



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

Research Commons

<http://researchcommons.waikato.ac.nz/>

## Research Commons at the University of Waikato

### Copyright Statement:

The digital copy of this thesis is protected by the Copyright Act 1994 (New Zealand).

The thesis may be consulted by you, provided you comply with the provisions of the Act and the following conditions of use:

- Any use you make of these documents or images must be for research or private study purposes only, and you may not make them available to any other person.
- Authors control the copyright of their thesis. You will recognise the author's right to be identified as the author of the thesis, and due acknowledgement will be made to the author where appropriate.
- You will obtain the author's permission before publishing any material from the thesis.

**MacKinder meets Buzan: A Geopolitical Extension to  
Security**

**Complex Theory with an emphasis on the Polar Regions**

A thesis submitted in fulfillment  
of the requirements for a degree of

**Doctor of Philosophy**

in

**Political Science**

at

**The University of Waikato**

By

**Denis Richard Gibbs**



THE UNIVERSITY OF  
**WAIKATO**  
*Te Whare Wānanga o Waikato*

**2011**

## *Abstract*

Throughout the centuries interstate wars have been fought over territory to satisfy the requirement of states' to secure sufficient land and resources to meet the lifestyle needs and economic aspirations of their citizens. While in the past, the conditions precipitating war were predominantly anthropogenic in their origin, in the twenty-first century, wars are increasingly likely to be the consequence of worldwide environmental degradation. Two environmental conditions that have paralleled humanity's unceasing drive for wealth and prosperity are becoming significant threats to the security of every state: these threats are global climate change and natural resource scarcity. Although these two threats are global in stature, their impact will initially influence security interdependencies at the state and regional levels.

Regional security complex theory is a methodological attempt to explain why traditional – military and political – security interdependencies trigger the aggregation of geographically contiguous states into regional groupings defined by the social condition of amity or enmity. However, strictures embedded within this typology prevent the same methodology from being used to explain regionalisation when threats arise from non-traditional sources or the affected states lack geographic contiguity. To overcome this methodological impediment, this thesis proposes a theoretical enlargement – a “hybrid” theory – which combines methodologies drawn from sector security analysis with essential elements of “externalities” and “Shatterbelts” drawn from Regional Orders and Geopolitics ontologies respectively.

To test the authority of the “hybrid” theory, two futuristic scenarios are composed, each representing a possible, even probable, future for the two Polar Regions. Each scenario depicts the world in the year 2035, when the human population and individual wealth will likely be of a magnitude greater than they are today and when the world is also detrimentally affected by an increasingly inclement climate and the declining availability of natural resources. Common to both scenarios are

potential changes to the political world order and the growing worldwide influence of emerging great powers in Asia and Latin America.

In the contemporary Arctic, the future is already being determined by the inimical politics of oil. In a scenario where the Arctic region has become progressively less sanguine, the “hybrid” theory suggests that antagonisms between Arctic-rim countries will forge the establishment of at least one security complex. There will, therefore, be a security response to the region-wide competition for resources. As the twenty-first century unfolds, the presence in the Arctic of non-Arctic states as resource competitors heightens the probability that established security complexes will transmute into conflict prone shatterbelts.

The Antarctic Treaty currently prohibits both the commercialisation and militarisation of the continent. It is an institutional regime that is not due to be reviewed until mid-century. Antarctica is a continent like no other for its legal status remains ill-defined and the existing seven territorial claims attract no universal endorsement. Given this political environment, the “hybrid” theory suggests, that in a world experiencing a severe shortage of resources no security complex will form in Antarctica but, instead the region will become a shatterbelt or the loci for resource wars.

### *Acknowledgements*

As with the writing of any thesis a number of people, either directly or indirectly, have assisted in its completion. The completion of this thesis has been a longstanding personal goal which would not have been possible without the guidance and encouragement of my supervisors, Dr Mark Rolls, from the Department of Political Science and Public Policy and Dr Willem de Lange, from the Department of Earth and Ocean Sciences. Without their support this thesis would have remained an elusive dream.

I take this opportunity to thank the University of Waikato for the scholarship I received, for study becomes easier when the financial burden is lightened through a generous gift. I also thank the staff of the Department of Political Science and Public Policy for their encouragement and friendship.

No acknowledgement could be complete without thanking my family, Nick and Michelle, Kate and Harley and Matthew and Kim, for their continuing support and untiring interest in a topic as new to them as it was to me. A similar debt of gratitude goes to my steadfast friends whose interest and encouragement never wavered.

By far my deepest gratitude goes to my partner Catherine; for once again she joined me on my personal journey with a willing heart. Without her unstinting support I may well have succumbed to the pleasures of idleness.



