactured. Alongside the successful examples of science diplomacy in Antarctic governance, this soft power is used as a smokescreen to mask two things: firstly, the integral role of hard power in Antarctica, and secondly, the imperial ambitions underpinning the national agendas of state actors involved with both SCAR and the ATS.

The question which follows this assumption then is - why? Why manufacture soft power in Antarctica? And why mask imperial ambitions and the role of hard power in Antarctica? This thesis argues that the successes of science diplomacy linked to the roles of SCAR and the ATS in administering the science and politics of Antarctica respectively, are essential to the continuation of current efforts to colonise Antarctica, as well as the future/potential colonisation posited by Elena Glasberg, with SCAR and its activities at the heart of these efforts.

1.3 Thesis Structure

This thesis applies the frameworks from the literature detailed above to an investigation of the internal politics of SCAR over this period. By accessing the newly available SCAR archives, located at the Scott Polar Research Institute at the University of Cambridge (UK), and interrogating the material, this thesis explores the role that SCAR has played in constructing several framings of the Antarctic, and the

political purposes that each of these framings has served, from 1958-1991. This thesis tackles SCAR's history in a chronological fashion, with periods of overlap. This thesis makes use of primary source material from the SCAR Archives at the Scott Polar Research Institute in Cambridge, UK; and The National Archives at Kew in London, UK. Stylistically, this thesis weaves the primary material from these archives with the secondary material, to integrate research material with the body of literature that already exists and to illustrate the ways in which this thesis contributes to and improves it.

Chapter 2 of this thesis provides integral context to the activities of SCAR and the political implications of the science that SCAR coordinated during the International Geophysical Year. Section 2.2 explores the politics of Antarctica prior to the International Geophysical Year, discussing the various claims to Antarctic territory and the reasons why some states had not laid formal claim to the Antarctic, despite clear evidence of their colonial ambitions in Antarctica. In exploring the role of scientific internationalism in setting up the IGY, section 2.3.1 explores the political goodwill engendered by scientific activity during the IGY, and section 2.3.2 explores the political tensions between the countries taking part in the IGY research programme. The chapter then explores the role of two scientific activities over the course of the IGY. The first of these is scientific exchange, which served to alleviate some of the underlying political tensions during the IGY (section 2.3.3). The second of these activities is meteorological research; section 2.3.4 explores not only the way in which meteorological research and Antarctic politics were co-produced before and during the IGY, but the effect that the political tensions in Antarctica had on building a programme of collaboration and

simultaneous data collection on a hitherto unseen scale, and the implications of this programme of research on Antarctic politics after the IGY.

Chapter 3 examines the role of SCAR in constructing the framing of Antarctica as a 'continent for peace and science' and the way such a framing of the Antarctic serves to obfuscate a developing role for science in Antarctica: that of effective occupation of Antarctic territory, which allows for the continuing colonisation of the Antarctic, by the assumption of authority over the Antarctic environment through scientific endeavours. Section 3.2 analyses the utility of SCAR in the continued coordination of research activity in Antarctica, and its centrality to developing the scientific internationalism which created an environment that was conducive to successful negotiation of the Antarctic Treaty (section 3.3). Section 3.4 problematizes the lack of a defined relationship between the established body for the coordination of scientific research and the newly negotiated Treaty, which becomes a source of tension in later chapters. Section 3.5 explores the early years of the Antarctic Treaty System and SCAR respectively, and their almost symbiotic relationship. This section demonstrates the ways in which SCAR's continued success in coordinating international meteorological research and scientific exchange, legitimises and validates its continued existence. SCAR's continued success also legitimises and validates the Antarctic Treaty System as a governance structure for the Antarctic, through which the Antarctic is subjected to the control of a small number of national actors.

Chapter 4 examines the early years of SCAR's existence, and specifically the role of SCAR as a vehicle for science diplomacy after the end of the IGY. This chapter interrogates the ways in which science is

becoming an entrenched tool of effective occupation during the early years of the Antarctic Treaty, and thereby a continuation of the pre-IGY colonial ambitions for Antarctica. This chapter looks at the ways in which SCAR's activity underpinned early Antarctic conservation initiatives, such as the Agreed Measures for the Conservation of Antarctic Flora and Fauna (AMCAFF) (section 4.3) and the Convention for the Conservation of Antarctic Seals (CCAS) (4.5). Using Adrian Howkins' notion of 'the assertion of environmental authority' and the work of Alessandro Antonello in his book *The Greening of Antarctica,* which looks at this period, SCAR allows for three interactions between science and sovereignty. These are: a reframing of former attempts to assert sovereignty over the Antarctic environment; a new assertion of that collective sovereignty over the Antarctic environment through the ATS, and lastly, the use of SCAR's activities during this period to lay the foundations for a future colonial administration of the Antarctic by another name.

Chapter 5 of this thesis explores the way that changing global attitudes towards the global commons and the common heritage of mankind affected Antarctica during the 1970s and 1980s. At the start of this period, factors such as the ongoing decolonisation and deconstruction of European empires led directly to the application of the principles of the global commons and the common heritage of mankind to Antarctica (Section 5.2). The introduction of a new international economic order to the United Nations and radical proposals for the use of the global commons initiated the negotiations of the Third Conference of the United Nations Convention on the Law of the Sea (UNCLOS), which applied extractive imaginaries to the ocean floor. Section 5.3 surveys some of the difficulties experienced by SCAR during this period, as Antarctica too, became the object of extractive

imaginaries. The negotiation of the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) (section 5.4) and the subsequent negotiation of the Convention for the Regulation of Antarctic Mineral Resources Activities (CRAMRA) (section 5.8) discuss the ways in which the ATS had begun to apply extractive imaginaries to the Antarctic, and this chapter also explores the ways in which this was challenged by critics at the United Nations (5.6) and environmental groups respectively. Ultimately, this chapter scrutinises the ways in which the framing of Antarctica during this period as a source of potential mineral wealth ultimately only challenged the existence of the ATS, and its ambitions to extract resources from Antarctica for a select group of member countries, until the only course of action left was to reframe Antarctica once more, as a 'fragile and vulnerable' environment in need of protection (section 5.10.2), a framing which allowed for a rejection of the extractive imaginary with the negotiation of the 1991 Madrid Protocol.

The final chapter (6) draws together the events from each of the previous chapters to detail the central arguments of this thesis, that the Antarctic is subject to the colonial ambitions of Antarctic Treaty System and SCAR Member states. The thesis also argues that Antarctica is not only colonised, but that it is colonised in a distinct way, which, in the absence of an indigenous population to subjugate, involves the exertion of control over the Antarctic environment instead.

2. Towards a New Scientific Internationalism: Antarctic Science and the Politics of The International Geophysical Year

2.1 Introduction

This chapter provides essential contextual detail regarding not only the politics of Antarctica before the International Geophysical Year (IGY) of 1957-1958, but a discussion of the political tensions throughout the IGY. The IGY is often framed as an event in which 'apolitical' scientific endeavour triumphed over territorial politics to conduct scientific investigation in Antarctica.[159] The timing of the IGY has only added to this narrative. It took place at the height of the Cold War, involving scientists from both the US and USSR, at a time when the USSR was viewed as a state actor which 'did not take part in any Western activity.'[160] Pierre-Bruno Ruffini argues that by 1955, the USSR had 'never participated in any international cooperation and, at United Nations summits, systematically opposed any suggestion originating from the Western camp.'[161] Much of the science diplomacy and history literature which looks at the IGY views it through an uncritical lens, lionising the scientists involved in setting up the IGY research programme and lauding them for creating 'the biggest natural laboratory

[159] Colin Summerhayes, 'Scientists Together In The Cold' In David W. H. Walton (Ed.), *Antarctica: Global Science from a Frozen Continent*: (Cambridge: Cambridge University Press, 2013), 253–272; Paul A. Berkman, 'President Eisenhower, The Antarctic Treaty and the Origin of International Spaces' in Paul A. Berkman, Michael A. Lang, David .W.H. Walton, and Oran R. Young.. *Science Diplomacy: Science, Antarctica, and the Governance of International Spaces* (Washington, DC: Smithsonian Institution Scholarly Press, 2011), 337.
[160] Pierre-Bruno Ruffini. *Science and Diplomacy: A New Dimension in International Relations.* (Paris: Springer International Publishing, 2015), 99-100.
[161] Ruffini, *Science and Diplomacy*, 99-100.

dedicated to nothing else but science.'[162] Much of this literature perpetuates what Alan D. Hemmings, Klaus Dodds and Peder Roberts term 'the appeal of the exceptional',[163] which leads to the reproduction of 'a particular (invariably uncritical) political–scientific story of Antarctic politics grounded in the geopolitical and institutional circumstances of the IGY.'[164] In more recent years, a more critical scholarship has investigated the IGY, and this chapter draws from it.

This chapter challenges the exceptionalist narratives by drawing from the critical body of work which interrogates the science and politics of the IGY. Aant Elzinga observes that science in Antarctica is a product of (as much as is also an exception to) geopolitical considerations and rivalries.[165] It is precisely because of these geopolitical considerations that it is essential to present Antarctic science as being exceptional. Elzinga argues that examining the International Polar Years (IPYs) of 1882-1883 and 1932-1933 and the IGY is integral to an understanding of the changing nature of scientific internationalism and its uses over the course of the nineteenth and twentieth centuries respectively.[166] Jessica M. Shadian, a researcher whose work brings together science and governance in the polar regions, agrees with Elzinga and further argues that polar science programmes are under-studied by scholars who look at the shifting nature of global politics and the role of 'non-state actors as formal

[162] Ruffini, *Science and Diplomacy*, 99.
[163] Alan D. Hemmings, Klaus Dodds and Peder Roberts. 'Introduction: The Politics of Antarctica' in Klaus Dodds, Alan D. Hemmings and Peder Roberts (Eds.) *Handbook on the Politics of Antarctica.* (Cheltenham, UK: Edward Elgar Publishing, 2017), 2.
[164] Hemmings, *Politics of Antarctica,* 2.
[165] Aant Elzinga 'The interplay of science and politics: the case of Antarctica' in Uno Svedin and Britt Aniasson (eds). *Society and the Environment: A Swedish Perspective.* (Dordrecht: Klewer, 1992) pp. 257–83.
[166] Aant Elzinga, 'Through the lens of the polar years: changing characteristics of polar research in historical perspective' *Polar Record* 2009 45(4): 313-336.

participants' in them.[167] She argues that the history of the IPYs specifically has the potential 'to help illuminate better understandings of the ongoing and contextual relationship between changing assumptions of science and governance', as new non-state actors have increasingly come to define and determine the ways in which the governance of both polar regions is carried out.[168] This thesis takes Shadian's argument, and aims to extend it to SCAR.

This chapter draws together the postcolonial and critical geography approaches of scholars examining the IGY through a more critical lens, to argue that SCAR's activities - first during the IGY, then during the subsequent negotiations of the Antarctic Treaty. Furthermore, I argue that with the negotiation and ratification of the Antarctic Treaty, Members of the Antarctic Treaty System began to view science in Antarctica as a potential form of effective occupation and a tool for administering the Antarctic in the absence of more traditional means of colonisation and fostering colonial ambitions without overtly appearing to do so. Without examining primary source material providing an insight into some of the actors involved in the ratification of the Antarctic Treaty and elucidating the intentions of these actors at the time, this thesis cannot investigate these intentions. If the COVID-19 pandemic had not stalled archival research, this argument would have been made, and supported by further documentation from the British actors, which can be found in the National Archives in the UK. Given that this research was unfortunately beyond the scope of this project due to these extenuating circumstances, this chapter rests on the argument that a retrospective exploration of these intentions and actions

[167] Jessica M. Shadian, 'Revisiting Politics and Science in the Poles: IPY and the Governance of Science in Post-Westphalia', in *Legacies and Change in Polar Sciences* (London: Routledge, 2020), 35.
[168] Shadian, "Revisiting Politics and Science," 35-36.

suggests that the parties involved were aware that science in the Antarctic was a form of effective occupation by other means. To these political actors, the science itself was merely tokenistic or instrumental in establishing effective occupation, and therefore, it did not matter which activities SCAR involved itself in, as long as they could be divorced from associations with potential colonisation of the Antarctic, or reframed as activities which might traditionally be associated with colonial ambitions, but were now simply apolitical lines of scientific enquiry.

By investigating two of the activities overseen by SCAR during the IGY, which have often been touted as examples of the ways in which science triumphed over politics in Antarctica and problematising them, I argue that the activity of SCAR has from the first been used to obfuscate the role science played and continues to play in Antarctica: the role of effective occupation, which begins in this period The two examples of SCAR activity explored in this chapter are the scientific exchange of researchers between stations and the collection and sharing of meteorological data. These examples have been chosen for a variety of reasons. Firstly, these activities were mentioned in the Resolutions from the Comité Special de L'Année Géophysique Internationale (CSAGI), the planning committee for the IGY scientific programme, which underlines their importance. Secondly, they have been used by various actors reinforcing the exceptionalist narrative about Antarctica, as examples of how the IGY's scientific programme was effective in eliminating Cold War tensions in the Antarctic.

This chapter scrutinises and problematizes both of these activities. Scientific exchange was used, it seems, to alleviate the political tensions during the IGY, in the spirit of scientific internationalism, but did not prove as effective as the exceptionalist narratives about Antarctica espouse. Similarly, the

scrutiny of the establishment of multiple meteorological stations across the Antarctic for simultaneous meteorological observations reveals reasons for its success during and after the IGY: the need for these simultaneous observations led to what Paul Edwards has termed 'the rise of infrastructural globalism in meteorology.'[169] This, coupled with the way that scientific internationalism was being put to use in Antarctica during the IGY created the conditions which allowed for the success of SCAR's meteorological research during this period. I argue that it is not solely the scientific internationalism fostered by SCAR and its research programme in Antarctica during the IGY which made meteorological data collection and analysis a success, but the fact that meteorology as a field of research demands a transnational infrastructure and large-scale collaborative efforts.

2.2 Antarctica Before the IGY

A thorough discussion of the nature of Antarctic politics and the state of claims to Antarctic territory is beyond the scope of this thesis, but it is important to provide some context for a discussion of the political tensions present during the course of the IGY. Prior to the IGY, formal claims to Antarctic territory had been made by seven nations: Australia, New Zealand, France, and Norway had all claimed separate and distinct Antarctic territories, and Argentina, Britain and Chile had all formally laid claim to the Antarctic Peninsula region, with all three claims overlapping.[170] This contested claim to the Peninsula made settling the question of Antarctic sovereignty impossible, as none of the

[169] Paul N. Edwards, "Meteorology as Infrastructural Globalism," *Osiris* 2006 21(1): 239.
[170] Klaus Dodds, *Antarctica: A Very Short Introduction* (Oxford: Oxford University Press, 2012), 6; Robert Fox, *Antarctica and the South Atlantic: Discovery, Development and Dispute* (London, British Broadcasting Corporation, 1985), 76-79.

claimants would cede their own claim, nor recognise a competing one - the issue was referred to as both 'the ABC problem' and as 'the Antarctic problem.'[171]

Before the International Geophysical Year the United States had not made a formal claim to Antarctic territory, which Dian Olson Belanger attributes to US territorial ambition in Antarctica being coloured by tempered by considering the implications of a Soviet response, which could turn Antarctica into another arena for Cold War conflict.[172] Conversely, Jason Kendall Moore attributes this firstly to an initial indecision as to how best to claim Antarctic territory at the US State Department, and later to the difficulties in doing so whilst remaining on cordial terms with the governments in Chile and Argentina.[173] Whereas the US stance on claiming Antarctic territory was unclear, the intentions of the US Government regarding a Soviet presence in the Antarctic were straightforward. The US Secretary of Defence at the time argued that 'it was imperative that sovereignty or active participation in control of the Antarctic, under trusteeship arrangements or otherwise, should be denied to groups of nations which include our most probable enemies.'[174] It is clear from the post-WWII US policy of containment towards the USSR, that the US and its allies 'wanted to keep the Soviet Union out of Antarctica and Antarctic Affairs.'[175] Klotz argues that this was principally due to

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[171] Adrian Howkins, *Frozen Empires: An Environmental History of the Antarctic Peninsula*. (Oxford: Oxford University Press, 2017), *2-3*.

[172] Dian O. Belanger, *Deep Freeze: The United States, the International Geophysical Year, and the Origins of Antarctica's Age of Science*. (Boulder: University Press of Colorado, 2010), 19.

[173] Jason K. Moore, "Diplomacy, Public Opinion, and the 'Fractionalization' of US Antarctic Policy 1946-1959," Unpublished PhD Thesis (University of Tasmania, 2006), 45-46; Jason K. Moore, "Bungled publicity: Little America, Big America, and the Rationale for Non-Claimancy, 1946-1961," *Polar Record* 2004 40(1): 19–30.

[174] Frank G. Klotz, *America on the Ice: Antarctic Policy Issues* (Washington DC: University Press of the Pacific, 2002), 21.

[175] Klotz, *America on the Ice*, 21.

the military potential the Antarctic held as a possible training ground for cold weather operations which for political reasons couldn't be conducted in the Arctic, and the Antarctic would later be used by the US for this purpose for Operations High Jump and Windmill respectively.[176] This reticence from the US, and indeed from other national actors from claimant nations, to allow the Soviets an opportunity to be involved in the IGY programme, and in doing so develop a presence on the Antarctic continent, has been explored by Belanger.[177] The anti-Soviet sentiment also presented the claimant nations and the Americans with an opportunity to begin negotiations for a proposed solution to the problem of Antarctic sovereignty.[178]

[176] Klotz, *America on the Ice*, 21; Belanger, *Deep Freeze*, 19.
[177] Belanger, *Deep Freeze*, 19.
[178] Moore, "Diplomacy, Public Opinion," 48-49.

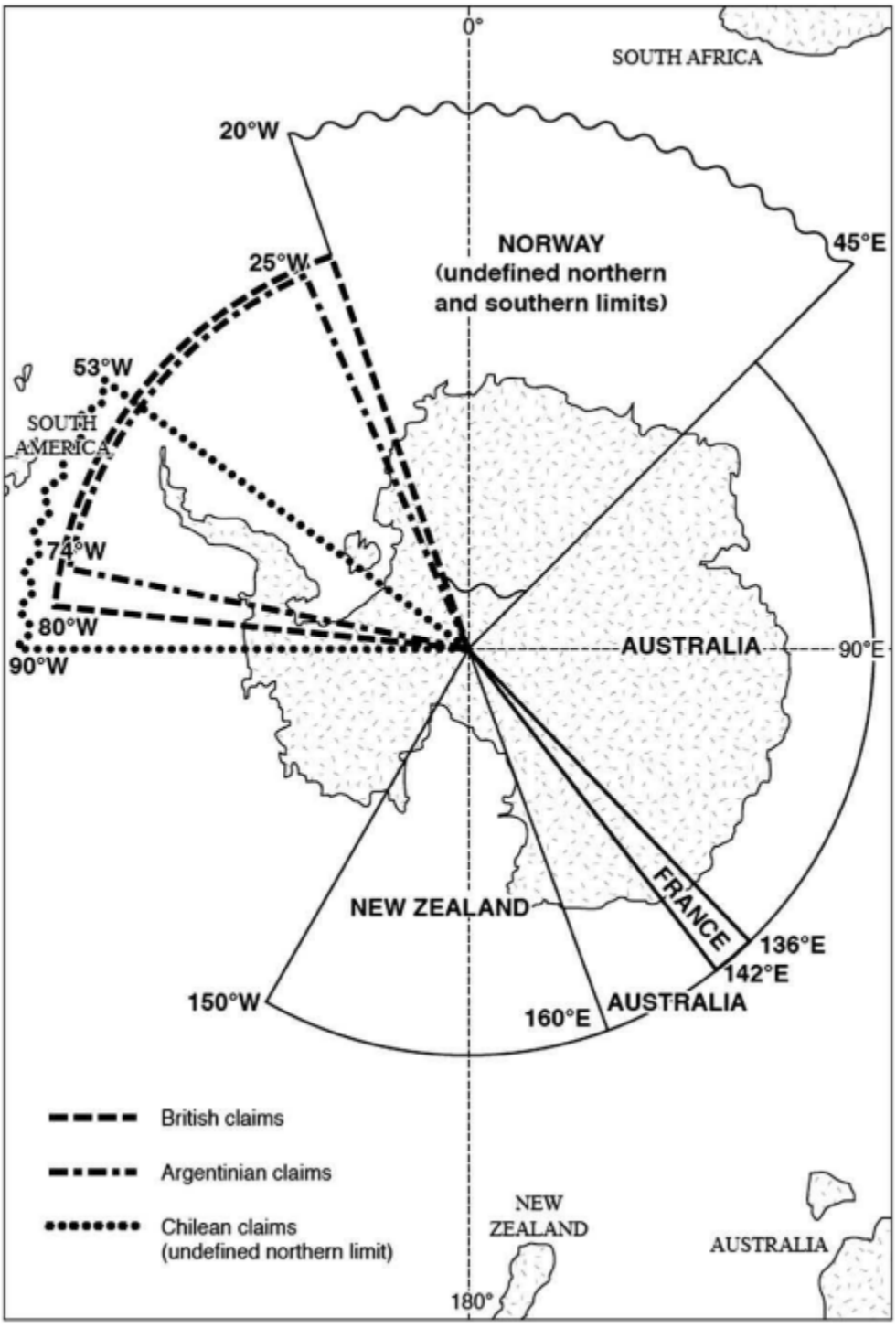

Figure 1. *National claims to Antarctica in the 1940s.*

2.3 Science and Politics During the IGY

2.3.1 SCAR and the IGY: Science, Internationalism, Exceptionalism and Antarctica

Adrian Howkins argues that 'it is tempting to think of the International Geophysical Year (IGY) of 1957-58 as some kind of deus ex machina, emerging independently and then resolving the political problems of Antarctica with a surge of idealistic scientific internationalism.'[179] There is a certain amount of mythmaking in the story of the IGY which reflects this framing. The official IGY origination story is as follows: during a dinner party hosted by James and Abigail Van Allen on April 5th 1950 in Maryland, American physicist and engineer Lloyd Berkner suggested that it was time for a new IPY, that a 50-year interval between polar years was not needed, primarily due to the numerous advances in technology since the second IPY.[180] Gregory A. Good notes that this story about the IGY origins has been retold so often, that it has become the IGY creation myth,[181] even being published in *Nature* by Sydney Chapman,[182] who alongside Lloyd Berkner and Harry Wexler, was instrumental in organising the IGY.[183] Audra J. Wolfe interrogates Berkner's proposal and the nature of the IGY research programme, noting that 'not coincidentally, many of the scientific studies promised to produce the sorts of geophysical measurements on which contemporary warfare depended.'[184] She

[179] Howkins, *Frozen Empires,*19.
[180] Gregory A. Good, "Sydney Chapman: Dynamo behind the International Geophysical Year," in *Globalizing Polar Science*, ed. Roger D. Launius, James Rodger Fleming, and David H. DeVorkin (New York: Palgrave Macmillan, 2010), 185;
[181] Good, "Sydney Chapman," 185;
[182] Sydney Chapman, "The International Geophysical Year," *Nature* 1953 4373: 327-329.
[183] Good, "Sydney Chapman," 185;
[184] Audra J. Wolfe, *Freedom's Laboratory: The Cold War Struggle for the Soul of Science*, (Baltimore: John Hopkins University Press, 2018), 97.

argues that the popularity of Berkner's proposal was connected to his influential contacts in the CIA and at the US State Department, who ensured that the 'IGY's scientific goals were deeply intertwined with national security concerns.'[185] Indeed, at the time Berkner proposed a new IPY, he had finished *Science and Foreign Relations,* a report which argued for the use of international scientific bodies to advance Western values.[186] This was a stance which Berkner would keep during his tenure as ICSU president during the IGY.[187] Allan A Needell also noted that the 'claim for government support was substantially bolstered by its potential value as a vehicle of foreign policy, as a means of providing certain information required by the military, and as a source of scientific and technical intelligence.'[188] Benjamin Goossen also adds to Wolfe's conclusions, and argues that there were always 'global and military applications of large-scale transnational science in an age of submarines and ballistic missiles.'[189] Goossen argues that these large-scale transnational science projects are often touted as a non-political form of peaceful universalism, using the IGY as a case study.[190]

Lloyd Berkner's suggestion for an International Polar Year was accepted by the International Council of Scientific Unions (ICSU) after he and Sydney Chapman, a British geophysicist and the vice president of the International Union for Geophysics and Geodesy (IUGG) petitioned relentlessly for

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[185] Wolfe, *Freedom's Laboratory,* 97.
[186] Allan A. Needell, *Science, Cold War and the American State: Lloyd V. Berkner and the Balance of Professional Ideals*, (Amsterdam: Harwood Academic Publishers, 2000), 314-315.
[187] David W. H. Walton, Peter D. Clarkson, and Colin P. Summerhayes, *Science in the Snow: Fifty Years of International Collaboration through the Scientific Committee on Antarctic Research*, (Cambridge: Scientific Committee on Antarctic Research, 2011)*,* 7; Needell, *Cold War and The American State,* 323-324.
[188] Needell, *Science, Cold War, and the American State*, 317.
[189] Benjamin W. Goossen, "A Benchmark for the Environment: Big Science and "Artificial" Geophysics in the Global 1950s," *Journal of Global History* 2020 15(1): 149–168.
[190] Goossen, "Benchmark for the Environment,"149–168.

it.[191] ICSU approved a new IPY in 1951, which in 1953 was expanded so that the scope of the research became global, and it was renamed the International Geophysical Year (IGY).[192] ICSU set up the Comité Special de l'Année Géophysique Internationale (CSAGI) to plan the scientific program and invite participation of interested scientific bodies.[193] Sydney Chapman was elected the CSAGI president at the committee's first meeting, which was held in Brussels from 30th June to 3rd July 1953, and focused on formulating the IGY program.[194] Because the Soviet Union was not at that time a member of ICSU, it was decided that the Soviets should be invited to cooperate with others and participate in the IGY as they had in the first two International Polar Years.[195] During the planning stages of the IGY, ICSU agreed to establish SCAR,[196] which was tasked "with furthering the co-operation of scientific activity in Antarctica with a view to framing a scientific program of circumpolar scope and significance."[197] As former SCAR President Colin Summerhayes notes,

[191] Allan A. Needell, 'Lloyd Berkner and The International Geophysical Year Proposal in Context: With Some Comments on the Implications for the Comité Spéciale de l'Année Géophysique Internationale, CSAGI, Request for Launching Earth Orbiting Satellites' in Roger D. Launius, James R. Fleming, Daniel H. DeVorkin (eds) *Globalizing Polar Science. Palgrave Studies in the History of Science and Technology*. (New York: Palgrave Macmillan, 2010).

[192] Harold Spencer Jones, 'The Inception and Development of the International Geophysical Year', *Annals of the International Geophysical Year* 1959 1: 383.

[193] Fogg, G. *A History of Antarctic Science*. (Cambridge: Cambridge University Press, 1992), 169; Jones, "The Inception and Development of the International Geophysical Year", 383.

[194] Walter Sullivan, *Assault on the Unknown: The International Geophysical Year*, (New York: McGraw-Hill Book Company, 1961), 26.

[195] Sullivan, *Assault on the Unknown*, 26.

[196] Philip W. Quigg, *A Pole Apart: The Emerging Issue of Antarctica*, (New York: New Press, 1983), 55; Walton, Clarkson and Summerhayes, *Science in the Snow,* 4-5.

[197] Quigg, *A Pole Apart,* 55.

SCAR's mission has been to facilitate and coordinate Antarctic research 'of a scope beyond that of its individual national members.'[198]

Scientific internationalism is at the heart of the IGY and of SCAR's tenure in Antarctica. At the first meeting of CSAGI, Georges Laclavère, who had been elected president of the committee and would go on to become the first SCAR President, stated that 'the overall aims of the Conference are exclusively scientific.'[199] Naylor, Dean and Siegert argue that although previous polar endeavours during the first two international polar years were also in part due to a budding scientific internationalism, the IGY and SCAR's creation heralded a new type of scientific internationalism in Antarctica.[200] Naylor, Dean and Siegert also posit that 'to many scientists and statesmen, Antarctica presented an ideal territory on which to embark on a global experiment in scientific internationalism.'[201] This argument assumes that the IGY itself and the extension of its research programme through SCAR in the years that followed, heralded the start of this new version of scientific internationalism, 'complete with coordinated scientific activities, personnel exchange programmes and global data centres.'[202] This is also the sentiment retrospectively ascribed by dominant IGY narratives to the meeting between Lloyd Berkner, Sydney Chapman, and Harry Wexler at a dinner party in Maryland, when 'it was decided that the time

[198] Colin P. Summerhayes, 'International Collaboration in Antarctica: The International Polar Years, the International Geophysical Year, and the Scientific Committee on Antarctic Research,' *Polar Record* 2008 44(4): 327.
[199] Walton, Clarkson and Summerhayes, *Science in the Snow,* 6.
[200] Simon Naylor, Katrina Dean, and Martin Siegert, 'The IGY and the ice sheet: surveying Antarctica,' *Journal of Historical Geography* 2008 34(4): 580.
[201] Naylor, Dean and Siegert, "The IGY and the ice sheet", 582.
[202] Naylor, Dean and Siegert, "The IGY and the ice sheet", 583.

was ripe for another International Polar Year.'[203] Gregory Good also argues that it was in part the skills and the connections of these three men, and in particular Sydney Chapman, which allowed for this global experiment in scientific internationalism to take place.[204] Clark Miller adds that 'the principle of intellectual and cultural exchange and friendship that defined previous versions of scientific internationalism was shifted into the realm of geopolitics among states during this period, whereby science morphed into 'a means for identifying, analysing, and solving global policy problems and promoting technological and economic growth as the foundation for democracy and national security.'[205] The Annals of the IGY also describe the ways in which the Soviet delegation to CSAGI meetings agreed with their colleagues on the key to fruitful cooperation during the IGY being 'the single-minded devotion to science.'[206]

Problematizing this argument, Jorge Berguño and Aant Elzinga posit that the reason that science was able to take on this peaceful veneer in the Antarctic was due to the implication 'that scientific activity could never become a full or even inchoate title to sovereignty, and it was also obvious that any new claimant desiring to enhance its claim with proof of recent activity would wish to resort precisely to those scientific and logistic activities that were denied juridical effect.'[207] This assumption, that science had not been definitively linked to effective occupation at the time of the negotiations for the Antarctic

[203] Walton, Clarkson and Summerhayes, *Science in the Snow,* 6; Jacob Darwin Hamblin, *Oceanographers and the Cold War: Disciples of Marine Science*, 1st ed (Seattle: University of Washington Press, 2005): 61.
[204] Good, "Sydney Chapman," 191-198.
[205] Clark Miller, "An Effective Instrument of Peace," *Osiris* 2006 21(1): 135.
[206] Marcel Nicolet, *Annals of the IGY 1958. The International Geophysical Year meetings, vol. IIA.* (London: Pergamon Press, 1994), 85.
[207] Jorge Berguño and Aant Elzinga, "The Achievements of the IGY," in Susan Barr and Cornelia Luedecke (eds) *The History of the International Polar Years (IPYs)*, (Heidelberg: Springer, 2010), 272.

Treaty, is what allowed the scientific internationalism in Antarctic science to pave the way for the Treaty in the first place. In this chapter, I build on Elzinga's work, and argue that this assumption is also what allowed science to begin to be considered a form of effective occupation once the Treaty was negotiated, signed in 1959 and ratified in 1961.

2.3.2 Political Paranoia During the IGY

Despite the scientific internationalism at the heart of the IGY and the almost mythical narrative around its supposed apolitical nature, there were numerous political tensions arising between countries taking part in the Antarctic programme of the IGY. There is a body of literature which takes a critical approach in interrogating the IGY to examine these. A closer examination of the politics of the IGY during the planning and delivery of the scientific programme reveals a plethora of the same underlying political tensions between Antarctic claimant states that were present before the IGY. Irina Gan explores the hostility to the Russians in the lead up to the IGY, from US actors and their counterparts across claimant nations. From her examination of Russian archival sources from this period, Gan argues that the sentiment expressed by officials in the USSR in reaction to the US attempt to find a solution to the problem of Antarctic sovereignty, and to do so whilst explicitly excluding the USSR, was most often outrage.[208] The official Soviet view described the negotiations as a 'charade' in which the US and 'other imperialist countries had embroiled themselves in their attempts to establish an international regime for the Antarctic without the participation of the USSR.'[209] The Soviet response

[208] Irina Gan, 'Red Antarctic: Soviet Interests in the South Polar Region Prior to the Antarctic Treaty 1946-1958,' (University of Tasmania, 2009). 38-40;
[209] Gan, "Red Antarctic," 38.

to this perceived US imperialism in Antarctica was to reiterate the Soviet Union's prior rights to the Antarctic due to the (albeit disputed) discovery of the Antarctic during the 1819-21 Russian Antarctic expedition, and to build a case for Soviet involvement in the IGY.[210]

From the first meeting of CSAGI, Cold War tensions were apparent. US Air Force General and later politician Frank G. Klotz addressed these tensions in his book *America on the Ice: Antarctic Policy Issues.* Klotz noted that 'Soviet involvement in Antarctica created some consternation among nations previously active in the region.'[211] Among these tensions was the worry that the USSR might outperform the United States with its comprehensive programme of scientific research, and that the US was 'very apt not only to be second to USSR, but a very poor second'[212] in both polar regions. Some of these tensions would manifest as outright paranoia - Klotz details this, arguing that specifically after the launch of the Sputnik satellite in October 1957, 'a few pundits went so far as to suggest that the Soviets might use the Antarctic as a base for missiles aimed at Southern Hemisphere targets or as a base for submarines.'[213] During the first meeting of CSAGI, it was decided that stations should be spread out across the Antarctic continent to allow for better quality of observations.[214] The Chilean and Argentine delegations voiced their discomfort with this resolution, asking for additions to be made to stress the temporary nature of these structures, but this did not receive enough support from the other delegations to be included in the wording of the resolution.[215] Jorge Berguño and Aant Elzinga

[210] Gan, "Red Antarctic," 39.
[211] Klotz, *America on the Ice,* 29-30.
[212] Belanger, *Deep Freeze,* 39.
[213] Klotz, *America on the Ice,* 30.
[214] Rip Bulkeley, "Politics at the First *Comité Special de l'Année Geophysique Internationale* (CSAGI) Antarctic Conference," *Polar Record* 2009 45(4): 381–383.
[215] Berguño, "Achievements of the IGY", 272.

argue that the very nature of the permanent scientific interests reflected in the Resolutions of the four Antarctic Conferences demonstrate that these stations were not temporary measures and that they reflected the need for more elaborate institutions in order to adequately ensure the interests of scientific development.[216] During the same meeting, Vladimir Beloussov, the Russian delegate to CSAGI, shared the Soviet plans for IGY stations in the Antarctic, to be built at the South Pole, at the Knox Coast and part way between the two.[217] There was some consternation over the the placement of a Soviet research station at the South Pole, as the US delegation found it to be symbolically and politically important, with several US officials voicing their concern that 'the site is so intrinsically valuable from a strategic point of view that the Soviet Union would immediately occupy it if the United States ever left.'[218] The Soviets ceded the South Pole to the US delegation, providing that the USSR could then build IGY stations at the South Geomagnetic Pole and the Pole of Relative Inaccessibility respectively.[219] Jorge Berguño and Aant Elzinga describe this placement of research stations as the sublimation of superpower politics into the science of the IGY, as the United States and the USSR competed to outdo each other in Antarctica.[220] To use Christy Collis' terminology regarding the 'relational trajectories' between Antarctica and outer space, there is a clear parallel in Antarctica which mirrors the 'space race', an important milestone of which eclipsed the IGY in popular

[216] Berguño, "Achievements of the IGY", 272.
[217] Sullivan, *Assault on the Unknown,* 292.
[218] Belanger, *Deep Freeze,* 358; Klotz, *America on the Ice*, 171.
[219] Irina Gan, "Towards the Great Unknown: The Soviets Prepare for Their Thrust into the Antarctic Interior," in Cornelia Lüdecke, Lynn Tipton-Everett, and Lynn Lay (eds) *National and Trans-National Agendas in Antarctic Research from the 1950s and Beyond*, Cornelia Lüdecke, Lynn Tipton-Everett, and Lynn Lay (Columbus, Ohio: Byrd Polar Research Centre, 2011), 117; Sullivan, *Assault on the Unknown,* 293.
[220] Berguño, "Achievements of the IGY", 272

imaginations: the launch of *Sputnik* by the USSR in 1957.[221] David Walton argues that there were two scientific 'frontiers' during the IGY: outer space and the Antarctic.[222] As an anonymous scientist interviewed by Robert Fox also states 'Antarctic science and space really entered the scene together [...] and they are related. In Antarctica we have the possibility of studying on the ground what is happening in space.'[223] This relationship between Antarctic science and space science underpins many of the motivations of the two Cold War superpowers during the IGY and in the decades that followed.

Early Soviet gestures of goodwill at CSAGI meetings in ceding the South Pole station did not assuage American anxieties about Soviet ambitions in Antarctica. Klotz explored the strategic significance of the Soviet stations, stating that 'Soviets currently occupy seven year-round stations on the continent and several summer stations (compared with three year-round and three Summer for the United States). Significantly, the Soviets have located their stations in ring-like fashion around the entire continent.'[224] Except for the territory claimed by New Zealand, the Soviets had placed a station in every sector of the Antarctic including the unclaimed territory around Marie Byrd Land, and Klotz believed that 'geopolitical considerations must have played a large part in the Soviet authorities' decisions on where to site their stations, since some are located in the most austere and inaccessible regions of the

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[221] Roger D. Launius, "An unintended consequence of the IGY: Eisenhower, Sputnik, the Founding of NASA," *Acta Astronautica* 2010 67(1): 256; Armel Kerrest, "Outer Space as International Space: Lessons From Antarctica," in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy: Antarctica, Science, and the Governance of International Spaces*, (Washington D.C.: Smithsonian Institution Scholarly Press, 2011), 135.

[222] David W. H. Walton, "The Scientific Committee on Antarctic Research and the Antarctic Treaty," in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy: Antarctica, Science, and the Governance of International Spaces*, (Washington D.C.: Smithsonian Institution Scholarly Press, 2011), 75-88, 76.

[223] Fox, *Antarctica and the South Atlantic*, 156.

[224] Klotz, *America on the Ice,* 123-124: Naylor, Dean and Siegert, " The IGY and the ice sheet," 591.

continent.'[225] Klotz also argued that the IGY was a catalyst for expanding Soviet interests in the Antarctic, and that the IGY provided the USSR 'with the perfect opportunity to secure a major presence on the icy continent with their large-scale scientific programme.'[226] Irina Gan's investigation of the Soviet perspective supports Klotz's assessment. Gan interviewed Leonid Dolgushin, a Russian IGY glaciologist, who was present at the flag raising ceremony over the first Russian Antarctic station, which already harkened back to colonial era ceremonies of possession. Dolgushin 'saw the inclusion of Stalingrad earth in the flagstaff base as 'a symbol that the Soviet Union has come to Antarctica in earnest and for a very long time.''[227]

The British response to Soviet inclusion in the IGY echoed American sentiments. A telegram from the Foreign Office expressed concern for 'Third Parties being allowed to set up bases all over Antarctica.'[228] The telegram also expressed concern that without a provision for freezing rights and claims to Antarctica, 'there would be nothing to prevent Third Parties hitherto uninterested in say the French zone, from engaging in activities there, and eventually claiming to have established rights on the grounds of the scale and extent of their activities.'[229] Despite science not having been considered a form of effective occupation prior to the IGY, the national stations in Antarctica heralded the beginning of scientific activity. This signals the beginning of science being considered effective occupation of

[225] Klotz, *America on the Ice,* 123-124.
[226] Klotz, *America on the Ice,* 171.
[227] Irina Gan, 'Will the Russians Abandon *Mirny* to the Penguins after 1959... or Will They Stay?,' *Polar Record* 2009 45(2): 172.
[228] *'Addressed to Washington telegram No: 4957',* 21 July 1958, CAB 124/1789, Antarctic Files, The National Archives, London, UK.
[229] *'Addressed to Washington telegram No: 4957',* 21 July 1958, CAB 124/1789, Antarctic Files, The National Archives, London, UK.