Map 12	Regions of Multiple Stresses as at 2040	218
Map 13	Arctic Region	240
Map 14	Arctic showing boundaries of claims and disputed territories	252
Map 15	Antarctica and the Southern Ocean	272
Map 16	Antarctica showing warming for a fifteen year period ending 2007	275
Map 17	Known mineral occurrences and probable areas of oil and natural gas reserves	294
Map 18	The region within the Arctic known as the “Area”.	321

<b>Chapter One</b> .....	<b>1</b>
Introduction.....	1
<b>Part I</b> .....	<b>233</b>
<b>Chapter Two</b> .....	<b>233</b>
Introduction: Towards a Single Theory.....	233
<b>Chapter Three</b> .....	<b>311</b>
Regional Security Complex Theory .....	311
<b>Chapter Four</b> .....	<b>522</b>
Regional orders.....	522
<b>Chapter Five</b> .....	<b>722</b>
A Non-traditional Approach to Security Complex Theory .....	722
<b>Chapter Six</b> .....	<b>1033</b>
The Politics of Geography.....	1033
<b>Chapter Seven</b> .....	<b>13535</b>
Conclusion: A Compendium of Theories .....	13535
<b>Part II</b> .....	<b>1411</b>
<b>Chapter Eight</b> .....	<b>1411</b>
Introduction: People, Climate and Resources .....	1411
<b>Chapter Nine</b> .....	<b>15858</b>
Scenario Driver – Resource Scarcity .....	15858
<b>Chapter Ten</b> .....	<b>1933</b>
Scenario Driver - Climate Change .....	1933
<b>Chapter Eleven</b> .....	<b>22424</b>
Conclusion: A Lack of Will.....	22424
<b>Part III</b> .....	<b>22929</b>
<b>Chapter Twelve</b> .....	<b>22929</b>
Introduction: The Thawing of Frozen Wealth .....	22929
<b>Chapter Thirteen</b> .....	<b>23737</b>
The Arctic: The High North .....	23737
<b>Chapter Fourteen</b> .....	<b>26969</b>
Antarctica: The Deep South .....	26969
<b>Chapter Fifteen</b> .....	<b>3022</b>
Discussion - The Precarious Poles.....	3022
<b>Chapter Sixteen</b> .....	<b>34444</b>
Conclusion: A Bleak Future.....	34444
<b>Bibliography</b> .....	<b>35757</b>



## Acronyms and Abbreviations

AAT	Australian Antarctic Territory
ACIA	Arctic Climate Impact Assessment
AEPS	Arctic Environmental Protection Strategy
AFRICOM	United States Africa Command
AOSIS	Alliance of Small Island States
AR4	Fourth Assessment Report
AT	Antarctic Treaty
ATCP	Antarctic Treaty Consultative Parties
ATP	Antarctic Treaty Parties
ATS	Antarctic Treaty System
BANZARE	British-Australian-New Zealand Antarctic Research Association
BAS	British Antarctic Survey
BP	British Petroleum
°C	Degrees Celsius
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CCAS	Convention for the Conservation of Antarctic Seals
CH <sub>4</sub>	Methane
CHM	Common Heritage of Mankind
CIS	Commonwealth of Independent States
CO <sub>2</sub>	Carbon dioxide
CP	Consultative Parties
CRAMRA	Convention on the Regulation of Antarctic Mineral Resources
CSCT	Classical Security Complex Theory

CSIS	Centre for Strategic and International Studies
CSS	Critical Security Studies
DCDC	Development, Concept and Doctrine Centre
DoD	United States Department of Defense
EEZ	Exclusive Economic Zone
EU	European Union
EWG	Energy Watch Group
FAO	United Nations Food and Agriculture Organisation
FID	Falkland Islands Dependency
Gb	Billion Barrels
GDP	Gross Domestic Product
GHG	Greenhouse Gases
GIUK	Greenland-Iceland-United Kingdom Gap
GT	Gigatonnes
IEA	International Energy Agency
IFPRI	International Food Policy Research Institute
IGY	International Geophysical Year
IPCC	Intergovernmental Panel on Climate Change
LNG	Liquefied Natural Gas
MOC	Meridional Overturning Circulation
Mtoe	Million tonnes of oil equivalents
NATO	North Atlantic Treaty Organisation
NGL	Natural Gas Liquids
NGO	Non-governmental Organisation
NIC	United States National Intelligence Council
NOAA	National Oceanic and Atmospheric Administration

NORAD	North American Aerospace Defense Command
NSR	Northern Sea Route
ODP	Ocean Drilling Program
OECD	Organisation for Economic Cooperation and Development
OPEC	Organisation of Petroleum Exporting Countries
PEPAT	Protocol on Environmental Protection to the Antarctic Treaty
PPP	Purchasing Power Parity
ADR	Quadrennial Defense Review
REE	Rare Earth Elements
RN	Royal Navy
RRR	Remaining Recoverable Reserves
RSC	Regional Security Complex
RSCT	Regional Security Complex Theory
SCAR	Scientific Committee on Antarctic Research of the International Council of Scientific Unions
SIPRI	Stockholm International Peace Research Institute
SLBM	Submarine-launched Ballistic Missile
SLOC	Sea Lines of Communications
SRES	Special Report on Emission Scenarios
SSBN	Nuclear-powered Ballistic Missile Submarine
SSC	Sector Security Complex
SSCT	Sector Security Complex Theory
SSN	Nuclear-powered Attack Submarine
tCO <sub>2e/p</sub>	Tonnes of carbon dioxide equivalent per persons
TPES	Total Primary Energy by Source
UN	United Nations
UNCLOS	United Nations Convention on the Law of the Sea

UNFCCC	United Nations Framework Convention on Climate Change
URR	Ultimate Recoverable Reserves
USGS	United States Geological Survey
WTO	World Trade Organisation
WWF	World Wildlife Fund

## Chapter One

### Introduction

**A**lthough the Cold War threat of nuclear conflagration has largely receded into history, states have not reaped the much vaunted ‘peace dividend’ so earnestly sought by world leaders two decades ago. Indeed, the traditional military and political security threat posed by the Soviet Union and its Warsaw Pact cohorts has been replaced by so called ‘non-traditional’ security threats such as ethnic rivalry, terrorism, environmental degradation, climate change, forced migration and pandemic diseases. Therefore, it is of little wonder that globally contemporary human society has become increasingly driven with uncertainty and insecurity. Under conditions of uncertainty, Gimpl and Dakin have noted the existence of a fundamental paradox in human behavior “the more unpredictable the world becomes the more we seek out and rely upon forecasts and predictions to determine what we should do.”<sup>1</sup>

Forecasting, prediction or speculation, for these are interchangeable terms, has a seductive quality that human society finds difficult to resist. This is true of predictions about future geopolitical events, especially future wars. Such predictions range from the cautionary like those of General Sir John Hackett<sup>2</sup> and Alfred Price,<sup>3</sup> both of whom during the Cold War wrote ‘predictive’ essays about the coming of World War III, to the supernatural such as Michael Rathford’s interpretation of Nostradamus’ prophetic quatrains that foretold of a world of 2008 racked by a global nuclear war.<sup>4</sup> Yet another seer, the eminent historian Niall Ferguson, suggested that a devastating nuclear exchange would signal the beginning of the 2007-2011 “Great Gulf War;” a war waged between America

---

<sup>1</sup> See Gimpl, M. L. and S. R. Dakin, ‘Management and Magic’, *Californian Management Review*, Fall 1984, p. 125.

<sup>2</sup> See Hackett, General Sir John, *The Third World War: August 1985*, New York, Berkeley, 1980.

<sup>3</sup> See Price, Alfred, *Air Battle Central Europe*, London, Sidgwick & Jackson, 1986. This predictive essay described a possible air war scenario fought over the flatlands of Northern Germany during the non-nuclear phase of a major conflict between NATO and Warsaw Pact forces between the years 1986 and 1990.

<sup>4</sup> See Rathford, Michael, ‘The Nostradamus Code: World War III 2008-2012’, <http://www.nostradamus.org> (9 January 2008).

and Iran.<sup>5</sup> Even the prestigious British weekly, *The Economist*, is not beyond dabbling in predictions about forthcoming security predicaments; one prediction going under the title “Defence in the 21<sup>st</sup> Century.”<sup>6</sup> In the post-Cold War world predictions are commonly about interstate wars over diminishing natural resources that might even force allies to turn against each other.<sup>7</sup> One prediction even went so far as to suggest that the United States will soon need to use its military power to curtail other states hegemonic aspirations, an action seen as the precursor of coming global warfare.<sup>8</sup>

Dire predictions are not the sole province of international politics; they are equally prevalent in the natural sciences, especially where the overuse of natural resources is the topic of discussion. Thomas Malthus (1776-1834), through his much derided Malthusian Principle, predicted that since “[t]he power of population is infinitely greater than the power in the earth to produce substance for man”<sup>9</sup> humanity’s misery is assured.” According to Malthus, human population in the future will founder and collapse if these two unequal powers – unchecked human population growth and food production – are not kept equal.<sup>10</sup> Today, as never before, these two powers are diverging to a point where a number of states can only support their human population by reaping the “ghost acreage,”<sup>11</sup> that is, by importing food from other countries and/or harvesting food from the sea. Natural science predictions are often couched as ‘likelihood’ scenarios; a series of discrete predictions positioned along a probability continuum. One end of this continuum is fixed by the most pessimistic, often the

---

<sup>5</sup> See Ferguson, Niall, ‘Tomorrow, when the war began,’ Auckland, *New Zealand Herald*, January 21, 2006, p. B14. A war between these two protagonists is also foreseen as a probable consequence of current United States policy towards Iran by Robert Baer, a former Central Intelligence Agency operative who first visited Iran in 1978. See Baer, Robert, *The Devil We Know: Dealing with the new Iranian superpower*, Scribe, Melbourne, 2009. pp. 249-262.

<sup>6</sup> See Beedham, Brian, ‘Defence in the 21<sup>st</sup> Century: Meet your unbrave new world’, *The Economist*, September 5<sup>th</sup> 1992, pp. 3-20.

<sup>7</sup> For example, see Friedman, George and Meredith LeBard, *The Coming War with Japan*, New York, St. Martin’s Press, 1991.

<sup>8</sup> See Joffe, Josef, ‘Why the World Still Needs Mr. Big’, *Newsweek Special Issues*, December 2007/February 2008, pp.26-27.