Antarctic territory by ATS signatories. Brian Roberts of the Scott Polar Research Institute in the UK, who worked part-time as a civil servant for the Foreign Office, was impressed by the Soviet science programme, but also questioned the long-term presence of the Soviets, asking how long this 'significant competitor' intended to stay and compete in the Antarctic.[230] The answer to this question was of just as much interest to the Australians, who were hoping that the USSR would share IGY discoveries and then quietly withdraw from the Antarctic territory.[231] Philip Law, the head of the Australian National Antarctic Research Expedition, praised the Soviet contributions to the IGY programme,[232] but the Australian delegation to CSAGI also expressed unease about the placement of several Russian IGY bases in Australian Antarctic Territory (AAT).[233] Despite Australia's welcoming overtures to the Soviets and requests for advice regarding the construction of bases in the region,[234] fears that such bases may be used to launch a nuclear attack in the future were expressed.[235] These fears were exacerbated when the Soviet IGY committee detailed three potential zones for rocket launching for research purposes – Franz Joseph Land in the Arctic, the Mirny base in Antarctica and the middle latitudes of the Soviet Union.[236] The fearful response from the Australians was in part due to the extreme anti-communist views of then Australian Prime Minister Robert Gordon Menzies, who had

[230] Gan, "Will the Russians abandon Mirny?", 169.
[231] John Hanessian, "Antarctica: Current National Interests and Legal Realities," *Proceedings of the American Society of International Law at Its Annual Meeting* 1958 52: 153.
[232] Philip Law, *Report on visit to USSR base Mirny*, (Kingston: Australian Antarctic Division Special Collection, 1956).
[233] Klotz, *America on the ice*, 30.
[234] Gan, "Towards the Great Unknown", 127.
[235] Simone Turchetti, Katrina Dean, Simon Naylor and Martin Siegert, "On Thick Ice: Scientific Internationalism and Antarctic Affairs, 1957–1980," *History and Technology* 2008 24(2): 355.
[236] Christy Collis and Klaus Dodds, "Assault on the Unknown: The Historical and Political Geographies of the International Geophysical Year (1957–8)," *Journal of Historical Geography* 2008 34(4): 569.

attempted to ban the Australian Communist Party, and was convinced that Australia had to prepare for an imminent war against 'imperialist communist forces.'[237] These sentiments prevented early consensus on the extension of IGY activities, in which the Soviet programme of research featured heavily. For the fourth meeting of CSAGI, the US National Committee sent a telegram to the General Secretary of CSAGI suggesting that the Antarctic programme should be continued for an additional year, because of the sheer scale of the investment into the programme.[238] This proposal for a year-long extension was enthusiastically supported by the scientists, but was ultimately rejected due to strong opposition from the UK, Chile and Australia.[239]

The responses of scientists from Australia and New Zealand to the Soviet presence on not only the Antarctic continent but also in Antarctic waters prior to the IGY, was in direct contrast to the attitudes of the governments in both countries.[240] Scientists in Australia and New Zealand respectively built long-lasting relationships with their Soviet counterparts, despite the ongoing tensions between their countries.[241] Irina Gan also points out that the Soviet IGY base *Mirny* (meaning 'peaceful' in Russian) served a dual purpose: by naming the base *Mirny*, the Soviets reinforced the peaceful and apolitical nature of their presence, whilst also naming the base after a ship which had been part of Bellinghausen's 1819 expedition in which he claimed to have discovered the continent.[242] Whilst it can

[237] David Lowe, *Menzies and the 'Great World Struggle': Australia's Cold War 1948-1954*, (Sydney: University of New South Wales, 1999), 74.
[238] Walton, Clarkson and Summerhayes, *Science in the Snow,* 9.
[239] Walton, Clarkson and Summerhayes, *Science in the Snow,* 9-10.
[240] Irina Gan, "The Reluctant Hosts: Soviet Antarctic Expedition Ships Visit Australia and New Zealand in 1956," *Polar Record* 2009 45(1): 47-48.
[241] Gan, "Reluctant Hosts," 47-48.
[242] Gan, "Red Antarctic," 46.

be argued that the naming of the station linked it to Soviet colonial ambitions in the Antarctic, Christy Collis also suggests that the placement of *Mirny* and other bases in AAT was also an intrinsically anti-colonial act, designed to reject Australian claims to Antarctic territory and Australian colonial ambitions in Antarctica.[243]

Alongside the tensions between the US and USSR during the IGY were several other sources of political tension. Peter J. Beck argued that Antarctica did not feature heavily in the Cold War strategies of most of the parties to the Antarctic Treaty, with the exception of Chile and Argentina, a position supported by other scholars.[244] Adrian Howkins' work explores some of these tensions between Argentina and Chile and the other nations participating in the IGY. Howkins argues that, rather than embracing the opportunity to contribute to the IGY programme, Argentina and Chile were 'reluctant collaborators' in both the IGY programme and the resulting negotiations for the Antarctic Treaty.[245] Howkins argued that the governments of both states 'feared that an unfettered movement of scientists would undermine their sovereignty claims, and worried that the United States and the Soviet Union would use the IGY as an opportunity to strengthen their grip on the southern continent with potentially disastrous geopolitical consequences.'[246] Howkins' work investigates the ways in which political actors in both Argentina and Chile viewed the relationship between science and politics in

[243] Christy Collis, "Mawson and Mirny Stations: The Spatiality of the Australian Antarctic Territory, 1954–61," *Australian Geographer* 2007 38(2): 215.
[244] Peter J. Beck, "International Relations in Antarctica," inM. A. Morris (ed) *Great Power Relations in Argentina, Chile and Antarctica*, ed. (London: MacMillan, 1990), 106; Christopher C. Joyner, "The Antarctic Treaty," in Christopher C. Joyner and S. K. Chopra (ed) *The Antarctic Legal Regime* (Dordrecht: Martinus Nijhoff, 1988) 177.
[245]Adrian Howkins, "Reluctant collaborators: Argentina and Chile in Antarctica during the International Geophysical Year, 1957–58," *Journal of Historical Geography* 2008 34: 597.
[246] Howkins, "Reluctant collaborators," 597.

Antarctica, arguing that both countries viewed the IGY as a 'formula of 'acting in the name of science' in order to take possession of Antarctica.'[247] Jorge Berguño and Aant Elzinga's interpretation of the Chilean concerns at the first CSAGI meeting, during which the Chilean delegation asked for assurances that the nature of scientific structures on Antarctica would be temporary, reflects these ideas about science being viewed as a tool of imperial ambitions on the continent.[248] Howkins' examination of the rhetoric from Chilean and Argentine politicians reveals that the IGY, and later the Antarctic Treaty, were understood as continuations of Antarctic expansionism in Argentina and Chile, and therefore IGY science was also intertwined with imperialism.[249]

Stepping away from the tensions that arose from the Soviet presence in Antarctica, it is also important to investigate the political tensions during the IGY which arose in part due allegiances during World War II, and an example of this is Japan. The victorious Allied powers had occupied the Japanese islands until 1952.[250] When the Japanese regained sovereignty in the spring of 1952, ICSU had already approved a third polar year and invited Japan to take part in the program.[251] William R Stevenson's work has been instrumental in using Japanese sources to elucidate the tensions between the Japanese delegation to CSAGI and others. Stevenson argued that the Japanese proposal at the first CSAGI meeting, for an expedition to the Knox Coast (which had been cabled to the meeting as the Japanese delegation could not attend in person) was roundly rejected due to opposition from the Americans

[247] Howkins, "Reluctant collaborators," 598.
[248] Berguño, "Achievements of the IGY," 272; Nicolet, *Annals of the IGY 1958*, 85.
[249] Howkins, "Reluctant collaborators," 598.
[250] William R. Stevenson III, "The Polar Years and Japan," in Roger D. Launius, James R. Fleming and David H. DeVorkin (eds) *Globalizing Polar Science: Reconsidering The International Polar and Geophysical Years*, (New York: Palgrave Macmillan, 2010), 131.
[251] Stevenson, "The Polar Years and Japan," 132.

and Soviets, who both expressed an interest in establishing a station in the same place, whilst 'both Australia and New Zealand baulked at the notion of seeing Japan in the Antarctic'[252]. Eventually, the matter was settled when the Japanese requested to build a station on Prince Harald Coast - a remote part of Queen Maud Land that CSAGI had previously stated was in need of an observation point before the Japanese sought to join the IGY programme in Antarctica.[253] Ultimately Stevenson argues that the IGY provided Japanese scientists a new avenue for international collaboration in the post-WWII period and when the scientists took advantage of this opportunity, it allowed for the emergence of a more internationalised Japan at the end of the IGY.[254]

In addition to the ways in which tensions between Japan and other countries played out, tensions between China and other IGY participants also affected the IGY programme in the Antarctic. In their investigation of the role of the state in scientific internationalism, Ronald E. Doel, Dieter Hoffmann, and Nikolai Krementsov looked at Chinese participation in the IGY programme in the Antarctic, finding that the People's Republic of China (PRC) issued an ultimatum to CSAGI when it became clear that a second Chinese delegation from Taiwan was also involved in the IGY programme.[255] Doel and his co-authors revealed that the formal withdrawal of the PRC was in part engineered by the US State Department, which prompted Taiwan to join the IGY preparations.[256] Zuoyue Wang and Jiuchen Zhang's interrogation of the CSAGI meetings for the Antarctic revealed that the People's Republic of

[252] Stevenson, "The Polar Years and Japan,"133-134.
[253] Nicolet, *Annals of the IGY 1958,* 424.
[254] Stevenson, "The Polar Years and Japan," 137.
[255] Ronald E. Doel, Dieter Hoffmann, and Nikolai Krementsov, 'National States and International Science: A Comparative History of International Science Congresses in Hitler's Germany, Stalin's Russia, and Cold War United States', *Osiris* 2005 20: 49-51.
[256] Doel, "National States and International Science," 49-51.

China viewed the acceptance of a second Chinese delegation from Taipei to be the handiwork of 'American Imperialists' who were determined to create 'two Chinas', a view which led the PRC to withdraw from the IGY altogether.[257] Lloyd Berkner would go on to express his disappointment in the PRC's Government for being 'so backward that it permitted its political jargon to stand in the way of its active participation' in the IGY.[258] Wang and Zhang concluded that 'even though scientific internationalism played an important role even at the height of the cold war, ultimately it was the states, on both sides of the Iron Curtain, that determined the conduct of international scientific interactions.'[259]

It is clear, therefore, that there were many political tensions between the countries involved in the IGY. Of these, many were exacerbated by the Cold War, due to either anti-communist sentiment or anti-American sentiment. Others hearkened back to older tensions linked to colonial ambitions for the continent, such as those around the 'ABC problem' in Antarctica. An examination of the planning stages of the IGY shows that not only was there a need to pave over these political tensions with science, but that the science had to also allay some of the fears that these political tensions revealed. The exchange of scientific personnel between research stations served this purpose perfectly, allaying the fears of national actors and allowing for the assumption that efforts at peacemaking and conducting

[257] Zuoyue Wang and Jiuchen Zhang, "China and the International Geophysical Year," in Roger D. Launius, James R. Fleming and David H. DeVorkin (eds) *Globalizing Polar Science: Reconsidering The International Polar and Geophysical Years*, (New York: Palgrave Macmillan, 2010), 150-151.
[258] Lloyd Berkner, "International Geophysical Year', January 27 1959, a speech at the Industrial College of the Armed Forces", accessed 12 March 2022, www.ndu.edu/library/ic3/L59-097.pdf
[259] Wang and Zhang, "China and the International Geophysical Year," 153.

science were overcoming politics during the IGY. This assumption was essential to the construction of Antarctica as a continent for peace and science.

2.3.3 Scientific Exchange During the IGY

The exchange of scientists or the hosting of guests from other IGY bases was an important element of the IGY programme. Two of the Resolutions from CSAGI meetings focused specifically on encouraging the exchange of scientists and knowledge - Resolution XXV focused on exchanges of scientific personnel and Resolution XXVI focused on the training of personnel, to 'amplify the horizons of Antarctic cooperation.'[260] The Soviets benefited from hosting several atmospheric scientists visiting their bases from other countries, including the American exchange meteorologists Gordon Cartwright, on the second Soviet Antarctic expedition, and Morton Rubin on the third expedition wintering at *Mirny* during the IGY.[261] In a conversation between the two scientists recorded in 1991, both fondly recalled the interpersonal relationships these exchanges fostered,[262] and other researchers involved in such exchanges such as John Behrendt and Charles Swithinbank recorded similar experiences.[263] From memoirs and transcripts of oral histories, it is clear that scientific exchanges

[260] Bulkeley, "Politics," 381–383.
[261] Sullivan, *Assault on the Unknown*, 413: Gan, "Will the Russians Abandon Mirny?," 172.
[262] "Transcript. 1991.", accessed 11 May 2022, https://opensky.ucar.edu/islandora/object/archives%3A7635/datastream/OBJ/view
[263] Charles Swithinbank, *Vodka on Ice: A Year with the Russians in Antarctica*, (London: Book Guild Publishing Ltd, 2002); John C. Behrendt, *Ninth Circle: A Memoir of Life and Death in Antarctica, 1960-1962*, (Alberquerque: University of New Mexico Press, 2005).

during the IGY improved relationships between scientists and often led to future research collaboration.[264]

However, these exchanges did not take place solely to improve relationships between scientists during the IGY. Rising tensions between states during the construction of IGY stations stimulated the agreement between US and USSR to exchange scientists during the IGY.[265] During the establishment of Weather Central at the Little America station for the IGY, the US IGY committee offered to host a Russian scientist, if an American could be similarly stationed at the main Soviet base.[266] In the opinion of Walter Sullivan, the American journalist who reported on the IGY programme in Antarctica, 'nothing could have done more to allay fear and suspicions than the series of personnel exchanges that resulted from this arrangement. The men selected for these ambassadorial roles, on both sides, were obviously chosen for their tact and good humour and did much to improve relations between the expeditions.'[267] On the Russian side, Mikhail Somov, Head of the first Soviet Antarctic Expedition and Vasiliy Burhanov, the Chief of the Glavsevmorput and Deputy Minister of the Merchant Fleet, seeing the value of this exchange, were keen to expand ties with other countries during the IGY by also inviting their scientists to participate in the Soviet scientific programme.[268] Turchetti, Naylor, Dean and Siegert have questioned the nature of these exchanges, suggesting that they provided surveillance opportunities.[269] Territorial ambitions and surveillance often go hand in hand, and it is entirely likely

[264] "Transcript. 1991.", accessed 11 May 2022, https://opensky.ucar.edu/islandora/object/archives%3A7635/datastream/OBJ/view
[265] Sullivan, *Assault on the Unknown,* 292; Klotz, *America on the Ice,* 27.
[266] Sullivan, *Assault on the Unknown*, 294.
[267] Sullivan, *Assault on the Unknown,* 294.
[268] Gan, "Will the Russians Abandon Mirny?," 172: Gan, "Red Antarctic," 129-30.
[269] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 351.

that the aim of these exchanges was to allow nations to place scientists across the Antarctic continent, and therefore across territory they would like to claim, or might want to claim in the future, whilst also gaining insight into the ambitions and actions of actors from nations competing for the same and often historically contested territories. Scientific exchange between stations served to perform an ideal of scientific internationalism: scientists were not sent where they did not serve a purpose for national agendas, but the national agendas they served were directed linked to colonial and territorial ambitions, as well as potentially surveillance. This assessment of scientific exchanges in Antarctica during and after the IGY aligns with Adrian Howkins' argument that the IGY served as a 'formula of 'acting in the name of science' in order to take possession of Antarctica.'[270]

[270] Howkins, "Reluctant collaborators," 598.

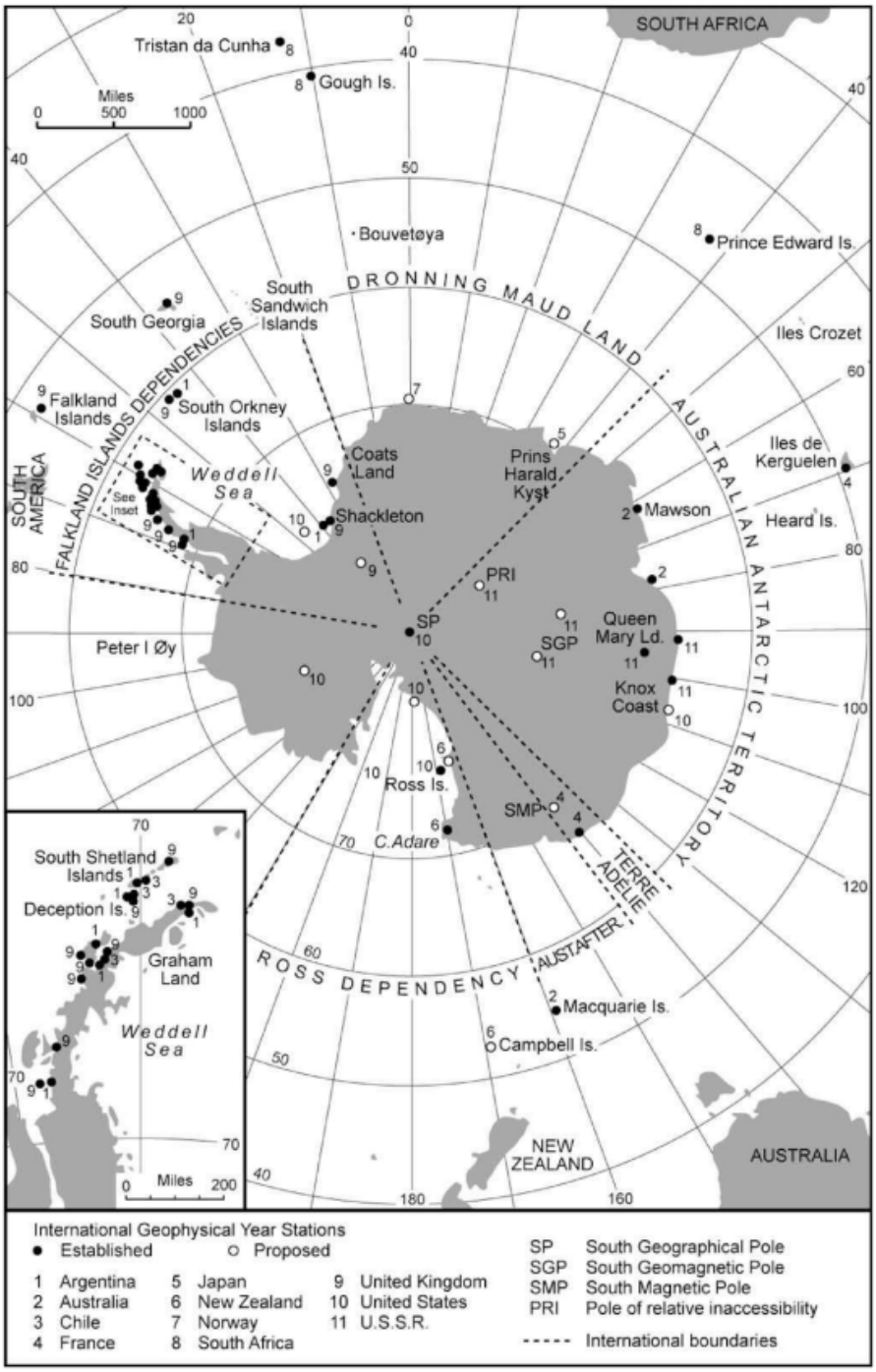

Figure 2. *International Geophysical Year stations operating in the Antarctic during the IGY.*

2.3.4 Meteorology During the IGY

Meteorological research has been a focus for all of the IPYs.[271] As Cornelia Lüdecke notes, international cooperation in meteorological research was not only a tradition of the polar years, but a necessity given the growing importance of meteorology in the twentieth century.[272] In the planning stages of the IGY, preparations for the simultaneous observation and collection of weather data was a priority, and the resolutions from the CSAGI meetings in setting up 'Weather Central', where all of this data would be collated and then shared with those who needed it, reflect this.[273] Meteorological research was also integral to ensuring the participation of the Soviet Union for the IGY, which was secured through the USSR's relationship with the World Meteorological Organisation (WMO), specifically through Vladimir Beloussov, a Russian earth scientist and member of the WMO, who would go on to become the leader of the Soviet delegation for the IGY.[274]

Adrian Howkins draws a definitive link between meteorology and colonial ambitions in the Antarctic prior to the IGY. Howkins argues that in the lead-up to the IGY the biggest problem facing Antarctic

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[271] Urban Wråkberg, "IPY Field Stations: Functions and Meanings," in Jessica M. Shadian and Monica Tennberg (eds) *Legacies and Change in Polar Sciences*, (New York: Routledge, 2009), 73-100, 74-75; Aant Elzinga, "An Evaluation of the Achievements of the First International Polar Year," in Susan Barr and Cornelia Lüdecke (eds) *The History of the International Polar Years (IPYs)*, (Heidelberg: Springer Berlin, 2010), 109-126; Aant Elzinga, "Achievements of the Second International Polar Year," in Susan Barr and Cornelia Lüdecke (eds) *The History of the International Polar Years (IPYs)*, (Heidelberg: Springer Berlin, 2010) 211-234; Berguño, "Achievements of the IGY," 259-278.

[272] Cornelia Lüdecke, "International Meteorological and Magnetic Co-operations in Polar Regions," in Susan Barr and Cornelia Lüdecke (eds) *The History of the International Polar Years (IPYs)*, (Heidelberg: Springer Berlin, 2010), 297-298.

[273] Nicolet, *Annals of the IGY 1958*, 85; Berguño, "Achievements of the IGY," 272.

[274] Naylor, Dean and Siegert, "The IGY and the ice sheet," 581.

meteorology was a lack of data, as meteorological stations simply did not exist in the Antarctic.[275] Over the course of a twenty-year period (1939-1959) scientific bases were built throughout the Antarctic, most of which engaged in meteorological observation, and which began to supply the data needed to test and validate existing meteorological theories.[276] The demand for meteorological data, however, was not the driving force behind this expansion, as Paul Edwards argues.[277] Howkins posits that competing nations built bases 'primarily for political purposes: to demonstrate effective occupation of the disputed territory.'[278] Howkins argues that scientific research was conducted in Antarctica in an effort to legitimise presence on the continent and that the resulting data was a by-product of this political rivalry - therefore, meteorology was advanced 'not despite international rivalry, but because of these tensions.'[279]

Alongside Sydney Chapman and Lloyd Berkner, Harry Wexler, the Chief Scientist of the US Committee for the IGY was influential in shaping the IGY programme of research. Harry Wexler was a meteorologist by training, and according to his colleague Morton J. Rubin was instrumental in training a generation of meteorologists for the IGY and building relationships between American researchers and their counterparts in several South American countries.[280] Wexler would go on to organise a complimentary study of meteorology in the Arctic during the IGY, and then used the IGY

[275] Adrian Howkins, "Political Meteorology," *History of Meteorology* 2008 4: 37.
[276] Howkins, "Political Meteorology," 37.
[277] Edwards, "Meteorology as Infrastructural Globalism," 239.
[278] Howkins, "Political Meteorology," 37.
[279] Howkins, "Political Meteorology," 37.
[280] "Transcript. 1991.", accessed 11 May 2022, https://opensky.ucar.edu/islandora/object/archives%3A7635/datastream/OBJ/view

investigations as a springboard for further research for further polar and global meteorology.[281] He was influential in using SCAR's dedication to meteorological research in Antarctica to advocate for an expansion of meteorological research, which would eventually lead to his proposal for a global observation system for weather, ultimately becoming the World Weather Watch (WWW).[282]

An important innovation of the IGY was 'a strategy of taking coordinated meteorological readings, especially by radiosonde, from across the Antarctic continent. These were then reported to Weather Central at the American Base Little America V.'[283] This collaboration 'made possible the first synoptic studies of the region and enabled atmospheric scientists to effectively model the behaviour of the atmosphere.'[284] The base at Little America was a site of international collaboration in meteorological research on a hitherto unseen scale in Antarctica, a site where meteorologists from 'the United States and several other countries, notably Argentina and the Soviet Union, joined forces to piece together reports sent in daily by the sixteen Antarctic stations'.[285] Morton 'Mort' J. Rubin, a meteorologist stationed at Weather Central who would go on to become a prominent scientist affiliated with SCAR, was integral to these operations. Having spent seven years in South America prior to joining Harry Wexler's team of meteorologists in Washington D.C. and being hand-picked to work on Antarctic observations, Mort was tasked with recruiting observers to collect data in Ecuador, Peru, Bolivia, Chile and Argentina during the IGY, as well as training the meteorologists stationed at Weather Central, and

[281] James Rodger Fleming, "Polar and Global Meteorology in the Career of Harry Wexler, 1933-62," in Roger D. Launius, James R. Fleming and David H. DeVorkin (eds) *Globalizing Polar Science. Palgrave Studies in the History of Science and Technology*, (New York: Palgrave Macmillan, 2010), 225-241, 235,
[282] Fleming, "Polar and Global Meteorology", 235.
[283] Howkins, "Political Meteorology," 35.
[284] Summerhayes, "International Collaboration in Antarctica," 326.
[285] Sullivan, *Assault on the Unknown*, 234.

this is when he first became involved with SCAR.[286] At the fourth Meeting of CSAGI, a full report of the meteorological activities was tabled. Difficulties were being experienced in collecting all the weather data for Antarctica by the IAAC scientists due to staff shortages, but a weather-collective for Antarctica was being broadcast four times daily.[287] Various weather analyses were also being prepared twice daily, and in response offers by various scientists to relay weather data to and from Weather Central were made to overcome issues in communication.[288] Working together in close quarters at Weather Central for the IGY was the basis of many long-term working relationships between these meteorologists, but more significant at the time was the gesture of goodwill from the Soviet scientists, who not only shared all meteorological data collected at Soviet research stations during the IGY, but also shared meteorological data from Russian archives dating back to 1899, a gesture so significant that Harry Wexler would report it back to the US Congress.[289]

Meteorological research was useful because it also served political purposes and military purposes.[290] The tensions about the research station locations were in part due to this link. When the Soviets eventually built a station at the Pole of Inaccessibility they saw the station 'as being a bold political gesture'[291] as well as having 'extremely useful meteorological potential, located at the geographical centre of the continent.'[292] Adrian Howkins argues that Antarctic meteorology and Antarctic politics

[286] "Transcript. 1991.", accessed 11 May 2022, https://opensky.ucar.edu/islandora/object/archives%3A7635/datastream/OBJ/view
[287] Walton, Clarkson and Summerhayes, *Science in the Snow,* 9.
[288] Walton, Clarkson and Summerhayes, *Science in the Snow,* 9.
[289] Sullivan, *Assault on the Unknown*, 400.
[290] Wolfe, *Freedom's Laboratory*, 97.
[291] Howkins, "Political Meteorology,"35.
[292] Howkins, "Political Meteorology," 35.

were co-produced during this time, meaning that the science of meteorology helped to shape the political context within which it developed.'[293] This co-production of science and policy is a theme of Antarctic governance and the activity in Antarctica from the IGY to the present day.

2.4 Conclusion

Before the IGY, Antarctica was explicitly the site of numerous colonial ambitions from seven claimant states, and several other nations with no formal claim to Antarctic territory. An examination of science and politics during the IGY reveals that SCAR's activity in coordinating international collaboration on a hitherto unseen scale during the IGY, generated a new form of scientific internationalism. Whereas much of the uncritical investigations of science during the IGY suggests that this scientific internationalism immediately extinguished the political tensions in Antarctica, this chapter demonstrates that political paranoia and cold war tensions were very much present during the IGY. These tensions existed between nations, as proven by the tensions between Australia and the USSR before and during the IGY. These tensions also existed between scientists and their respective governments, an example which is also proven in the case of Australian scientists espousing different views to their government in regards to Soviet ambitions in Antarctica.

The scientific exchanges during the IGY came about as a direct result of the heightened tensions between the USSR and the nations with staunchly anti-communist governments and attitudes. An exchange of scientists was offered as a gesture of political goodwill during the planning stages of the

[293] Howkins, "Political Meteorology," 28.

IGY, and because of this, scientific exchange became one of the hallmarks of SCAR's activity during the IGY. This chapter has explained the reason for using exchange of scientists between nations during the IGY: to alleviate, or seem to alleviate, political tensions. An examination of the reality of these exchanges shows that whilst interpersonal relationships built during these exchanges often translated into lifelong friendships, they did not impact the political tensions between their respective nations, despite being described as doing so.

Meteorology has been explored throughout this chapter. As a scientific discipline which has been the focus of previous international collaborative efforts during the first and second international polar years, it was once again a focus during the IGY. During the IGY, simultaneous observations of weather data were collected across the Antarctic for the first time, and these were collected at 'Weather Central', before being distributed and disseminated. Meteorological research, by dint of practical necessity, allowed nations to expand their Antarctic presence under the guise of providing weather data from remote parts of the Antarctic across the continent. In this way, meteorology allowed for a covert enactment of colonial ambitions on the Antarctic by nations participating in the IGY research programme. From 1939 onwards, the scientific internationalism ascribed to meteorology as a field of research, has been just as driven by the practical need to establish sites for observation, as it has by any efforts from researchers and SCAR to advance international collaboration. Antarctic meteorology expanded concurrently with important developments in the political history of Antarctica during the IGY. This is because both Antarctic meteorology as a field and Antarctic politics were being

co-produced: a process which SCAR facilitated and promoted for scientific reasons as well as political reasons.

3. Constructing 'A Continent for Peace and Science' Through SCAR

3.1 Introduction

The previous chapter has explained the underlying political tensions in Antarctica, the colonial ambitions that national actors in Antarctica represent, and the role that SCAR-sponsored activities such as scientific exchange and meteorological research play in either hiding or alleviating these tensions.

This chapter explores the role of SCAR in the years following the IGY. First, this chapter briefly examines the negotiation of the Antarctic Treaty, and the political tensions throughout this process, and some of the early criticisms of the ATS. This chapter also elucidates the role of SCAR in reinforcing the concept of Antarctic exceptionalism. By making use of documents from the SCAR Archive from 1958-1964, this chapter interrogates the ways in which helped to construct the framing of Antarctica as a continent dedicated to peace and science. This chapter scrutinises the utility of this framing of Antarctica, and the role it plays in legitimising both a new system of governance for the Antarctic, and SCAR. The continued presence of scientists in Antarctica following the IGY and the ATS negotiations allows for the argument that the continuation of SCAR's activities in the Antarctic allowed for science to become a form of effective occupation of Antarctic territory, whilst being framed as apolitical. Once again, the question is raised as to whether the actors at the time were aware that science was becoming a proxy for effective occupation. The work of Berguño and Elzinga, and Adrian Howkins' body of work established that this was the case to some extent, and certainly retrospective

framings of this period which take a critical stance, applying Klaus Dodds' post-colonial approaches to Antarctica, seem to agree that this is the case.

This chapter interrogates scientific exchange and meteorological research in the early 1960s in the same way that the previous chapter did these activities during the IGY, with the addition of archival material from SCAR. Scientific exchange and meteorological research were used as examples of what could be achieved in the Antarctic through the goodwill engendered by international collaboration in science. Therefore, I argue that they are integral to understanding the ways in which SCAR science was used to construct the idea of a continent for peace and science during this period.

By closely examining the nature of these continued scientific exchanges, I argue that more often than not, they tend to reinforce cold war tensions rather than alleviate them in the Antarctic. A closer examination of the ongoing expansion of meteorological research pioneered by SCAR and its emerging partnership with the World Meteorological Organisation (WMO) shows that the scale of Antarctic meteorology continues to grow after the IGY, in establishing an International Antarctic Analysis Centre (IAAC) in Australia, allowing for the further legitimization of SCAR as an established non-governmental body in the Antarctic, an Antarctic arbiter in its own right.

Ultimately, I argue that the research activity in Antarctica was used to justify creating a governance structure for Antarctica that centred on 'apolitical' science, in order to justify the ongoing political agendas in the Antarctic, establishing science as the only acceptable activity on the Antarctic continent, which would paradoxically politicise it and allow it to become the only way to exert power and control over Antarctic territory, and therefore become a form of effective occupation of the Antarctic. In the

absence of a population to subjugate, exerting power and control over the Antarctic environment becomes the avenue for colonial ambitions. By then making science central to both presence in the Antarctic and decision-making power over the Antarctic environment, science becomes a tool of effective occupation, and of colonial administration.

3.2 SCAR After The IGY: A Permanent Fixture

After the IGY ended, SCAR continued in its role coordinating research between the countries involved in IGY science, as scientific activity in the Antarctic was extended for another year.[294] Irina Gan noted that 'the USSR was eager to continue the momentum of international collaboration and called on the countries involved 'to expand the success of international scientific co-operation' and to continue the IGY activities for one year until 31 December 1959.'[295] The first SCAR Bulletin in 1959 would reflect this, reporting on the events of the fourth conference of the CSAGI, which 'resolved that the continuation of scientific activity in Antarctic research should be regarded as being inspired by the interest roused by the activities of the IGY but in no way as an extension of the IGY.'[296] This need to continue the scientific activities in the Antarctic whilst also choosing not to extend the IGY programme allowed SCAR to take centre stage in the Antarctic, and the temporary 'Special Committee on Antarctic Research' became the permanent new ICSU body, the 'Scientific Committee

[294] *SCAR Bulletin No.1, January 1959,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[295] Irina Gan, "Will the Russians Abandon *Mirny* to the Penguins after 1959... or Will They Stay?," *Polar Record* 2009 45(2): 172.
[296] *SCAR Bulletin No.1, January 1959,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK, 361.

on Antarctic Research.'[297] Narratives of Antarctic exceptionalism may not have begun with the IGY, but they were certainly reinforced by this period. When the IGY was over, SCAR was formed as a permanent organisation.[298] From the outset SCAR's existence was subject to these narratives of Antarctic exceptionalism; the SCAR constitution differed from the constitution of other ICSU bodies and this was allowed 'in view of the exceptional structure of the committee.'[299] I argue that SCAR feeds into exceptionalist narratives about Antarctica, which are integral to constructing Antarctica as 'a continent for peace and science'. Turchetti, Naylor, Dean and Siegert argue that the IGY and SCAR's activities during it effectively entwined science with diplomacy, as 'the coordination of and collaboration between national teams in international research projects acquired diplomatic significance and helped place scientific internationalism at the centre of Antarctic governance; defining alliances between states and becoming a tool of foreign policy.'[300] Given this intertwining of science and diplomacy, and the way that science replaced previous efforts to show colonial presence in the Antarctic, it is difficult to envision how science in Antarctica could exist as an activity in the Antarctic independent of colonial ambitions, precisely because of the construction of Antarctica as a 'continent for peace and science'.

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[297] David W. H. Walton, Peter D. Clarkson, and Colin P. Summerhayes, *Science in the Snow: Fifty Years of International Collaboration through the Scientific Committee on Antarctic Research*, (Cambridge: Scientific Committee on Antarctic Research, 2011,) 7.

[298] David W. H. Walton, "The Scientific Committee on Antarctic Research and the Antarctic Treaty," in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy: Antarctica, Science, and the Governance of International Spaces*, (Washington D.C.: Smithsonian Institution Scholarly Press, 2011) 76.

[299] *SCAR Bulletin No.3,* September 1959, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK, 591.

[300] Simone Turchetti, Katrina Dean, Simon Naylor and Martin Siegert. "On Thick Ice: Scientific Internationalism and Antarctic Affairs, 1957–1980," *History and Technology* 2008 24(4): 352.

Irina Gan adds that, for the Soviets, the extension of the IGY programme was also viewed as a unique opportunity.[301] Professor Vladimir Belousov, head of the Russian Antarctic programme, expressed considerable interest in the formation of a special committee by ICSU to look into post-IGY Antarctic programmes on an international scale.'[302] Science was seen as the key to 'drawing attention away from the geopolitical considerations that underpinned Treaty negotiations.'[303] By extension, polar researchers attached to SCAR were essential to the process of securing future collaboration in the region, as they were seen as being untroubled by political machinations for territory in Antarctica, and therefore held the key to ensuring that conflict over Antarctic territory could be suspended in much the same way that claims to Antarctica were suspended.[304] Many scholars and proponents of science diplomacy who have looked at the example of SCAR and Antarctica have taken it at face value that SCAR exemplifies the triumph of apolitical and universal scientific values over political tensions.[305] Conversely, Dian Olson Belanger argues that politics is ever-present in the IGY programme, from the

[301] Gan, "Will the Russians Abandon Mirny?," 169.
[302] Gan, "Will the Russians Abandon Mirny?," 169.
[303] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 351.
[304] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 351.
[305] Paul Arthur Berkman, "President Eisenhower, the Antarctic Treaty, and the Origin of International Spaces," in in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy : Science, Antarctica, and the Governance of International Spaces* (Smithsonian Institution Scholarly Press, 2011), 17-28; Paul Arthur Berkman, *Science into Policy: Global Lessons from Antarctica* (San Diego: Academic Press, 2002), 59; Pierre-Bruno Ruffini, *Science and Diplomacy: A New Dimension of International Relations* (Paris: Springer, 2017), 99-100; Colin P. Summerhayes, "Scientists Together in the Cold," in David W. H. Walton (ed) *Antarctica: Global Science from a Frozen Continent*, (Cambridge: Cambridge University Press, 2013), 253-272; Colin P. Summerhayes, "International Collaboration in Antarctica: The International Polar Years, the International Geophysical Year, and the Scientific Committee on Antarctic Research," *Polar Record* 2008 44(4): 327.

placement of the research stations to the exchange of scientists.[306] Research activity in Antarctica was used to justify creating a governance structure for Antarctica that centred on 'apolitical' science, in order to justify the ongoing political agendas in the Antarctic.

3.3 Constructing Antarctic Governance

3.3.1 Negotiating the Antarctic Treaty

This thesis does not provide a comprehensive overview of Antarctic Treaty negotiations: this has been done by other scholars.[307] I will, however, provide a brief account of these negotiations in order to situate the role of SCAR science in them. The United States convened a conference aimed at finding a new form of international governance for the Antarctic following the 'unquestionable success of the IGY.'[308] Papers from John Heap, an Antarctic scientist and British diplomat, dispute this claim,

[306] Dian Olson Belanger, "The International Geophysical Year in Antarctica: A Triumph of "Apolitical" Science, Politics and Peace," in Roger D. Launius, James R. Fleming and David H. DeVorkin (eds) *Globalizing Polar Science. Palgrave Studies in the History of Science and Technology*, (New York: Palgrave Macmillan, 2010) 268.

[307] For an exploration of the Antarctic Treaty negotiations see: Klaus Dodds 'The Great Game in Antarctica: Britain and the 1959 Antarctic Treaty' *Contemporary British History* 2008 22: 43-66; Marie Jacobsson, "Building the International Legal Framework for Antarctica," in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy: Antarctica, Science, and the Governance of International Spaces*, (Washington D.C.: Smithsonian Institution Scholarly Press, 2011) 1-16; Alan D. Hemmings, Donald R. Rothwell, and Karen N. Scott (eds) *Antarctic Security in the Twenty-First Century: Legal and Policy Perspectives*, (Abingdon: Routledge, 2012); Aant Elzinga, "Origin and Limitations of the Antarctic Treaty," in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy : Science, Antarctica, and the Governance of International Spaces*, (Smithsonian Institution Scholarly Press, 2011), 59-68; Adrian Howkins, *Frozen Empires: An Environmental History of the Antarctic Peninsula* (Oxford: Oxford University Press, 2017).