<sup>9</sup> Malthus, Thomas Robert, *An Essay on the Principle of Population*, Penguin Books, Harmondsworth, 1798, Reprint 1976, p. 71. In 1803, Malthus published his *Essay on the Principle of Population* in which he maintained that unrestrained human population increases in a geometric ratio, while food production increases in an arithmetic ratio. Malthus states the obvious when he wrote “[a] slight acquaintance with numbers will show the immensity of the first power in comparison with the second.” *Ibid.*

<sup>10</sup> *Ibid.*

<sup>11</sup> See Catton, William R JR., ‘Overshoot’, in Philip Appleman (ed.), *Thomas Robert Malthus: An Essay on the Principle of Population*, Norton, New York, 2004, p. 177.

business-as-usual-scenario, while the other end is anchored by the most optimistic, and often the author's recommended policy option.<sup>12</sup> Increasingly, the more pessimistic of these scenarios, especially those cataloguing environmental degradation, are couched as looming cataclysmic events using terms similar to those highlighting the inevitability of a Third World War. Not unrealistically, many of these authors foresee environmental degradation as the harbinger of human conflict.

In 2005, Colin Gray, a widely acclaimed author and strategist, went as far as to predict that under conditions of abrupt climate change and diminishing natural resources, warfare would once again define human life.<sup>13</sup> More recently (2008), five of the West's most senior military officers and strategists argued that the North Atlantic Treaty Organisation (NATO) must be prepared to carry out pre-emptive nuclear strikes to halt the progress of numerous threats to Western values and way of life. Included in this list of threats was climate change and mass human migration.<sup>14</sup>

Despite their obvious failings, predictions appear an attractive exercise, in part, because predictions are so rarely checked against subsequent experience. Those who make predictions remember only their successes and prefer to forget their failures. According to Marguerite Kramer, in international affairs systematic efforts to evaluate predictions and to relate success or failure to a particular method or intellectual perspective are rare. Sometimes this is no more than an unwillingness to compare a forecast with records of events, but more often it is the way predictions are made in the first place.<sup>15</sup> The noted researcher and author Michael Crichton, maintains that the complexities inherent within natural and social systems makes suspect the very notion that events can be predicted with any accuracy.<sup>16</sup> However, predictions are usually not expressed with sufficient

---

<sup>12</sup> For a contemporary example, although by no means the only example, see World Wildlife Fund, *Living Planet Report 2006*, Banson, Cambridge, 2006, pp.20-24.

<sup>13</sup> See Gray, Colin S., *Another Bloody Century: Future Warfare*, Weidenfield & Nicolson, London, 2005, p. 396.

<sup>14</sup> See AAP, 'Nuclear dawn for the West,' *New Zealand Herald*, January 23, 2008, p. B1.

<sup>15</sup> See Kramer, Marguerite and Bruce Russett, 'Images of World Futures', *Journal of Peace Research*, Vol. 21, No. 4, 1984, p. 317.

<sup>16</sup> See Crichton, Michael, 'Complexity Theory and Environmental Management,' Speech to the Washington Centre for Complexity and Public Policy, Washington D.C., November 6, 2005, <http://www.crichton-official.com/speech-complexity.html> (14 April 2008).

precision to enable an independent observer to determine whether or not they were actually fulfilled.<sup>17</sup>

Because of this shortcoming it could be argued that speculation about the future, especially in the absence of hard data, only serves to exacerbate an existing sense of uncertainty and insecurity. While this is a compelling argument there are two worthy counter-arguments. First, as Thérèse Delpech claims, it is simply not true to say that nothing is known about the future and in particular the future state of international affairs. While it might be difficult to predict in detail world affairs for one year let alone for a decade or two hence, it would be an exaggeration to say that absolutely nothing is known about the future.<sup>18</sup> Delpech also argues that it would be a mistake to assume that nothing enables us to imagine the future since history tells us that the world usually goes in the direction of our thinking.<sup>19</sup> Thus, according to Delpech, by the year 2025 our thinking is unlikely to have advanced much beyond today's international security issues: global terrorism, continued proliferation of weapons of mass destruction, and China's role in world affairs.<sup>20</sup>

Secondly, as futurist Alvin Toffler maintains, musing about the future is a credible academic discipline for highlighting civilization's uncertain destiny. Toffler, in his seminal book *Future Shock*,<sup>21</sup> acknowledged that no person can speak with any precision and certainty about future events. However, Toffler makes a pertinent point in maintaining that lack of precision and certainty is no excuse for silence. Also of considerable import is his contention that "[W]here 'hard data' are available, of course, they ought to be taken into account. But where they are lacking, the responsible writer – even the scientist – has both a right and an obligation to rely on other kinds of evidence, including impressionistic or anecdotal data and the opinions of well-informed people."<sup>22</sup> When considering the future, Toffler is of the opinion that it is more important to be imaginative and insightful than to be 100 per cent 'right', and that speculation does not have to be 'right' to be enormously useful.<sup>23</sup> In the fields of climate change and resource

---

<sup>17</sup> Kramer, *op. cit.*, p. 317.

<sup>18</sup> See Delpech, Thérèse, *Savage Century: Back to Barbarism*, Carnegie Endowment for International Peace, Washington, 2007, p. 82.

<sup>19</sup> *Ibid.*, p. 83.

<sup>20</sup> *Ibid.*, p. 84.

<sup>21</sup> See Toffler, Alvin, *Future Shock*, Pan books, London, 1970, p. 15.

<sup>22</sup> *Ibid.*

<sup>23</sup> *Ibid.*



scarcity speculation is rife. Much of this may ultimately be proved wrong but, right or wrong such speculation could turn out to be enormously useful in charting humanity's future.

Speculation about the likelihood of an adverse event occurring is often dismissed as nothing more than an unlikely worst-case scenario espoused by the ill-informed. However, given the undeniable seriousness of climate change, Gwyn Prins argues for the import into this arena of the Cold War military threat assessment tool – worse case analysis.<sup>24</sup> Like Prins, Michael Edwards also suggests that a direct analogy can be drawn between the case of climate change and nuclear war and therefore worst-case analysis is an appropriate analytical tool.<sup>25</sup> Furthermore, Prins maintains that "... military worst-case analysis can be extremely powerful in moving from analysis to action. It forces choices and that, in addressing the environmental security threat, this is just the sort of forcing we require."<sup>26</sup> Nonetheless, worst-case analysis when applied to climate change is not without its failings. Edwards' worries that developed countries might use such an analysis to coerce the developing world into submitting to a new strand of colonialism – ecocolonialism<sup>27</sup> – or worse still, it will create a new subset of environmental refugees<sup>28</sup> – 'climate refugees'.<sup>29</sup> It is not impossible that under a worst-case scenario, created to cover the situation of depleted energy resources, to

---

<sup>24</sup> See Prins, Gwyn and Robbie Stamp, *Top Gun and Toxic Whales: The Environment and Global Security*, Earthscan Publications, London, 1991. p.71.

<sup>25</sup> See Edwards, Michael J., 'Climate Change, worst-Case Analysis and Ecocolonialism in the Southwest Pacific', *Pacifica Review*, Vol. 8, No. 1, 1996, p. 78.

<sup>26</sup> Prins & Stamp, *op. cit.*, p. 71.

<sup>27</sup> Edwards, *op. cit.*, p. 78.

<sup>28</sup> Gwyn Prins mentions that a leading authority on the adverse impacts of environmental degradation has suggested that degraded environments throughout the world (i.e. those environments unable to grow sufficient food due in part to climatic changes) would result in no fewer than 65 million environmental refugees by the year 2000. See Prins, Gwyn, 'A New Focus for Security Studies,' in Desmond Ball and David Horner (eds.), *Strategic Studies in a Changing World: Global, Regional and Australian Perspectives*, Australian National University, Canberra, 1992, p. 198. This figure will in the future pale into insignificance due to the unrelenting advancement of deserts. In the years ahead it has been estimated that desertification will place at least 135 million people worldwide at risk of being driven from their lands. See Renner, Michael, 'Security Redefined,' in Michael Renner, Hilary French and Erik Assadourian (eds.), *State of the World: Global Security 2005*, Earthscan, London, 2005, p. 8. Whilst Andrew Simms of the United Kingdom based New Economic Foundation predicts that 50 million people worldwide will be displaced by 2010 because of rising sea-levels, desertification, depleted aquifers, weather-induced flooding and other serious environmental changes. See West, Larry, 'Scholars Predict 50 Million Environmental Refugees by 2010,' *About.Com:Environmental Issues*, 2007, <http://environment.about.com/od/globalwarming/a/enviorefugees.htm> (20 June 2007).

<sup>29</sup> See Edwards, Michael J., 'Security implications of a Worst-Case Scenario of Climate Change in the South-west Pacific,' *Australian Geographer*, Vol. 30, No. 3, p. 317.

foresee whole communities or even nations being forced to move to where a semblance of a petroleum economy still functions. Some industry experts call this scenario the “psychological avalanche,”<sup>30</sup> which conceivably would result in a flood of ‘oil refugees.’

Barry Buzan also cautions against worst-case scenario thinking since it can deny consideration of other alternatives to direct military action as a means of resolving security issues.<sup>31</sup> Michael Renner, using the nomenclature “livelihood insecurity,” maintains that pressures on society and people often translate into a political dynamic that increases both polarization and radicalization. Worst-case outcomes usually arise where grievances are left to fester. Thus, Renner suggests that while worst-case outcomes do not necessarily lead to violent conflict they can result in lengthy periods of instability and mass suffering that create conditions that may jeopardize the basic fabric of communities and states.<sup>32</sup>

Despite these concerns, Prins remains emphatic that climate change is one environmental problem where worst-case analysis has a direct application since there is no intermediate position between the worst-case and best case scenarios.<sup>33</sup> Furthermore, Prins,<sup>34</sup> Edwards,<sup>35</sup> and to a limited extent Renner,<sup>36</sup> maintain that when predicting worst-case outcomes the only assumptions that can safely be made are pessimistic ones. Unfortunately, today’s society tends to treat pessimistic predictions in exactly the same manner as the ancient Trojans treated their Goddess Cassandra’s prophetic visions – they might be true but they are not to be believed.