[308] Jorge Berguño and Aant Elzinga, "The Achievements of the IGY," in Susan Barr and Cornelia Ludecke (eds) *The History of the International Polar Years (IPYs)*, (Heidelberg: Springer Berlin, 2010), 272.

arguing instead that the British Foreign Office had been responsible for convening the conference.[309] Turchetti, Naylor, Dean and Siegert, exploring the results of Soviet ambitions during the IGY, have argued that the aim of this conference was to allow diplomats of four nations, namely the USA, Australia, New Zealand and Britain, to secretly engineer 'a new international regime centred on science in an attempt to avoid the militarisation of the South Pole by those, the Soviets especially, who might threaten the 'free world powers' from there.'[310] It was assumed by the American delegation that the Soviets would 'torpedo' the negotiations if involved.[311] The reasoning for this was the notion that the 'free world' only stood to lose from the militarisation of Antarctica: 'while Russian bases in Antarctica could represent a menace to Australia, Soviet interests were not vulnerable to the strategic positioning of Australian bases."[312]

In a summary of the discussions of the initial meetings, it was argued that 'the Cold War has not yet been extended to the Antarctic. This favourable climate of opinion and absence of conflict may not last for long after the end of the IGY and therefore the present moment offers an opportunity which may not recur for considering a change in the status quo.'[313] Klaus Dodds agrees with this assessment: in examining the correspondence and personal diaries of Brian Roberts, who represented the UK during these early meetings, he explored the events from the British delegation's point of view. Roberts found

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[309] John Heap, *The Future Direction of British Policy in the Antarctic. A Background Paper,* 26 May 1967, Confidential, 2. In UK Policy in the AT area, Secret, FCO 7/3248, The National Archives, Kew, London, UK.
[310] Turchetti, Dean, Naylor and Siegert, "On Thick Ice,", 352.
[311] Jason Kendall Moore, "Diplomacy, Public Opinion, and the 'Fractionalization' of US Antarctic Policy 1946-1959," Unpublished PhD Thesis (University of Tasmania, 2006), 4-5.
[312] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 352.
[313] *Summary report of informal talks held among officials of Australia, Great Britain, New Zealand and the United States*, Annex I – UK Document, Secret, 2–3, FCO 7/3248, The National Archives, Kew, London, UK.

that 'the meetings were dominated by three particular concerns—to ensure that the Argentines and Chilean delegations did not jeopardise proposals for a suspension of sovereignty, to persuade the Australians that the Soviets had to be accommodated within the Antarctic Treaty, and to ensure that the United States did not abuse its position as Conference host in terms of insisting, for example, that there should be some allowance for nuclear testing in the Antarctic region.'[314] Dodds' exploration of Roberts' papers also reveals that, whilst science was seen as a tool to forge relationships in Antarctica, the British delegation was not confident that a positive outcome would arise from the initial negotiations, and Roberts himself believed that 'a highly politicised scientific programme was necessary in the event of the Treaty failing to materialise.'[315] Other scholars have examined the intent of other parties to the negotiations and found evidence of similar intentions.[316]

The scientific internationalism embraced by the countries participating in the IGY was tested at these meetings. Dodds and Collis discussed the unique nature of the IGY and the ways in which it 'placed a considerable strain on competing ideas about national security and 'scientific internationalism'.'[317] For the Australian delegation in particular, the scientific internationalism of the IGY had already led to a

[314] Dodds, "The Great Game in Antarctica," 59.
[315] Dodds, " The Great Game in Antarctica," 44.
[316] Howkins, *Frozen Empires,* 40-46; Dodds, " The Great Game in Antarctica," 43-66; Tucker Scully, "The Development of the Antarctic Treaty System," in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy : Science, Antarctica, and the Governance of International Spaces*, (Smithsonian Institution Scholarly Press, 2011), 29-38; Alan D. Hemmings, Klaus Dodds and Peder Roberts, "Introduction: The Politics of Antarctica," in ed. Klaus Dodds, Alan D. Hemmings and Peder Roberts (eds) *Handbook on the Politics of Antarctica,* (Cheltenham: Edward Elgar Publishing, 2017), 5-6; Alessandro Antonello, *The Greening of Antarctica: Assembling An International Environment* (Oxford: Oxford University Press: 2019), 30-31.
[317] Christy Collis and Klaus Dodds, "Assault on the Unknown: The Historical and Political Geographies of the International Geophysical Year (1957–8)," *Journal of Historical Geography* 2008 34(4): 569.

perceived threat to AAT. Fearing further Soviet penetration of AAT, the Australian delegation, alongside the French and Argentines, initially refused to countenance any further internationalisation of Antarctica.'[318] Dodds' interrogation of the challenge that science during the IGY presented to Australian ambitions in Antarctica serves to underline the imperial nature of these ambitions. During the negotiations for the Antarctic Treaty, the same scientific internationalism generated by the IGY which was viewed as a threat morphed into the last line of defence for Australian Antarctic Territory. Therefore, scientific internationalism became a diplomatic weapon to respond to the threat of a permanent Soviet presence in Antarctica. From the initial meetings, further negotiations emerged, inviting all twelve countries that made up SCAR to take part. During those negotiations the Antarctic Treaty came into being in 1959, and was ratified by all signatories on 23rd June 1961.[319]

Despite the triumphant nature of the negotiation and ratification of the Antarctic Treaty, and dewy-eyed assertions that the universality and openness of science had won over hard-hearted politicians,[320] there were and remain many sceptics. Among the cynics was Klotz, who was still wary of Soviet ambitions, stating that 'if the treaty system for some reason collapsed, the Soviet Union, by virtue of its presence in the region, would be in a very good position to exert a strong influence over affairs of the region, and eventually stake a claim.'[321] What Klotz does not admit is that the exact same

[318] Dodds, "The Great Game in Antarctica," 59; Gan, "Will the Russians Abandon Mirny?," 170.
[319] Walton, "SCAR and the Antarctic Treaty,", 76.
[320] C. Wilfred Jenks, The New Science and the Law of Nations (Cambridge: Cambridge University Press, 2008); Summerhayes, "Scientists Together," 253-72; Walton, "SCAR and the Antarctic Treaty," 76; Berkman, "President Eisenhower," 17-28; Oran R. Young, "Governing International Spaces: Antarctica and Beyond," in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy : Science, Antarctica, and the Governance of International Spaces* (Smithsonian Institution Scholarly Press, 2011), 287–94.
[321] Frank G. Klotz, *America on the Ice: Antarctic Policy Issues* (Washington DC: University Press of the Pacific, 2002), 125.

argument could be made for the United States. However cynical Klotz and others were about the potential longevity of the Antarctic Treaty, it would go on to become the system for Antarctic governance from 1961 onwards. SCAR too became a permanent fixture at the same time, but it was not until 1987 that the two would be formally linked, and this thesis questions this lack of a defined relationship.

3.3.2 Critically Appraising The Antarctic Treaty

Susan Buck's work has explored the ways in which scientific cooperation has set the conditions for going beyond traditional relations between nation states in order to create a 'global commons.'[322] Oran Young builds on similar ideas and argues that Antarctica is the first and most prominent example of a space set aside by international consensus for peaceful uses, the principal use being international scientific collaboration.[323] Richard S. Lewis and Philip M. Smith emphasised the role played by international groups of scientists in Antarctica as participants in a new glorious experiment, involving the creation of a continent 'without war, without cold war, without crime, without pollution, without national rivalries, without secret states.'[324] Elsewhere, Ron Doel and Kristine Harper have explored the role of large-scale nuclear physics and geophysics in translating US foreign policy into international research programs during the Cold War,[325] providing another example of a relational trajectory

[322] Susan J. Buck, *The Global Commons: An Introduction* (London: Earthscan, 1998), 17.
[323] Oran Young, *International Governance: Protecting the Environment in a Stateless Society* (Ithaca, Cornell University Press, 1994), 17.
[324] Richard S. Lewis and Philip M. Smith, ed., *Frozen Future: A Prophetic Report from Antarctica*, (New York: Quadrangle Books, 1973), 57-58.
[325] Ronald E. Doel, and Kristine C. Harper. "Prometheus Unleashed: Science as a Diplomatic Weapon in the Lyndon B. Johnson Administration." *Osiris* 2006 21(1): 66.

between Antarctica and Outer Space. The narrative that Antarctica was not only a scientific laboratory, but a political laboratory, where scientific cooperation would help maintain peace on the continent is a prominent one, but also one which has been criticised by scholars.

In their book *Handbook on the Politics of Antarctica,* Alan Hemmings, Klaus Dodds and Peder Roberts argue that the ATS entrenched science as the dominant currency within the political economy of Antarctica, and that political practice itself could (and did) place a further premium on acquiring ever more knowledge about the region and its non-human inhabitants.[326] This argument, that the ATS made science an instrument of politics rather than an alternative to it, challenges Young's assessment of the ATS and its relationship to Antarctic science.[327] Turchetti, Naylor, Dean and Siegert agree, adding that 'the AT did not curtail traditional geopolitical ambitions; rather it translated them into scientific relations.'[328] The AT did not curtail political ambitions for the Antarctic, and neither did it curtail colonial ambitions. By introducing Article IV, the AT created a 'bifocal' approach to Antarctic politics, allowing for claimant nations and non-claimants to be equally satisfied with the freezing of prior claims to the Antarctic and the inability of signatories to claim territory whilst the treaty was in force.[329] However, Article IV does not protect the Antarctic from a scenario in which the Treaty is no longer in place, and it is in preparation for this scenario that colonial ambitions for Antarctica persist.[330] In this vein, Adrian Howkins argues that the Antarctic Treaty did not change the colonial ambitions for the

[326] Hemmings, Dodds and Roberts, "Introduction: The Politics of Antarctica", 2.
[327] Hemmings, Dodds and Roberts, "Introduction: The Politics of Antarctica", 2.
[328] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 351.
[329] Marcus Haward, 'The Antarctic Treaty System: Challenges, coordination and congruity' in Anne-Marie Brady (ed) *The Emerging Politics of Antarctica* (London: Routledge, 2013): 18.
[330] Elena Glasberg, *Antarctica as Cultural Critique: The Gendered Politics of Scientific Exploration & Climate Change*, (New York: Palgrave Macmillan, 2012), 6.

Antarctic, because the ATS did not decolonise the Antarctic.[331] All of these critical approaches to the Antarctic Treaty are useful to understand the relationship between SCAR and the ATS.

3.4 SCAR and the Antarctic Treaty System: An Undefined Relationship

Despite the centrality of science to the Antarctic Treaty, and SCAR's work both in the provision of data and in facilitating scientific exchanges (thereby constructing the scientific internationalism which underpinned the creation of the AT) SCAR was not formally recognised in the Treaty.[332] Given that the parties called to negotiate the AT and write its founding articles were all the founding members of SCAR, and given that SCAR's activity on the Antarctic continent was integral to creating the conditions which allowed for the negotiation of the Treaty, this choice not to formally recognise SCAR is worthy of closer examination. There are several reasons as to why this may have been the case: Alessandro Antonello refutes Turchetti, Dean Naylor and Siegert's suggestion that SCAR was the de-facto chief advisory body to the Antarctic Treaty,[333] arguing instead that SCAR was not mentioned in the Antarctic Treaty because 'the negotiators and early interpreters of the treaty assumed SCAR was implicitly covered under the Article III subclause stating that the parties would cooperate with international organizations.'[334] On the other hand, Aant Elzinga suggests that the lack of a defined relationship between the two may have arisen due to an unwillingness to unnecessarily politicise

[331] Howkins, *Frozen Empires,* 31.
[332] Alessandro Antonello, *The Greening of Antarctica,* 31.
[333] Simone Turchetti, Katrina Dean, Simon Naylor and Martin Siegert, "Accidents and Opportunities: A History of the Radio Echo-Sounding of Antarctica, 1958–79," *The British Journal for the History of Science* 41, no. 3 (September 2008), 417-44.
[334] Alessandro Antonello, *The Greening of Antarctica,* 31.

SCAR.[335] Elzinga argues that an exploration of the papers of the Australian delegate Keith Bullen to the first SCAR meeting revealed that numerous descriptions of SCAR's constitution had been drafted due to concerns about its remit.[336] At first, SCAR had been charged with the 'administration' of the scientific programme, but this was swapped for 'co-ordination', as 'administration' was considered too political.[337] The reason given for this was that 'administration' linked SCAR (and therefore science in Antarctica) to the central planning of a research programme, rather than one led by individual nations, and central planning was a principle associated with Soviet (and therefore communist) practices.[338] Conversely, the same wording hearkened back to the idea of colonial administration, and raised questions, Elzinga argued, about 'occupied territory'.[339] These anxieties about SCAR being linked to occupation reinforce the argument of this thesis; that not only was science beginning to be seen as a potential form of effective occupation during this period, but that the scientists themselves were aware of this link and sought to minimise or deny it during this period when needed.

Conversely, when making the case for scientific funding, the same actors would underline the political need for membership of SCAR and continued activity in the Antarctic. A report from the Royal Society dated 8 July 1958, which laid out the case for British involvement in SCAR, revealed several important points.[340] Firstly, in regards to remaining a SCAR Member after the IGY, 'the Royal Society

[335] Aant Elzinga, "Rallying around a Flag? On the Persistent Gap in Scientific Internationalism between Word and Deed," in Anne-Marie Brady (ed) *The Emerging Politics of Antarctica*, (London ; New York: Routledge, 2013), 193-94.
[336] Elzinga, "Rallying Around a Flag?," 195.
[337] Elzinga, "Rallying Around a Flag?," 195.
[338] Elzinga, "Rallying Around a Flag?," 195.
[339] Elzinga, "Rallying Around a Flag?," 195.
[340] *'Future Scientific Research in Antarctica By The United Kingdom',* 8 July 1958, CAB 124/1789, Antarctic Files, The National Archives, London, UK.

immediately consulted the Colonial Office regarding future UK interest in SCAR.'[341] Furthermore, the report highlighted the importance of SCAR membership for 'a very favourable position vis-a-vis the USSR and the USA,'[342] underlining the scientists' awareness of the need for caution regarding ongoing Cold War tensions. Finally, the strategic importance of maintaining Antarctic bases in the peninsula was reinforced in the same document, claiming that if Halley Bay 'is not held firm, Argentina may occupy it and the United Kingdom position vis-a-vis Argentina will be very poor indeed.'[343] This argument especially underlines the link between scientific bases and effective occupation of the Antarctic, given that the need to fund ongoing research at a station was specifically linked to Britain's strategic interests in the region. It was an effective argument; the response from the Colonial Secretary fully supported the scientific case made by the Royal Society, noting support for 'the view that it would be highly disadvantageous, politically, for the UK to withdraw from this base.'[344] There is a clear relationship between science and colonial ambitions illustrated in this exchange, with the need for continuous funding for Antarctic research operations at Halley Bay justified by linking the science to Britain's territorial ambitions in the Antarctic, and equating a British scientific presence in the Antarctic with a stronger position in the region, and specifically with being able to continue to refute Argentine colonial ambitions in the Antarctic.

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[341] *'Future Scientific Research in Antarctica By The United Kingdom',* 8 July 1958, CAB 124/1789, Antarctic Files, The National Archives, London, UK.
[342] *'Future Scientific Research in Antarctica By The United Kingdom',* 8 July 1958, CAB 124/1789, Antarctic Files, The National Archives, London, UK.
[343] *'Future Scientific Research in Antarctica By The United Kingdom',* 8 July 1958, CAB 124/1789, Antarctic Files, The National Archives, London, UK.
[344] *'Draft Letter, Colonial Secretary From the Lord President',* July 1958, CAB 124/1789, Antarctic Files, The National Archives, London, UK.

3.5 The Early Years of SCAR and the ATS

3.5.1 Legitimising and Validating Antarctic Science and Politics

The first six years of SCAR and indeed, of the ATS, were integral to ensuring their long-term success in coordinating science and politics for the continent. From 1958 onwards for SCAR and 1959 onwards for the ATS the primary objective for both was to gain legitimacy and validity as sources of authority in Antarctica. Adrian Howkins argues that the ATS did not decolonise the Antarctic.[345] Using Louis and Robinson's seminal ideas on the 'imperialism of decolonisation'[346] Howkins argues that in place of individual countries trying to perform acts of nationalism or environmental authority, the ATS introduced a collective assertion of environmental authority across the continent.[347] Contrary to the dominant narrative about the ATS, there is an element of continuity for imperial ambitions in the Antarctic. Imperial continuity is consistent with Louis and Robinson's interpretations of European decolonization, which emphasise the deliberate retention of imperial attitudes and policies in a 'postcolonial' world.[348] Howkins argues that the ATS may 'have brought about a significant relaxation of hostilities in the Antarctic'[349] but that the underlying power structures remained much the same. In the years following the ratification of the Treaty, it was essential for the ATS to be seen as an alternative to the pre-IGY assertions of authority and sovereignty, and therefore the focus of the ATS was to use

[345] Howkins, *Frozen Empires,* 131.
[346] William Roger Louis and Ronald Robinson, "The Imperialism of Decolonization," *The Journal of Imperial and Commonwealth History* 1994 22(3): 464.
[347] Howkins, *Frozen Empires,* 131.
[348] Louis and Robinson, "The Imperialism of Decolonization,": 463.
[349] Howkins, *Frozen Empires,* 132.

science and its associated ideals of internationalism to construct Antarctica as a continent for peace and science. In doing so too, by relaxing former hostilities in favour of continuous scientific collaboration, the stage was set for a new form of colonialism in the Antarctic, one in which science paved the way for a control over the Antarctic environment, rather than an indigenous population.

Similarly, SCAR's activities in its early years were focussed on the validation of its activities and the legitimising of its existence as a permanent organisation for the Antarctic. The lack of a defined relationship between SCAR and the ATS led to some difficulties during these early years, as both bodies navigated the ways in which science and governance in Antarctica would be carried out and the ways in which they would interact. The analysis in the previous chapter has demonstrated that SCAR, and specifically scientific exchange and meteorological research overseen by SCAR during the IGY, was integral to the construction of the narrative of Antarctica as a continent for peace and science, and by extension, the legitimisation of the ATS. Meanwhile, the ATS was integral to the ongoing commitment by its signatories to scientific activity in Antarctica, and in encouraging this commitment, legitimised SCAR, giving the two an almost symbiotic relationship.

3.5.2 Legitimising SCAR Through the ATS

Science is at the heart of the Antarctic Treaty. Articles II and III focus on the freedom of scientific investigation in Antarctica and the promotion of international cooperation in scientific investigation respectively,[350] which is partially why Alessandro Antonello argues that SCAR's remit was covered by

[350] "The Antarctic Treaty," Antarctic Treaty Secretariat, accessed June 18 2022. https://documents.ats.aq/keydocs/vol_1/vol1_2_AT_Antarctic_Treaty_e.pdf.

the Antarctic Treaty, and SCAR did not need to be formally mentioned in the articles specifically.[351] Article III also specifically references the exchange of scientific personnel between Antarctic research stations and expeditions.[352] SCAR may not have been formally linked to the ATS, but it was recognised and acknowledged. Papers from the British Colonial Office explicitly underline the importance of SCAR from a diplomatic point of view, arguing that 'the scientific importance of our presence in the Antarctic has been enhanced by the decision of our own and certain other countries' scientific bodies to collaborate through a new committee on Antarctic Research.'[353] During the first Antarctic Treaty Consultative Meeting (ATCM), in Canberra in 1961, inputs from SCAR were highlighted and several recommendations were devoted to SCAR and its role.[354] The first recommendation from the first ATCM stated that those present 'recommend to their Governments that they should facilitate the continuation of the exchange of information regarding plans for scientific programmes' carried out by SCAR.[355] Furthermore, the exchange of scientists was a particular focus at the first ATCM. In Recommendation I-II of the meeting, the representatives were urged 'to promote the continuation of the exchange, on a basis of bilateral agreements, of scientific personnel amongst their expeditions.'[356] In addition, large-scale projects like the sharing of weather data were also a focus at the first ATCM. Following discussions of the ongoing science in Antarctica, another recommendation promoted the

[351] Antonello, *The Greening of Antarctica,* 31.
[352]"The Antarctic Treaty," Antarctic Treaty Secretariat, accessed June 18 2022. https://documents.ats.aq/keydocs/vol_1/vol1_2_AT_Antarctic_Treaty_e.pdf.
[353] *'Letter to Quintin Hogg',* 15 July 1958, CAB 124/1789, Antarctic Files, The National Archives, London, UK.
[354] "Report of the First Antarctic Treaty Consultative Meeting, Canberra, 1961," Antarctic Treaty Secretariat, accessed June 11 2022. https://documents.ats.aq/ATCM1/fr/ATCM1_fr001_e.pdf.
[355] "Report of the First Antarctic Treaty Consultative Meeting, Canberra, 1961," Antarctic Treaty Secretariat, accessed June 11 2022. https://documents.ats.aq/ATCM1/fr/ATCM1_fr001_e.pdf.
[356] "Report of the First Antarctic Treaty Consultative Meeting, Canberra, 1961," Antarctic Treaty Secretariat, accessed June 11 2022. https://documents.ats.aq/ATCM1/fr/ATCM1_fr001_e.pdf.

continued exchange 'of observations and results from Antarctica through the recognized international data centres and by such other means as may be appropriate to ensure the exchange and free availability of this information.'[357] Therefore, an examination of the exchange of scientists between research stations and the ongoing meteorological research programme in Antarctica during the early years of both SCAR and the ATS allows for an understanding of how both SCAR and the ATS fed into the framing of Antarctica as a continent for peace and science.

3.5.3 SCAR's Early Years and Scientific Exchange

The exchange of scientists between countries is essential to examining the changing relationships between IGY countries, and specifically the US and USSR. As mentioned earlier, scientific exchange featured in the Antarctic Treaty and was encouraged at the first ATCM. Similarly, at the first meeting of SCAR at The Hague in 1958, 'it was recommended that exchange of scientific personnel, as during the IGY, should be continued as a general policy, subject to bilateral agreement in every case.'[358] In accordance with this recommendation SCAR oversaw and encouraged such bilateral agreements in the years following the IGY. The early SCAR Bulletins recorded the number of scientists (from both SCAR member countries and other states) spending either the summer or winter research seasons in Antarctica, whilst visiting research stations staffed by scientists from other countries. In 1959, the first instances of exchange of personnel at various bases were recorded, including US cooperation with New

[357] "Report of the First Antarctic Treaty Consultative Meeting, Canberra, 1961," Antarctic Treaty Secretariat, accessed June 11 2022. https://documents.ats.aq/ATCM1/fr/ATCM1_fr001_e.pdf.
[358] *SCAR Bulletin No.1, January 1959,* SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Scott Polar Research Institute, Cambridge, UK.

Zealand to jointly run Hallett station, and the first post-IGY exchanges of scientific staff between the US and the USSR at the Mirny and Little America stations respectively.[359] SCAR was a key player in establishing a climate of collaboration and encouraging trust between SCAR member countries, and these exchanges in 1959 preceded a boom in scientific exchange between not only the US and USSR, but between Soviet satellite states and North Atlantic Treaty Organisation (NATO) countries.

The other side of the scientific exchange coin was intelligence-gathering. Through scientific exchanges, it was possible to establish positive relations that allowed states to monitor the activities that others were carrying out at their bases. This is explored by Turchetti, Naylor, Dean and Siegert, who argue that 'the development of scientist exchange programs, especially with the Soviet Union, facilitated intelligence gathering of others' research operations beyond the official system of inspection put forward by the AT.'[360] Exchanges, they argued, were part of 'the escalation of a scientific 'arms-race' in Antarctica, where the US and Soviet governments each continued to invest in work there primarily because the other was doing so.'[361] In the 1961-1962 research seasons, the list of exchanges of scientists in the Antarctic expanded, growing to fifteen, with eleven American scientists working at foreign stations, hosted by Australia, Argentina, and France.[362] During this period, a meteorologist from the USSR was also hosted at US-run McMurdo station.[363]

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[359] *SCAR Bulletin No.3,* September 1959, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[360] Turchetti, Dean, Naylor and Siegert "On Thick Ice,", 360.
[361] Simon Naylor, Katrina Dean, and Martin Siegert, "The IGY and the ice sheet: surveying Antarctica," *Journal of Historical Geography* 200834(4): 590-591.
[362] *SCAR Bulletin No.13*, January 1963, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[363] *SCAR Bulletin No.13*, January 1963, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.

When the Antarctic Treaty came into force, 'the USSR put up no resistance to article VII of the Treaty, which reserved unlimited rights of inspection of installations, ships or aircraft by any other signatory nation.'[364] Some scholars argued that 'this decision was consistent with Nikita Khrushchev's policy of strengthening the Soviet nuclear capability and at the same time favouring compromises in the management of international affairs.'[365] The first round of these inspections was triggered by the unease between the US and USSR after the events of the Cuban missile crisis of October 1962, which exacerbated existing concerns at the time. Indeed, shortly after it in 1963, the US State Department arranged a round of inspections of Antarctic bases, including the Soviet bases.'[366]

The 1963-1964 list of exchange scientists was slightly smaller than in previous years, but saw two US stations (McMurdo and Byrd) and a US ship (the *Eltanin*) host ten of the thirteen scientists exchanged, including four Chilean and five Japanese scientists, whilst also continuing their exchange with the USSR.[367] For the first time, post-IGY, the UK and the Soviet Union exchanged scientists during this period: the UK hosted geologist G.E. Grikurov and sent glaciologist Charles Swithinbank to the USSR station Vostok.[368] This was an exchange which he would write about extensively in his memoirs, positively recalling his experiences.[369]

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[364] Turchetti, Dean, Naylor and Siegert "On Thick Ice,", 359.
[365] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 359.
[366] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 363.
[367] *SCAR Bulletin No.19,* January 1965, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[368] Charles Swithinbank, *Forty Years on Ice: A Lifetime of Exploration and Research in the Polar Regions* (Lewes: Book Guild, 1998), 21; *SCAR Bulletin No.19,* January 1965, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[369] Charles Swithinbank, *Vodka on Ice: A Year with the Russians in Antarctica*, (London: Book Guild Publishing Ltd, 2002), 24.

In the following years, there was an uptick of exchanges between the USSR's allies as Eastern Bloc countries sent researchers to the Antarctic, primarily to Soviet research stations. During the 1963-1964 seasons, Czechoslovakia sent two scientists to Russian stations in the Antarctic.[370] During 1964-1965, more countries began to participate in exchanges: East Germany sent a scientist to a USSR station and West Germany sent a scientist to Hallett, a US station.[371] Similarly, during the next year (1965-1966), Poland and Hungary sent scientists to Soviet stations in the Antarctic. This was part of a trend in which USSR satellite states would send their scientists specifically to USSR stations, whilst NATO allies of the US would send scientists specifically to US stations.[372]

Irina Gan argues that this feature of ongoing exchange made the Australian government wary of Soviet plans in the Antarctic, despite the Antarctic Treaty.[373] For the Australians, the introduction of additional Eastern bloc scientists into Antarctic research was considered noteworthy 'in view of persistent Soviet desires to broaden accession to the AT.'[374] Although these geopolitical considerations regarding accession to the Antarctic Treaty cannot be discarded, there were also other factors at play. Gan recorded an invitation from the Soviets Mikhail Somov and Vasiliy Burhanov, noting that the Soviets invited the Danish delegate to a SCAR meeting to send a scientist on the next Soviet Antarctic expedition, which was sent for approval to the central committee of the Communist Party of the Soviet Union.'[375] However, the central committee was not quite as enthusiastic as Somov and Burhanov 'to

[370] *SCAR Bulletin No.21*, September 1965, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[371] *SCAR Bulletin No.23*, May 1966, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[372] *SCAR Bulletin No.23*, May 1966, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[373] Gan, "Will the Russians Abandon Mirny?," 172.
[374] Gan, "Will the Russians Abandon Mirny?," 172.
[375] Gan, "Will the Russians Abandon Mirny?," 172.

encourage fraternisation with western scientists' and suggested that they find ways to 'tactfully deny permission' to the Danish scientist, but it was happy to approve the eastern bloc representative from Poland.'[376] This phenomenon suggests that although scientific exchange was celebrated as an example of the triumph of science over politics, and therefore encouraged by SCAR and the ATS, a closer examination of the nature of these exchanges shows that Cold War loyalties to superpowers were often not very far from the surface.

3.5.4 SCAR's Early Years and Meteorology:

3.5.4.1 SCAR and the WMO

From 1958, the World Meteorology Organization (WMO) had a permanent observer status to the SCAR WG on Meteorology after a request from ICSU.[377] Correspondence from Acting SCAR Secretary Gordon Robin noted the successful collaboration between SCAR and WMO during the IGY, offering thanks for the practical assistance and suggesting that WMO might also send a representative to the first SCAR meeting in August 1958, as an observer acting in an advisory capacity.[378] The first of these observers was Oliver M. Ashford who began a long and fruitful collaboration between the two organisations.[379] Further correspondence between Robin and J. R. Rivet, the Deputy Secretary General of WMO, 'concerning the proposed prolongation of IGY

[376] Gan, "Will the Russians Abandon Mirny?," 172.
[377] Walton, Clarkson and Summerhayes, *Science in the Snow,* 35.
[378] *Letter from Acting Secretary of SCAR, Gordon Robin to WMO Secretary-General,* 9th July 1958, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[379] Walton, Clarkson and Summerhayes, *Science in the Snow,* 35,

activities in the Antarctic'[380] shows enthusiasm for an extension of the collaboration between the two organisations, with an invitation extended to a WMO representative to the second SCAR Meeting in Canberra.[381] Several months after the SCAR Meeting, the WMO Secretary-General D. A. Davies sent a summary of the recommendations made at the 1959 WMO Executive Committee Meeting to Robin, stating that the committee 'welcomed the development of a close collaboration between SCAR and WMO on all matters relating to meteorological problems in the Antarctic and agreed that adequate arrangements should be made for continuing this collaboration.'[382] In the same letter, Davies pledged WMO support for SCAR's International Antarctic Analysis Centre (IAAC) in Melbourne, having asked WMO Members to assist in its operations, and committed to providing an annual progress report to be sent to SCAR on matters of mutual concern to both SCAR and WMO.[383]

The first of these reports detailed that SCAR's meteorological programme, which had been adopted at the SCAR meeting in Moscow during August 1958, had been distributed to the members of the WMO Commission for Aerology for their comments and so that the Commission could incorporate the Antarctic in future activities.[384] The report reinforced WMO's commitment to continued collaboration with SCAR on practical matters, from the continuation of various procedures put in

[380] *Letter from WMO Deputy Secretary-General J. R. Rivet to Gordon Robin,* 14th July 1958, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[381] *Letter from Acting Secretary of SCAR, Gordon Robin to WMO Director General,* 4th February 1959, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[382] *Letter from WMO General Secretary D. A. Davies to Gordon Robin*, 14th May 1959, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK..
[383] *Letter from WMO General Secretary D. A. Davies to Gordon Robin*, 14th May 1959, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK..
[384] *Report on WMO's Activities of Special Interest to SCAR, Submitted by the Secretary-General of WMO,* March 1959, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.

place during the IGY, such as the creation of meteorological station index numbers for Antarctic research stations, and requests sent to WMO members urging them to send competent meteorologists to the IAAC and provide telecommunications facilities to the centre so that the daily synoptic charts generated at the centre could be requested and shared widely.[385]

Over the next two years, WMO was integral to the continued sharing of meteorological data in the Antarctic, reassuring the Soviet scientist Dr Zolotuhin of access to meteorological data from American scientist based at McMurdo station[386] on one occasion, and making all data collected at the WMO Meteorological Data Centre in Antarctica during the IGY readily available.[387] In 1960, the WMO Executive Committee discussed the collection and dissemination of meteorological data in the Antarctic and submitted a plan to SCAR perfecting the ways in which this was done.[388] Expressions of satisfaction regarding the ongoing relationship between the two organisations were communicated on multiple occasions by the WMO Secretary-General Davies and Dr Kaare Langlo, the WMO Representative to SCAR Meetings.[389]

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[385] *Report on WMO's Activities of Special Interest to SCAR, Submitted by the Secretary-General of WMO,* March 1959, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.
[386] *Letter from F. W. Reichelderfer, Permanent Representative of the US to WMO, To Participants in Informal Meeting During WMO Executive Committee Twelfth Session Concerning Communications in the Antarctic,* 10th August 1960, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.
[387] *Report on WMO's Activities of Special Interest to SCAR, Submitted by the Secretary-General of WMO,* March 1959, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.
[388] *Letter from WMO Secretary-General D. A. Davies to Gordon Robin,* 16th August 1960, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.
[389] *Letter from WMO Secretary-General D. A. Davies to Gordon Robin,* 16th August 1960, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK; *Letter from WMO Secretary-General D. A. Davies to Gordon Robin,* 12th September 1960, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.

Over the course of 1961 and 1962, the invitation of a WMO Representative to SCAR Meetings was made again, and further invitations were issued to WMO to allow meteorologists with an interest in Antarctic affairs to take part in SCAR working group meetings if they wished to do so.[390] In return, WMO extended an invitation for a SCAR Representative to join the Panel of Experts in Antarctic Meteorology.[391]

3.5.4.2 The International Antarctic Analysis Centre (IAAC)

One of the first large-scale projects pioneered by SCAR built on meteorological research carried out during the IGY: the International Antarctic Analysis Centre (IAAC). Such a project, which involved collaboration with longer standing, UN-affiliated bodies such as the WMO, established SCAR as a legitimate body for the coordination of research. During the first meeting of SCAR in The Hague in 1958, delegates from New Zealand and Australia were asked 'to consider the possibility of the establishment of an international analysis centre in one of these two countries',[392] which would collate meteorological data from across the southern hemisphere in one international centre and host meteorologists to carry out continuous analysis of the data. The centre was set up in Melbourne, Australia in 1959 and depended largely on communication of data from various locations, processing 'reports from Antarctica, South America, South Africa and other stations south of lat. 30° S. available

[390] *Fourth Progress Report on WMO's Activities of Special Interest to SCAR, Covering the period June 1961 - June 1962,* July 1962, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.
[391] *Fourth Progress Report on WMO's Activities of Special Interest to SCAR, Covering the period June 1961 - June 1962,* July 1962, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.
[392] *SCAR Bulletin 1: Aims and Establishment of SCAR*, January 1959, SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Cambridge, UK.

in Melbourne within six hours of the time of observation.'[393] Uwe Radok and William Budd, both prominent IGY scientists based at the Meteorology Department at the University of Melbourne, were integral to setting up the IAAC.[394] The research facility became the focus of international scientific coordination between states with an interest in Antarctica from 1959 onwards, when it began to host the IAAC.[395] Turchetti, Naylor, Dean and Siegert described the IAAC as a 'notable new development in the field of international scientific co-operation.'[396] They also noted that Radok and Budd had pioneered meteorological research in Australia, as well as later developing the international coordination of meteorology.[397]

Early SCAR documents follow the progress of the centre. From its inception, the IAAC relied on international collaboration, with the Director of the Australian Bureau of Meteorology emphasising to SCAR that governments of SCAR member countries 'should actively collaborate by sending competent meteorologists to work in the Centre.'[398] After this statement was released, an American scientist was sent to the analysis centre.[399] Further American cooperation came 'through the good offices of Dr Harry Wexler'[400] when the United States IGY National Committee donated the library of

[393] *SCAR Bulletin 1: Aims and Establishment of SCAR*, January 1959, SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Cambridge, UK.
[394] Turchetti, Dean, Naylor and Siegert, "On Thick Ice,", 364.
[395] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 364.
[396] Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 361.
[397]Turchetti, Dean, Naylor and Siegert, "On Thick Ice," 361.
[398] *SCAR Bulletin No. 2: Establishment of the International Antarctic Analysis Centre, Melbourne, Australia, May 1959,* SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Cambridge, UK, 475.
[399] Summerhayes, "International Collaboration in Antarctica", 326.
[400] Summerhayes, "International Collaboration in Antarctica", 326.

data from Little America's Weather Central to the IAAC, which provided the researchers at the IAAC with the extensive data from observations throughout the IGY.[401]

The IAAC remained the focus of SCAR attention, as meteorologists from SCAR Member countries were seconded to Melbourne. SCAR continued to encourage members to provide professional meteorologists to staff the centre.[402] This eventually led to the formal endorsement of the project by ICSU as an organ of ICSU and the WMO, in 1961.[403] A year later in October 1962, at the fourteenth meeting of ICSU, further support from ICSU's Executive Board was announced for the IAAC when ICSU 'agreed to establish a special fund to assist the operation of the International Antarctic Analysis Centre and granted the fund a loan of $10,000 and the Treasurer of ICSU, President of SCAR and Secretary-General of WMO had been appointed Trustees.'[404] The issue of adequately staffing and funding the IAAC dominates most of the correspondence between the WMO Executive Committee and Gordon Robin. Despite the necessity of the data which was being gathered, analysed and disseminated in Melbourne, various means of supporting the centre financially had been discussed by the WMO Executive Committee, with no positive results.[405] A call for meteorologists to be stationed at

[401] Summerhayes, "International Collaboration in Antarctica", 326.
[402] *SCAR Bulletin No. 7 January 1961,* SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Cambridge, UK, 420-432.
[403] *SCAR Bulletin No. 10: Fifth Meeting of SCAR, Wellington, NZ, January 1962,* SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Cambridge, UK, 90.
[404] *SCAR Bulletin 16: Seventh Meeting of SCAR – Cape Town, South Africa, January 1964,* SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Cambridge, UK, 87.
[405] *Progress Report on WMO's Activities of Special Interest to SCAR, Submitted by the Secretary-General of WMO,* September 1960, SCAR 2/7/1/1, Box 53.

the IAAC was sent out in September 1960, in the hope that WMO Members reluctant to offer funds upfront might offer brainpower instead.[406]

SCAR documented the activity at the IAAC closely, providing lists of meteorologists who had been based at IAAC in its first years and noting in 1964 the extent to which international collaboration had played a part.[407] It was noted at the SCAR meeting in 1964 that 'the work of the Centre has been very greatly assisted, particularly by the considerable practical assistance on communications given by Argentina, France, New Zealand, South Africa,. the United Kingdom and the United States of America, and generally by the co-operation of all the national bases in the Antarctic.'[408] In many ways, SCAR was legitimised and validated by this project: the IAAC was an important example of successful collaboration. One of the reasons why the IAAC project was lauded as a triumph of scientific internationalism is its clear link to the science of the IGY, without as clear a link to the politics of the Antarctic. The IAAC was a venture that linked SCAR to the WMO, and therefore the Antarctic to the world, and could therefore be more effectively divorced from the underlying colonial ambitions at Weather Central in Little America in an exceptionalist narrative. The clear downside to this physical and ideological distance was that funding the IAAC did nothing to further Antarctic ambitions for national actors who were ATS members, whereas staffing meteorological stations on the continent did,

[406] *Progress Report on WMO's Activities of Special Interest to SCAR, Submitted by the Secretary-General of WMO,* September 1960, SCAR 2/7/1/1, Box 53.
[407] *SCAR Bulletin 17: Isotopes in Relation to Polar Glaciology, by C. Lorius*, May 1964, SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Cambridge, UK.
[408] *SCAR Bulletin 17: Isotopes in Relation to Polar Glaciology, by C. Lorius*, May 1964, SCAR 6/1/3, Box 37, Folder 15, SCAR Archives, Cambridge, UK.

suggesting that this may have been one of the reasons that the centre was consistently underfunded and understaffed.