While this thesis is hopefully visionary and not overly pessimistic, there appears little point in discussing any vision other than the worst-case scenario

---

<sup>30</sup> A “psychological avalanche” would be the likely outcome from a situation where a country finds that it can no longer import enough oil because of a spike in price or local supply problems. Media hysteria then creates within the public an impression of a looming oil shock and panic buying ensues that ultimately degenerating into a global grab for oil. See Sample, Ian, ‘Final warning,’ *New Scientist*, Vol. 198, No. 2662, 28 June 2008, p. 34.

<sup>31</sup> See Buzan, Barry, *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*, Pearson, Harlow, 1991, p. 140.

<sup>32</sup> See Renner, Michael, ‘Security Redefined’, in Michael Renner, Hilary French and Erik Assadourian (eds.), *State of the World: Global Security 2005*, Earthscan, London, 2005, p.5.

<sup>33</sup> Prins, ‘A New Focus for Security Studies,’ p. 213.

<sup>34</sup> Prins, *ibid.*, p. 198.

<sup>35</sup> Edwards, 1996, *op. cit.*, p. 66,

<sup>36</sup> Renner, *op. cit.*, p. 6.

since given the chosen subject matter, a best-case climate change scenario is rapidly moving beyond humanity's reach.<sup>37</sup>

Since the end of the Cold War many analysts have attempted to broaden and deepen the concept of security by redefining the central principle of contemporary international relations. Prior to 2001 and the centrality international terrorism imposed upon this debate, several authors gained prominence by identifying what, in their opinion was security's new defining principle. Among these authors were Samuel Huntington,<sup>38</sup> who claimed that global security dynamics could in the future be shaped by a "clash of civilizations"; Robert Kaplan,<sup>39</sup> who depicted a world overtaken by human population excesses leading to environmental degradation and international anarchy; Thomas Homer-Dixon<sup>40</sup> and Michael Klare,<sup>41</sup> both of whom foresaw the growing shortage of natural resources as a threat to global security.

The traditional concept of security which evolved over the course of the Cold War was viewed as a function of interstate power competition. It took the sovereign state as the principal referent (the thing to be made secure) and was concerned only with military threats or threats emanating from an 'enemy' state. Moreover, security has customarily been considered synonymous with 'military security' since in the past most challenges to state sovereignty have come from externally initiated state aggression.<sup>42</sup>

However, the problem in any study of post-Cold War security is that there is now no agreement on what constitutes 'security.' Since the end of the Cold War the view of security has been increasingly focused on non-traditional security

---

<sup>37</sup> See United Nations, *Confronting Climate Change: Avoiding the Unmanageable, Managing the Unavoidable*, United Nations Foundation, New York, February 2007, p. XVIII. Also view United Nations Environmental programme, *Global Environmental Outlook GEO4*, United Nations, New York, 2007, pp. 395-454. While the World Wildlife Fund maintains that humanity has only five years to save the planet from the ravages of climate change – see Amanda Brown, 'We have five years to save the planet: WWF,' Auckland, *New Zealand Herald*, May 16, 2007, p. A13. For a report on the consequences of ecosystem degradation see Millennium Assessment Board, *Millennium Ecosystem Assessment Synthesis Report*, New York, United Nations, March 23, 2005, p. 27.

<sup>38</sup> See Huntington, Samuel P., *The Clash of Civilizations*, Touchstone, New York, 1997.

<sup>39</sup> See Kaplan, Robert D., 'The Coming Anarchy,' *Atlantic Monthly*, February 1994, pp. 44-75.

<sup>40</sup> See Homer-Dixon, Thomas F., *Environment, Scarcity and Violence*, Princeton University Press, Princeton, 1999.

<sup>41</sup> See Klare, Michael T., *Resource Wars: The New Landscape of Global Conflict*, Metropolitan Books, New York, 2001,

<sup>42</sup> See Rowlands, Ian, 'The security challenges of global environmental change,' *Washington Quarterly*, Winter 1991.

threats.<sup>43</sup> Non-traditional security threats differ from the more traditional ones in numerous ways. First, they are not necessarily state centered but stem from factors or actors that are sub-state or trans-state in character. Secondly, they have no single geographical locus because they are so diffuse, multidimensional and multidirectional in make-up. Thirdly, they often cannot be countered by military means alone, as their resolution often requires a raft of non-military approaches. Finally, they represent a threat to every level of society from the individual to the global community.

Barry Buzan explores this traditional/non-traditional security dichotomy from a perspective created by dividing the security genre into five recognisable sectors - military, political, societal, economic and ecological.<sup>44</sup> As all five of these security sectors can interact it is often difficult to examine one while at the same time excluding an examination of the remaining four. For some the environment is not accepted as a threat to national security and, therefore, does not warrant the 'security' categorization. In arriving at this stance, however, many commentators overlook the fact that the boundary between these five sectors is blurred. Thus, environmental threats in many instances can also be classified as societal, economic, or even military ones,<sup>45</sup> and therefore fit into the rubric of traditional security.

Marc Levy and Joseph Nye argue that the environment refers to physical and biological systems, as distinct from political, economic and other social constructs.<sup>46</sup> The propensity amongst security commentators to list natural resource scarcity, especially of mineral deposits, as an environmental security issue is highly problematic since mineral resources do not involve "biological or physical systems characterized either by significant ecological feedbacks or by their importance to the sustenance of human life".<sup>47</sup> Furthermore, Levy and Nye are not alone for there is a cohort of scholars who continue to reject any suggestion that the environment is a security issue. In their view such an inclusion

---

<sup>43</sup> See Dokken, Karin, 'Environment, security and regionalism in the Asia-Pacific: is environmental security a useful concept?' *The Pacific Review*, Vol. 14, No. 4, 2001, p. 518.

<sup>44</sup> Buzan, *op. cit.*, pp. 116-133.

<sup>45</sup> See Buzan, Barry, Ole Wæver and Jaap de Wilde, *Security: A new Framework for Analysis*, Lynne Rienner, Boulder, 1998, p. 175.

<sup>46</sup> See Levy, Marc A., 'Is the Environment a National Security Issue,' *International Security*, Vol. 20, No. 2, 1995, pp. 35-62 and Joseph S. Nye and Sean M. Lynne-Jones, 'International Security Studies,' *International Security*, Vol. 12, No. 4, 1988, pp. 5-27.

<sup>47</sup> Levy, *op. cit.*, p. 39

will only serve to weaken, possibly wreck, the foundation upon which the concept of national security has been painstakingly built since the inception of the Cold War. This viewpoint is completely opposite to that taken by Jessica Tuchman Mathews and Richard Ullman<sup>48</sup> in their respective seminal essays and it is also contrary to the views of Homer-Dixon and Klare. These four scholars claim that depletion of any form of natural resource is a security issue and one that constitutes a major threat to the national security of all states. Despite this lack of unanimity amongst security commentators over the existence of an environment-security nexus, there is little disunity amongst commentators that biospheric issues do represent a national security threat.

Climate change appears to have reached an ill-defined threshold of acceptance as a threat to national security. Indeed, it appears to be accepted as a threat of some significance at all levels of analysis, be that at the global, regional, state, societal or individual level. Such acceptance raises the question as to whether this contemporary biospheric phenomenon<sup>49</sup> should remain a sub-set of the environmental security genre or warrant a distinct category of its own. Interestingly, Levy accepts that the biosphere warrants inclusion in the traditional security genre, although he remains adamant that the environment *per se* was not a security concern.<sup>50</sup> While this distinction is an interesting digression, it is one that will not be pursued further in this thesis.

John Mearsheimer doubts that any threat emanating from the degradation of the global commons - for that is what the biosphere is - was likely to threaten the survival of states, especially powerful states. Therefore, according to Mearsheimer, climate change constitutes, at the most, only a second-order

---

<sup>48</sup> See Ullman, Richard H., 'Redefining Security,' *International Security*, Vol. 8, No. 1, 1983, pp. 129-153 and Jessica Tuchman Mathews, 'Redefining Security,' *Foreign Affairs*, Vol. 62, No. 2, 1989, pp. 162-177.

<sup>49</sup> The term biosphere has been defined by James Lovelock as "a self-regulating entity with the capacity to keep our planet healthy by controlling the chemical and physical environment." While this definition is similar to that offered by Levy, neither definition is all-encompassing. This definitional restriction resulted in Lovelock coining the term 'Gaia', for Gaia includes the earth's biosphere, atmosphere, oceans and soils which combine to form a cybernetic system to provide the optimal conditions for life on earth. See Bryer, Gary C., *Gaia's Wager*, Rowman & Littlefield, Oxford, 2001, pp. xix-xxi.

<sup>50</sup> Levy, *op cit.*, p. 39. Klare suggests that wars in the twenty-first century will be fought not over ideology but over commodities, as states battle to control the dwindling supply of natural resources. Under this scenario, Klare posits that interstate wars will not be caused by environmental degradation but, environmental degradation will be the inevitable outcome of any international scramble for resources and consequently environmental degradation could result in further intra-state conflicts.

security threat.<sup>51</sup> This position is vigorously contested by Mark Lacy who maintains that Mearsheimer's continued advocacy of "offensive realism" has blinded him to the rising importance of non-traditional security threats in general and climate change specifically.<sup>52</sup> As a global event, climate change is, according to Buzan and his co-authors, comparable to past global events such as the two World Wars and the Great Depression - an event that will affect every corner of the world to differing degrees.<sup>53</sup> Given the societal and economic calamity wrought by these three twentieth-century events, climate change arguably warrants greater status in the security lexicon than that afforded to it by Mearsheimer.