3.5.4.3 The WMO and the World Weather Watch (WWW)

In the years that followed, some IAAC responsibilities were taken over by an international project pioneered by the United Nations (UN) and the World Meteorological Organisation (WMO) - the new World Weather Watch (WWW).[409] In September 1961, a report by Harry Wexler had recommended the establishment of 'a truly global observing system and an International Atmospheric Science Program.'[410] Robert Fleagle argues that recommendations for a World Weather Watch programme from this report then became the basis for President John F. Kennedy's proposal to the United Nations General Assembly for cooperative efforts between 'all nations in weather prediction and eventually in weather control.'[411] Kennedy's proposal later led to the adoption of UN Resolution 1721 (XVI) on December 20, 1961.[412] A year later, there was another UN resolution, inviting the WMO and ICSU to develop a weather research program aimed at understanding climate, developing weather modification, and improving prediction.[413] The example of successful international collaboration for meteorological research during the IGY and later at the IAAC acted as a catalyst for the WWW, a much larger and

[409] James Rodger Fleming, "Polar and Global Meteorology in the Career of Harry Wexler, 1933-62," in Roger D. Launius, James R. Fleming and David H. DeVorkin (eds) *Globalizing Polar Science. Palgrave Studies in the History of Science and Technology* (New York: Palgrave Macmillan, 2010) 238-239.
[410] Robert G. Fleagle, "From the International Geophysical Year to Global Change," *Reviews of Geophysics* 1992 30(4): 308.
[411] Fleagle, "From the International Geophysical Year," 308.
[412]Fleagle, "From the International Geophysical Year," 308.; "Resolution 1721 (XVI): International co-operation in the peaceful uses of outer space" United Nations, accessed 10 May 2022, https://www.unoosa.org/oosa/en/ourwork/spacelaw/treaties/resolutions/res_16_1721.html.
[413] Fleagle, "From the International Geophysical Year," 308.

more ambitious project. Former SCAR President Colin Summerhayes certainly argued that this was the case, stating that research coordinated by SCAR had 'stimulated the development of a similar series of programmes in the field of atmospheric research.'[414]

SCAR welcomed the World Weather Watch project, noting that 'the establishment of a World Centre of the World Weather Watch in Melbourne relieves the International Antarctic Analysis Centre of the one commitment for routine data and chart processing, and it is now free to concentrate on research related to Antarctic meteorology. The title of the Centre has accordingly been changed from International Antarctic Analysis Centre (IAAC) to International Antarctic Meteorological Research Centre (IAMRC).'[415] By studying the IAAC, it is possible to illuminate the ways in which SCAR fostered diplomatic ties between IGY countries through meteorological research and paved the way for larger-scale projects involving countries who were not members of SCAR, at a point in history where infrastructural globalism was on the rise. Despite the diplomatic value of SCAR's activities, especially with regards to its provision of meteorological services, SCAR was not acknowledged as a key institution involved in the structure of Antarctic governance and has been largely ignored by the literature on infrastructural globalism and meteorological research.

It is at this point where a critical approach to the IAAC and the resulting WWW project is essential. Martin Hewson has queried the relationship between large international or intergovernmental structures and research during the twentieth century, arguing that globalist attitudes and the creation

[414] Summerhayes, "International Collaboration in Antarctica", 327.
[415] *SCAR Bulletin 22: Geodetic Links in the Southern Hemisphere, by Georges R. Laclavère*, January 1966, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK,

of these structures could not be divorced from the sharing of information on a hitherto unforeseen scale.[416] Paul Edwards draws from Hewson's ideas, and argues that the World Weather Watch was 'a global information infrastructure' which encapsulated the ideals of infrastructural globalism, viewing the project as an effort 'to achieve globalist goals by building permanent, unified world-scale institutional-technological complexes.'[417] He also states that infrastructural globalism in meteorology specifically had greatly benefited from the IGY, and the scientific internationalism at the heart of the venture.[418] Edwards considered the WWW to be 'the successful transfer of key standard-setting and coordinating powers from national weather services to a permanent, globalist intergovernmental organisation.'[419] However, Edwards neglects to mention the IAAC, an integral step in coordinating meteorological research from multiple countries and its significance. He also focuses entirely upon WMO's role in the WWW, omitting SCAR's contributions, and its role in promoting the scientific internationalism that had paved the way for the rise in infrastructural globalism he describes.

Edwards' argument about meteorology begs an important question: did meteorology become a prominent feature of SCAR's activity during and after the IGY because of scientific internationalism? Or could the success of international collaboration in Antarctic meteorological research rather be due to the fact that the infrastructure needed for accurate weather predictions across the Southern Hemisphere required a network of stations across the Antarctic regularly providing observations? And that these stations were seen as a form of effective occupation by the administrations in charge of

[416] Martin Hewson, "Did Global Governance Create Informational Globalism?" in Martin Hewson and Timothy J. Sinclair (eds) *Approaches to Global Governance Theory*(Albany, N.Y., 1999), 97–113.
[417] Paul N. Edwards, "Meteorology as Infrastructural Globalism," 2006 *Osiris* 21(1): 239.
[418] Edwards, "Meteorology as Infrastructural Globalism," 245-246.
[419] Edwards, "Meteorology as Infrastructural Globalism," 249.

releasing the budget needed for their staffing and upkeep? Ultimately, both of these factors played a part. Howkins argues that meteorology and politics were being co-produced at this time.[420] Taking Howkins' argument, which primarily focuses on the co-production of meteorology and Antarctic politics until 1959, and applying it to the early years of SCAR and the ATS, allows us to add a layer of complexity beyond Edwards' account of infrastructural globalism. Meteorology in Antarctica was indeed co-produced alongside Antarctic politics (namely the ATS), and a large-scale project like the IAAC legitimised the political environment it was co-produced alongside, as well as the organisation (SCAR) by which it was overseen. Therefore, I argue that meteorology became a focus in Antarctica during this period for multiple reasons: some political, some practical, some colonial, but ultimately, weather research during this period strengthened both SCAR and the ATS.

3.6 Conclusion

SCAR became a permanent fixture in Antarctic science after the IGY, in much the same way that research activity on the continent became a permanent fixture, and the effective occupation of the Antarctic through science became an established activity. It is in this period that the actors involved in funding post-IGY 'big science' projects which required international collaboration explicitly linked these projects and their ongoing funding with colonial ambitions in the Antarctic. As explored in this chapter, the activities of SCAR, and its perceived successes in harnessing scientific internationalism contributed in part to the negotiation, signing and ratification of the Antarctic Treaty and the creation of a new system of governance for the Antarctic.

[420] Adrian Howkins, "Political Meteorology," *History of Meteorology* 2008 4: 37. 35.

SCAR was not formally linked to the Antarctic Treaty, despite the undeniable relationship between the two organisations, which can be categorised as a form of organisational co-dependency. The example of the changed wording for SCAR's remit, from being an 'administrative' body, to a 'coordinating' body foreshadows some of the future conflicts that would arise from a lack of a defined relationship between the two. It did not cause many teething issues in the period this chapter focused on, but would go on to become a bone of contention in the decades to come.

The main function of SCAR in the early years of both SCAR and the ATS was to legitimise and validate the existence of both bodies and their authority in the Antarctic. This chapter used material from the SCAR archive to elucidate the role that sustained scientific exchange between national stations played in the years that followed the IGY. Scientific exchange, once scrutinised, reveals that despite the narrative of a depoliticised Antarctica, many of the exchanges that took place embodied Cold War tensions, and that the nature of these scientific exchanges still inevitably echoed Cold War loyalties to the US or USSR. This becomes painfully apparent during the attempt by a Soviet researcher to invite a Danish colleague to a research station, only for his request to be denied, and to be told to invite a Polish colleague instead.

Meteorology once again features heavily in establishing SCAR as an internationally renowned body in coordinating large-scale research projects. The transition from collecting weather data in the Antarctic to setting up the International Antarctic Analysis Centre (IAAC) in Melbourne; sustaining its activities, and collaborating with the WMO to establish the World Weather Watch (WWW)'s Antarctic component showcases the importance of meteorology in validating SCAR's activities in the

Antarctic. Meteorology also serves as a tool for encouraging international cooperation and collective funding of transnational science, whilst also being a useful tool in establishing a permanent 'apolitical' presence on the Antarctic. This permanent presence allows for science to become an effective tool of ongoing occupation in Antarctica, and whereas this role of science was only hinted at during the IGY, it becomes established in this period. Furthermore, with the explicit link between funding research at bases like Halley Bay, and colonial ambitions, it becomes clear that the justification for funding expensive Antarctic research was to further territorial ambitions in Antarctica, and to be able to continue refuting other national actors' territorial ambitions. During its early years and the coordination of activities such as those detailed in this chapter, SCAR established itself post-IGY and in doing so, was integral to the reframing of the Antarctic as a space dedicated to science and peace alone. This framing of Antarctica allowed for complex political and colonial agendas to continue to be enacted on the Antarctic, whilst also creating space for the funding of international scientific collaboration in Antarctica through SCAR.

4. SCAR in the 1960s and 1970s: SCAR, Science Diplomacy and Asserting Sovereignty over the Antarctic

4.1 Introduction

During the 1960s and the early 1970s, SCAR was integral in coordinating the ways in which science in Antarctica met the questions of Antarctic sovereignty. Anita Dey Nuttall argues that the years following the establishment and ratification of the Antarctic Treaty saw the conflation of scientific activity in Antarctica with effective occupation, arguing that 'it was the start of nation states beginning to combine occupation, to one degree or another, with science.'[421] It is impossible to divorce ongoing scientific activity in the Antarctic from the colonial ambitions of ATS members, and the agendas that exist for these national actors when it comes to science in the Antarctic. The ratification of the Antarctic Treaty in 1961 allowed for the creation of what environmental historian Adrian Howkins refers to as 'a collective assertion of environmental authority'[422], which he argues is a direct continuation of previous imperial ambitions in the Antarctic, in a new structure.[423] It is this collective assertion of authority which is at the heart of the interactions between science and politics in Antarctica during the late 1960s and early 1970s. This collective assertion of authority allows for a

[421] Anita Dey Nuttall, "National Antarctic Programmes: The politics-science interface," In *The Routledge Handbook of the Polar Regions*, ed. Mark Nuttall, Torben R. Christensen, Martin J. Siegert, (London: Routledge, 2018), 296.
[422] Adrian Howkins, *Frozen Empires: An Environmental History of the Antarctic Peninsula* (New York, NY: Oxford University Press, 2017), 167.
[423] Howkins, *Frozen Empires,* 31.

structure to subjugate the Antarctic environment, in the absence of an indigenous population to subjugate.

This chapter explores several instances in which science and sovereignty begin to interact in Antarctica. Some are successful examples of SCAR's science diplomacy. Others tease out some of the tensions between science and politics in the Antarctic which are beginning to become apparent to both SCAR-affiliated scientists and political actors at the ATS. In this chapter, I argue that the success stories are successful specifically because they involve activities which align with national agendas. These activities under SCAR's remit allowed for one, or a mixture, the following interactions between Antarctic science and Antarctic sovereignty. Firstly, Antarctic science is used to provide a basis for future sovereignty. Elena Glasberg explores the nature of Antarctic politics, and posits that much of the activity in Antarctica, be it scientific or artistic, exists to give states a basis for future claims to the Antarctic in a world where the Antarctic Treaty no longer exists.[424] I have applied Glasberg's logic throughout my analysis of SCAR's activities, finding that many of the 'successful' examples of SCAR's science diplomacy are successful because they align with this use of Antarctic science in preserving claims for a 'future nationalism.'[425] This preservation of Antarctica for a 'future nationalism' is a natural successor to the subjugation and control of the environment, whereby conserving the Antarctic environment becomes a proxy for colonial administration. Secondly, SCAR's successful science diplomacy efforts allow for national actors to distance themselves from previous attempts at

[424] Elena Glasberg, *Antarctica as Cultural Critique: The Gendered Politics of Scientific Exploration and Climate Change*, Critical Studies in Gender, Sexuality, and Culture (New York: Palgrave Macmillan, 2012)., 6.
[425] Glasberg, *Antarctica as Cultural Critique*, 6.

exerting sovereignty in the Antarctic, attempts with more overt colonial intent. Many of the conservation measures for Antarctic wildlife, including the two examples in this chapter - the Agreed Measures for the Conservation of Antarctic Flora and Fauna (AMCAFF), and the Convention on the Conservation of Antarctic Seals (CCAS), are proven by Alessandro Antonello's work, and this thesis, to allow national actors to reframe their involvement in activities such as sealing, which has been linked to colonial ambitions in the Antarctic, and to present themselves as proponents of conservation instead. The efforts at conserving the Antarctic environment during this period signal the ways in which conservation of the environment replaced previous attempts at administering the Antarctic by the states with claims to Antarctic territory. Finally, each of the examples of SCAR's activity in Antarctica are used to exert the collective new sovereignty over the Antarctic that Adrian Howkins describes, through the ATS, but also through successful SCAR science diplomacy, thereby controlling and subjugating the environment.

The instances where SCAR's science diplomacy has been ineffective are just as interesting as the successful examples. Certain activities in Antarctica, such as mapping, and as discussed in the next chapter, exploring the Antarctic for potential mineral resources, cannot be disentangled from the question of sovereignty, and this became more apparent during the 1960s. In these examples, it becomes clear that SCAR, although allowing for a variety of activities to take place under its umbrella, cannot fully depoliticise certain activities, regardless of how 'scientific' they may be. In these events, the default narrative of Antarctic exceptionalism, and naive assumptions about science diplomacy are challenged, and it becomes clear that whereas SCAR's role as a vehicle for science diplomacy can ease

older tensions, there is a danger in SCAR-affiliated scientists being seen to overstep their mark, and in doing so, becoming enmeshed in Antarctic politics. Paradoxically, at the same time, science is synonymous with effective occupation of Antarctic territory, and central to the efforts to exert control and authority over the Antarctic. This creates the dual nature of SCAR in Antarctic narratives, whereby it is both central to ongoing efforts to colonise the Antarctic, and to the activities which have led to a distancing from traditional forms of colonising the Antarctic, to be able to designate it 'a continent for peace and science'.

4.2 Cartography and Geodesy

Cartography and mapmaking cannot be divorced from imperial and colonial traditions. In his discussion on the relationship between cartography and colonialism from a postcolonial perspective, David Howard notes that postcolonial theorists have rightly linked imperial desire to cartographic design.[426] J. Brian Harley's work in this area has been incredibly influential, premising cartography as 'primarily a form of political discourse concerned with the acquisition and maintenance of power.'[427] Christopher Tomlins' work expands on the reasoning between the linking of mapmaking and colonialism. He argues that the elaborated legality of mapmaking 'provided the necessary legitimacy for

[426] David Howard, "Cartography and Visualization," In *A Concise Companion to Postcolonial Literature*, ed. Shirley Chew and David Richards (Oxford: Wiley-Blackwell, 2010), 141

[427] J. Brian Harley, 'Maps, Knowledge, and Power' In Dennis Cos and Stephen Daniels (eds) *The Iconography of Landscape: Essays on Representation, Design, and Use of Past Environments* (Cambridge and New York: Cambridge University Press, 1988), 278.

colonizing projects.'[428] Furthermore, the 'achievement of intellectual control over appropriated territory through survey and mapping'[429] was, he posits, an essential aspect of European imperialism, as 'maps enabled their creators and their sponsors to take effective visual and conceptual possession'[430] of new territories. Given this well-established link between mapping and colonialism, it is not unreasonable to see mapping as an inherently political form of knowledge production, closely associated with supporting claims to territory, or to establishing sovereignty and control over a new 'colony'.

Mapping in Antarctica is no less political than mapping elsewhere. Elena Glasberg referred to the mapping of Antarctica as having value beyond the simple act of filling in the final blank on the world map. She argues that cartographic efforts in Antarctica are 'not only a matter of filling in knowledge, but signalling a relation to the rest of the world and among the territories of the rest of the world. Antarctica since the 1960s has figured as a site of convergence, or for a 'coming together' of the entire globe.'[431] Before the IGY, the mapping of Antarctica was one of the primary activities used to perform the traditional rites of the colonial ceremony. Ursula Rack notes that science, exploration and cartography have all been used to claim and colonise Antarctica during expeditions to the Antarctic in the nineteenth and early twentieth centuries. She argues that the 'need for accurate maps fitted well with national aims of exploring new land and becoming increasingly interested in scientific

[428] Christopher Tomlins, "Law's empire: Chartering English colonies on the American mainland in the seventeenth century," In *Law, History, Colonialism: The Reach of Empire*, ed. Diane Kirkby and Catharine Coleborne (Manchester: Manchester University Press, 2001), 27.
[429] Tomlins, "Law's Empire,", 30.
[430] Tomlins, "Law's Empire,", 30.
[431] Glasberg, *Antarctica as Cultural Critique, 1-2.*

knowledge.'[432] The pursuit of geographical knowledge and the creation of maps, Rack argues, became an instrumental link between science, economy and territorial claims in support of colonialism.[433] A newer, more technologically driven version of this relationship existed in the interwar years, when Richard Byrd made use of aeroplanes, aerial camera equipment and advances in radio communication technologies to create more accurate maps of sections of the Antarctic.[434] Klaus Dodds argues that there is a long history of political and scientific justifications offered in the British context for the mapping of Antarctica by the predecessor of the British Antarctic Survey, the Falkland Islands Dependencies Survey (FIDS).[435] Dodds effectively posits that cartography in Antarctica was politics by other means, and that maps and surveys of Antarctica 'reflected British anxieties concerning Argentina in the immediate postwar world.'[436]

Significantly, during the IGY, cartography was considered too political an activity to be included in the research programme. In the conferences leading up to the IGY, the potential for including cartography in the official programme of activity was discussed.[437] As Walton, Clarkson and Summerhayes noted, all countries could have contributed cartographic data, particularly those operating aircraft which could provide aerial photography, but whilst it was concluded that cartography of Antarctica was not a

[432] Ursula Rack, "Exploring and mapping the Antarctic: Histories of discovery and knowledge," In *The Routledge Handbook of the Polar Regions*, ed. Mark Nuttall, Torben R. Christensen, Martin J. Siegert, (London: Routledge, 2018) 36.
[433] Rack, 'Exploring and mapping the Antarctic", 37.
[434] Dian Olson Belanger, *Deep Freeze: The United States, the International Geophysical Year, and the Origins of Antarctica's Age of Science* (Boulder, Colo.: University Press of Colorado, 2010),19.
[435] Klaus Dodds, "Putting maps in their place: The demise of the Falkland Islands Dependency Survey and the mapping of Antarctica, 1945-1962," *Ecumene* 7, 2 (2000), 176-178.
[436] Dodds, "Putting Maps In Their Place": 179.
[437] Marcel Nicolet, *Annals of the IGY 1958. The International Geophysical Year meetings, vol. IIA.* (London, New York, Paris, Los Angeles: Pergamon Press, 1958), 87-88.

'proper' discipline for inclusion in the IGY programme, and that 'it was hoped that the data gathered might be made publicly available and used by map-makers.'[438] Reports of the different research activities carried out by the numerous stations across Antarctica during the IGY reflect this unwillingness to be seen to engage in such a political activity - most stations did not report engaging in mapping activities during the IGY, and very few reported cartography as one of their official research activities during 1959.[439] This is not to say that cartography and map making activities were not being conducted covertly, but the SCAR archive did not provide sources to suggest this was happening during the IGY, and as such, a discussion of the counterfactual narrative is beyond the scope of this research.

During the 1960s, SCAR provided a unique opportunity for not only the continuation of previous efforts to map Antarctica, but a forum for collaborating on Antarctic map-making. The work of one of SCAR's early working groups, the Working Group on Geodesy and Cartography, provided an opportunity to share historical cartographic data, and collaborate on future attempts at mapping a

[438] David W. H. Walton, Peter D. Clarkson, and Colin P. Summerhayes, *Science in the Snow: Fifty Years of International Collaboration through the Scientific Committee on Antarctic Research*, (Cambridge: Scientific Committee on Antarctic Research, 2011) 9.

[439] *Report from Argentina on Stations,* 5 February 1959, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from Australia on Stations*, 9 December 1958, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from Belgium on Stations,* July 1959, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from France on Stations,* July 1959, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from Japan on Stations*, 1959, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from New Zealand on Stations,* 27 February 1959, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from Norway on Stations*, July 1959, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from South Africa on Stations*, 29 January 1959, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from United Kingdom on Stations*, 27 January 1959, SCAR 7/3/1, Box 48, Cambridge, UK; *Report from United States on Stations*, 13 January 1959, SCAR 7/3/1, Box 48; SCAR Archives, Cambridge, UK; *Report from USSR on Stations,* 10 January 1959, SCAR 7/3/1, Box 48, Cambridge, UK.

continent which was largely untouched.[440] The planned scientific activity in Antarctica changed following the end of the IGY, as national committees for Antarctic research began to incorporate new technologies and the study of geodesy into mapping Antarctica.[441] The signing of the Antarctic Treaty, and the establishment of the SCAR Working Group on Geodesy and Cartography opened the door to research which had previously been considered too politically fraught. For example, documents from New Zealand, now held at the National Archives, detailed plans to include cartography in the scientific programme from 1960 onwards, to 'map 300 miles of the unknown coastal area between McMurdo sound and Hallett Bay'[442] in order to fill in gaps in cartographic records.[443]

SCAR provided a seemingly depoliticised way forward for collaborative efforts at mapping the continent, and 'there was every expectation that national mapping groups could use SCAR as the basis for developing collaboration.'[444] At face value, cartography is a perfect vehicle for a triumph of science diplomacy: one which could divorce national actors from the underlying sovereignty implications of past mapping activities in Antarctica. As I will demonstrate, cartography in particular is an activity which is still overtly associated with sovereignty, and therefore, whilst SCAR's activities in cartography and geodesy could have provided ATS members with a smokescreen for their colonial ambitions, cartography in the Antarctic is instead an example of the preservation of Antarctica for the 'future nationalism' that Elena Glasberg discusses, which heralds a natural progression from the exertion of

[440] Walton, Clarkson and Summerhayes, *Science in the Snow,* 31-32.
[441] Robert Clancy, John Manning, and Hank Brolsma, *Mapping Antarctica: A Five Hundred Year Record of Discovery*, (Dordrecht: Springer International, 2014) 221-250.
[442] "Future Scientific Work in Ross Dependency," *Press Statement by New Zealand Minister in Charge of Scientific and Industrial Research,* 1959, CAB 124/1789, Antarctic Files, The National Archives, London, UK.
[443] *"Future Scientific Work in Ross Dependency",* Antarctic Files, The National Archives.
[444] Walton, Clarkson and Summerhayes, *Science in the Snow* 31.

environmental authority described by Adrian Howkins, and which, I argue, is tool used to enact control over the Antarctic environment in place of the traditional colonial administration over territory involving the subjugation of an indigenous population.[445]

Jørgen Alnæs explores the ways in which maps of Antarctica from the 1960s onwards can be interpreted as a performance of sovereignty over the Antarctic.[446] In examining several Norwegian maps of the Antarctic, Alnæs draws out the relationship between maps of Antarctica and the history of Norwegian activity in Antarctica, ultimately arguing that maps of the Antarctic are used to inscribe a nation's territorial claims onto a visual marker of territory.[447] It was impossible for SCAR to divorce colonial ambitions from cartography. Even the official SCAR history notes that in the 1960s 'all the claimant nations decided that politically they would wish to publish their own maps as a way of advertising their sovereignty'[448] and that this meant that sensible collaborations between Argentina, Chile and the UK in particular, to collectively map the peninsula, were 'never possible.'[449] Elena Glasberg's notion of mapping Antarctica as an activity which reinforces 'persistent fantasies about empty territory through a collusion of international science-as-colonization'[450] is essential to an examination of cartography in Antarctica after the IGY. Glasberg argues that the aim of scientific activity in Antarctica is to serve a 'future nationalism', and in doing so, provide proof of effective

[445] Glasberg, *Antarctica as Cultural Critique*, 6; Howkins, *Frozen Empires*, 167.
[446] Jørgen Alnæs, "The Global Antarctic: Map Assemblages and the Performing of Territory," *Cartographica* 55, 1 (2020): 43-44.
[447] Alnæs, "Global Antarctic,", 49-50.
[448] Walton, Clarkson and Summerhayes, *Science in the Snow,* 31.
[449] Walton, Clarkson and Summerhayes, *Science in the Snow,* 31.
[450] Glasberg, *Antarctica as Cultural Critique*, 14.

occupation through knowledge production - no other activity in Antarctica exemplifies Glasberg's argument better.

There were several factors which made mapmaking under SCAR's remit a politically fraught activity. Firstly, there was the question of naming places in Antarctica. When the SCAR Working Group on Cartography and Geodesy met in 1960, members were asked to circulate information on place names, to share new names as they were given, and where numerous names existed for the same place, to come to a decision bi-laterally as to what the standardised version of the name should be.[451] The very mention of standardising names in the contested peninsula region was a problem from the first. Walton, Clarkson and Summerhayes comment on the way that name standardisation raised tensions and led to discussions that would inevitably touch on territorial claims.[452] Despite the ongoing tensions, and the consistent recommendations at SCAR meetings for more standardised and cohesive maps, each member was involved in multiple traverses for cartography, and the resulting different maps were distributed through SCAR on an annual basis.[453] It was decided at the 1967 SCAR Executive Committee Meeting that a representative, namely Mr B. P. Lambert, Secretary of the SCAR Working Group on Geodesy and Cartography, would be sent to the UN Conference on Standardisation of Geographical Names in September 1967, to report on the activity in Antarctica, and the significant progress made towards not only mapping Antarctica, but making much slower strides towards the standardisation of place names in the Antarctic too.[454]

[451] SCAR Archives, *Report on Geodetic and Cartographic Activities, 1960-1965,* SCAR 13/2/1, Box 53.
[452] Walton, Clarkson and Summerhayes, *Science in the Snow,* 31-32.
[453] *Report on Geodetic and Cartographic Activities, 1960-1965,* SCAR 13/2/1, Box 53.
[454] SCAR Archives, *Minutes of the Meeting of the SCAR Executive Committee, Cambridge,* 24-26 July 1967, SCAR 13/2/1, Box 53.

Another important factor to consider when examining cartography in the Antarctic is the advent of remote sensing technology in the 1960s and 1970s. Documents from the SCAR archive suggest that 'the availability of satellite borne imagery will permit small scale planimetric mapping of the relatively inaccessible areas of Antarctica from photographic type imagery and possibly production of contours by use of prolific techniques.'[455] In 1966, WMO support for Radio Echo Sounding projects was expressed, as WMO offered to assist in establishing special observing networks for such projects. WMO also passed a resolution inviting members 'to study the possibility of establishing radiation sounding programs in the Antarctic.'[456] Turchetti, Dean, Naylor and Siegert have looked at the use of radio echo-sounding (RES) technologies in Antarctica and its implications. They argue that mapmaking using radio echo-sounding technologies was an example of a 'big science' project in Antarctica.[457] The first mention of the application of remote sensing technologies for mapping Antarctica, and the ice and snow features of the continent, was in 1960[458]. By 1979, the largest survey of the Antarctic concluded, making use of RES to map Antarctica above and below the ice, with geopolitical significance for SCAR's members.[459] Aant Elzinga argues that in becoming the body for the

[455] SCAR Archives, *Notes on the Possible Application of Satellite Borne Remote Sensing Techniques to the Activities of Working Groups,* 14 August 1972, SCAR 10/3/1/4, Box 38.
[456] SCAR Archives, *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53.
[457] Simone Turchetti et al., "Accidents and Opportunities: A History of the Radio Echo-Sounding of Antarctica, 1958–79," *The British Journal for the History of Science* 41, no. 3 (September 2008), 418.
[458] SCAR Archives, *Notes on the Possible Application of Satellite Borne Remote Sensing Techniques to the Activities of Working Groups,* 14 August 1972, SCAR 10/3/1/4, Box 38.
[459] Turchetti, 'Accidents and Opportunities", 419.

coordination of Antarctic research, SCAR gained diplomatic and geopolitical significance[460] and Fae Korsmo posits that after the IGY 'the interests of scientists and national security coexisted in alignment and mutual support.'[461] Turchetti, Dean, Naylor and Siegert argue that the successful use of RES in mapping Antarctica was in part due to the alignment of the political agendas of the United States during the late 1960s, and in part due to the involvement of many of the pioneering researchers in SCAR, one of whom was Gordon Robin, the Acting Secretary and President of SCAR from 1970.[462] Here, the national agendas which call for a new form of exerting control over Antarctic territory, and performing traditional colonising activities under the auspices of SCAR align with scientific need for data collection.

Cartography is an interesting case study when examining the history of SCAR. At a first glance, it seems that mapping would be an activity ripe for a triumph of science diplomacy. It has been argued by the scholars discussed above that SCAR's oversight of Antarctic mapping provided the setting for a new, less political form of cartography. However, a closer look at the history of cartography in Antarctica shows that cartography could not be divorced from colonial ambitions in the Antarctic after the IGY, despite SCAR dedicating a working group and extensive collaborative efforts to mapping the Antarctic. In enacting colonial administration upon the Antarctic environment by another name, the mapping of Antarctica by SCAR-affiliated scientists directed by national agendas contributed to

[460] Aant Elzinga, "The interplay of science and politics: the case of Antarctica," In *Society and the Environment: A Swedish Perspective*, ed. U. Svedin and B.H. Aniasson (Dordrecht: Klewer, 1992) 258.
[461] Fae Korsmo, "Science in the Cold War: The legacy of the International Geophysical Year," *NSF Special Scientific Report*, presented at the International Conference on Science, Technology, and Society, Hiroshima, Japan, 7 April 1998.
[462] Turchetti, "Accidents and Opportunities", 432.

the subjugation of the Antarctic environment. National agendas and the exertion of traditional sovereignty cannot be divorced from cartography, and therefore cartography is an activity in the Antarctic which exemplifies Elena Glasberg's idea of preserving the Antarctic for a future nationalism.[463]

4.3 The Agreed Measures for the Conservation of Antarctic Flora and Fauna (AMCAFF)

If the ratification of the Antarctic Treaty led to a collective assertion of environmental authority, as described by Howkins, the use of this newfound environmental authority led to the creation of multiple instruments of environmental protection in Antarctica over the Treaty System's history. This is a phenomenon Alessandro Antonello refers to as the 'Greening of Antarctica.'[464] Howkins argues that the twelve original signatories of the Antarctic Treaty (and by extension, the twelve original SCAR member countries) exerted this environmental authority often in the early years of the Treaty, not only in order to protect the Antarctic environment, but also to effectively protect the political interests of signatory countries.[465] Howkins adds that the 'continuation of the imperial rhetoric that Antarctic science is being conducted 'in the interests of humanity' has proved to be an effective means of preserving political power in the southern continent.'[466] As noted in the previous chapter, Howkins also posits that in place of individual countries trying to perform acts of nationalism or exert

[463] Glasberg, *Antarctica as Cultural Critique,* 6.
[464] Alessandro Antonello, *The Greening of Antarctica: Assembling an International Environment* (New York, NY: Oxford University Press, 2019), 6.
[465] Howkins, *Frozen Empires,* 167.
[466] Howkins, *Frozen Empires,* 167.

environmental authority over the Antarctic, the ATS introduced a collective assertion of environmental authority across the continent.[467] In applying the critical framework used by Howkins and Antonello, the actions of scientists affiliated with SCARin pushing for environmental protections at early Antarctic Treaty Consultative Meetings take on a more overt political dimension. AMCAFF can be viewed as one of the first examples of this collective assertion of environmental authority over the Antarctic by the ATS, and by extension, an instrument of colonial ambitions in the Antarctic.

When the treaty was first negotiated, conservation measures were not built into it.[468] This is because the primary purpose of the ATS was to defer a decision on Antarctic sovereignty in a way that would be amenable to all nations with colonial ambitions for the Antarctic. In the previous chapter, I argued that the internationalism engendered by SCAR during the extended IGY allowed for a Treaty which capitalised on this new way of seeing Antarctica to effectively change the way that Antarctica was framed. Klaus Dodds argues that this change saw Antarctica shift from being yet another potential site of Cold War militarization and conflict, to a continent for peace and science,[469] and I argue that SCAR was integral to such a shift. So, the actors involved in negotiating the Antarctic Treaty were focused on creating a regime to govern Antarctica, keeping it free of conflict and reserved for continued scientific research, but chose not to include any conservation measures in the Treaty.[470] Instead, James Hansom

[467] Adrian Howkins, *Frozen Empires,* 131.
[468] James D. Hansom, and John E. Gordon. *Antarctic Environments and Resources: A Geographical Perspective* (Harlow: Longman, 1998), 267.
[469] Klaus Dodds, *Geopolitics in Antarctica: Views from the Southern Oceanic Rim*, Polar Research Series (Chichester ; New York: Published in association with Scott Polar Research Institute, University of Cambridge by J. Wiley, 1997), 40-41.
[470]Antarctic Treaty Secretariat, "The Antarctic Treaty," [online]. Available at: https://documents.ats.aq/keydocs/vol_1/vol1_2_AT_Antarctic_Treaty_e.pdf (Last accessed 18/06/2022).

and John Gordon argue that the early signatories 'recognized that while environmental protection was necessary in parts of the Antarctic continent, any agreements would have to be negotiated and agreed upon within the Antarctic Treaty System as a way of furthering its principles and objectives.'[471]

At the First Antarctic Treaty Consultative Meeting in Canberra in 1961, several delegations had SCAR-affiliated scientists amongst their ranks, with many of the scientists who had taken on the role of SCAR Delegate expected to attend the Meeting of the Antarctic Treaty in an advisory capacity.[472] As a formal relationship between SCAR and the ATS was not defined until 1987, SCAR input into the early Meetings of the Treaty was largely through papers presented by the UK Delegation.[473] Walton, Clarkson and Summerhayes suggest that, given that the SCAR Secretariat was based in Cambridge, UK, this was 'a most efficient route' to the Antarctic Treaty, whilst adding that 'it was also because the UK had enthusiastically embraced many of the early ideas put forward by SCAR and was, therefore, an eager proponent of them at the meetings.'[474] This co-option of SCAR papers and proposals by the UK delegation is an example of science, and SCAR-sponsored science specifically, being used as a political tool in the Antarctic Treaty System from the first, and an extension of Britain's past efforts to administer its Antarctic territory through traditional forms of colonial authority.

At the First Antarctic Treaty Consultative Meeting, one of the Recommendations agreed upon by the attendees pertained to the protection of the Antarctic environment, directly adopting the *General Rules of Conduct for Preservation and Conservation of Living Resources in Antarctica,* until the ATS

[471] Hansom and Gordon. *Antarctic Environments and Resources*, 267.
[472] Walton, Clarkson and Summerhayes, *Science in the Snow* 30.
[473] Walton, Clarkson and Summerhayes, *Science in the Snow,* 30.
[474] Walton, Clarkson and Summerhayes, *Science in the Snow,* 30.

came up with an alternative.[475] These rules were taken directly from a document prepared by the SCAR Biology Working Group, and discussed at the annual SCAR Meeting in 1960, and would act as a precursor to the Agreed Measures for the Conservation of Antarctic Fauna and Flora (AMCAFF).[476] The *General Rules* document was drawn up in response to the environmentally irresponsible attitudes of researchers and military personnel alike in the preparation for and during the IGY. John Behrendt mentions some of these attitudes in his memoir detailing life on Antarctica during the IGY. Behrendt detailed how he and his colleagues would dispose of waste in McMurdo Sound[477] and recalled the use of explosive charges for underwater seismic experiments, stating that 'no one considered the impact on the fragile and possibly unique biota.'[478]

Despite such attitudes during the IGY, biologists were beginning to bring up the need for conservation and the minimisation of impacts on the Antarctic environment. The work of SCAR-affiliated scientist Robert Carrick was integral to highlighting the need for conservation of the Antarctic environment. Carrick, a passionate biologist and ornithologist, had brought up the issue of conservation at the SCAR Meeting in Canberra in March of 1959[479] and intended to present his paper *'Conservation of nature in the Antarctic'* at the SCAR Antarctic Symposium held in Buenos Aires in November of the same year, but was ultimately unable to attend. His paper was published in full in the sixth SCAR

[475] Antarctic Treaty Secretariat, "Report of the First Consultative Meeting, Canberra, 1961," *Polar Record* 11, 70 (1962) 8-9.
[476] Walton, Clarkson and Summerhayes, *Science in the Snow,* 30.
[477] John C. Behrendt, *Ninth Circle: A Memoir of Life and Death in Antarctica, 1960-1962*, (Alberquerque: University of New Mexico Press, 2005), 31.
[478] Behrendt, *Ninth Circle,* 27-28.
[479] *SCAR Bulletin No.3,* September 1959, SCAR 6/1/3, Box 37, SCAR Archive, Cambridge, UK.

Bulletin[480] and gained support from other notable Antarctic ornithologists, including Brian Roberts,[481] the leading British diplomat for Antarctic matters, who had been part of the UK delegation to the Antarctic Treaty negotiations.

By 1960, 'there was not an extensive agreement about exactly what part it [conservation] should play in Antarctica's emerging political architecture.'[482] At this point, scientists under the SCAR umbrella were cognisant of the complexities of introducing conservation to the ATS, and the diplomats did not want to be seen to influence scientific work.[483] In April 1960, Gordon Robin contacted Carrick, asking him to draft recommendations for conservation measures to be discussed at the SCAR Meeting.[484] In his letter, Robin also noted the misgivings of some other SCAR-affiliated scientists in even drawing up recommendations, given the need to continue with the apolitical science of the IGY.[485] Robin was ultimately hopeful that SCAR might provide scientific advice to the ATS as and where it was appropriate.[486] The recommendations which Carrick detailed in his response were based on his 1959 paper, and he suggested that a permit system be put in place so that vulnerable species could be

[480] *SCAR Bulletin No.6,* September 1960, SCAR 6/1/3, Box 37, SCAR Archive, Cambridge, UK.
[481] Allessandro Antonello, 'Nature conservation and Antarctic diplomacy, 1959–1964,', *The Polar Journal* 2014 4(2): 340.
[482] Antonello, *The Greening of Antarctica,* 31.
[483] Alessandro Antonello, 'The Greening of Antarctica: Environment, Science and Diplomacy, 1959-1980'. Unpublished PhD Thesis, 2014, 47-53.
[484] *Letter from Executive Secretary Gordon Robin to Robert Carrick,* 5 April 1960, SCAR 13/1/1, Box 53, SCAR Archive, Cambridge, UK.
[485] *Letter from Executive Secretary Gordon Robin to Robert Carrick,* 5 April 1960, SCAR 13/1/1, Box 53, SCAR Archive, Cambridge, UK.
[486] *Letter from Executive Secretary Gordon Robin to Robert Carrick,* 5 April 1960, SCAR 13/1/1, Box 53, SCAR Archive, Cambridge, UK.

protected.[487] At the following SCAR Meeting in Cambridge, Carrick's proposals were discussed. It was decided that an International Symposium on Antarctic Biology would be held two years later, allowing the new permanent working group on Biology, with Carrick at its head, to draw up relevant information regarding potential sanctuaries, for the Antarctic Treaty Consultative Meeting (ATCM).[488] Antonello points out that some diplomats were wary of the potential mixing of science and politics, and that chief amongst them was Brian Roberts.[489] Roberts' misgivings were also echoed by other SCAR-affiliated scientists and hinted at in the next SCAR Bulletin.[490] By May 1961, the recommendations were put to the governments sending delegations to the Antarctic Treaty Meeting.

The Second ATCM in 1962 saw the recommendations from the SCAR biologists discussed, and a general agreement that conservation should come under the remit of the ATS.[491] By Examining Brian Roberts' personal papers, Antonello reveals the Chilean position at the second ATCM, for conservation to formally be included in the Treaty rather than a separate convention. Roberts reported that the US delegation was uneasy with the idea of designating sanctuaries, which he himself saw as wresting influence away from the British in the ATS.[492] This notion, that conservation initiatives could create an imbalance of power in the Antarctic supports the argument that conservation initiatives in the Antarctic were viewed by political actors as efforts to exert power and influence over Antarctic

[487] *Letter from Robert Carrick to Gordon Robin, 4 May 1960,* SCAR 13/1/1, Box 53, SCAR Archive, Cambridge, UK.
[488] *SCAR Bulletin No. 7. January 1961,* SCAR 6/1/3, Box 37, SCAR Archive, Cambridge, UK; Antonello, *The Greening of Antarctica,* 31; Antonello, 'The Greening of Antarctica: Environment, Science and Diplomacy', 47-53.
[489] Antonello, *The Greening of Antarctica,* 32.
[490] *SCAR Bulletin No.8. May 1961,* SCAR 6/1/3, Box 37, Cambridge, UK
[491] Antonello, *Nature conservation, 1959–1964,* 342.
[492] Antonello, *The Greening of Antarctica,* 41.

territory, replacing previous efforts at colonial administration of the continent. In the intervening years between ATCMs, several further meetings were held, to hash out the exact language and drafting of AMCAFF, with scientists affiliated with SCAR feeding in.[493] Outside its relationship with the ATCM, SCAR was beginning to gain a reputation for being involved in conservation measures in the Antarctic. Correspondence between the renowned ornithologist Edward Max Nicholson and Martin Holdgate at The Nature Conservancy shows that Holdgate considered the SCAR Working Group on Biology to be 'the appropriate authority in respect of Antarctica.'[494] In 1964 at the Third ATCM, the better part of six years after Carrick's first paper, the protection of flora and fauna was the first item on the agenda, and by the end of the Meeting, AMCAFF was passed.[495] SCAR-affiliated scientists recognised at this point that they had successfully offered recommendations to the ATS, and that not only had their recommendations underpinned policymaking in the Antarctic, but that additions and changes to AMCAFF would also arise from SCAR recommendations in the years that followed.[496] AMCAFF seemed to be the start of what Walton, Clarkson and Summerhayes have termed the 'de facto advisory role' that SCAR has played to the ATS.[497]

Adrian Howkins' has argued that, for Britain and the United States, the IGY alleviated some anxieties about the mineral potential in the Antarctic, proving that there were no readily-accessible mineral

[493] *Minutes of the Meeting of the SCAR Executive Committee, Cambridge, 24-26 July 1967,* SCAR 13/2/1, Box 53, Cambridge, UK.
[494] *Letter from Martin Holdgate to Edward M Nicholson, 11 September 1963,* SCAR 10/10/1, Box 48, Cambridge, UK.
[495] Antarctic Treaty Secretariat, "Report of the Third Antarctic Treaty Consultative Meeting." [online] Available at: https://documents.ats.aq/ATCM3/fr/ATCM3_fr001_e.pdf (Last accessed 02/06/2022).
[496] *Minutes of the Meeting of the SCAR Executive Committee, Cambridge,* 24-26 July 1967, SCAR 13/2/1, Box 53, Cambridge, UK.
[497] Walton, Clarkson and Summerhayes, *Science in the Snow,* 45.

resources in Antarctica.[498] Antonello argues that the IGY blinded some of the national actors to the history of economic exploitation of the Antarctic, and that the Antarctic Treaty 'doubled down on the sense of historical caesura.'[499] Both Howkins and Antonello effectively argue that this blindness to past exploitation, and the sense that present and future exploitation was not a possibility, respectively allowed for a new, neutral framing of Antarctica as a space for peace and science. The negotiation of AMCAFF not only strengthened these arguments, but illustrates that SCAR-related science diplomacy works when it serves these purposes. In his article critically examining the events of the six years leading up to the adoption of the AMCAFF, Alessandro Antonello provides an illuminating insight into the AMCAFF and its importance as the first instrument of the Antarctic Treaty. Antonello argues that the AMCAFF came into being partly because the challenge of how best to conserve the Antarctic environment posed by SCAR-affiliated scientists to the Treaty parties in the first meeting of the Treaty 'allowed for an opportunistic and advantageous embellishment and expansion of the young regime.'[500] Therefore, he argues that the AMCAFF allowed for the Treaty parties to reimagine and reinterpret, in some small way, the ATS, and its remit, in the name of environmental protection and acting on the recommendations of scientists.[501] It also makes sense then, that this provided an opportunity for political actors to see this reinterpretation of the ATS and its remit as an opportunity to exert influence and control in a new way over the Antarctic. Olav S. Stokke and Davor

[498] Adrian Howkins, "Science, Environment and Sovereignty: The International Geophysical Year in the Antarctic Peninsula Region," In *Globalizing Polar Science: Reconsidering the International Polar and Geophysical Years*, ed. Roger D. Launius, James R. Fleming, and Daniel H. DeVorkin, (New York: Palgrave Macmillan, 2010) 257.
[499] Antonello, *The Greening of Antarctica,* 33.
[500] Antonello, *Nature conservation, 1959–1964,* 336.
[501] Antonello, *Nature conservation, 1959–1964,* 336.

Vidas argue that the robustness of the ATS depends in part on not just the effectiveness of its rules, institutions and processes but also the ability of these rules, institutions and processes to incorporate relevant global issues which may be 'external' to the Antarctic.[502] Duncan French agrees with Stokke and Vidas, arguing that the ATS cannot solely rely on its own internal structures and operations - as a trusteeship of a global resource, the ATS can only continue to exist if it continues to justify its existence by way of incorporating external factors that support its claim to exclusive jurisdiction and control over the Antarctic.[503] From French, Stokke and Vidas, it can be argued that the flexibility of the Antarctic Treaty is then essential to its continuation as a regime. Antonello remarks that AMCAFF was the first instrument of the ATS which tested the regime and its ability to incorporate external values and principles on conservation.[504] Incorporating this new dimension to the ATS, was no easy feat - it took six years for the measures to be negotiated and agreed upon.

The AMCAFF also allows for the application of Elena Glasberg's notion holding Antarctica in suspension for a future nationalism.[505] Glasberg's ideas are echoed by Alessandro Antonello, who details the relationship between nature conservation and colonial aspirations for the Antarctic. Antonello links the exploitation and therefore, conversely, the conservation of environments.[506] Taking

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[502] Olav Stokke and Davor Vidas, "Introduction," In *Governing the Antarctic: The Effectiveness and Legitimacy of the Antarctic Treaty System*, ed. Olav Stokke and Davor Vidas (Cambridge: Cambridge University Press, 1996) 17-18.
[503] Duncan French, "Regime integrity *qua* Antarctic security: Embedding global principles and universal values within the Antarctic Treaty System," In *Antarctic Security in the Twenty-First Century: Legal and Policy Perspectives*, ed. Alan D. Hemmings, Donald R. Rothwell and Karen N. Scott (London: Routledge, 2012) 56.
[504] Antonello, *The Greening of Antarctica,* 20.
[505] Glasberg, *Antarctica as Cultural Critique*, 6.
[506] Antonello, *The Greening of Antarctica,* 24.

this argument further is to bridge the gap between the two: conservation initiatives were central to exerting power and control over the environment in the absence of an indigenous population. Given that conservation measures for the Antarctic may or may not exist without the Antarctic Treaty, it is then politically expedient to prepare for the eventuality that the Antarctic Treaty may no longer be in force in the future, and the face of such uncertainty, to prepare for it by treating current presence and activity in Antarctica as if it might one day act as justification for a claim to Antarctic territory. This is the 'future nationalism' Glasberg speaks of.

If Glasberg's analysis is applied to the actions of delegations to the Consultative Meetings of the Antarctic Treaty, the use of SCAR science to underpin instruments like AMCAFF for the protection of the Antarctic environment can be problematised more effectively. If science is a tool used to preserve the environment, we must ask why the environment is being preserved, and for what purpose. I argue that this purpose is to subjugate the environment in place of an indigenous population, and to enact colonial ambitions upon the Antarctic. In her work, Dian Olson Belanger points out that certain research activities had been deliberately excluded during the IGY, among them 'the quintessentially geophysical discipline of geology.'[507] It was thought to be too political a discipline: someone might discover a valuable mineral resource, which could set off a 'gold rush' and then 'inflame adversarial relationships or the claims issue.'[508] In preserving the Antarctic environment, the question of claims to the Antarctic could be avoided, as could the question of the potential mineral wealth in Antarctica. It

[507] Dian Olson Belanger, 'The International Geophysical Year in Antarctica: A Triumph of "Apolitical" Science, Politics and Peace' in Roger D. Launius, James R. Fleming and David H. DeVorkin (eds) *Globalizing Polar Science. Palgrave Studies in the History of Science and Technology.* (Palgrave Macmillan, New York: 2010), 268.
[508] Belanger, "IGY in Antarctica," 268.

is this yet to be discovered mineral wealth that is being preserved for the 'future nationalism' Glasberg alludes to.[509]

Ultimately, the successful negotiation of AMCAFF allowed for a slight reimagining of not only the scope of the ATS but also of SCAR. AMCAFF also provides a clear example of an assertion of this new form of collective sovereignty over the Antarctic through the ATS, which can be interpreted as either a triumph of post-colonialism, or an extension of the colonial ambitions of ATS members translated into new forms of governance. Not only did AMCAFF provide an example of ongoing sovereignty over the Antarctic, it also allowed national actors to distance themselves from previous, more overtly colonial attempts at exerting sovereignty over the environment. AMCAFF also ultimately began the process of holding the Antarctic environment, and by extension, natural resources in the Antarctic, in preservation for a future colonisation of the Antarctic.

4.4 Meteorology

Howkins argues that the history of meteorology in Antarctic and Antarctic politics are intertwined, and that 'the science of meteorology helped to shape the political context within which it developed'.[510] This co-production of Antarctic meteorology and politics, with one shaping the other,[511] has been explored in regards to the construction of Antarctica as a continent for peace and science during the early years of SCAR. This co-production of Antarctic politics and meteorology continued throughout

[509] Glasberg, *Antarctica as Cultural Critique*, 6.
[510] Adrian Howkins, "Political Meteorology," *History of Meteorology* 4 (1 December 2008): 28
[511] Howkins, "Political Meteorology", 28.

the 1960s and 1970s. At the heart of this narrative tying together SCAR, Antarctic meteorology and Antarctic politics, is the collaboration between the WMO and SCAR, particularly in funding and running the International Antarctic Analysis Centre (IAAC) over the course of the 1960s. I argue that the success of antarctic meteorology as an example of SCAR's science diplomacy activity is due to several factors: that meteorological research has helped to build the relationship between SCAR and the ATS; that meteorological research has allowed for the bridging of the gap between the Antarctic and the rest of the world, and ultimately, it is a tool of the sovereignty enacted on the Antarctic by the ATS.

Gordon de Quetteville Robin was central to the story of SCAR's role in developing Antarctic meteorology. An Australian glaciologist, Robin had built an academic career in the UK and served as the UK Delegate to SCAR from 1958 onwards. He also acted as SCAR's Honorary Secretary, a role in which he was intimately involved with the everyday running of SCAR's scientific remit, as well as the submission of research and conservation proposals to the Antarctic Treaty System, until his presidency of SCAR began in 1970.[512] Gordon de Quetteville Robin also served as the Director for the Scott Polar Research Institute in Cambridge from 1958-1982, and was instrumental in securing a permanent space in Cambridge for the SCAR Secretariat.[513] In August 1962, the question arose as to how best divide up Antarctic meteorology activities between SCAR and WMO effectively,[514] and it was suggested that these activities might be delegated in accordance with the WMO/ICSU relationship,

[512] Walton, Clarkson and Summerhayes, *Science in the Snow,* 45.
[513] Walton, Clarkson and Summerhayes, *Science in the Snow,* 45.
[514] *Extracts from the General Summary of the work of the fourteenth session of the Executive Committee, August 1962,* SCAR 2/7/1/1, Box 53, Cambridge, UK.

given that SCAR was an ICSU body.[515] In October of that year, financial support for the IAAC was offered by the Executive Board of ICSU, which established a special fund for the centre and called upon WMO for further support.[516] It was decided that the WMO Secretary-General would act as one of the trustees for this fund, and that WMO would support the successful operation of the IAAC by seconding staff to the centre or by arranging financial support for the recruitment of staff.[517] Furthermore, WMO committed to taking on the cost and labour associated with disseminating Antarctic meteorology research through symposia and seminars.[518]

In 1963, Larry M. Gould, a celebrated American geologist, was elected President of SCAR.[519] Gould had previously led on the construction of Little America, joining Admiral Byrd during his 1928-1930 expedition,[520] and had also served as the head of the US IGY delegation to SCAR.[521] He was a strong proponent of creating a more defined relationship between the Antarctic Treaty System and SCAR, having raised the question in early 1961 of how SCAR should communicate with the newly agreed Treaty Parties".[522] In 1963, an important step in cementing the relationship between SCAR and WMO was also taken, when the constitution of SCAR was amended to allow WMO to become a full SCAR

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[515] *Letter from WMO Deputy Secretary-General J. R. Rivet to SCAR Secretary G. Robin, 13 August 1962,* SCAR 2/7/1/1, Box 53, Cambridge, UK.
[516] *Fifth Progress on WMO's Activities of Special Interest to SCAR, Covering the period June 1962 - June 1963,* July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[517] *Fifth Progress on WMO's Activities of Special Interest to SCAR, Covering the period June 1962 - June 1963,* July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[518] *Fifth Progress on WMO's Activities of Special Interest to SCAR, Covering the period June 1962 - June 1963,* July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[519] Walton, Clarkson and Summerhayes, *Science in the Snow,* 28.
[520] Walton, Clarkson and Summerhayes, *Science in the Snow,* 29.
[521] Laurence M. Gould, *Cold: The Record of an Antarctic Sledge Journey* (Northfield: Carleton College Press, 1984), 39.
[522] Walton, Clarkson and Summerhayes, *Science in the Snow,* 30.

member, and Dr Kaare Langlo became the permanent WMO Representative to SCAR, as well as the Chief of the Technical Division of the WMO Secretariat.[523] At this time, the advent of artificial satellites raised questions about their potential for collecting meteorological data for remote locations, and an advisory committee for the WMO Executive Committee was set up, to consider these possibilities and to maintain contact with other organisations with an interest in meteorology and related disciplines.[524] The creation of this committee also mentioned for the first time a possible 'world weather watch programme', a project which would bring together SCAR and WMO efforts in the coming years and which drew from Harry Wexler's ideas during the IGY.[525] It is important to note that the scientists invited onto the advisory committee were often wearing several hats, representing national and international interests in several fora, and there was a recognition of this, as they were 'expected to speak as individual scientists rather than representatives of organisations'[526] whilst on the committee.

With the WMO dedicated to formally supporting the IAAC, its continued lack of funding and staffing became a source of tension. In the previous chapter, it was argued that an explanation for the chronic underfunding of the IAAC may have been due to the fact that it was not based in Antarctica: it's

[523] *Fifth Progress on WMO's Activities of Special Interest to SCAR, Covering the period June 1962 - June 1963,* July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[524] *Fifth Progress on WMO's Activities of Special Interest to SCAR, Covering the period June 1962 - June 1963,* July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[525] *Fifth Progress on WMO's Activities of Special Interest to SCAR, Covering the period June 1962 - June 1963,* July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK; James Rodger Fleming, "Polar and Global Meteorology in the Career of Harry Wexler, 1933-62," In *Globalizing Polar Science. Palgrave Studies in the History of Science and Technology*, ed. Roger D. Launius, James R. Fleming and David H. DeVorkin (New York: Palgrave Macmillan, 2010) 235.
[526] *Fifth Progress on WMO's Activities of Special Interest to SCAR, Covering the period June 1962 - June 1963,* July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.

physical and political distance from the Antarctic divorced it in some ways from a politically fraught environment, but it also seems to have divorced the project from the funding that much Antarctic research received in this period: staffing certainly never seemed to be an issue at the meteorological stations in the Antarctic. In late July of 1963, Robin wrote to the permanent WMO Representative to SCAR, Langlo, asking him 'to assess the response to the various appeals for support of IAAC'[527] and further asking for 'a brief statement by the end of August on contributions to the fund through WMO channels received or promised.'[528] Not a week after this request was communicated, the IAAC was forced to cease regular broadcasts of data analysis statements due to an ongoing shortage of staff at the centre.[529] This was resolved with the arrival of more meteorologists to the centre in the weeks that followed.

In the next year, the relationship between SCAR and WMO grew closer, largely due to the creation of an International Commission on Polar Meteorology (ICPM) by the International Association of Meteorology and Atmospheric Physics (IAMAP). Langlo was nominated to represent WMO on the IAMAP Commission[530] and Mort J. Rubin, an American meteorologist and the Chair of the SCAR Working Group on Meteorology was chosen to represent SCAR,[531] which formed 'a very convenient

[527] *Letter from SCAR Secretary G Robin to WMO Representative to SCAR Dr K Langlo,* 26th July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[528] *Letter from SCAR Secretary G Robin to WMO Representative to SCAR Dr K Langlo,* 26th July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[529] *Circular No. 107 to SCAR National Committee Delegates and WMO from SCAR Secretary G Robin,* 31 July 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[530] *Letter from SCAR Secretary G Robin to Chair of SCAR WG on Meteorology M Rubin,* 20th March, 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[531] *Letter from SCAR Secretary G Robin to Chair of SCAR WG on Meteorology M Rubin,* 20th March, 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.

link between SCAR, WMO and the IAMAP Commission.'[532] Rubin was acutely aware of the complexity that came with wearing several hats and representing several different organisations, but also saw it as a necessity, stating in a letter to Gordon Robin that 'there should be enough overlapping membership to effect optimum coordination, but not so much that the separate working groups, commissions and standing committees cannot act independently.'[533] Rubin used this new avenue for the sharing of meteorological research to push for a joint ICPM-SCAR-WMO symposium,[534] having previously pushed for a joint SCAR-WMO Meteorology Symposium without result.[535] Not long after the creation of the Commission, Mort Rubin was elected to the position of President, which delighted Robin, who felt he could step back and 'know that liaison between SCAR meteorologists, the IAMAP Commission and WMO is so completely ensured'[536] and expressed a hope that there would no longer be a need to make a special point of pressing Kaare Langlo for funding for the IAAC.[537] Robin was correct in assuming this, as both the USSR and Japan decided to send meteorologists to the IAAC, with the Japanese meteorologist making use of the ICSU fund to do so.[538] The additional staff at the

[532] *Letter from SCAR Secretary G Robin to Chair of SCAR WG on Meteorology M Rubin,* 20th March, 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[533] *Letter from Chair of SCAR WG on Meteorology M Rubin to SCAR Secretary G Robin,* 23rd March 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[534] *Letter from Chair of SCAR WG on Meteorology M Rubin to SCAR Secretary G Robin,* 23rd March 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[535] *Letter from Chair of SCAR WG on Meteorology Morton Rubin to WMO Representative on SCAR K Langlo,* 15th November 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK; *Letter from WMO Representative on SCAR K Langlo to Chair of SCAR WG on Meteorology Morton Rubin,* 13th December 1963, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[536] *Letter from SCAR Secretary G Robin to Chair of SCAR WG on Meteorology M Rubin,* 4 April 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[537] *Letter from SCAR Secretary G Robin to Chair of SCAR WG on Meteorology M Rubin,* 4 April 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[538] *Sixth Progress Report on WMO's Activities of Special Interest to SCAR, Covering the period June 1963 - June 1964,* July 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.

centre were sorely needed, as observations for the International Years of the Quiet Sun (IQSY) were to be taken in the Antarctic during 1964 and 1965 by the SCAR Meteorology working group,[539] and the IAAC was designated a STRATWARM centre,[540] responsible for providing forecasts of the occurrence of sudden stratospheric warming periods.[541] Despite this lull in the constant scrabble for funding, in June of 1964, Robin sent another letter to Langlo, asking if the WMO Executive Committee had reached a decision regarding 'tangible support for the IAAC and the Special Fund.'[542]

In November of 1964, the WMO officially established a Working Group for Antarctic Meteorology, chaired by W. J. Gibbs, who was the Director of the Bureau of Meteorology in Australia, and took on the responsibility of overseeing the work being carried out at the IAAC.[543] At the first meeting of the working group's Executive Committee in 1966, a SCAR Observer, H. R. Philpott was invited, and his report on the proceedings is enlightening. There seemed to be a focus in delineating the remit of both SCAR and WMO, with WMO handling matters of an operational nature, under the auspices of the United Nations, and research questions in Antarctic meteorology to be the remit of SCAR meteorologists. The report explained that WMO's interest in the Antarctic had been 'stimulated by the

[539] *SCAR Circular No 132 from Secretary G Robin to SCAR WG on Meteorology,* 15 July 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[540] *Sixth Progress Report on WMO's Activities of Special Interest to SCAR, Covering the period June 1963 - June 1964,* July 1964, SCAR 2/7/1/1, Box 53, Cambridge, UK.
[541] *SCAR Bulletin No. 18, September 1964,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[542] *Letter from SCAR Secretary G Robin to WMO Rep to SCAR K Langlo,* 30 June 1964, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[543] *Letter from WMO Rep to SCAR K Langlo to SCAR Secretary G Robin*, 4 November 1964, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

planning of a new World Weather system'[544], and that the system was being developed in response to three resolutions put forth by the General Assembly of the United Nations that year, all of which prioritised the peaceful use of the atmosphere and outer space, and encouraged international collaboration in these spaces.[545] The notion that Antarctica can provide 'lessons that are relevant to the governance of other extra-territorial spaces beyond sovereign jurisdictions, including Outer Space' is posited by Juan Francisco Salazar, and his argument can be applied here.[546] In building a relationship with WMO, a body of the United Nations, SCAR was integral to creating a scientific relationship between Antarctica and the rest of the world, and in doing so, supported the exceptionalist narrative that Antarctica had become 'a continent for peace and science.' I also argue that the success of SCAR's efforts in coordinating international meteorology, which is often seen as one of the successes of science diplomacy in the Antarctic, came about for two reasons. Firstly, as argued in the previous chapter, meteorology as a scientific endeavour benefited from the practical need for a large-scale international infrastructure. Secondly, meteorology was a discipline which allowed for the assertion of a new collective sovereignty over the Antarctic for ATS members through SCAR-sponsored knowledge production. This collective exertion of authority over the Antarctic environment replaced more traditional forms of colonial administration, but aimed at effectively demonstrating power and control

[544] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[545] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[546] Juan Francisco Salazar, "Antarctica and Outer Space: Relational Trajectories," *The Polar Journal* 7, no. 2 (2017) 259-69.

in Antarctica, and in doing so, holding Antarctic territory in suspension for a future in which more overt colonisation of the Antarctic might take place.

The IAAC was directly credited with providing meteorologists with the experience they would need to run the World Meteorological Data Centres (WDCs) which would feed data into the World Weather Watch.[547] Not only had the IAAC provided experienced meteorologists, but its establishment in Melbourne had 'led the Australian Government to accept the invitation to establish a World Meteorological Centre in Melbourne.'[548] Similarly, it was recognised by those in attendance that Antarctic research stations sending data to the IAAC had effectively been 'performing some of the communications functions appropriate to Regional Telecommunications Hubs under the WMO World Weather Watch Plan'[549] and it was planned that Regional Telecommunications Hubs be established at Molodezhnaya and McMurdo stations, and another research station on the Antarctic Peninsula.[550] During this meeting, the fate of the IAAC was decided upon. Given the establishment of a new WMO-funded World Meteorological Centre in Melbourne to collate, analyse and disseminate weather data from across the Antarctic, the IAAC was relieved of 'a heavy operational commitment,

[547] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[548] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[549] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[550] *SCAR Bulletin No 24. September 1966,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.

leaving it free to concentrate on research'[551], and the Centre's name accordingly changed to the 'International Antarctic Meteorological Research Centre (IAMRC)' towards the end of 1965.[552] In many ways, this change came as a relief to the five members of the SCAR Working Group for Meteorology in attendance at the meeting, including Mort Rubin, who reported that the Working Group wanted 'to concentrate on the many research problems in Antarctic meteorology which represent SCAR's main interest and concern.'[553] In a letter to the WMO Secretary-General following the meeting, Gordon Robin suggested that 'it might be appropriate to consider the IAAC project as having been completed'[554], and offered SCAR's appreciation for the fellowships provided by WMO, suggesting that such fellowships might be offered to PhD students based at the IAMRC,[555] and part-funded by SCAR.[556] The project, which was politically and physically divorced from the Antarctic, could not garner the same funding commitments as meteorological research on the continent - with no implications for colonial authority on the continent, it failed to be prioritised by the actors in charge of allocating funds to Antarctic research across SCAR/ATS member nations.

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[551] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[552] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[553] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[554] *Letter from SCAR Secretary G Robin to WMO Secretary-General D. A. Davies,* 6 December 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[555] *Letter from SCAR Secretary G Robin to WMO Secretary-General D. A. Davies,* 6 December 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[556] *Letter from SCAR Secretary G Robin to WMO Secretary-General D. A. Davies,* 26 January 1967, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

Another focus of the first meeting of the WMO Working Group on Antarctic Meteorology was the 'present close liaison'[557] between SCAR, WMO and IAMAP, which was praised, and although the WMO Working Group on Antarctic Meteorology 'had the authority to discuss research, maximum benefit would be achieved through the closest liaison with SCAR and the ICPM.'[558] It seems that this demarcation of responsibilities between SCAR and WMO was seen as a positive development, with H. R. Philpott stating his approval, and expressing that:

> 'SCAR can feel completely satisfied with developments in the meteorological field. The SCAR Meteorology Working Group can now concentrate on the problems of research which are its primary concern, confident in the knowledge that there is an efficient and effective organization to handle problems of an essentially operational character in the Antarctic.'[559]

Philpott's comments represent one of the first instances of delineation between logistics and science, which would become important in the following years. Overall, the changes following the meeting were quickly implemented, with SCAR not only bringing the IAAC project to its conclusion in the months following the meeting, but also contributing to materials advertising the new IAMRC[560], and

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[557] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[558] *World Meteorological Organisation: Executive Committee Working Group On Antarctic Meteorology, First Session Melbourne, 23 February - 3 March 1966. Report by SCAR Observer H. R. Philpott,* March 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

[559] *SCAR Bulletin No 24. September 1966,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.

[560] *Letter from SCAR Secretary G Robin to WMO Secretary-General D. A. Davies,* 26 January 1967, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK; *Letter from WMO Deputy Secretary-General J. R. Rivet to Australian WMO Representative W.J. Gibbs,* 15 February 1967, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.

securing $5000USD from ICSU 'to support young research meteorologists at IAMRC.'[561] Similarly, the joint SCAR-WMO-IAMAP symposium went ahead, and it was agreed between Robin and Langlo that WMO would take on the cost of publishing the papers presented as part of the WMO Technical Note Series.[562] Following the meeting, a list of resolutions was drawn up by WMO in regards to establishing and operating facilities on the Antarctic Continent going forwards, and these resolutions were submitted to the Antarctic Treaty signatory parties for consideration at the next Antarctic Treaty Consultative Meeting.[563]

In 1970, the work done by SCAR and WMO to coordinate the collection, analysis and dissemination of meteorological research, in the Antarctic and beyond the Antarctic convergence, culminated in the formal recognition of these efforts at the Antarctic Treaty Consultative Meeting in Tokyo.[564] The Parties at the Meeting noted the importance of meteorological observations from Antarctica feeding into the World Weather Watch (WWW) programme at the World Meteorological Organisation (WMO)[565] and that the WWW programme was a culmination of the work done by SCAR meteorologists during the IGY and the years following it, to coordinate meteorological observations across the Antarctic Continent and the Southern Oceans.[566] This recognition of SCAR's activities by

[561] *SCAR Executive Meeting Agenda,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archives, Cambridge, UK.
[562] *Letter from SCAR Secretary G Robin to WMO Secretary-General D. A. Davies,* 6 December 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[563] *Letter from WMO Representative to SCAR K Langlo to SCAR Secretary G Robin,* 7 September 1966, SCAR 2/7/1/1, Box 53, SCAR Archives, Cambridge, UK.
[564]Antarctic Treaty Secretariat, "Report of Sixth Consultative Meeting, Tokyo, 19-31 October 1970," [online] Available at: https://documents.ats.aq/ATCM6/fr/ATCM6_fr001_e.pdf (Last accessed 28/06/2022).
[565]Antarctic Treaty Secretariat, "Report of Sixth Consultative Meeting, Tokyo, 19-31 October 1970," [online] Available at: https://documents.ats.aq/ATCM6/fr/ATCM6_fr001_e.pdf (Last accessed 28/06/2022).
[566]Antarctic Treaty Secretariat, "Report of Sixth Consultative Meeting, Tokyo, 19-31 October 1970," [online] Available at: https://documents.ats.aq/ATCM6/fr/ATCM6_fr001_e.pdf (Last accessed 28/06/2022).

the ATS legitimised and validated SCAR as an organisation - it was an important step in creating a more defined relationship between the Antarctic Treaty and SCAR. It was also a culmination of Larry M. Gould's efforts as SCAR President. The SCAR-WMO collaboration during the 1960s and 1970s on the IAAC, and the coordination of meteorological research, is a success of SCAR's science diplomacy. Ultimately, this success was primarily due to the importance of weather research in bringing the Antarctic together with the rest of the globe through the World Weather Watch. But it was also successful because of what it meant for the ATS members; the assertion of a new form of collective sovereignty over the Antarctic.

4.5 The Convention for the Conservation of Antarctic Seals (CCAS)

The wider context around sealing activities is integral to understanding the impetus for the Convention on the Conservation of Antarctic Seals (CCAS). During the period this chapter focuses on, public perceptions of commercial whaling and sealing were changing. From 1964-1972, parallel to the negotiations process for CCAS, opposition to the killing of seals for their fur was growing.[567] Across Europe and North America, the brutal nature of certain commercial sealing ventures was being exposed.[568] A prominent example was the televised footage of a baby seal being skinned alive, which had been filmed by animal rights activists and disseminated to bring widespread attention to the issue.[569] This, coupled with the early activities of famous actress and impassioned animal rights activist

[567] Antonello, *The Greening of Antarctica,* 50-51.
[568] Peter Dauvergne and Kate J. Neville, "Mindbombs of right and wrong: cycles of contention in the activist campaign to stop Canada's seal hunt," *Environmental Politics* 20, 2 (2011): 197.
[569] Dauvergne and Neville, 'Mindbombs of right and wrong', 197.

Brigitte Bardot, contributed to the shift in public opinion towards sealing in the 1960s.[570] creating an environment in which the political goodwill needed for conservation measures like CCAS, was formed.[571]

Sealing and whaling are activities which cannot be divorced from colonial ambitions in the Antarctic. Traditional colonisation of territories involved the exploitation of natural resources to benefit the imperial metropole, and the Antarctic does not differ from other colonised spaces in this respect. William M Adams and Martin Mulligan argue that the colonial exploitation of new territories began with the European Enlightenment, which 'placed faith in the capacity of the rational human mind to order and conquer all – suggesting a superiority of mind over matter and of humans over 'non-rational' nature.'[572] Sealing and whaling were activities which had underpinned territorial claims to the Antarctic; John Dudeney and David W. H. Walton explored the British presence in the 1920s in the sub-Antarctic and the Antarctic, linking commercial sealing exploits and research on seal populations to the British claim to Antarctic territory.[573] In the case of a non-claimant state such as the USSR, Irina Gan argues that proof of past sealing activities was also used to exercise leverage in being

[570] Kathleen Rodgers and Willow Scobie, "Sealfies, seals and celebs: expressions of Inuit resilience in the Twitter era," *Interface* 7, 1 (2015): 83; Brian Lowe, "War for the Seals: The Canadian Seal Controversy and Sociological Warfare," *Taboo: The Journal of Culture and Education* 12, 1 (2017): 73-74.
[571] László Erdős, "In the Front Line of Animal Advocacy - From Brigitte Bardot to Lek Chailert," In *Green Heroes: From Buddha to* Leonardo, ed. László Erdős (Geneva: Springer Nature Switzerland, 2019) 71-72.
[572]William M. Adams and Martin Mulligan, "Introduction," In *Decolonizing Nature: Strategies for conservation in the Post-colonial era*, ed. William M Adams and Martin Mulligan (London: Routledge, 2002) 3.
[573]John R. Dudeney and David W. H. Walton, "From Scotia to 'Operation Tabarin': developing British policy for Antarctica," *Polar Record* 48, 247 (2012): 347.

involved in negotiations for an international regime for the Antarctic, and might potentially be used to support a future claim to Antarctic territory.[574]

Robert Clancy, John Manning and Hank Brolsma note that CCAS partially came into being after the AMCAFF 'was immediately challenged by a proposal for a sealing expedition from Norway, at a time when the near obliteration of Antarctic fur seals by uncontrolled slaughter was within living memory.'[575] They argue that CCAS was based on a growing awareness of the need for a broader policy for conservation.[576] The topic of the commercial-scale killing of seals first came up at the Antarctic Treaty Consultative Meeting in 1966, and although the discussion was short, the sentiments expressed were broadly pro-seal, reflecting the necessary political goodwill for the beginnings of negotiations.[577] At the Meeting, there were several appeals to protect seal populations in the Antarctic, which were reportedly followed by the Soviet delegate, Yevgeny Ivanovich Tolstikov, asking: "Now, who is against seals?"[578] This attitude reflects the assumed political expediency of CCAS, which cannot be underestimated - the conservation of seals was both a popular measure, and one which allowed ATS members to distance themselves from previous attempts at colonising the Antarctic, by exerting a new, collective form of sovereignty over the Antarctic which was in direct opposition to former activities associated with colonisation. It was decided by the delegations that until more concrete measures could be negotiated, interim guidelines would be put into place; these guidelines did not impose restrictions

[574]Irina Gan, "Red Antarctic: Soviet Interests in the South Polar Region Prior to the Antarctic Treaty 1946-1958," (University of Tasmania, 2009), 22.
[575] Clancy, Manning and Brolsma, *Mapping Antarctica,* 253.
[576] Clancy, Manning and Brolsma, *Mapping Antarctica,* 253.
[577] Antonello, *The Greening of Antarctica, 49.*
[578] Antonello, *The Greening of Antarctica, 49.*

on sealing, but made suggestions on how to go about implementing regulations which would protect the seal populations in the Antarctic on a voluntary basis, until further decisions were made on the issue.[579] Despite the political will for seal conservation existing, it would be six years until the initial discussion on pelagic sealing at the ATCM bore fruit. The reasons as to why CCAS negotiations took so long, given the relative speed at which AMCAFF had been agreed upon, were numerous. Alessandro Antonello has laid out a number of these reasons, which, included, but are not limited to:

> "the motives for a seal or sealing agreement, disagreements over the place of science and scientists in the treaty regime, the flux of environmental sensibilities, and the persistent contest for authority over Antarctica among its various actors, including the first hints of an international public."[580]

In regards to the motives for a sealing agreement, Alessandro Antonello argues that the British delegation in particular, headed by Brian Roberts, relished the opportunity to spearhead the seal conservation efforts, and in doing so, take advantage of an opportunity to paint over Britain's previous commercial sealing exploits in the Antarctic with a newfound concern for the environment and seal species.[581] Britain's long history of Antarctic sealing was intrinsically linked to colonial ambitions.[582] After the negotiation and ratification of the Antarctic Treaty, Britain was keen to replace previous administrative activity aimed at effectively colonising the Antarctic with the new collective sovereignty

[579] *SCAR Bulletin No. 27,* September 1967, SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[580] Antonello, *The Greening of Antarctica,* 49-50.
[581] Alessandro Antonello, 'The Antarctic Treaty as a temporal order' *Polar Record* 2019 55: 324; Antonello, *The Greening of Antarctica,* 66-67.
[582] Dudeney and Walton, 'From Scotia to Operation Tabarin', 347..

enacted in Antarctica by the ATS, through the assertion of environmental authority.[583] The fact that this new collective authority might act as a form of control over the Antarctic not unlike previous colonial administration likely made it easier to enact. CCAS, like the AMCAFF before it, was an example of this new, shiny sovereignty which allowed Britain to replace its previous exertions of colonial sovereignty with a newer sovereignty that pointedly rejected associations with colonisation, whilst still preserving the Antarctic for future colonial exploits, and whilst not being particularly unlike the original exertions of colonial sovereignty.

The various events which led to the creation and ratification of CCAS also brought to light the 'disagreements over the place of science and scientists in the treaty regime'[584] that Antonello refers to. Although these questions had been raised to some degree during the negotiating process for AMCAFF, the negotiating process for CCAS brought the issue to light once more. The role of scientists working under the auspices of SCAR in providing evidence and advice to the Antarctic Treaty system was tested by the CCAS negotiation process. Science had been used to underpin policy making at the International Whaling Commission (IWC) at this point, but to little avail.[585] Antarctic conservation for seals preceded successful conservation for whales in the Antarctic, via the IWC, which had been active much longer.[586] Antonello points to the fact that many of the biologists involved in pushing for Antarctic conservation measures for flora and fauna, and eventually, for seal populations,

[583] Howkins, *Frozen Empires,* 167.
[584] Antonello, *The Greening of Antarctica,* 49-50.
[585] Michael Heazle, "Scientific Uncertainty and the International Whaling Commission," *Marine Policy* 28, 5 (2004): 362-363.
[586] Virginia M. Walsh, "Illegal Whaling for Humpbacks by the Soviet Union in the Antarctic, 1947-1972," *Journal of Environment & Development* 8, 3 (1999): 307-308.

were the same scientists who had attempted to create similar measures to protect whales at the International Whaling Commission (IWC) and had failed to do so.[587] The attempts by scientists to curtail whaling activity in the Southern Ocean at the IWC was referred to by Herluf Sigvaldsson as 'a text-book example of the tragedy of the commons', due to the nature of access to, and the depletion of, whaling stocks.[588] For these scientists, the ATS seemed to provide a new avenue for the protection of wildlife. Shortly after the initial discussion, SCAR was tasked with providing the Fifth ATCM in Paris in 1968 with proposals for the regulation of Antarctic sealing.[589] However, the way in which this was done was not as straightforward as SCAR being given the responsibility for providing evidence and proposals. Instead, SCAR's research into the effects of pelagic sealing was presented as being independent from the Antarctic Treaty System, rather than being integrated into it. It was suggested that national delegations 'recommend to their Governments that they encourage SCAR to continue its interest in these matters and to prepare reports from time to time on this subject.' [590] However, due the lack of a defined relationship between the ATS and SCAR, all communications between the two organisations were conducted through national delegations, which considerably slowed and complicated the process.

The eventual report from the SCAR Biology Working Group was sent on to the national committees and the delegations. An important actor at this stage was Martin Holdgate, who had held the position of Chief Biologist at the British Antarctic Survey before moving on to become the Deputy Director at

[587] Antonello, *The Greening of Antarctica,* 25.
[588] Herluf Sigvaldsson, "The International Whaling Commission: The Transition from a 'Whaling Club' to a 'Preservation Club'," *Cooperation and Conflict* 31, 3 (1996): 317-318.
[589] *SCAR Executive Meeting Agenda,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[590] *SCAR Bulletin No. 27,* September 1967, SCAR 6/1/3, Box 37, SCAR Archive, Cambridge, UK, 600.

the British Nature Conservancy in London, whilst also serving as the Chair for the SCAR Working Group on Biology.[591] Holdgate was integral not only in forming the proposals on pelagic sealing put to the ATCM, but also to the British efforts to push for conservation of seals in the Antarctic. In his correspondence with SCAR Secretary Robin, whilst deferring to Brian Roberts on the proposals put forth by the SCAR WG on Biology,[592] Holdgate also travelled from London up to Cambridge in order to confer with Robin and other members of the SCAR Executive, 'to discuss the problems raised by the Treaty Consultative Meeting on pelagic sealing.'[593] One of these problems had been the fact that there had been little time to prepare for the first discussion on pelagic sealing at the ATCM in 1966.[594] Roberts' response to the recommendations of the working group were not positive; having offered his own ideas on potential conservation measures, Roberts found these to be rejected by the working group.[595] In response to this rejection, Roberts lashed out, arguing that SCAR 'is not operating as effectively as it should' and that 'there is not the same feeling of high endeavour which helped to oil the early complexities of scientific co-operation.'[596] Holdgate was tasked with ensuring that recommendations from Antarctic biologists be incorporated into the next round of SCAR proposals on pelagic sealing to be put before the ATCM.[597]

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[591] Martin Holdgate, "Interview profile of Dr. Martin Holdgate," *Environmentalist* 8 (1988): 87.
[592] *Letter from SCAR Secretary G Robin to Martin Holdgate at The Nature Conservancy,* 12 May 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[593] *Letter from SCAR Secretary G Robin to Martin Holdgate at The Nature Conservancy,* 16 June 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[594] *SCAR Executive Meeting Agenda,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[595] Antonello, *The Greening of Antarctica,* 63.
[596] Antonello, *The Greening of Antarctica,* 63-64.
[597] *Minutes of the Meeting of the SCAR Executive Committee, Cambridge,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.

It was at the 1967 SCAR Executive Meeting where the lack of a formal channel for submitting proposals and scientific evidence to the Antarctic Treaty Meeting delegations was first discussed, and the resulting proposal to the ATCM and the Treaty System response to this issue is discussed later in this chapter. It was, however, the difficulties involved in providing good quality scientific evidence from SCAR to the Antarctic Treaty Meeting in a timely manner, which became a problem in 1967. SCAR had been tasked with submitting proposals to the ATS in time for the Fifth ATCM in Paris in November of 1968.[598] However, with the SCAR Symposium on Antarctic Biology not taking place until July 1968, and SCAR processes requiring further refinement before proposals to the ATCM could be drafted, it was realised that it would be nearly impossible to deliver the expected proposals in advance of the next ATCM.[599] Furthermore, a letter from Robin to the Executive Secretary of ICSU reveals a lack of consensus between SCAR biologists, which had made it 'extremely difficult for SCAR to recommend to the Antarctic treaty governments effective control measures.'[600] Some SCAR-affiliated scientists supported a total ban on seal exploitation until enough research could be carried out to gain a more complete understanding of Antarctic seal populations, and other scientists took a more realistic approach to the commercial sealing industry, and therefore supported the introduction of quotas.[601] As the letter was mainly in response to a request that SCAR be represented

[598] *Minutes of the Meeting of the SCAR Executive Committee, Cambridge,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[599] *Minutes of the Meeting of the SCAR Executive Committee, Cambridge,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[600] *Draft Letter to Executive Secretary of ICSU,* 15 June 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[601] *Draft Letter to Executive Secretary of ICSU,* 15 June 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.

at the next Intergovernmental Oceanographic Commission (IOC) meeting, despite Robin's declining the request for SCAR representation, Robin also offered a suggestion that further research into the effects of pelagic sealing might be carried out under IOC's remit.[602]

Following the 1968 SCAR Symposium on Antarctic Biology, a Sub-Committee of Specialists on Seals was set up, made up of primarily American and British researchers, unlike the 1966 group, and also including Robert Carrick, whose work had been instrumental in the AMCAFF.[603] The report presented by this sub-committee in 1968 to the Fifth Antarctic Treaty Consultative Meeting was acceptable to some parties, but not to others, and the report from ATCM V noted that only a preliminary exchange of views on seal conservation had occurred.[604] Ultimately, whilst there was no consensus on seal conservation measures, the ATS accepted a revised version of SCAR's earlier voluntary guidelines on the regulation of Antarctic pelagic sealing.[605] In preparation for the Sixth ATCM in Tokyo in 1970, another draft proposal was circulated, and once the US and Britain (the two ATS members most invested in conservation) and Norway and Japan (the two ATS members most invested in sealing) agreed on the draft, it was circulated to the rest of the Parties.[606] The work of Brian Roberts in renaming the draft proposal so that it became the draft 'Convention for the Conservation of Antarctic Seals' was significant in developing CCAS.[607] There is no better example of the UK

[602] *Draft Letter to Executive Secretary of ICSU,* 15 June 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[603] Antonello, *The Greening of Antarctica,* 66.
[604] Antarctic Treaty Secretariat, *Final Report of the Fifth Antarctic Treaty Consultative Meeting* [online]. Available at: https://documents.ats.aq/ATCM5/fr/ATCM5_fr001_e.pdf (Last accessed 18/06/2022).
[605] Antarctic Treaty Secretariat, *Final Report of the Fifth Antarctic Treaty Consultative Meeting* [online]. Available at: https://documents.ats.aq/ATCM5/fr/ATCM5_fr001_e.pdf (Last accessed 18/06/2022).
[606] Antonello, *The Greening of Antarctica,* 69.
[607] Antonello, *The Greening of Antarctica,* 70.

exerting a new form of authority over the Antarctic environment than the fact that the final version of CCAS was agreed upon at a special conference in London during February 1972, outside of the ATS, with the British Antarctic Survey in the UK acting as a depository for the Convention,[608] and in doing so, changing the story of British sealing from one of exploitation to one of conservation. This special conference and the signing of CCAS was commented upon by the Chilean delegation at ATCM VII in New Zealand in 1972 later that year, when 'the Representative of Chile expressed regret that the conservation of Antarctic seals should have been dealt with at a special conference, and trusted that this subject would again be brought within the scope of the Antarctic Treaty.'[609] SCAR is mentioned consistently throughout the Convention, and Article V of the Convention charges SCAR with 'providing scientific advice to all Parties on all aspects of harvesting including stocks, catch and any amendments to the practical details.'[610]

Ultimately, CCAS was an important step for both the ATS and SCAR. The convention is unique for several reasons: firstly, it was the first international agreement to provide for regulating the commercial use of marine living resources in the Antarctic; secondly, it was the first of the subsidiary, free-standing agreements negotiated by the ATCPs, and the first to mention SCAR as the source of scientific advice; and finally, unlike the consensus decision-making mandated by the Antarctic Treaty and other components of the Treaty System, decision-making under CCAS is by a simple two-thirds majority of the parties.[611] It is also an anomaly in that it is an instrument of the ATS which was ultimately finalised

[608] Walton, Clarkson and Summerhayes, *Science in the Snow,* 55; Antonello, *The Greening of Antarctica,* 73.
[609] Antarctic Treaty Secretariat, *Final Report of the Seventh Antarctic Treaty Consultative Meeting* [online] https://documents.ats.aq/ATCM7/fr/ATCM7_fr001_e.pdf (Last accessed 18/06/2022).
[610] Walton, Clarkson and Summerhayes, *Science in the Snow,* 55.
[611] Robert J. Hofman, "Sealing, whaling and krill fishing in the Southern Ocean: past and possible future

outside of a Treaty Meeting, which suggests that in this period, there were still distinct difficulties in involving SCAR in a Treaty instrument. Similarly, the difficulty in reaching a consensus at the ATCMs revealed a weakness in the ATS in these early years - despite the ATS allowing for 'embellishment and expansion'[612] of a young regime, it was clear that there would be limits to what this expansion might look like.

4.6 Tensions between SCAR and the ATS

The lack of a formal, or indeed a defined relationship between SCAR and the Antarctic Treaty System may have been a boon in some respects, given the ways in which SCAR ornithologists and biologists were able to work towards early Antarctic conservation efforts in the 1960s, but during this period, it also became a source of conflict. As international relations scholar Philip Quigg noted, there was a difference of opinion between the twelve signatories to the Antarctic Treaty as to what kind of relationship SCAR would have with the Antarctic Treaty.[613] This ambiguity would bring with it a series of events which led some Treaty Parties to formally complain that SCAR was attempting to influence decision making in the Antarctic Treaty System in 1969,[614] by not adhering to a remit which had yet to be formally delineated.

The Antarctic Treaty Meeting on Telecommunications in Washington DC in 1963, with SCAR, the WMO and the International Telecommunications Union (ITU) present was one of the early instances

effects on catch regulations," *Polar Record* 53, 1 (2017): 90.
[612] Antonello, *Nature conservation, 1959–1964,* 336.
[613] Philip W. Quigg, *A Pole Apart: The Emerging Issue of Antarctica*, (New York: New Press, 1983), 159.
[614] Walton & Clarkson, *Science in the Snow,* 47.

of tension between SCAR and the ATS. At this meeting, the use of radio communications was discussed, and SCAR was asked to weigh in with recommendations for standardising practice. What followed was a rejection of SCAR's involvement in communication. Firstly, the Norwegian delegation challenged the suggestions from the SCAR Working Group on the use of radio stations, stating that 'the Norwegian Government will not object to the adoption of this recommendation, but will reserve the right to establish and operate radio stations in the Antarctic if this should be required for Norwegian activities.'[615] Secondly, the final recommendation suggested that 'the SCAR Communications Working Group may wish to limit its responsibilities in the field to the co-ordination of scientific requirements for telecommunication services.'[616] Walton, Clarkson and Summerhayes noted that 'the Australian Government position was that communications were not a proper responsibility for SCAR.'[617] This also links to some of H. R. Philpott's comments in his WMO report, in distinguishing between telecommunications and logistics and the remit of SCAR. Although parts of the transition to SCAR focusing on research matters at the IAMRC in 1966 went smoothly, tensions arose in regards to telecommunications. A letter from Kaare Langlo to Gordon Robin hints at these tensions, referring to a previous discussion on the subject over the telephone, and reiterating that 'there is no strong need for SCAR to continue its activities in this field. If SCAR, however, insists on

[615] Antarctic Treaty Secretariat, 'Antarctic Treaty Meeting on Telecommunications: Final Report, Washington D.C 24-26 June 1963 [online] Available at: https://documents.ats.aq/ATME1963/fr/ATME1963_fr001_e.pdf (accessed 25/06/2022).
[616] Antarctic Treaty Secretariat, 'Antarctic Treaty Meeting on Telecommunications: Final Report, Washington D.C 24-26 June 1963 [online] Available at: https://documents.ats.aq/ATME1963/fr/ATME1963_fr001_e.pdf (accessed 25/06/2022).
[617] Walton, Clarkson and Summerhayes, *Science in the Snow*, 47.

re-establishing its telecommunications group and organizing a meeting of the group, WMO will endeavour to attend in order to inform the group of the current situation.'[618]

In the lead up to the annual SCAR Executive Committee Meeting in 1967, the meeting agenda asked that the SCAR leadership, having been made aware of the issues explored earlier in this chapter regarding the communication of SCAR resolutions on pelagic sealing and conservation, explore the possibility of 'postponing the Fifth Antarctic Treaty Consultative Meeting until May 1969, and that thereafter there be an interval of at least six months between SCAR Meetings and Treaty Consultative Meetings.'[619] This was considered a step too far for ATS delegations, and 'SCAR was told firmly that it should not be suggesting how the Treaty should behave.'[620] A further request suggested that 'consideration should be given to establishing a procedure whereby the Secretary of SCAR could be authorised to convey SCAR documents formally to Treaty powers.'[621] In effect, these items for discussion were floating the idea of a more formalised relationship between SCAR and the Antarctic Treaty System, which could be made more concrete through establishing the procedures of information exchange, and the delivery of scientific advice from SCAR to the various Consultative Party delegations in advance of the Treaty Meetings. Such efforts were very much in keeping with the approach of Larry M Gould to the ATS, as SCAR President. When these items were discussed at the Meeting, the idea of asking SCAR National Committees to seek permission from their respective governments for SCAR to send appropriate documents to the Ministry of Foreign Affairs in each

[618] *Letter from WMO Representative on SCAR K Langlo to SCAR Secretary G Robin,* 26 May 1967, SCAR 2/7/1/1, Box 53, SCAR Archive, Cambridge, UK.
[619] *SCAR Executive Meeting Agenda,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[620] Walton, Clarkson and Summerhayes, *Science in the Snow*, 47.
[621] *SCAR Executive Meeting Agenda,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.

country dealing with Antarctic affairs, was floated. The attendees agreed that the issue should be discussed at the Fifth ATCM in Paris.[622] At the SCAR Executive Committee meeting in Cambridge, in July 1967, it was also suggested that the Antarctic Treaty Consultative Parties should, perhaps through national governments, provide SCAR with any of the data gathered 'under the agreed exchange of information'[623] on account of the fact that SCAR 'had a responsibility for tendering scientific advice to the Antarctic Treaty Consultative meetings'.[624] This back-and-forth between SCAR and National governments hinted at the awkwardness caused by a lack of a defined relationship between the two organisations, which would continue until SCAR became a formal observer to the Treaty in 1987.

4.7 Conclusion

By the late 1960s and early 1970s, science was an established form of effective occupation of the Antarctic. In the period this chapter focuses on, it becomes impossible to divorce ongoing scientific activity in the Antarctic from the colonial ambitions of the members of the ATS, and the national agendas of these actors, and the ways in which these agendas sought to shape and control the Antarctic environment and its resources.

This chapter explores various activities coordinated by SCAR over the course of the 1960s and 1970s and the ways in which they showcase the developing relationships between sovereignty in Antarctica

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[622] *Minutes of the Meeting of the SCAR Executive Committee, Cambridge,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[623] *Minutes of the Meeting of the SCAR Executive Committee, Cambridge,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.
[624] *Minutes of the Meeting of the SCAR Executive Committee, Cambridge,* 24-26 July 1967, SCAR 13/2/1, Box 53, SCAR Archive, Cambridge, UK.

(past, present and future) and science. There are effectively three of these relationships between science and sovereignty in the Antarctic, which this chapter elucidates.

The first of these relationships is one which uses scientific investigation to change the perception of previous iterations of the same activity in the Antarctic, to obfuscate past colonial desires, whilst still enacting power and control over the Antarctic environment. The Convention for the Conservation of Seals (CCAS) effectively allowed this. For the UK in particular, CCAS provided an opportunity to pave over previous activity in the Antarctic and the commercial exploitation of seal populations (which cannot be divorced from traditional colonial ambitions to exploit a territory for the benefit of the imperial metropole), in favour of a new conservationist outlook. The UK reframed its previous exploitative activity by being a passionate proponent of seal conservation, but also took advantage of the opportunity to act as a depository for all CCAS-related documentation, which illustrates that conservation measures might be seen as useful tools for enacting a new type of control and power over the environment by a state with ongoing colonial ambitions in the Antarctic.

In this vein, under the auspices of SCAR, the working group on cartography and geodesy undertook several projects to draw up new, more accurate maps of the Antarctic. Prior to the IGY, mapping efforts had taken place, but cartography was not included in the official IGY programme of research because it was seen to be too closely linked with colonial ambitions in the Antarctic. SCAR's attempt to bring cartography under its 'apolitical' remit could not, in fact, obfuscate the colonial link between mapping territory and claiming it, suggesting that there are limits to the ways in which science could be used to depoliticise the colonial overtones of Antarctic activities.

The second of the three relationships between sovereignty and science in Antarctica is the use of scientific activity to effectively assert a form of collective authority over the Antarctic. Nearly every scientific activity overseen by SCAR can be linked to an assertion of environmental authority, but the novel measures for doing so are first the Agreed Measures for the Conservation of Antarctic Flora and Fauna (AMCAFF) and CCAS during this period. Similarly, the continued efforts in collaborating with the WMO in meteorological research, which was highlighted by the ATS in 1970 as an example of the value that SCAR and the ATS provided together, also highlights the use of science for an assertion of sovereignty and authority over the Antarctic. Ultimately, it is during this period that the Antarctic Treaty System members begin to reintroduce colonial ambitions covertly, by seeking to control the Antarctic environment and its resources. In these early years, once both SCAR and the ATS had been established, the ATS began to use efforts to conserve the Antarctic environment and wildlife to delineate which parts of the Antarctic environment and wildlife could be controlled by regulating access to them. In this respect, AMCAFF and CCAS were both instruments in not only conservation, but in designating what could be considered a resource to be controlled: a hallmark of colonial ambition and sovereignty.

The third and final version of the relationship between SCAR and the ATS is predicated on the unspoken Antarctic imaginary applied by each national actor in the ATS. The question of what might happen in a future where the ATS no longer exists is an unspoken one, and the ATS is treated as though it will exist in perpetuity. But every national agenda factors in the likelihood, however small, that Antarctica will not always have territorial claims frozen. If there is the chance that an opportunity

arises to claim territory in the Antarctic, national agendas have prepared for that eventuality. In preparation for this eventuality, every tool of asserting authority over the Antarctic environment can be seen as a form of colonial administration. Therefore, almost every scientific effort overseen by SCAR can be framed as an effort to preserve the Antarctic for a future in which the ATS no longer exists and the continent is ripe for claims based on the effective occupation of the Antarctic through scientific activity.

5. A Crisis of Antarctic Legitimacy

5.1 Introduction

SCAR and the ATS cannot be separated when investigating Antarctic affairs during the 1970s and 1980s. During the 1970s and 1980s, SCAR and the ATS became distinctly more intertwined as Antarctic science and politics became more complicated. By the late 1970s, Antarctica was no longer 'a continent for peace and science'. The utility of such rhetoric had faded, and Antarctica was surrounded by a different rhetoric, the rhetoric of a now established system of governance, which now focused its efforts not on conserving the environment but exploring its possible uses beyond scientific investigation. To use the framings described by Klaus Dodds in *Geopolitics in Antarctica,* Antarctica was now 'a potential source of mineral wealth.'[625] It was at this point in Antarctic history that ATS signatories seemed to be enacting the 'future nationalism' that Elena Glasberg argued their previous activities had preserved Antarctica for.[626] This shift in the framing of Antarctica was due in part to a shift in global geopolitics, which focused on the potential to extract resources from not only the Antarctic, but the other 'global commons', too. Aant Elzinga's work argues that 'the ATS is successful because it uses science to further knowledge and reinforce the regime of intergovernmental political

[625] Klaus Dodds, *Geopolitics in Antarctica: Views from the Southern Oceanic Rim*, Polar Research Series (Chichester ; New York: Published in association with Scott Polar Research Institute, University of Cambridge by J. Wiley, 1997). *41.*

[626] Elena Glasberg, *Antarctica as Cultural Critique: The Gendered Politics of Scientific Exploration & Climate Change*, (New York: Palgrave Macmillan, 2012), 6.

management.[627] This is an argument which holds weight when discussing the notion that scientific endeavour in Antarctica had become the accepted form of effective occupation of Antarctic territory by the 1970s. Due to this, science became the barrier for entry to the ATS, and a justification for excluding countries who wanted to be involved in the Antarctic decision-making forum, but did not have the financial or academic resources to conduct scientific research activities. Similarly, the enactment of control over the Antarctic environment through instruments of the Treaty like AMCAFF and CCAS became a new way to administer to the Antarctic, subjugating and controlling the environment, by deciding which elements of the environment could be designated resources to be regulated and controlled in the absence of an indigenous population to exert sovereignty over. With the membership of the Antarctic Treaty System predicated upon significant spend on Antarctic research, the national actors who could involve themselves in creating regulations for the Antarctic environment were mostly limited to countries able to meet such a financial commitment, many of them former colonial powers.

SCAR has played an important role in the evolution of the Antarctic Treaty. It originated as a scientific mechanism for coordinating activities in Antarctica for the IGY, and following the IGY, it became a permanent body to provide a continuing means for coordinating and facilitating scientific research activities and for identifying scientific priorities in Antarctica.[628] Tucker Scully contends that SCAR

[627] Aant Elzinga, "Origin and Limitations of the Antarctic Treaty," in *Science Diplomacy : Science, Antarctica, and the Governance of International Spaces*, ed. Paul Arthur Berkman et al. (Smithsonian Institution Scholarly Press, 2011) 60.
[628] Tucker Scully, "The Development of the Antarctic Treaty System," in *Science Diplomacy : Science, Antarctica, and the Governance of International Spaces*, ed. Paul Arthur Berkman et al. (Smithsonian Institution Scholarly Press, 2011) 32.

has been essential to the development and the evolution of ATS over time, allowing the ATS to define the issues that require intergovernmental responses and agreements, several of which are explored in this chapter. David Walton noted that there was a 'fine line between policy and science, advocacy and reporting', and that SCAR had been charged with walking that fine line.[629]

This chapter explores the ways in which the new rhetoric around Antarctica changed the Antarctic, and led to the rapid negotiation of two new conventions; CCAMLR and CRAMRA, for living resources and mineral resources respectively, and the role played by both the ATS and SCAR in creating these. This chapter also discusses the ways in which SCAR and the ATS were challenged by the framing of Antarctica as a source of potential mineral wealth. For SCAR, this meant a series of internal conflicts, which I argue led to a distinct split between the instruments of soft and hard power in Antarctica. Concurrently, for the ATS, this challenge took the form of the 'Question of Antarctica' being raised at the United Nations General Assembly, and the ongoing critique that this invited from the UN over the course of the 1980s. This chapter investigates the expansion of both SCAR and ATS membership, and the reasons why both bodies changed, arguing that the 'opening' of SCAR and the ATS to new members was a response to challenges to the validity and legitimacy of both. I also argue that these challenges to SCAR and the ATS were resolved when the rhetoric on Antarctica changed once more in the late 1980s, and the Antarctic was once more being preserved for a future nationalism, in part due to a growing environmental pressure to preserve the Antarctic for different reasons.

[629] David W. H. Walton, 'The Scientific Committee on Antarctic Research and the Antarctic Treaty' in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) Science Diplomacy: Antarctica, Science, and the Governance of International Spaces, 76.

Following the discovery of the hole in the ozone layer over Antarctica, and the subsequent framing of Antarctica as a 'fragile' and vulnerable environment in need of protection, the Madrid Protocol of 1991 was signed, and with it, a new Antarctica era would begin.

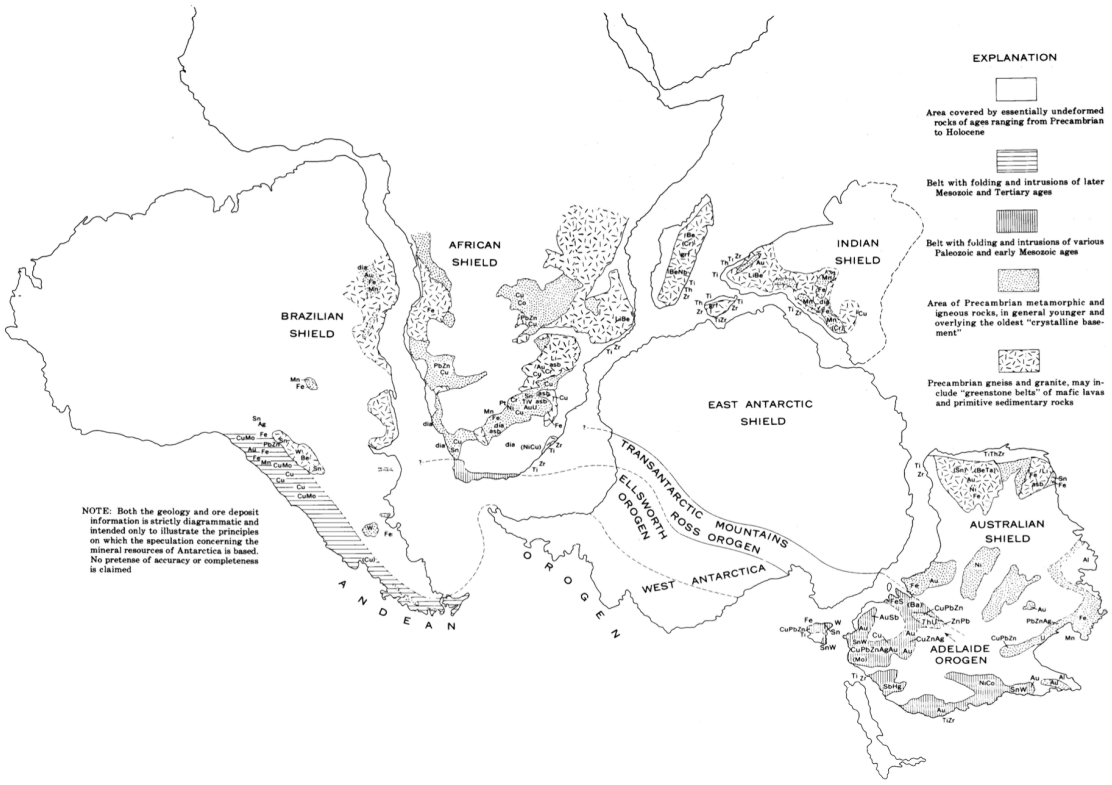

Figure 3. *Schematic representation of major features of the geology and ore deposits of Gondwanaland.*

5.2 Decolonisation, the United Nations and The New International Economic Order

The withdrawal of European powers from colonies and colonised nations in the postwar period changed the nature of international politics. A discussion on the decline of European empires is beyond the scope of this thesis, but the decolonisation process had a significant impact on the ways that Outer Space, the High Seas, and eventually Antarctica, were understood. Decolonisation changed world politics and particularly the membership of the United Nations, which went from a forum for 51 founding states to a forum for 110 states by 1962, and 159 states by 1991, the large majority of which were 'developing', newly independent nations free from colonial rule.[630] This led to the emergence of a distinctive set of groupings of formerly colonised nations at the United Nations General Assembly which followed the decolonisation process. These groupings, primarily the 'Group of 77' (established in 1964) and the 'Non-Aligned Movement' (established in 1961) were focused on promoting the interests of developing and decolonised countries, which Chris Alden, Sally Morphet and Marco Antonio Vieira assert was 'the hallmark of the South in world politics during the Cold War.'[631]

Aant Elzinga considers a hallmark of this era, in the wake of the international oil crisis of 1973, to be the 'discussions of the prospects for mineral and hydrocarbon resources.'[632] Arguably another hallmark

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[630] Nils Gilman, 'The New International Economic Order: A Reintroduction' *Humanity: An International Journal of Human Rights, Humanitarianism, and Development* 2015 6(1), 5.

[631] Chris Alden, Sally Morphet and Marco Antonio Vieira, *The South in World Politics* (London: Palgrave Macmillan, 2010), 57-58.

[632] Aant Elzinga, 'Some Reflections on the Emergence of Antarctic Humanities' in Peder Roberts, Lize-Marié van der Watt and Adrian Howkins (eds) *Antarctica and the Humanities* (London: Palgrave Macmillan, 2016), 279.

of world politics was 'the imperialism of decolonization', a term ascribed to the overtures to formerly colonised nations by the USSR and the United States respectively by William Roger Louis and Ronald Robinson.[633] Louis and Robinson argue that an Anglo-American alliance offering aid to former colonies in Africa and Asia came into being to challenge Soviet interventions, aiming to preserve political and economic ties to the West.[634]

The Group of 77 and the Non-Aligned Movement brought innovative and radically anti-colonial economic proposals to the United Nations General Assembly over the course of the latter half of the twentieth century.[635] One of the first examples of this is the proposal put forth by Arvid Pardo, the Maltese representative to the United Nations, who introduced the concept of the 'common heritage of mankind' in 1967 to the United Nations General Assembly: the idea that some resources belong to all, including future generations, and that rights or responsibilities in relation to them which cannot be denied.[636] Surabhi Ranganathan and Isabel Feichtner draw attention to the application of this concept to both Outer Space and the High Seas.[637] Surabhi Ranganathan coined the term 'extractive imaginaries' to describe the plans to use techno-scientific progress to extract mineral resources from the seabed by applying the common heritage principle, and the hopes for what such extractions might

[633] William Roger Louis and Ronald Robinson, 'The Imperialism of Decolonization', *The Journal of Imperial and Commonwealth History* 1994 22(3): 469.
[634] William Roger Louis and Ronald Robinson, 'The Imperialism of Decolonization', *The Journal of Imperial and Commonwealth History* 1994 22(3): 473-474.
[635] Vijay Prashad, *The Darker Nations: A People's History of the Third World* (New York: The New Press, 2007) 95-96.
[636] Surabhi Ranganathan, 'Global Commons' *The European Journal of International Law* 2016 27(3): 694.
[637] Isabel Feichtner and Surabhi Ranganathan, 'International Law and Economic Exploitation in the Global Commons: Introduction' *The European Journal of International Law* 2019 30(2): 543.

achieve, in terms of redressing economic disparities for developing countries.[638] The common heritage of mankind would be applied to the seabed and the ocean floor, and go on to be adopted by the UN via Resolution 2749, which detailed the *Declaration of Principles Governing the Seabed and Ocean Floor.*[639] This concept would underpin the conferences resulting in the Third United Nations Convention on the Law of the Sea (UNCLOS III), which began in 1973. Sam Robinson, whose work focuses on the histories of the oceans, draws upon Ranganathan's work and 'sociotechnical imaginaries' as introduced by Sheila Jasanoff and Sang-Hyun Kim, to discuss the concerns these extractive imaginaries for the seabed raised.[640] Robinson found that developing coastal nations were wary of technologically advanced nations 'entering their territorial waters to exploit marine resources, fearing how these global powers might wield their technological and economic superiority.'[641] Robinson asserts that multiple sociotechnical imaginaries of ocean exploitation emerged in the late 1960s in both developed and developing countries, and that these imaginaries featured in national approaches to UNCLOS III.[642]

Shortly after the beginning of UNCLOS III negotiations, in 1974, the New International Economic Order (NIEO) was also introduced to the UN General Assembly.[643] Nils Gilman describes the NIEO

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[638] Surabhi Ranganathan, 'Ocean Floor Grab: International Law and the Making of an Extractive Imaginary' *The European Journal of International Law* 2019 30(2): 587.
[639] United Nations, 'Declaration of Principles Governing the Sea-Bed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction' https://digitallibrary.un.org/record/201718?ln=en, accessed 22 June 2022.
[640] Sam Robinson, 'Scientific imaginaries and science diplomacy: The case of ocean exploitation' *Centaurus* 2021 63: 152.
[641] Robinson, "Scientific Imaginaries", 154.
[642] Robinson, "Scientific Imaginaries", 153.
[643] United Nations, 'Declaration on the Establishment of a New International Economic Order' http://www.un-documents.net/s6r3201.htm, accessed 22 June 2022.

as 'an improbable political creature that surfaced out of the economic and geopolitical dislocations and uncertainties of the early to mid-1970s.'[644] The NIEO Declaration was made up for a number of proposals, and effectively called for the absolute right of states to control the extraction and marketing of their domestic natural resources; the establishment and recognition of state-managed resource cartels to stabilise commodity prices; the regulation of transnational corporations; no-strings-attached technology transfers from the Global North to the Global South; the granting of preferential trade preferences to countries in the South; and the forgiveness of certain debts that states in the south owed to the north.[645] Together, these proposals amounted to an assertion of the 'economic sovereignty' of postcolonial states, and a radical new vision for the international economy.[646] Given the focus on applying the common heritage of mankind to spaces beyond traditional jurisdiction (the High Seas and Outer Space) and the advent of radical reimaginings of the use of these spaces during the early 1970s, it seemed only a matter of time until the same logic was applied to Antarctica.

Bernard P. Herber's work applies the common heritage of mankind principle to the Antarctic, drawing the link between the efforts of developing nations in endorsing the use of the common heritage principle and the efforts to implement a more equitable distribution of resources and income between the developed and developing nations of the world.[647] Herber notes that the common heritage principle is a distinct alternative to the designation of Antarctica as a *terra nullius,* in which resources

[644] Gilman, "The New International Economic Order", 6.
[645] Gilman, "The New International Economic Order", 3.
[646] P. N. Agarwala. *The New International Economic Order: An Overview* (New York: Pergamon, 1983), 6.
[647] Bernard P. Herber, 'The Common Heritage Principle: Antarctica and the Developing Nations' *American Journal of Economics and Sociology*, 1991 50(4): 391.

belong to no nation until activities such as discovery, exploration and occupancy establish sovereignty over them.[648] By instead designating Antarctica a *terra communis* or commons, Antarctic resources would come under a global ownership by all nations, and therefore not be subject to appropriation by any nation regardless of its ability to appropriate them, thereby applying a postcolonial imaginary to the Antarctic. Paschalis Arvanitidis and Aikaterini Almyriotou complicate Herber's view by framing the ATS as a governance structure which already embodies some of the principles of a commons, enabling it to guarantee its stability and successful management of the various demands of participating states and international players.[649] The work of Sanjay Chaturvedi and Shirely V Scott also argues that the principles of the global commons and the common heritage of mankind are difficult to apply to the Antarctic, given that 'any future prospects of ecologically-sustainable and socially-just development of Antarctic resources cannot be divorced from long-standing histories of imperialism.'[650]

5.3 SCAR in the 1970s and early 1980s: Overlooked, Underfunded and Under Threat

During the 1970s, SCAR faced a number of issues which put pressure on its leadership, and raised questions about the future of the organisation. Chief among these issues was SCAR's flagship project

[648] Herber, 'The Common Heritage Principle", 391.
[649] Paschalis Arvanitidis and Aikaterini Almyriotou, 'The commons institution of Antarctica: a roadmap to governance of mankind resources', *Journal of Property, Planning and Environment* 2021 13(2): 165-166.
[650] Sanjay, Chaturvedi,. *The Polar Regions: A Political Geography* (Chichester: John Wiley & Sons, 1996); Shirley V. Scott,'Three waves of Antarctic imperialism' in Klaus Dodds, Alan D. Hemmings and Peder Roberts (eds) *Handbook on the Politics of Antarctica.* (Cheltenham: Edward Elgar, 2017), 37–49; Sanjay Chaturvedi, 'The future of Antarctica: Minerals, bioprospecting, and fisheries' in Mark Nuttall, Torben R. Christensen, Martin J. Siegert (eds) *The Routledge Handbook of the Polar Regions* (London: Routledge, 2018), 409.

BIOMASS (Biological Investigation of the Marine Antarctic Systems and Stocks). BIOMASS was the most prominent of SCAR's research programmes in the 1970s and 1980s. The BIOMASS programme was 'the first major international regional study in marine science related to living resources.'[651] It was set up over the course of 1976, after an outline of research areas was agreed upon during an international conference in Woods Hole, USA.[652] Following this, the specific research programmes were designed by a SCAR and Scientific Committee on Oceanographic Research (SCOR) Joint Group of Specialists on Southern Ocean Ecosystems and Their Living Resources.[653] The BIOMASS programme planned to carry out several large-scale experiments into the nature of Antarctic marine ecology, which was not well understood at the time, over a period of ten years.[654] The programme brought together experts from across various fields, from marine ecologists to physical oceanographers, with expert groups and workshops organised and funded by SCAR and an affiliated Working Group in the SCOR structure, which contributed to the oceanographic study of the Southern Ocean.[655] Correspondence between Warren S. Wooster, the Executive Secretary of SCOR, and George Hemmen, of SCAR, details these plans for setting up a new joint SCAR/SCOR working group, with oversight from the IOC.[656] This working group would eventually become a bone of contention as it was

[651] *Draft Report on Antarctic Marine Ecosystem Data Interpretation Workshop, 20 October 1981.* SCAR 1/10/6, Box 8, SCAR Archives, Cambridge UK.
[652] Sayed Z. El-Sayed, *Southern Ocean Ecology: The BIOMASS Perspective* (Cambridge: Cambridge University Press), 2; *Draft Report on Antarctic Marine Ecosystem Data Interpretation Workshop, 20 October 1981.* SCAR 1/10/6, Box 8, SCAR Archives, Cambridge UK.
[653] *Draft Report on Antarctic Marine Ecosystem Data Interpretation Workshop, 20 October 1981.* SCAR 1/10/6, Box 8, SCAR Archives, Cambridge UK.
[654] El-Sayed, *Southern Ocean Ecology,* 2.
[655] El-Sayed, *Southern Ocean Ecology,* 2.
[656] *Letter from W. S. Wooster to G. E. Hemmen, 29 November 1971,* SCAR 1/10/6, Box 8, SCAR Archives, Cambridge UK.

overlooked by the scientific community at large and much of the work was duplicated elsewhere. In the early 1980s, the group was disbanded, allowing SCOR to take over coordinating international cooperation for oceanographic research in the Southern Ocean region under the remit of the Intergovernmental Oceanographic Commission (IOC). A letter from SCAR Vice-President Gotthilf Hempel to George Hemmen regarding Hemmen's final report on the Working Group and its inactivity illustrates his frustrations with the project, stating:

> 'Your draft report on the lack of activities of the SCAR WG Oceanography is a masterpiece. To my mind the WG should be discontinued. I suppose that BIOMASS on one hand and SCOR on the other cope with southern oceanography in a satisfactory way. Let us discuss this in Woods Hole and later in Queenstown, to find out whether any harm to ocean affairs in SCAR would be done by killing the WGO.'[657]

From the beginning of BIOMASS, there were concerns around getting ahold of adequate funding for such a large-scale project. With the IOC being involved in overseeing the SCOR contributions to BIOMASS, SCAR was reliant on UN funding through the IOC, as SCAR Membership contributions could not cover the cost of the project alone. Letters between SCAR Executive Secretary G. E. Hemmen and American Sayed Z. El-Sayed, the biologist in charge of the BIOMASS project over the course of the 1980s, reveal various difficulties in finding the funds for the project.[658] Letters between Hemmen and IOC Executive Secretary Mario Ruvio also showcase the difficulty experienced by SCAR

[657] *Letter from G. Hempel to G. E. Hemmen,* SCAR 1/10/6, Box 8, SCAR Archives, Cambridge UK.
[658] *Assorted Letters, dated 1973-1978,* SCAR 10/3/3/2, Box 48, SCAR Archives, Cambridge, UK.

in obtaining IOC funding for BIOMASS.[659] It was difficult to access IOC funds, which were limited to 'such activities as can be supported out of existing funds, provided they are consistent with the intentions expressed in IOC resolutions.'[660] The first two large-scale BIOMASS experiments, FIBEX (the First International BIOMASS Experiment) and SIBEX (the Second International BIOMASS Experiment) were considered incredibly successful and the results were published widely as a result.[661] Despite this success, the cost of running BIOMASS was an ongoing concern for SCAR.[662] This concern is reflected in meeting minutes from the 1980 XVI SCAR Meeting in Queenstown, when the consistent underfunding of the BIOMASS programme was a prominent subject of discussion.[663] In response to the financial constraints, SCAR Delegates agreed to apply to ICSU for a grant of USD $25,000, and also looked elsewhere for funding.[664] More correspondence to the IOC dated August 1980 details a request for funding to support BIOMASS-related expenses, including fellowships on board research vessels for FIBEX and funding for a workshop to be held the following year on data management.[665] During the conclusion of the BIOMASS project, there were concerns that the IOC

[659] *Letter from G. E. Hemmen to M Ruvio, 10 January 1980,* SCAR 16/1/18/1, Box 48, SCAR Archives, Cambridge, UK.
[660] *Letter from M Ruvio to G. E. Hemmen, 17 January 1980,* SCAR 16/1/18/1, Box 48 SCAR Archives, Cambridge, UK.
[661] *Draft Report on Antarctic Marine Ecosystem Data Interpretation Workshop, 20 October 1981.* SCAR 1/10/6, Box 8, SCAR Archives, Cambridge, UK.
[662] *Letter from G. E. Hemmen to George Knox, 11 January 1980,* SCAR 16/1/18/1, SCAR Archives, Cambridge, UK.
[663] *Minutes of the Sixteenth SCAR Delegates Meeting 14-24 October 1980,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[664] *Minutes of the Sixteenth SCAR Delegates Meeting 14-24 October 1980,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge UK.
[665] *Letter from G. E. Hemmen to Dr M Ruvio, 8 August 1980.* SCAR 1/10/6, Box 8, SCAR Archives, Cambridge UK.

might 'take over' under the auspices of its new physical oceanography project.[666] Hemmen assured El-Sayed that such an outcome was unlikely in 1983.[667] The importance of BIOMASS, beyond its impressive scale, lies primarily in its relevance to the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR). SCAR directly relates the collection of data on the Southern Ocean's delicate ecosystem to the establishing of CCAMLR, with many of the biologists involved in BIOMASS later found in national delegations to CCAMLR.

5.4 From Krill to CCAMLR: SCAR, the ATS and Living Resources

In keeping with the reframing of the High Seas and Outer Space, Klaus Dodds argues that the rhetoric on the Antarctic also changed during the 1970s, and it was viewed as a potential source of mineral wealth.[668] This framing of Antarctica is exemplified by both CCAMLR and the Convention on the Conservation of Antarctica Mineral Resource Activities (CRAMRA) negotiations, and the continuation of the ATS designating what constituted a resource in Antarctica, and then going on to regulate its use, and by enacting such regulations, assert control over the Antarctic environment.

CCAMLR was negotiated in the late 1970s and early 1980s. The convention was negotiated primarily in response to concern at the ATS about the growing interest in the harvesting of krill and the potential adverse impacts this may have on the Antarctic ecosystem and the recovery of the Antarctic whale

[666] *Letter from S. Z. El-Sayed to G. E. Hemmen, 3 January 1983*, SCAR 1/10/6, Box 8, SCAR Archives, Cambridge UK.
[667] *Letter from G. E. Hemmen to S. Z. El-Sayed, 13 January 1983*, SCAR 1/10/6, Box 8, SCAR Archives, Cambridge UK.
[668] Klaus Dodds, *Geopolitics in Antarctica*, 33-34.

populations.[669] At the Eighth Antarctic Treaty Consultative Meeting in 1975, the need to integrate an instrument for the protection of Antarctic 'marine living resources' was first suggested.[670] SCAR's BIOMASS project was essential to the large-scale collection of data needed to inform the negotiations for CCAMLR, and definitively established the importance of krill to the Antarctic food chain.[671]

The Ninth ATCM in London, called for a Special Consultative Meeting for setting up a conservation regime for living resources.[672] This led to the Conference on the Conservation of Antarctic Marine Living Resources, which began in 1978 and concluded with the signing of the Convention on the Conservation of Antarctic Marine Living Resources (CAMLR Convention) in Canberra, Australia, on 20 May 1980.[673] The entry of CCAMLR into force was noted at the Tenth ATCM in Buenos Aires in 1981, and ATCPs were urged to ratify the Convention as soon as possible, which led to the full ratification of CCAMLR by 1982.[674] Peter J. Beck associates the success of CCAMLR with not only the prior success of the AMCAFF and CCAS instruments explored in the previous chapter, but with the 'constructive ambiguity' embodied in article IV of CCAMLR, which largely repeats the wording

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[669] Anthony J. Press, Indi Hodgson-Johnston, and Andrew J. Constable. 'The Principles of the Convention on the Conservation of Antarctic Marine Living Resources: Why Its Commission is Not a Regional Fisheries Management Organisation' In Nengye Liu, Cassandra M. Brooks, and Tianbao Qin (eds) *Governing Marine Living Resources in the Polar Regions* (Cheltenham: Edward Elgar, 2019), 9.

[670] "Report of the Eighth Antarctic Treaty Consultative Meeting, Oslo, 1975," Antarctic Treaty Secretariat, accessed June 29 2022. https://documents.ats.aq/ATCM8/fr/ATCM8_fr001_e.pdf.

[671] El-Sayed, *Southern Ocean Ecology,* 2.

[672] "Report of the Ninth Antarctic Treaty Consultative Meeting, London, 1977," Antarctic Treaty Secretariat, accessed June 29 2022. https://documents.ats.aq/ATCM9/fr/ATCM9_fr001_e.pdf.

[673] Seth T. Sykora-Bodie and Tiffany H. Morrison, "Drivers of Consensus-based Decision-making in International Regimes: Lessons from the Southern Ocean", *Aquatic Conservation: Marine and Freshwater Ecosystems*, 2019 29(12), 2148.

[674] Peter J. Beck, 'The Resource Conventions Implemented: Consequences for the Sovereignty Issue' *International Challenges* 1990 10(1): 56.

of article IV of the Antarctic Treaty, except for the addition of a phrase referring to the right 'to exercise coastal state jurisdiction under international law within the area to which the convention applies.'[675]

CCAMLR has an explicit mandate to make decisions about the conservation of Antarctic marine living resources and the protection of the Antarctic ecosystem, and also the ability to regulate harvesting and related fishing activities in the Convention area.[676] The area covered by CCAMLR includes the Antarctic Treaty area, as well as areas to the north of 60°S.[677] The creation of CCAMLR began to introduce a limit in the ways the Antarctic Treaty System members could expect to effectively designate elements of the Antarctic wildlife as resources to be managed, and then build instruments for their management, echoing colonial administration whilst also claiming to be completely at odds with such a project. Such activities would eventually attract newer member states with their own designs for the Antarctic continent. During the negotiation process for CCAMLR, only four countries acceded to the Antarctic Treaty, which contrasted heavily with the larger number of speedy accessions to the Treaty during CRAMRA negotiations. On 16th May 1975, Brazil became a non-Consultative Party, followed by Poland on 29 July 1977 and gained Consultative Party status.[678] A year later, Bulgaria acceded to the Treaty as a non-Consultative Party on 11 September 1978, and on 11 Jan 1980, Uruguay also acceded as a non-Consultative Party, expanding the ATS regime.[679]

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[675] Beck, "The Resource Conventions Implemented", 59-60.
[676] Andrew J. Press and Andrew J. Constable, 'Conservation Law in Antarctica and the Southern Ocean: the Antarctic Treaty System, conservation, and environmental protection' Australian Journal of International Affairs 2022 76(3), 310.
[677] Press and Constable, "Conservation Law in Antarctica", 308.
[678] 'Parties', Secretariat of the Antarctic Treaty, accessed 28 May 2022, https://www.ats.aq/devAS/Parties?lang=e
[679] 'Parties', Secretariat of the Antarctic Treaty, accessed 28 May 2022, https://www.ats.aq/devAS/Parties?lang=e

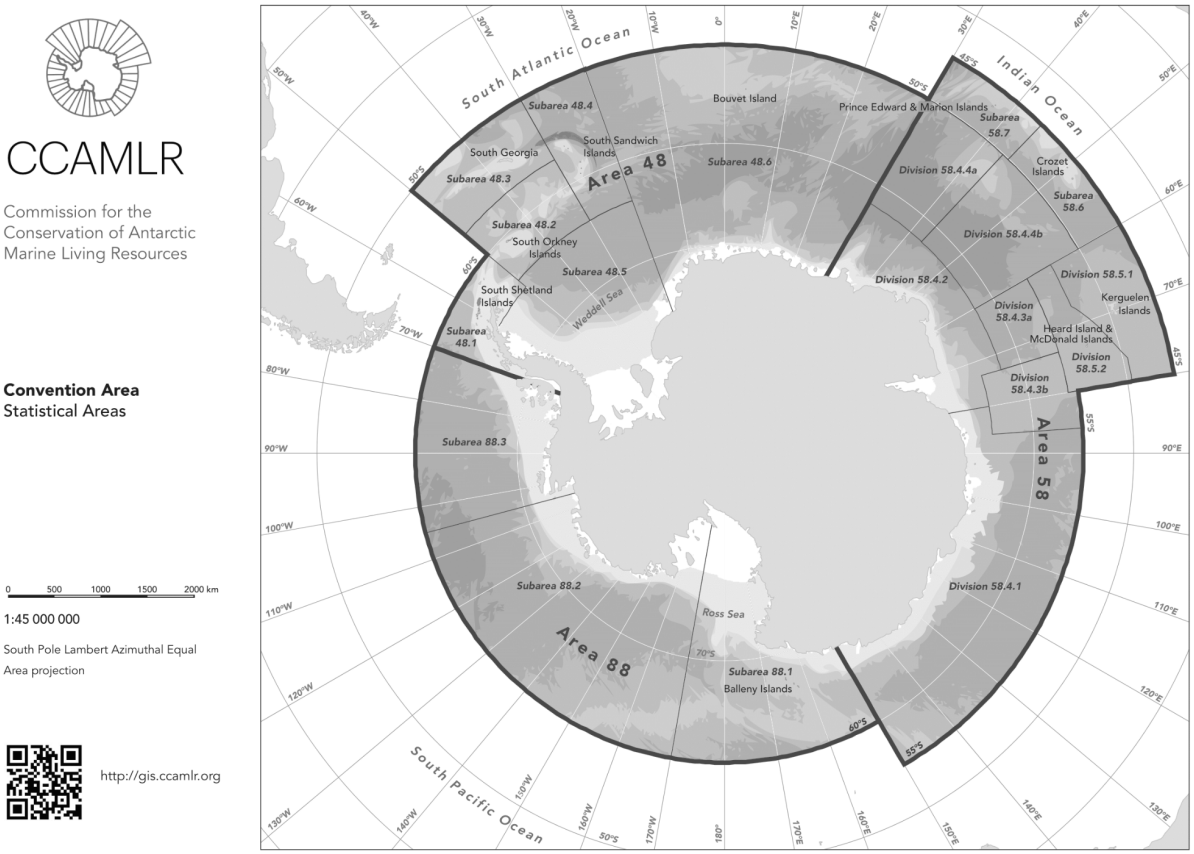

Figure 4. *Map of the CCAMLR area.*

5.5 The Expansion of SCAR

In 1978, new countries joined SCAR, expanding its membership. The Federal Republic of Germany (FRG) and Poland became the first new SCAR members in over twenty years on 22 May 1978 at SCAR XV in Chamonix, France.[680] There had been no previous call for inducting new SCAR members until 1978, so a special meeting of the SCAR Executive Committee was called in by SCAR President Tore Gjelsvik in early 1978 to formally accept the two new members.[681] At SCAR XV, two questions were discussed which foreshadowed the CRAMRA negotiations, which would begin in earnest in 1981. The first of these questions raised was the report from the SCAR's 'Environmental Impact Assessment of Mineral Exploration/Exploitation in Antarctica' (EAMRA) group, which was announced ready for circulation to SCAR members.[682] Jim H. Zumberge, an American geologist who would later go on to become SCAR President in 1982, was convenor of the group, and charged with distributing the preliminary report, and re-examining the scope of the group's activities, in order to identify tasks which would complement the upcoming Treaty initiatives on mineral resources.[683] The second of these questions, and possibly the more pressing, was the question of the nature of the relationship between SCAR and the ATS. There was a discussion at the SCAR meeting, during which several delegates professed their desire for a clearer demarcation of the interests of Treaty governments

[680] *Minutes of the Fifteenth SCAR Delegates Meeting 16-26 May 1978,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge UK.
[681] *Minutes of Special SCAR Executive Committee Meeting, 10-11 February 1978,* SCAR 1/9/6/File 1, Box 48, SCAR Archives, Cambridge UK.
[682] *Minutes of the Fifteenth SCAR Delegates Meeting 16-26 May 1978,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge UK.
[683] *Minutes of the Fifteenth SCAR Delegates Meeting 16-26 May 1978,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge UK.

and the interests of SCAR.[684] The question of resource management was brought up, and it was agreed that although SCAR had a responsibility to provide scientific information that might assist governments with coming to decisions about resources in Antarctica, it 'does not consider that it should be responsible for advising governments on resource management issues.'[685] The meeting closed with the election of a new SCAR President from New Zealand, George A Knox, who would be at SCAR's helm during the ratification of CCAMLR and the start of CRAMRA negotiations.[686]

Due to the 'explosion of interest' in the Antarctic caused by the ongoing negotiation of CRAMRA at the ATS, several new countries had joined SCAR.[687] The German Democratic Republic joined SCAR in 1980.[688] In 1984, India and Brazil would also join SCAR as members, followed by China in 1986.[689] At the SCAR meeting in San Diego in June 1986, the new and expanded membership was discussed by the SCAR Executive Committee, as expressions of interest had been received by countries who had acceded to the Antarctic Treaty, namely Italy, Uruguay, Spain, the Netherlands, and the Republic of Korea.[690] The category for a new type of membership for 'Associate Members' had been drawn up by

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[684] *Minutes of the Fifteenth SCAR Delegates Meeting 16-26 May 1978,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge UK.
[685] *Minutes of the Fifteenth SCAR Delegates Meeting 16-26 May 1978,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge UK.
[686] David W. H. Walton, Peter D. Clarkson, and Colin P. Summerhayes, *Science in the Snow: Fifty Years of International Collaboration through the Scientific Committee on Antarctic Research*, (Cambridge: Scientific Committee on Antarctic Research, 2011) 68.
[687] *Letter from George Knox to G. E. Hemmen,* 10 May 1986, SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.
[688] Walton, Clarkson and Summerhayes, *Science in the Snow,* 69.
[689] Walton, Clarkson and Summerhayes, *Science in the Snow,* 71-72.
[690] *Minutes of SCAR Executive Meeting, 23-27 June 1986,* SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.

former Norwegian SCAR President Tore Gjelsvik in 1985.[691] This new membership would require both changes in the SCAR constitution and its rules of procedure, but it was considered the best course of action.[692] It was decided that the newer members from 1986 onwards would be given associate membership of SCAR and would be able to then become full members in due course.[693]

5.6 The 'Question of Antarctica' at the United Nations

Bernard P. Herber attributes the intensification of discussions on Antarctica at the United Nations 1980s to the culmination of the negotiations for UNCLOS III.[694] Following the successful conclusion to UNCLOS III there was momentum at the UN for the application of a similar approach to the Antarctic, which has been extensively documented and critically appraised by Peter J. Beck. Beck's work explores the tensions between the Group of 77 and the Non-Aligned Movement at the United Nations, and the member states of the ATS, and the 'Question of Antarctica' from the 1980s onwards. The discussions at the UN and the dissenting opinions on whether Antarctica should continue to be governed by the ATS also led to a change in the rhetoric about Antarctica.[695] Peder Roberts, Lize-Marié van der Watt and Adrian Howkins argue that the UN debates on Antarctica 'brought to the fore the

[691] *Letter from Tore Gjelsvik to George Knox,* 9 June 1985, SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.
[692] *Minutes of SCAR Executive Meeting, 23-27 June 1986,* SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.
[693] *Minutes of SCAR Executive Meeting, 23-27 June 1986,* SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.
[694] Herber, 'The Common Heritage Principle", 394.
[695] Peder Roberts, Adrian Howkins, and Lize-Marié van der Watt, 'Antarctica: A Continent for the Humanities' in Peder Roberts, Adrian Howkins, and Lize-Marié van der Watt (eds) *Antarctica and the Humanities* (London: Palgrave Macmillan, 2016), 3.

continent's status as a colonised space in addition to a potential natural resources base.'[696] This notion of Antarctica as a colonised space challenges the dominant exceptionalist narrative, which suggests that the continent is a space that cannot be traditionally colonised and has evaded the colonial ambitions found elsewhere. Brazilian scholar Luís Guilherme Resende de Assis argued in his PhD thesis that not only had Antarctica been colonised, but that science had become the primary colonial activity on the white continent.[697] He states that 'by engaging their bodies in Antarctic nature, scientists ensure consultative or deliberative status in their respective countries of origin in the Antarctic Treaty System', and in doing so, he paints scientists as inherently political actors in the Antarctic.[698] Resende de Assis points out that 'scientific research emerges as the main means of Nation States to take part in activities in the southern region, immersed in the cosmopolitan politics of peace, cooperation and science of the Antarctic Treaty.'[699] These arguments, whilst a natural extension of the post-colonial approaches to Antarctic history pioneered by academics like Klaus Dodds and Adrian Howkins, are significant in forming the critical approach to this period of tensions at the UN.

According to historian Philip Quigg, author of *A Pole Apart: The Emerging Issue of Antarctica,* one of the first histories of Antarctic science in the twentieth century, during the early days of the UN, there were varied calls for UN Trusteeship of Antarctica, and setting up some sort of 'Antarctic Research body.'[700] Another discussion around the best system of governance for Antarctica began to gain

[696] Roberts, Howkins, and van der Watt, "Antarctica: A Continent for the Humanities", 3.
[697] Luís Guilherme Resende de Assis, *A Proa Pressentida: táticas oceanográficas para atravessar a duração e avistar baleias no Estreito de Gerlache, Península Antártica,* (Unpublished PhD Thesis, Federal University of Santa Catarina, 2019), i.
[698] Assis, *A Proa Pressentida,* i.
[699] Assis, *A Proa Pressentida,* i.
[700] Philip W. Quigg, *A Pole Apart: The Emerging Issue of Antarctica* (New York: New Press, 1983), 164-165.

popularity with the Indian proposal at the United Nations General Assembly, as early as 1956, raising the 'Antarctic Question', and hinting that India supported a form of UN trusteeship and internationalisation of Antarctica.[701] The proposal by the Indian delegation to discuss the 'Antarctic Question' was vehemently opposed by claimants to the Antarctic, especially Britain, Argentina and Chile, who claimed that the Indian delegates did not understand 'the complexity of the Antarctic reality'.[702] When the Indian delegation next raised the question in 1958, negotiations for the Antarctic Treaty were well under way, and it seemed like the end of the question of Antarctica at the United Nations.[703] Further efforts to involve the UN in Antarctica were blocked by ATS signatories in 1971 and 1975 respectively.[704]

In November 1983, United Nations General Assembly heard from the Malaysian Prime Minister Mahathir bin Mohammad, in favour of raising the 'Question of Antarctica' at the United Nations once more.[705] Mahathir declared that 'Antarctica as the common heritage of mankind requires a regime that is truly universal in character and committed to serving the interest of the entire international community' and further, that 'the exploration of Antarctica and exploitation of its resources must be carried out for the benefit of mankind.'[706] Peter J. Beck explores the events leading up to this intervention at the UN - he and Klaus Doddd investigate the conflict between the UK and Argentina in the Falklands War, arguing that it was in part driven by the need to control potential Antarctic

[701] Adrian Howkins, 'Defending polar empire: opposition to India's proposal to raise the 'Antarctic Question' at the United Nations in 1956' *Polar Record* 2008 44(228): 35.
[702] Howkins, 'Defending Polar Empire', 40-42.
[703] Peter J. Beck, *The International Politics of Antarctica* (London: Routledge, 1986), 285-286.
[704] Peter J. Beck, 'Antarctica: A Case For The UN?' *The World Today* 1984 40(4): 169.
[705] Beck, 'Antarctica: A Case For The UN?', 166.
[706] Herber, "The Common Heritage Principle" 396.

resources.[707] Beck also analysed the raising of the 'Question of Antarctica' at the UN, noting that Malaysia had raised the topic of Antarctica at the Non-Aligned Summit Conference in Delhi in March 1983; at the meetings of the Organisation of Eastern Caribbean States in May 1983 and again at the Caribbean Community and Common Market in June 1983.[708] Given this context, Malaysia bringing the 'Question of Antarctica' to the UN was not entirely unexpected, and it brought the extractive imaginaries for the seabed to the Antarctic continent. Sanjay Chaturvedi discusses the centrality of resource exploitation to conceptions of the Antarctic future, contending that much of the contemporary geopolitical discourse around 'Antarctic futures' is predicated on the inevitability of resources use in the Antarctic, an inevitability that borders on determinism.[709] This centrality of resource exploitation, the notion that exploitation of the Antarctic is not a question of 'if', but rather a question of 'when', underpins colonial ambitions for the Antarctic, and the explains the urgency of the ATS members in creating a regime for access to, and eventually, the control of, Antarctic resources.

By 1983, the ATS had begun to expand its membership: Spain, China, Brazil and India had acceded to the treaty and become Consultative Parties prior to the beginning of the 'Question of Antarctica' at the United Nations.[710] Submissions from UN members on the Question of Antarctica were discussed,

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[707] For further reading, see: Klaus Dodds, *Pink Ice: Britain and the South Atlantic Empire* (London: I.B. Tauris, 2002); Peter J. Beck, "Britain's role in the Antarctic: some recent changes in organization," *Polar Record* 1984 22(136): 85; Peter J. Beck, 'History and Current Events: A Historian and the Media During the 1982 Falklands War' *Current Research on Peace and Violence* 1984 7(2): 165-179; Peter J. Beck, 'Britain's role in the Antarctic: some recent changes in organization,' *Polar Record* 2009 22(136): 85-87.

[708] Beck, "Antarctica: A Case For The UN?", 166.

[709] Sanjay Chaturvedi, 'The future of Antarctica: Minerals, bioprospecting, and fisheries' in Mark Nuttall, Torben R. Christensen, Martin J. Siegert (eds) *The Routledge Handbook of the Polar Regions* (London: Routledge, 2018), 404.

[710] Beck, "Antarctica: A Case For The UN?", 166.

and the Secretary-General prepared an extensive 'Study on Antarctica.'[711] This was based on information sent to the UN by SCAR. On 20th March 1984, SCAR received a formal request from Viacheslav Ustinov, the Under-Secretary General for Political and Security Council Affairs at the United Nations, asking for relevant information on scientific activities in Antarctica.[712] This request was a matter of priority, and a call for summaries from SCAR Working Groups was circulated, asking scientists affiliated with SCAR to sum up the work being carried across the continent, to provide the ICSU with the material, aimed at providing a preliminary response to the UN request.[713] The 'Question of Antarctica' at the UN in 1984 was not just focused on Malaysia applying an extractive imaginary to the Antarctic, but also involved valid criticisms of the ATS from other nations, too. The ATS was referred to as both 'a rich man's club' and 'one of the remaining vestiges of colonialism' by the Ghanaian Representative to the UN, and the signatories to the Antarctic Treaty were accused of excluding other nations from governing Antarctica.[714] The Ghanaian and Nigerian Representatives to the UN also protested against the inclusion of South Africa in ATS.[715] The ATS was ultimately declared as a colonial project, with parallels being drawn between the history of Antarctic exploration and the Scramble for Africa.

This request to SCAR for information from the UN began a longer process by which SCAR informed interested parties at the UN about the scientific research taking place in Antarctica during this period.

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[711] Peter J. Beck, 'The United Nations' Study on Antarctica' 1985 *Polar Record* 22(140): 501.
[712] *Letter from Viacheslav Ustinov to G.E. Hemmen,* 20 March 1984, SCAR 10/11/2/1, Box 48, SCAR Archives, Cambridge UK.
[713] *Letter from G.E. Hemmen to Chief Officers of SCAR Working Groups,* 27 March 1984, SCAR 10/11/2/1 Box 48, SCAR Archives, Cambridge UK.
[714] Beck, *The International Politics of Antarctica,* 184.
[715] Beck, *The International Politics of Antarctica*, 185.

SCAR commissioned Richard Fifield, who was the editor of *New Scientist* at the time, to put together a more thorough account of SCAR-facilitated science in Antarctica, with the express intent of sending the final product to UN members.[716] All SCAR Working Groups were asked to share information with Fifield regarding their activity.[717] The first draft was sent to the SCAR executive a year later, and was circulated to the scientists for comment.[718] As Walton, Clarkson and Summerhayes noted, Fifield had the 'unenviable job of trying to please this diverse group of scientific contributors as well as turning out a book that would appeal to the public and could be understood by the UN.'[719] When Fifield's draft was circulated, there were many impassioned comments from the chief officers of SCAR's working groups.[720] The final draft was agreed upon by September 1986.[721] When it was released in 1988, Fifield's final book *International Research in the Antarctic* did not receive much praise from the SCAR Executive Committee.[722] Despite this, copies were still sent to the UN for distribution to delegations.[723] SCAR-affiliated scientists felt their work was undervalued, or that the book was missing many of their original submissions for consideration; the Chief Officers felt that their work had not been adequately

[716] *Letter from G.E. Hemmen to Viacheslav Ustinov,* 6 June 1984, SCAR 10/11/2/1 Box 48, SCAR Archives, Cambridge UK.
[717] *Letter from G.E. Hemmen to Chief Officers of SCAR Working Groups,* 7 June 1984, SCAR 10/11/2/1 Box 48, SCAR Archives, Cambridge UK.
[718] *Letter from G.E. Hemmen to Chief Officers of SCAR Working Groups,* 12 September 1985, SCAR 10/11/2/1 Box 48, SCAR Archives, Cambridge UK.
[719] Walton, Clarkson and Summerhayes, *Science in the Snow,* 72.
[720] *Assorted Letters from Chief Officers of SCAR Working Groups to G. E. Hemmen,* 1985-1986, SCAR 10/11/2/1 Box 48, SCAR Archives, Cambridge UK.
[721] *Letter from G.E. Hemmen to Richard Fifield,* 26 September 1986, SCAR 10/11/2/1 Box 48, SCAR Archives, Cambridge UK.
[722] *Minutes of the SCAR Executive Meeting*, 1-3 July 1987, SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge UK.
[723] Walton, Clarkson and Summerhayes, *Science In The Snow,* 72.

acknowledged and SCAR leadership felt that SCAR's work had also been undervalued in delivering information about it to the UN.[724]

5.7 Antarctica and the Discovery of the Ozone Hole

Although it is not a focus for this chapter, the discovery of the hole in the ozone layer over Antarctica provides some necessary context for the strength of the environmental movement to protect the Antarctic in the 1980s. In October 1981, Japanese, British and other Antarctic research stations recorded a drastic 20% reduction in ozone levels above Antarctica. None of the Antarctic scientists published their results or consulted other stations to confirm their observations, believing that the reading was too low to suggest anything other than a malfunctioning instrument.[725] Findings in October a year later in 1982 mirrored their original findings, showing similar low levels of ozone, and caused alarm in the scientific community.[726] This then coupled with the published findings in 1983 from the Committee on Causes and Effects of Stratospheric Ozone from the USA, which confirmed a relationship between the amount of chlorofluorocarbons in the stratosphere and the reduction in stratospheric ozone levels.[727] In 1985, the hole in the ozone layer was confirmed by three British Antarctic Survey scientists based at Halley Bay Station, who published their findings in *Nature.*[728]

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[724] Walton, Clarkson and Summerhayes, *Science In The Snow,* 72.

[725] Stephen O. Andersen and K. Madhava Sarma, *Protecting the Ozone Layer: The United Nations History*, (London: Earthscan Publications, 2002), 13.

[726] Andersen and Sarma, *Protecting the Ozone Layer*, 13.

[727] Shigeru Chubachi, 'Preliminary Result of Ozone Observations at Syowa Station from February 1982 to January 1983,' *Environmental Science, Memoirs of National Institute of Polar Research (Special issue)*, 1984: 13-19.

[728] Joseph C. Farman, Brian G. Gardiner and Jon D. Shanklin, 'Large losses of total ozone in Antarctica reveal seasonal ClOx/NOx interaction', *Nature* 315, 6016 (1985): 207-210.

These findings, alongside the work of diplomats at the UN, provided the necessary impetus to negotiate and sign first the 1985 Vienna Convention for the Protection of the Ozone Layer, and in 1987, the Montreal Protocol.[729] The Montreal Protocol has been described by David Downie as the most successful environmental treaty to date, with a focus on the protection of the ozone, but also a focus on protecting the Antarctic environment.

5.8 Mineral Exploitation Comes To Antarctica

5.8.1 CRAMRA, SCAR and the ATS

CRAMRA was negotiated during the 1980s as a pre-emptive measure, to ensure that legally binding measures were in place should mining activities commence in the Antarctic Treaty area. At the time of its negotiation no mining had been undertaken or was occurring in the Antarctic.[730] The issue of commercial minerals exploitation was first raised informally at the Sixth ATCM in 1970 by New Zealand and was then included on the Seventh ATCM agenda in 1972.[731] This followed the raising of the question of assessing Antarctica's mineral prospectivity at the Eleventh SCAR Meeting two months previously.[732] At the Eighth ATCM in 1975 interested Parties were asked to convene a

[729] David Downie, 'Stratospheric Ozone Depletion' in Paul G. Harris (ed) *The Routledge Handbook of Global Environmental Politics.* (New York: Routledge, 2013), 33.
[730] Lee A. Kimball, 'Special Report on the Antarctic Minerals Convention' in John F. Splettstoesser and Gisela A.M. Dreschhof (eds) *Mineral Resources Potential of Antarctica, Volume 51* (Washington DC: American Geophysical Union, 1990), 275.
[731] "Report of the Sixth Antarctic Treaty Consultative Meeting, Canberra, 1970," Antarctic Treaty Secretariat, accessed June 29 2022. https://documents.ats.aq/ATCM6/fr/ATCM6_fr001_e.pdf.
[732] *Minutes of the Eleventh Meeting of SCAR, 17-22 August 1970,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.

preparatory meeting on the question of minerals exploitation.[733] References to this are found in SCAR President Tore Gjelsvik's correspondence to his predecessor Gordon Robin. Gjelsvik suggested that SCAR would be involved in the question of mineral resource extraction in Antarctica, stating that 'the Treaty parties are trying to get the scientists to solve the political questions.'[734] Despite these misgivings expressed by Gjelsvik, he added that SCAR's continued existence depended on the Treaty, and that politics and science were intertwined in Antarctica.[735]

An initial SCAR report on the effects of mineral exploration was delivered to ATS parties within the year, which suggested that it was unlikely that there would be deposits of valuable minerals in the Antarctic.[736] Several scientists wrote to SCAR Executive Secretary G. E. Hemmen with their concerns about the prospect of commercial exploitation in Antarctica.[737] At SCAR XIV in October 1976, there was a discussion on how to respond to a further request for information from the ATS on mineral exploitation; several biologists were concerned that responding to such a request would be interpreted as support for a mineral exploitation regime.[738] Others, mostly geologists, saw the opportunity to provide an accurate assessment of the potential to extract resources (namely, that it was unlikely that

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[733] "Report of the Seventh Antarctic Treaty Consultative Meeting, Wellington, 1972," Antarctic Treaty Secretariat, accessed June 29 2022. https://documents.ats.aq/ATCM7/fr/ATCM7_fr001_e.pdf.

[734] *Letter from Tore Gjelsvik to Gordon Robin,* 31 October 1975*,* SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK.

[735] *Letter from Tore Gjelsvik to Gordon Robin,* 31 October 1975*,* SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK.

[736] *Antarctic Resources: Effects of Mineral Exploration, May 1976,* SCAR 10/1/8/8, Box 38, SCAR Archives, Cambridge, UK.

[737] *Letter from Uwe Radok to G E Hemmen,* 29 October 1975, SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK; *Letter from Jim H Zumberge to G E Hemmen, 22 September 1976,* SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK.

[738] *Minutes of the Fourteenth Meeting of SCAR, 18-23 October 1976,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.

commercial exploitation in the Antarctic would be viable).[739] During the meeting, SCAR formed a Group of Specialists on the Environmental Impact Assessment of Mineral Exploration/ Exploitation in Antarctica (EAMREA) to tackle the question more thoroughly and respond to future ATS queries on the subject.[740] This led to even more concern amongst the SCAR members. In a letter to his colleague John A. Heap, Tore Gjelsvik expressed his concern about the 'hard feelings' in regards to providing SCAR advice to the Antarctic, and questioned whether SCAR's advisory role to the ATS should be re-examined.[741]

Rolf Trolle Andersen argues that the Consultative Parties to the ATS considered it a matter of urgency to conclude a regime on Antarctic mineral resources, and that the only realistic path to take at the time was to get negotiations for a mineral regime under way.[742] It certainly seemed that there was a hurry now that possible mineral wealth might be in need of regulating: in 1981, the ATCM adopted a recommendation which called on the parties to convene a special consultative meeting to develop an Antarctic mineral resources regime, specifying that such a regime should be based on principles such as the maintenance of the Antarctic Treaty; the safeguarding of Article IV of the Treaty and the

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[739] *Minutes of the Fourteenth Meeting of SCAR, 18-23 October 1976,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[740] *Minutes of the Fourteenth Meeting of SCAR, 18-23 October 1976,* SCAR 6/1/3, Box 37, SCAR Archives, Cambridge, UK.
[741] *Letter from Tore Gjelsvik to J. A. Heap*, 6 January 1976, SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK.
[742] Rolf Trolle Andersen, 'Negotiating a New Regime: How CRAMRA Came into Existence' *International Challenges* 1990 10(1): 21.

protection of the environment.[743] There were three main challenges that CRAMRA negotiations had to overcome:

- The 'internal' accommodation: the challenge of reaching a consensus between the seven claimant nations and nations who do not recognise these claims.
- The 'external' accommodation: the consideration of the wider international community, given the interest in Antarctic mineral resource activities during the 1980s.
- Establishing a balance between establishing a practical and workable regulatory system for possible minerals development in Antarctica, and ensuring that decisions to permit minerals activities did not undermine other uses of Antarctica nor significantly alter its relatively pristine environment.[744]

By 1983, the SCAR EAMRA group had produced its final report, which was rapidly approved by the SCAR executive without being handed out to international committees for a comment, and was then sent on to the Special ATCM in Bonn, where CRAMRA negotiations had begun in earnest.[745] CRAMRA negotiations took six years, and were conducted in a separate forum from the annual ATCMs, during a series of 'Special Consultative Meetings, which drew criticism for their allegedly secretive nature. During the negotiations, the SCAR EAMRA group was tasked with providing more

[743] "Report of the Eleventh Antarctic Treaty Consultative Meeting, Buenos Aires, 1981," Antarctic Treaty Secretariat, accessed June 29 2022. https://documents.ats.aq/ATCM11/fr/ATCM11_fr001_e.pdf.
[744] Kimball, "Special Report on the Antarctic Minerals Convention", 279-280.
[745] *Final report of AEIMEE,* 1986, SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.

advice, and authored a report on 'Antarctic Environmental Implications of Possible Mineral Exploration/Exploitation' in 1986.[746]

Four states had acceded to the Treaty during CCAMLR negotiations: Brazil, Poland, Bulgaria and Uruguay.[747] From the beginning of the formal negotiations process for CRAMRA until the conclusion of the negotiations on 2 June 1988, the following states both acceded to the Treaty and became Consultative Parties to it:

State	Date of Accession	Date of Consultative Party Status
Italy	18 March 1981	5 October 1987
Peru	10 April 1981	9 Oct 1989
Spain	31 March 1982	21 September 1988
China	8 June 1983	7 October 1985

[746] *Final report of AEIMEE,* 1986, SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.
[747] 'Parties', Secretariat of the Antarctic Treaty, accessed 28 May 2022, https://www.ats.aq/devAS/Parties?lang=e.

India	19 August 1983	12 Sep 1983
Sweden	24 April 1984	21 September 1988
Republic of Korea	28 November 1986	9 October 1989
Ecuador	15 September 1987	19 November 1990

There were just 3 weeks between India's accession and gaining Consultative Party status, which was in keeping with the stance of India at the United Nations, where the Indian delegate joined ATS signatories in refuting claims of ATS exclusivity. The two German states, both of which had acceded to the Treaty previously became a single Consultative Party on 2 October 1990.[748] During the same time period, two of the non-Consultative parties who had acceded to the Treaty became Consultative Parties: Brazil on 27 September 1983, and Uruguay on 7 October 1988.[749] There were also a number of states who acceded to the treaty during this time and kept their non-consultative status, namely; Papua New Guinea on 16 March 1981; Hungary on 27 January 1984; Greece on 8 January 1987; the Democratic People's Republic of Korea on 21 January 1987; Austria on 25 August 1987; Canada on 4

[748] 'Parties', Secretariat of the Antarctic Treaty, accessed 28 May 2022, https://www.ats.aq/devAS/Parties?lang=e.
[749] 'Parties', Secretariat of the Antarctic Treaty, accessed 28 May 2022, https://www.ats.aq/devAS/Parties?lang=e.

May 1988, and Colombia on 31 Jan 1989.[750] This influx of states acceding to the Treaty was directly related to CRAMRA, and its condition which stated that a nation must accede to the Antarctic Treaty in order to explore Antarctica for mineral resources and potentially profit from their commercial extraction.

The final Articles of CRAMRA set out the plans to establish a convention with three distinct bodies:

- The Antarctic Minerals Resources Commission, comprising those states which were

Antarctic Treaty Consultative Parties (ATCPs) on the date CRAMRA was opened for signature, as well as other states engaged in 'substantial scientific, technical or environmental research of relevance to minerals'.

- A Scientific, Technical and Environmental Advisory Committee. Membership of that committee was to be open to all Parties.

- Antarctic Mineral Resources Regulatory Committees with responsibility for each area designated suitable for mining activities by the commission. Each of these was to be made up of ten members including the relevant claimant state if the area lay in territory that had a previous claim to it.[751]

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[750] 'Parties', Secretariat of the Antarctic Treaty, accessed 28 May 2022, https://www.ats.aq/devAS/Parties?lang=e.

[751] Christopher C. Joyner. 'The Antarctic minerals negotiating process.' *American Journal of International Law* 1987 (81): 888–905; Karen N. Scott, 'Ice and Mineral Resources: Regulatory Challenges of Commercial Exploitation' in Daniela Liggett, Bryan Storey, Yvonne Cook and Veronika Meduna (eds) *Exploring the Last Continent: An Introduction to Antarctica* (Heidelberg: Springer International, 2015), 499-500.

The final version of CRAMRA did not incorporate the principle of the common heritage of mankind. It did not provide for a UN role in minerals planning, nor did it contain a plan for sharing revenue from commercial exploitation of Antarctic resources globally, unlike UNCLOS.[752] Moreover, Bernard Herber argues that 'since developing nations are the least likely to be economically capable of undertaking mineral activities in Antarctica, the failure to recognize Antarctica as the common heritage of mankind strikes an economic blow at these nations.'[753] It was a convention for the members of the Antarctic Treaty System alone, building on former successes designating and regulating other Antarctic resources, and aimed at laying the foundations for the exploitation of mineral resources in Antarctica, which suggested the possibility of wealth extraction, whilst never explicitly mentioning it.

There was a feeling in the SCAR EAMRA working group that SCAR was expected to give advice on potential mining activities, which would undoubtedly have a negative effect on the whole Antarctic ecosystem, and which the group expressed discomfort with.[754] The final report from the SCAR EAMRA group suggested that 'the greatest environmental concern is aroused by those activities that most hold the prospect of persistent and extensive effects on natural processes in the Southern Ocean.'[755] Jim H Zumberge, who convened the EAMRA group passed on his own reservations following the final Special ATCM concluding the negotiations of CRAMRA in Wellington in June 1988. He noted to SCAR President George Knox that he believed CRAMRA needed more

[752] Herber, "The Common Heritage Principle", 397.
[753] Herber, "The Common Heritage Principle", 397.
[754] *Final report of AEIMEE,* 1986, SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.
[755] *Final report of AEIMEE,* 1986, SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.

consideration of the environmental impacts of mining activities.[756] Not all SCAR-affiliated scientists felt that CRAMRA was to be approached with caution. In sharing his thoughts on CRAMRA in a guest editorial, American John C. Behrendt glaciologist suggested that it would have 'a positive effect on scientific research with increased funding' for a host of scientific fields of investigation, and that any possible commercial exploration for resources would have to abide by stringent protective measures.[757]

5.8.2 SCAR Skirmishes: Internal Tensions

5.8.2.1 Dissent in the Ranks

At the SCAR Meeting in June 1986, there was an important development in the creation of an Arctic equivalent to SCAR, which is the focus of the final chapter of this thesis. In San Diego, a lunchtime meeting was convened between Jim H. Zumberge, then SCAR President, Fred Roots, the scientific advisor to Canada's Minister for the Environment and Odd Rogne, the Director of the Norwegian Polar Institute, and the three discussed how best to develop a similar body for coordinating research in the Arctic. At the same meeting, ongoing disagreements about SCAR's role were discussed once more. The SCAR delegates raised concerns that SCAR meetings had become so busy with detailed business and responses to ATS questions, that there was little time left to discuss new opportunities in science.[758] Another concern was that of SCAR's profile and visibility in the wider community - in

[756] *Letter from J. H. Zumberge to G. A. Knox,* 8 July 1988, SCAR 10/11/1/4, Box 48, SCAR Archives, Cambridge UK.
[757] John C. Behrendt, 'Guest editorial: Treaty on Antarctic minerals and oil - what impact on science and environment?' *Antarctic Science* 1989 1(3): 191.
[758] *Minutes of the Nineteenth Meeting of SCAR, San Diego, 23-27 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.

response to this, it was suggested that there should be a new SCAR strategy developed at the next SCAR meeting in 1988.[759] A letter from the incoming SCAR President Claude Lorius to SCAR Executive Secretary George Hemmen details his feelings on these matters, as he states that 'it is time for SCAR to make a decision on its future.'[760] Lorius was not the only one who felt this way; shortly after the 1986 Meeting, Gunter Weller, writing on behalf of the US Polar Research Board, sent a letter to George Hemmen, calling for more collaboration with other international organisations and criticising how much time SCAR had been devoting to answering questions from Treaty Parties, which he stated had caused some scientists to question the purpose of SCAR.[761] This recurrent theme of SCAR-affiliated scientists questioning the resource costs of SCAR interaction with the treaty, and whether it was appropriate for SCAR to continue to serve the ATS in this way, was a prominent feature of internal SCAR debates in the 1980s. As SCAR President, Claude Lorius was keen to address this issue and had strong opinions on the subject. In 1987, at the SCAR Executive Committee meeting in Grenoble, Lorius voiced his concerns on a number of challenges facing SCAR. The first of these was his concern that SCAR was not able to manage so many large interdisciplinary scientific programs and wanted SCAR to have a lower profile.[762] Despite Lorius' personal misgivings, the SCAR Executive Committee would go on to give Vice-President of SCAR Gotthilf Hempel leadership over a new

[759] *Minutes of the Nineteenth Meeting of SCAR, San Diego, 23-27 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[760] *Letter from Claude Lorius to G. E. Hemmen,* 10 July 1986, SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK.
[761] *Letter from Gunter Weller to G. E. Hemmen,* 13 July 1986, SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK.
[762] *Minutes of the SCAR Executive Meeting, 1-3 July 1987,* SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK.

group of SCAR specialists on Antarctic Environmental Affairs in preparation for the various questions on environmental impacts which were foreseen due to ongoing CRAMRA negotiations.[763] In the official SCAR history, Walton, Clarkson and Summerhayes note their surprise 'that so many scientists simply failed to see that the science diplomacy had immense value' to SCAR, and that 'politics is and always has been the underpinning for Antarctic science and we forget that at our peril.'[764] Walton argues elsewhere that SCAR's activities having a science diplomacy element ensures 'that an independent scientific voice was always injected into the legal developments, and that the legitimate interests of the scientists themselves were represented in key international forums.[765] It seems that the political dimension to Antarctic research was an accepted fact for many researchers in Antarctica, who, like Walton, felt it was better to be advising the ATS than having no input into the ways in which the Antarctic environment was being brought under its control. During the late 1980s, there seemed to be the feeling amongst SCAR-affiliated scientists that politics had nothing to do with science, and that SCAR should avoid getting involved, and this would lead to one of the most drastic changes to SCAR in the splitting of Antarctic Science and Logistics.

[763] *Minutes of the SCAR Executive Meeting, 1-3 July 1987,* SCAR 10/11/1/4, Box 38, SCAR Archives, Cambridge, UK.
[764] Walton, Clarkson & Summerhayes, *Science in the Snow,* 74.
[765] David W.H. Walton, 'The Scientific Committee on Antarctic Research and The Antarctic Treaty' in Paul Berkman, Michael A. Lang, David W. H. Walton and Oran Young (eds) *Science Diplomacy: Antarctica, Science, and the Governance of International Spaces*, (Washington DC: Smithsonian Institution, 2009), 82.

5.8.2.2 The Science/Logistics Split: The Creation of COMNAP

Alongside the ongoing negotiations for CRAMRA, in 1986 many of the internal tensions in SCAR came to a head at the 1986 XIX SCAR Meeting in June. Of these, one conflict had been brewing for years: the conflict between the SCAR Working Group for Logistics, and the SCAR leadership. If SCAR represents the soft power of Antarctic science, the Logistics group was a physical representation of hard power, as representatives to the SCAR Working Group for Logistics were often political appointees from SCAR Member countries, with control over logistical support for science (often of a military nature) and the purse strings for scientific research in Antarctica. The clash between the SCAR Executive Committee and the Working Group for Logistics, which would lead to the breaking off of the Logistics group to form its own organisation, was directly related to the tensions outside of SCAR. With ATS signatories gearing up for mineral exploitation of the Antarctic continent, the time was ripe for an enactment of traditional colonial ambitions on the Antarctic, and therefore, there was less of a need to rely on the effective occupation of the Antarctic through science, and the soft power of SCAR to assert authority over the Antarctic through science.

In 1983, the American representative to the working group for logistics Edward Todd shared a scathing view of SCAR's activities, noting that 'some SCAR participants forget that commitments to SCAR are not governmental commitments by most SCAR participants who have no such charter; this confusion has led to SCAR to assume management direction of research activities to which governments are not committed.'[766] Todd's successor as the Director of the Office of Polar Programs in

[766] Alfred N. Fowler, *COMNAP: The National Managers in Antarctica* (Baltimore: American Literary Press, 2000), 32.

the US, Peter Wilkniss was equally unhappy with the way the SCAR Logistics Working Group was run, and he found an ally in his Australian counterpart, Jim Bleasel, who shared the same passion for wresting control of Antarctic Logistics away from SCAR.[767] At the SCAR XIX Meeting in San Diego in 1986, discussions were held by the SCAR Working Group on Logistics on the possibility of organising logistical operations under a separate body; the informal discussions came up with the name 'National Antarctic Programme Directors (NAPDs).'[768] At this same meeting, Jim Bleasel, was elected to the position of the Secretary for the SCAR Working Group on Logistics, which put him in a strong position to support Wilkniss' proposals.[769] During the discussions, Wilkniss suggested that too many of the relevant ATCM topics in which the NAPDs had a major interest were being missed, delayed or lost in the existing SCAR system, and to ensure this would not continue, meetings of the NAPDs were needed.[770] He added that it would be better if the NAPDs were separate from the SCAR Working Group, but suggested that they might meet at the same time and in the same place.[771] The response to Wilkniss' suggestions from the attendees in these discussions was positive, and there seemed to be plenty of enthusiasm for change, so Wilkniss offered that the US would host an extra meeting in

[767] Walton, "The Scientific Committee on Antarctic Research", 82.
[768] *Minutes of the Nineteenth Meeting of SCAR, San Diego, 23-27 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[769] *Minutes of the Nineteenth Meeting of SCAR, San Diego, 23-27 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[770] *Minutes of the Nineteenth Meeting of SCAR, San Diego, 23-27 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[771] *Minutes of the Nineteenth Meeting of SCAR, San Diego, 23-27 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.

Boulder, Colorado in 1987 to establish the new NAPD forum and determine how the agenda could be split with the SCAR Logistics Working Group.[772]

Both Wilkniss and Bleasel felt that another organisation would be a better venue for coordinating Antarctic logistics and Wilkniss communicated these thoughts in a letter after the meeting in San Diego to incoming SCAR President Claude Lorius.[773] In his letter to Lorius, Wilkniss expressed the opinion that government employees handling logistical operations should not be subservient to a non-governmental organisation such as SCAR.[774] This stance alarmed the SCAR Executive Committee, given Wilkniss' decision-making power over US Antarctic affairs and research funding, and Lorius expressed this in his correspondence with George Hemmen, SCAR's Executive Secretary.[775] Lorius took a pessimistic view of the whole affair, and of SCAR's future if the issue could not be resolved.[776] In accordance with Wilkniss' plans the first meeting of the 'National Antarctic Program Directors' was held, hosted by the US Division of Polar Programs in Colorado, in June 1987 alongside the SCAR WG.[777] Minutes from the meeting reveal that Wilkniss' proposal for a breakaway organisation outside of SCAR for Antarctic Logistics had gained the support of his counterparts in

[772] *Minutes of the Nineteenth Meeting of SCAR, San Diego, 23-27 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[773] *Letter from P. Wilkniss to C. Lorius,* 13 July 1986, SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[774] *Letter from P. Wilkniss to C. Lorius,* 13 July 1986, SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[775] *Letter from C. Lorius to G. E. Hemmen,* 14 July 1986, SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[776] *Letter from C. Lorius to G. E. Hemmen,* 14 July 1986, SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[777] Walton, Clarkson and Summerhayes, *Science In The Snow,* 75.

Argentina, Chile and Japan.[778] At this meeting, Wilkniss outlined his reasons for breaking down the SCAR Working Group on Logistics into a 'Council of Managers of National Antarctic Programmes (COMNAP) and a SCAR Standing Committee on Antarctic Logistics and Operations.[779] The discussions that followed brought with them a new set of tensions, as some attendees suggested that perhaps the new COMNAP might, in working to establish scientific priorities or the ongoing exchange of scientists between stations, be straying into SCAR territory.[780]

In October 1987, an informal meeting took place in Rio de Janeiro between Claude Lorius, and Jim Bleasel, during the Fourteenth ATCM, to discuss the future of Logistics under SCAR's oversight, which Lorius would discuss with Hemmen.[781] Lorius had told Bleasel that he did not want the Logistics group to breakaway and Bleasel was open to negotiations, even agreeing to draw up plans for possible ways the group could work within SCAR.[782] Buoyed by this, Lorius invited Bleasel to the SCAR Executive Committee Meeting in Paris in March 1988, where Bleasel presented his ideas on a new way of organising SCAR's structure to give the managers of National Antarctic Programs more power.[783] The concessions offered by the SCAR Executive Committee during these discussions

[778] *Minutes from the Meeting of National Antarctic Program Directors, 8-12 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[779] *Minutes from the Meeting of National Antarctic Program Directors, 8-12 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[780] *Minutes from the Meeting of National Antarctic Program Directors, 8-12 June 1986,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[781] *Letter from C. Lorius to G. E. Hemmen,* 22 October 1986, SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[782] Walton, Clarkson and Summerhayes, *Science In The Snow,* 75-76.
[783] *Minutes from the SCAR Executive Committee Meeting, March 1988,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.

included a place on the SCAR Executive Committee for the managers.[784] This suggestion echoed Lorius' earlier anxieties that SCAR might not survive a split from the national managers in the Logistics group. It also indicated that power was shifting away from the SCAR Leadership and over to the managers, many of whom were political appointees. Despite efforts to continue working together, at the SCAR XX Meeting in Hobart in September 1988, COMNAP would officially split from SCAR.[785] This demarcation between science as one activity and logistics as another separate activity requiring governmental oversight, is a clear example of the de-prioritisation of Antarctic science and its associated soft power. The hard power of COMNAP was being prioritised over the soft power of SCAR in national agendas for the Antarctic in 1988, and the timing of this demarcation between logistics and science, a few short months after CRAMRA negotiations had concluded and the extraction of mineral wealth from Antarctica had become a distinct and imminent possibility, is no coincidence.

5.9 The Continued 'Question of Antarctica'

After 1985, the debate on the 'Question of Antarctica' at the UN which initially involved a consensus of both treaty and non-treaty nations, quickly devolved into a polarised debate for and against the ATS.[786] The consensus between treaty and non-treaty nations ended in 1985 at the UN General Assembly, as three Resolutions were passed on; an updated UN Study on Antarctica; the provision of

[784] *Minutes from the SCAR Executive Committee Meeting, March 1988,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[785] *Meeting of the SCAR Working Group on Logistics and Managers of National Antarctic Programmes: Summary Report*, *September 1988,* SCAR 7/1/33/6, Box 48, SCAR Archives, Cambridge, UK.
[786] Beck, 'Antarctica: A Case For The UN?', 170-171.

information to the UN on the ongoing CRAMRA negotiations; and a call for the exclusion of South Africa from the ATS on the basis of its apartheid regime.[787] The ATS nations pointedly refused to participate in these votes in an effort to oppose a meaningful UN role in Antarctica.[788] An almost identical outcome occurred in 1986, with Beck suggesting that more questions were raised as to the ATS' ability to preserve its unity.[789] In 1987, several more UN Resolutions were passed, calling for a moratorium on the ongoing negotiations for CRAMRA; calling for an enhanced role for the UN in Antarctic affairs and again calling for the expulsion of South Africa from the ATS.[790] Although Richard Woolcott, the Australian Representative to the UN would refer to the repeated calls from the UN as a 'sterile annual ritual', Beck contends that this was an example of the external pressure the ATS was facing on both the question of South African membership and mineral extraction. By 1988, the 'Question of Antarctica' had changed completely, as CRAMRA negotiations concluded in June 1988, only for France and Australia to refuse to ratify the convention, which set into motion the events that would lead to another reframing of the Antarctic, and the rhetoric used to describe it.

[787] Peter J. Beck, 'Antarctica at the United Nations, 1985: the end of consensus?' *Polar Record* 1986 23(143): 160-163.
[788] Beck, 'Antarctica at the United Nations,' 160-163.
[789] Peter J. Beck, 'The United Nations and Antarctica' *Polar Record* 1987 23(147): 683-690.
[790] Peter J. Beck, 'Another sterile annual ritual? The United Nations and Antarctica, 1987' *Polar Record* 1988 24(150):140.

5.10 The Failure of CRAMRA and the Future of the ATS

5.10.1 The Unlikely Anti-CRAMRA Coalition: Greenpeace, Bob Hawke, and Jacques Cousteau

In the 1980s, a burgeoning environmental movement was growing, and it was determined to protect the Antarctic environment, not for colonial reasons, but for ideological ones. Chief amongst the groups involved in the efforts to protect Antarctica were the Antarctic and Southern Ocean Coalition (ASOC), and Greenpeace, with ASOC acting as the leading non-governmental coalition advocating for Antarctica, representing over 200 member organisations.[791] Both ASOC and Greenpeace advocated for Antarctica to be designated a 'World Park', meaning that the Antarctic environment would be effectively preserved under a UN regime applying the common heritage of mankind to Antarctica in a way that banned mineral exploitation, but would also not economically benefit developing nations.[792] In 1987, the World Park Base was established by Greenpeace at Cape Evans on Ross Island as a form of peaceful protest against the Antarctic Treaty System and the authority it had assumed over the Antarctic continent, and as a way to raise awareness of the World Park Antarctica campaign.[793] The base was used to undertake a variety of scientific studies: through providing useful and necessary data,

[791] Emma Shortis, "In the Interest of All Mankind': Women and the Environmental Protection of Antarctica' in Lara Stevens, Peta Tait and Denise Varney (eds) *Feminist Ecologies: Changing Environments in the Anthropocene*, (London: Palgrave Macmillan, 2017), 253.

[792] Ellen S. Tenenbaum, 'A World Park in Antarctica: The Common Heritage of Mankind' *Virginia Environmental Law Journal* 1990 10(1): 112.

[793] Margaret L. Clark, "The Antarctic Environmental Protocol: NGOs in the protection of Antarctica" in Thomas Princen & Matthias Finger, *Environmental NGOs in World Politics: Linking the Local and the Global*, (London, New York, Routledge), 164-165.

Greenpeace claimed that it was operating within the boundaries of the ATS, and that it was providing free, open scientific exchanges, as well as monitoring pollution at other stations across Antarctica.[794] The Greenpeace base was established at a critical period, as CRAMRA negotiations were being concluded.

Klaus Dodds hypothesises that CRAMRA negotiations would reveal the growing influence of environmental NGOs such as Greenpeace and ASOC, and the international media to challenge the legitimacy of the ATS and itc activities, which had previously evaded scrutiny from such actors.[795] Dodds' assessment is correct, but a closer look at this challenge to CRAMRA, and by extension, the ATS, reveals that capturing public imagination was also central to the failure of CRAMRA. An important actor in the challenge to CRAMRA, who would become incredibly influential in raising public awareness of it and the threat it posed to the Antarctic environment was the French filmmaker, inventor and conservationist Jacques-Yves Cousteau. Cousteau had previously attempted to influence UNCLOS negotiations by meeting with several world leaders, to argue for what he considered to be a more equitable outcome, but this did not have the desired effect.[796] Cousteau joined environmental organisations under the umbrella of ASOC in their already established campaign for designating Antarctica a 'World Park.'[797] Emma Shortis argues that after CRAMRA negotiations concluded in June 1988, Cousteau harnessed his celebrity for a global campaign in 1989 to marshall public opinion,

[794] Clark, "The Antarctic Environmental Protocol", 164-165.
[795] Klaus Dodds, 'Governing Antarctica: Contemporary Challenges and the Enduring Legacy of the 1959 Antarctic Treaty' *Global Policy* 2010 1(1): 111-112.
[796] Emma Shortis, '"Who can resist this guy? Jacques Cousteau, Celebrity Diplomacy, and the Environmental Protection of the Antarctic' *Australian Journal of Politics and History* 2015 61(3): 370.
[797] Sam Blay and Ben M. Tsamenyi, 'Australia and the Convention for the Regulation of Antarctic Mineral Resource Activities (CRAMRA)', *Polar Record* 1990 26(158): 197-198.

targeting the French, Australian and US governments to reconsider their support for CRAMRA and to commit instead to alternative protection measures for the Antarctic environment.[798] Members of Cousteau's organisation, The Cousteau Society, worked alongside campaign staff at Greenpeace and ASOC to strategise how best to tackle the issue of CRAMRA.[799] Cousteau's involvement in the campaign against CRAMRA began with a petition, which aimed for 100,000 signatures in France, to convince French President François Mitterand to stop the ratification process and seek an alternative to CRAMRA in France.[800] By April 1989, Cousteau's petition had gained over 300,000 signatures in France and furthermore, he had met with both President Mitterand and the Prime Minister Michel Rocard, to apply pressure and have the Prime Minister agree publicly that France should not ratify CRAMRA.[801]

Concurrently in Australia, the Australian Prime Minister Robert 'Bob' Hawke was under increasing pressure from activists in Greenpeace Australia.[802] Emma Shortis argues that women activists at Greenpeace Australia, and Lyn Goldsworthy in particular, were integral to applying this pressure to Bob Hawke and his government.[803] Although Cousteau was also involved in applying pressure to politicians in Antarctica, Hawke himself admits to having been personally swayed not to ratify CRAMRA before this.[804] Hawke's government signalled a shift in Antarctic politics in May 1989,

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[798] Shortis, '"Who can resist this guy?", 367.
[799] Blay, 'Australia and the Convention...', *19*7-198.
[800] Shortis, '"Who can resist this guy?", 372-373.
[801] Dan Brockington, *Celebrity and the Environment: Fame, Wealth and Power in Conservation* (London: Bloomsbury Publishing, 2009), 37.
[802] Marcus Haward and Tom Griffiths. *Australia and the Antarctic Treaty System: 50 Years of Influence* (Sydney: UNSW Press, 2011), 244-245.
[803] Emma Shortis, "In the Interest of All Mankind", 253.
[804] Robert Hawke, *The Hawke Memoirs* (London: William Heinemann Ltd, 1994), 467-468.

when it was announced that Australia would not ratify CRAMRA, in a move that was much more in keeping with Hawke's own stance on environmental conservation, and his government's strong record on conservation initiatives.[805] Hawke announced that Australia would instead seek international support for a comprehensive environmental regime for Antarctica, and shortly after, would meet with Cousteau to discuss the issue.[806] In a matter of days, Hawke had met with Mitterand and Rocard, and negotiated a joint position on CRAMRA for France and Australia.[807] Alessandro Antonello argues that the Franco-Australian rejection killed CRAMRA, and also broke the foundational treaty principle of unanimity.[808] He also suggests that despite the setback, the negotiating and environmental energies of the ATS were directed toward negotiating a new agreement on environmental protection, including a ban on mining, 'which eventuated with the Protocol on Environmental Protection to the Antarctic Treaty (the Madrid Protocol) in 1991.'[809]

5.10.2 The New Vulnerable Antarctic

Thanks to Greenpeace, ASOC and The Cousteau Society the ideas underpinning the mining moratorium which would be central to the 1991 Madrid Protocol had been introduced to the popular imagination. In *The Greening of Antarctica,* Alessandro Antonello notes that much of the rhetoric of conservation measures in the Antarctic had moved away from the idea of Antarctica as an empty space,

[805] Haward and Griffiths, *Australia and the Antarctic Treaty System*, 247.
[806] Shortis, '"Who can resist this guy?", 374.
[807] Hawke, *The Hawke Memoirs*, 470.
[808] Antonello, *The Greening of Antarctica,* 79.
[809] Antonello, *The Greening of Antarctica,* 79.

and instead, framed it as fragile, pristine and precious.[810] The changing of the rhetoric around Antarctica began with environmental groups and passionate conservationists, and was then co-opted by politicians in their refusal to ratify CRAMRA. In the years between the conclusion of CRAMRA negotiations and the signing of the Madrid Protocol, the framing of Antarctica as a fragile, pristine and vulnerable environment in need of protection became the dominant narrative about the continent. The feminist literature on Antarctica is essential to understanding the gendered nature of this rhetoric. Lisa Bloom asserts that these understandings of Antarctica as 'pure', 'pristine', 'unspoiled', and so on, align with broader narratives in nature protection which value purity and tend to feminise nature.[811] Emma Shortis describes the way that Cousteau, in his advocacy, described the Antarctic as an innocent, virginal environment: as late as 1990, Jacques Cousteau was referring to the Antarctic as 'this virgin land.'[812] As Victoria Rosner outlines, in referencing the poles 'as pure, pristine, or untouched, we hear echoes of the old talk about the seventh, virgin continent, so chilly and remote yet so sought after by men.'[813] Virginity, of course, is also associated with purity—a characterization of Antarctica that was deliberately perpetuated during the 'World Park Antarctica' campaign by environmental activists. Antarctica was, as Cousteau described it, 'the last unspoiled area of our planet.'[814] Australian Prime Minister Bob Hawke would espouse similar rhetoric about the vulnerability of the Antarctic environment, stating that it 'was inconceivable that we should put at risk the one remaining pristine

[810] Antonello, *The Greening of Antarctica,* 80.
[811] Lisa Bloom. *Gender on Ice: American Ideologies of Polar Expeditions.* (Minneapolis: University of Minnesota Press, 1993), 3.
[812] Emma Shortis, "In the Interest of All Mankind", 253.
[813] Victoria Rosner, 'Gender and Polar Studies: Mapping the Terrain.' *Signs: Journal of Women in Culture and Society* 2009 34(4): 489.
[814] Emma Shortis, 'In the Interest of All Mankind", 253.

continent.'[815] This new, pristine version of Antarctica replaced the site of international discord. It was an Antarctic that required unity and a shared duty of protection, and this rhetoric worked for both the ATS and the UN. It also challenged future colonial ambitions in Antarctica which might despoil the pristine, fragile environment, leaving CRAMRA dead in the water.

5.10. 3 Opening Up the ATS and Closing the 'Question of Antarctica'?

Bernard Herber argues that one of the major points of contention at the UN was the question of whether or not there should be a formal internationalisation of Antarctica in accordance with the common heritage concept.[816] Sanjay Chaturvedi asserts that the failure of CRAMRA due to a 'crisis of consensus', which was a 'forceful reminder that the Antarctic Treaty, despite legal-geopolitical innovation achieved under Article IV, had made its first order values a 'permanent' hostage to the colonial legacy of territorial claims, counter-claims and 'rights'.'[817] Chaturvedi also argues that the Madrid Protocol 'restored the dialogic politics and consensual diplomacy to the ATS.'[818] This crisis of consensus over the minerals issue had been much more threatening than the campaigns of the critical lobby on the 'Question of Antarctica', led by Malaysia in the UN, because the dispute was internal to the ATS and not between the ATS and those opposed to it. The negotiation and eventual signing of the 1991 Madrid Protocol just three years after the failure of CRAMRA was therefore essential to the

[815] Robert J. Hawke, *The Hawke Memoirs,* 467-468.
[816] Herber, "The Common Heritage Principle", 396.
[817] Sanjay Chaturvedi, 'The future of Antarctica: Minerals, bioprospecting, and fisheries' in Mark Nuttall, Torben R. Christensen and Martin J Siegert (eds) *The Routledge Handbook of the Polar Regions* (London: Routledge, 2018), 407.
[818] Sanjay, Chaturvedi,. *The Polar Regions: A Political Geography* (Chichester: John Wiley & Sons, 1996), 193.

continued health of the Antarctic Treaty System. The failure to ratify CRAMRA exposed the inability of the ATS to meet the challenges posed by the framing of Antarctica as a source of potential mineral wealth and the colonial ambitions associated with it. There were two Antarctic futures posed by two different international systems of governance: the 'Question of Antarctica' at the United Nations framed the Antarctic as a global commons like the oceans, a new space to apply the common heritage of mankind principle, and by extension, technoscientific and extractive imaginaries that would benefit every UN member. The ATS framed the Antarctic as territory to be commercially explored by a select, exclusive number of national actors. Both of these versions of the Antarctic were predicated on the assumption that Antarctica would be mined for resources, subject to either post-colonial or colonial ambitions. The only alternative to these two imaginaries for the Antarctic was one which removed the extractive from the imaginary altogether, by way of a moratorium on mineral exploration in the Madrid Protocol of 1991, which satisfied the critics of both UN and ATS, namely groups like ASOC and Greenpeace, who had public opinion on their side.

There are clear parallels to be drawn here between the rhetoric of Antarctica as a fragile environment in need of protection, which served to prevent UN intervention in Antarctica and the rhetoric of 'a continent for peace and science', which served to create an exclusive club of national actors to govern Antarctica. The ATS came into being in response to the threat of internationalisation of Antarctica post-IGY. Jacob Darwin Hamblin, who considers the IGY 'as much a geopolitical event as it was a

geophysical one', views the ATS as a tool for balancing power and strategic interests in the Antarctic.[819] The ATS was an outcome which opened Antarctica up to more nations with colonial ambitions, but the seven original claimants found this preferable to complete internationalisation of the continent.[820] During the 1980s, the ATS was faced with a new internationalisation threat, which might open up Antarctica and its exploitation to a radical post-colonial imaginary. To the ATS, the deferment of mining activity in Antarctica and its associated colonial ambitions, through the rhetoric that designated Antarctica a pristine and fragile environment, was again preferable to the alternative. This alternative Antarctic future imagined the Antarctic as a decolonised space, a framing of the Antarctic which could not co-exist with the ATS. Therefore, enacting a mining ban in Antarctica and opening up accession to the ATS to new Consultative and Non-Consultative Parties was the lesser of two evils for ATS Members, as it preserved their colonial ambitions for the Antarctic.

5.11 Conclusion

During the 1970s and 1980s, SCAR and ATS became more intertwined as Antarctic politics and science became increasingly complex. During the 1970s, the scientific work of projects such as BIOMASS, and geological surveys led to the understanding of Antarctica as a space which was available not only for a future colonisation and exploitation, but for exploitation under the auspices of the ATS in the present. To allow for this exploitation of first living and then mineral resources, two

[819] Jacob Darwin Hamblin, "Master of Landscapes and Seascapes. Science at the Strategic Poles during the International Geophysical Year," In *Extremes: Oceanography's Adventures at the Poles*, ed. Keith Rodney Benson and Helen M. Rozwadowski (Sagamore Beach: Science History Publications, 2007) 201-203.
[820] Adrian Howkins, "Science, Environment and Sovereignty", 256-257.

conventions were negotiated by the ATS: the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) and later the Convention for the Regulation of Antarctic Mineral Resource Activities (CRAMRA). Both sought to designate new, more commercially viable resources in Antarctica, and aimed to regulate their use to benefit primarily ATS members. In the expectation that mineral exploitation would occur, the SCAR working group on logistics, which considered itself more closely allied with national agendas rather than scientific agendas, would split from SCAR to form the Council of Managers of National Antarctic Programs (COMNAP). The membership of both SCAR and the ATS swelled as more national actors aimed to be involved in potential mineral exploitation in the Antarctic.

During this same time period, other actors outside of the ATS also began to view Antarctica as a source of potential mineral wealth. At the United Nations, after the question of applying the common heritage of mankind principle to areas beyond traditional jurisdiction was raised at the United Nations General Assembly in 1967 by the Maltese representative, these areas were designated global commons by the Group of 77 and the Non-Aligned Movement at the United Nations, who saw these spaces, namely the High Seas and Outer Space as the subjects of extractive imaginaries, and by dint of this, the source of economic wealth which could be distributed equitable amongst nations which were still recovering from European colonial rule. Given the radical imaginaries associated with other global commons, and the way extractive imaginaries featured in the Third Conference for the United Nations Convention on the Law of the Sea (UNCLOS III), it was only a matter of time until the same ideas were applied to the Antarctic.

The application of radical extractive imaginaries from actors at the United Nations, in the Group of 77 and the Non-Aligned Movement, led to the introduction of the 'Question of Antarctica' at the United Nations General Assembly by the Malaysian Prime Minister in 1983, where it would remain a subject of discussion annually. This 'Question of Antarctica' debate allowed developing nations to question the validity of the ATS during the negotiations for CRAMRA, posing questions as to why the mineral wealth from Antarctica and any associated economic benefits should only be reaped by a select few countries in a closed system of governance with an expensive barrier to entry.

The debates at the United Nations weakened the case for CRAMRA, as did the rise in environmental campaigning to protect the Antarctic environment from mining activities, which was spearheaded by Greenpeace and ASOC. However, despite these challenges, CRAMRA negotiations were completed on 2 June 1988, only to fall victim to an unexpected alliance between French and Australian governments who responded to environmental campaigns from celebrity Jacques Cousteau and environmental groups alike, and in doing so, refused to ratify the convention, which, given their status as claimant nations, made it impossible to fully ratify CRAMRA.

In response to these challenges, the Antarctic was reframed once more, in a way that served the ATS, and in a direct parallel to the way the Antarctic had been framed as a continent for peace and science. After the failure of CRAMRA, and growing public pressure to protect the Antarctic in light of the discovery of the hole in the ozone layer over the Antarctic, the Antarctic became a fragile, vulnerable environment in need of protection, and the question of mineral exploitation, which had been so

closely linked to both colonial and postcolonial extractive imaginaries, was deferred by the negotiation, signing and ratification of the 1991 Madrid Protocol.

6. Conclusion

6.1 Conclusion

This thesis applied several frameworks to a study of the Scientific Committee on Antarctic Research (SCAR). The first chapter of this thesis draws from traditions of critical geography, postcolonial theory and the newly emerging body of science diplomacy literature, and their applications to Antarctica. This allowed for this thesis to investigate the activities of SCAR through a critical lens to elucidate the impacts and implications of SCAR's activity in the Antarctic over the latter half of the twentieth century. This thesis began from a perspective that assumes that the Antarctic is a space which is continuously subjected to colonial ambitions and imaginaries by national actors.These ambitions have influenced and shaped the scientific activity in the Antarctic since 1958, and contributed to the ongoing colonisation of the Antarctic, through an exertion of authority and control over the Antarctic environment in place of a more traditional form of colonisation that seeks to subjugate an indigenous population and extract resources and wealth from a colony for the benefit of the imperial metropole. This is predominantly achieved by decided what constitutes a resource in Antarctica, and then creating a legal instrument associated with the ATS to regulate activities which concern the resource in question.

The second chapter of this thesis explored the scientific activity in Antarctica during the International Geophysical Year (IGY) and the role of SCAR in coordinating international collaboration on a hitherto unseen scale during the IGY. This international collaboration generated a new form of

scientific internationalism, which in turn generated enough political goodwill to set into motion the negotiations for the Antarctic Treaty. However, this chapter also showed that despite the new scientific internationalism seen in Antarctica during the IGY, political paranoia and cold war tensions were very much present during this period. These tensions were present on an international scale but also between scientists and their respective governments.

Exchange of scientists was offered as a gesture of political goodwill during the preparations for the IGY. The reason for using exchange of scientists between nations during the IGY was to alleviate, or seem to alleviate, political tensions. Exchanges often translated into lifelong friendships, but did not impact the political tensions between their respective nations, but they did allow for an enactment of colonial ambitions on the Antarctic environment during and after the IGY.

Chapter two also discussed the ways in which meteorological research allowed nations to expand their Antarctic presence and in doing so, also enact colonial ambitions under the guise of providing weather data from remote parts of the Antarctic across the continent. In this way, meteorology allowed for a covert enactment of colonial ambition on the Antarctic. Facilitated by SCAR, Antarctic meteorology expanded concurrently with important developments in the political history of Antarctica during the IGY and reflected the colonial ambitions of the national actors funding the research.

Chapter 3 established that SCAR became a permanent fixture in Antarctic science after the IGY. SCAR's activity in harnessing scientific internationalism contributed in part to the negotiation, signing and ratification of the Antarctic Treaty and the creation of a new system of governance for the Antarctic. However, despite this, SCAR was not formally linked to the Antarctic Treaty, but this

chapter shows the ways in which it can be argued that they were organisationally co-dependent. This lack of defined relationship and the alteration of SCAR's status from 'administrative' body, to a 'coordinating' body during its first meeting after the IGY foreshadowed some of the future conflicts between the two bodies, and between the roles of science and politics in Antarctica.

Chapter three made use of original material from the SCAR archive to show that the role of SCAR during the early years of both SCAR and the ATS was to legitimise and validate the existence of both bodies and their authority in the Antarctic. Many of the scientific exchanges that took place during these early years embodied Cold War tensions, and the nature of these scientific exchanges still inevitably echoed Cold War loyalties to the US or USSR. During the same period, another key role of SCAR was its coordination of meteorological research, in: setting up the International Antarctic Analysis Centre (IAAC) in Melbourne; sustaining its activities, and collaborating with the WMO to establish the World Weather Watch (WWW)'s Antarctic component. This encouraged international cooperation and collective funding of transnational science, whilst also being a useful tool in establishing a permanent 'apolitical' presence, and was a tool of ongoing effective occupation of the Antarctic. During this period, the archival and secondary material show that SCAR was integral to the reframing of the Antarctic as a space dedicated to science and peace alone, despite evidence to the contrary, which suggested that both activities reflected the colonial ambitions of ATS member states and their own national agendas.

By the late 1960s and early 1970s, it became impossible to divorce ongoing scientific activity in the Antarctic from the colonial ambitions of the members of the ATS. and the national agendas of these

actors. During this period, three relationships between science and sovereignty in the Antarctic became apparent, which this chapter elucidated.

The first of these relationships is one in which scientific investigation is used to change the perception of previous iterations of the same activity in the Antarctic, to obfuscate past colonial desires. Examples from this chapter are the Convention for the Conservation of Antarctic Seals (CCAS) and the activities of the SCAR working group on cartography and geodesy. In this chapter, it is shown that this relationship is successful in allowing the UK to reframe its previous exploitative activity by being a passionate proponent of seal conservation whilst also taking advantage of the opportunity to act as a depository for all CCAS-related documentation, an action which illustrated that conservation measures like CCAS were also seen as useful tools for enacting a new type of control and power over the environment by a state that harboured ongoing colonial ambitions in the Antarctic. The SCAR working group on cartography and geodesy undertook several projects to draw up new, more accurate maps of the Antarctic, but SCAR's attempt to bring cartography under its 'apolitical' remit could not, in fact, obfuscate the colonial link between mapping territory and claiming it, illustrating the limitation to SCAR's ability to depoliticise activities which had a clear and obvious link to colonial ambitions for the Antarctic, and traditional methods of enacting power over colonised territory.

The second of these three relationships is one which uses scientific activity to effectively assert a form of collective authority over the Antarctic. The Agreed Measures for the Conservation of Antarctic Flora and Fauna (AMCAFF), CCAS, and SCAR's ongoing collaboration with the WMO in meteorological research are examples of this relationship between science and sovereignty, and the use

of science for an assertion of sovereignty and authority over the Antarctic. Once both SCAR and the ATS had been established and validated, the ATS began to use efforts to conserve the Antarctic environment and wildlife to delineate which parts of the Antarctic environment and wildlife could be controlled by regulating access to them. In this respect, both AMCAFF and CCAS were both instruments in not only conservation, but in designating what could be considered a resource to be controlled.

The third relationship between science and Antarctic sovereignty relies on an unspoken Antarctic imaginary applied by each national actor in the ATS. In this imaginary, the ATS is treated as though it will not exist in perpetuity, and there is the assumption that Antarctica will not always have territorial claims frozen. National agendas have prepared for this eventuality, and most scientific activity in Antarctica serves these agendas by preserving the Antarctic for a future nationalism, which is illustrated by every instrument of the Antarctic Treaty, which seeks to control and exert power over potential resources from the Antarctic environment.

Chapter five of this thesis explores events during the 1970s and 1980s which forced change for both SCAR and the ATS. SCAR projects such as BIOMASS and surveys into the potential for mineral resources in Antarctica led to the inevitable understanding of Antarctica as a space which was available for exploitation in the traditional sense. The designation of these resources, both in the sea around Antarctica and on the continent itself, as resources to be regulated by the ATS, led to the negotiation of two conventions in this period: CCAMLR and CRAMRA. The membership of both SCAR and

the ATS swelled as more national actors saw the potential for the extraction of wealth from the Antarctic through mineral exploitation during the negotiation period for CRAMRA.

During this time, spaces beyond tradition forms of jurisdiction framed as sources of potential resource wealth, were designated 'global commons' by actors at the United Nations, who saw these spaces, namely the High Seas and Outer Space as the subjects of extractive imaginaries, and by dint of this, the source of economic wealth which might be distributed in radical and equitable ways amongst nations which were still recovering from European colonial rule. This framing of Antarctica as a global commons and the common heritage of mankind led to the introduction of the 'Question of Antarctica' at the United Nations General Assembly. This debate, which would last over a decade, posed questions as to why the mineral wealth from Antarctica and any associated economic benefits should only be reaped by a select few countries in the ATS, which was referred to as 'a vestige of colonialism.'

The debates at the United Nations weakened the case for the ratification of CRAMRA, as did the rise in environmental campaigning by actors such as Greenpeace and ASOC to protect the Antarctic environment from mining activities. In response, the relationship between SCAR and the ATS was strengthened by the introduction of a formal and defined relationship between the two bodies. The Antarctic was also reframed once more, in a way that served the ATS, and in a direct parallel to the way the Antarctic had been framed as a continent for peace and science in the late 1950s. The Antarctic became a fragile, vulnerable environment in need of protection, and the question of mineral exploitation, which had been so closely linked to both colonial and postcolonial extractive imaginaries,

was deferred by the negotiation, signing and ratification of the 1991 Madrid Protocol. In this period, SCAR and its activities were able to reframe Antarctica as a fragile and vulnerable environment in need of protection, which could not be mined for mineral wealth, and this was distinctly advantageous for both SCAR and the ATS. The 1991 Madrid Protocol and the creation of the Committee for Environmental Protection (CEP) to enact it, reinforced the legitimacy of the ATS as a system of governance, and reinforced the centrality of science to the framing of Antarctica.

Ultimately, this thesis posits that the Antarctic is subject to colonial ambitions, and that it is colonised in a distinct way, which, in the absence of an indigenous population to subjugate, involves the exertion of control over the Antarctic environment. Therefore, the ways in which the Antarctic has been used or conserved over the last sixty years take on a new dimension: one in which regulating the presence in Antarctica and defining what constitutes a resource to be exploited, allows would-be colonial powers to then regulate which actors have access to Antarctica's resources, in the past, in the present, and in the future.

6.2 Future Lines of Inquiry

This thesis would have benefited greatly from more lines of enquiry. Of these, a focus on more feminist literature would surely have contributed to a greater depth of understanding, specifically in the ways Antarctica has been framed as fragile and the ways in which this framing is intertwined with colonial ambitions for, and historical attitudes to, Antarctica. Similarly, being able to more effectively explore

the relationships between the global commons, and to incorporate some of the excellent theoretical work being done in this regard would have also strengthened the arguments of this thesis.

As always, the opportunity to carry out a wider variety of archival research would have benefitted this thesis, but chances to visit archives were severely limited by the COVID-19 pandemic. Specifically, several visits to The National Archive in London would have helped to clarify the extent to which political actors and scientists involved in the early years of SCAR's history may have been aware of the colonial subtext underpinning much of the early conservation efforts of the Antarctic Treaty System.

Oral histories would also have contributed greatly to this project, and absolutely should be a focus for any future work in this area. Many of the actors mentioned in chapters four and five of this thesis are still with us, and it would be important to include their histories in a future examination of the history of SCAR. As the SCAR and IASC archives are still relatively unexplored, future research should also focus on a more thorough exploration of these sources of material than could be managed during a pandemic. The original plan for the final chapter of this thesis, which was not written due to a lack of access to archival material, was to explore in greater detail the framing of the Antarctic as a fragile environment in need of protection, and to use material from both SCAR archives, and the newly declassified material in The National Archives from this period, so future work building on this thesis, should also make use of these sources of research material.

The central argument of this thesis is a bold one, and one which invites further work. It would have been possible to go into much further detail for each instance recorded in this thesis, and to dedicate an

academic career spanning decades into exploring and elucidating the unique shape that colonialism takes in Antarctica. I hope that this thesis has opened the door for another scholar to walk through.

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