The causal link between climate change and security is often assumed as indirect or even tenuous, but evidence does exist that climate change induced environmental stresses can metamorphose into national and international security threats. This progression has been identified by a number of authors and analysts.<sup>54</sup> Moreover, the idea that climate change induced environmental problems could trigger war has not been lost on the United Nations. In 2004, the UN convened a 'global summit' to consider the range of possible environmental threats to the national security of nation-states and how these might be mitigated.<sup>55</sup> In 2006, the United Nations Secretary-General Ban Ki-moon announced that climate change was likely to be globally catastrophic and a major

---

<sup>51</sup> See Mearsheimer, John J., *The Tragedy of Great Power Politics*, Norton, New York, 2001, p. 372.

<sup>52</sup> See Lacy, Mark J., *Security and Climate Change: International Relations and the Limits of Realism*, Routledge, Abingdon, 2005.

<sup>53</sup> Buzan et al., *Security: A New Framework for Analysis*, p. 85.

<sup>54</sup> See Gleick, Peter H., 'The Implication of Global Climatic Changes for International Security,' *Climatic Change*, Vol. 15, 1989, pp.309-325; Homer-Dixon, Thomas, 'Environmental and Demographic Threats to Canadian Security,' *Canadian Foreign Policy*, Vol. 2, No. 2, 1994, p. 17; Edwards, 'Security Implications of a Worst-case Scenario of Climate Change in the South-west Pacific,' *op. cit.*, pp. 311-330; Barnett, Jon, 'Security and Climate Change,' *Tyndall Centre Working Paper No. 7*, October 2001; Strippel, Johannes, 'Climate change as a security issue,' in Edward A. Page and Michael Redclift (eds.), *Human Security and the Environment International Comparisons*, Elgar, Cheltenham, 2002, pp. 105-127; Shibuya, Eric, 'Climate Change and Small Island States: Environmental security as National Security,' in Eric Shibuya and Jim Rolfe (eds.), *Security in Oceania in the 21<sup>st</sup> Century*, Asia-Pacific Centre for Security Studies, Honolulu, 2003, pp. 137-150; Lacy, *op. cit.*; Brown, Oli, Anne Hammill and Robert McLean, 'Climate change as the 'new' security threat: implications for Africa,' *International Affairs*, Vol. 83, No.6, 2007, pp. 1141-1154.

<sup>55</sup> See Associated Press, 'UN studies environmental catalysts for warfare,' *The New Zealand Herald*, Auckland, April 1, 2004, p. B4.

precipitator of war and conflict.<sup>56</sup> More recently, in April 2007, the United Nations Security Council held its first ever debate on the likely impact climate change would have on global peace and security.<sup>57</sup>

Prior to these contemporary warnings, Neville Brown suggested that altering climatic conditions could wreak a ‘paradigmatic change’ to the way security is viewed, similar to the change in academic thought brought about by the creation of nuclear deterrence theory.<sup>58</sup> Other authors, such as Peter Gleick, consider climate change will no more than exacerbate existing security issues rather than being a principal cause of conflict. Unlike Brown though, Gleick foresees climate change, and the manner in which it may alter access to natural resources in the future, as a significant cause of interstate tension that could result in pre-emptive military action, especially by a strong state against a weaker, but resource-rich neighbour.<sup>59</sup> If Gleick is correct, then a multilateral solution to the climate change/resource scarcity/security nexus appears unlikely.

Although the link between climate change and security has received considerable acceptance there is still no universal acceptance amongst climatologists as to whether the Earth’s climate is actually changing, whether the planet is warming rather than cooling,<sup>60</sup> and if changes are indeed occurring the extent to which they are of anthropogenic origin.<sup>61</sup> Yet, irrespective of the climatologist’s view, public perception is that the climate is indeed changing and warming rather than cooling. This view, according to the sceptics, is being driven by both the climate change prophets - such as the former United States Vice President Al Gore<sup>62</sup> and distorted presentations of scientific findings by the

---

<sup>56</sup> See United Nations, ‘Climate change as dangerous as war: U.N. chief Ban,’ *Reuters*, 3 November 2006, <http://nz.news.yahoo.com/070301/5/3oe.html> (March 2, 2007).

<sup>57</sup> See United Nations, ‘Security Council holds first-ever debate on impact of climate change on peace and security,’ 27 April 2007, <http://www.un.org/Docs/Scinfo.htm> (4 May 2007).

<sup>58</sup> See Brown, Neville, ‘Climate, ecology and international security,’ *Survival*, Vol. XXXI, No. 6, 1989, p. 531.

<sup>59</sup> Gleick, *op. cit.*

<sup>60</sup> A prediction that Earth will enter a cooling phase due to a new Solar Minimum around 2040-2050 has been proposed by Nils-Axel Mörner. See Mörner, Nils-Axel, *The Greatest Lie Ever Told*, JOFO Grafiska A, 2007, p. 15.

<sup>61</sup> For the view of a climate change disbeliever or sceptic see Akasofu, Syun-Ichi, ‘Storm in a Teacup Over Climate Change,’ *Far Eastern Economic Review*, Vol. 170, No. 7, September 2007, pp. 27-31. A similar view is expressed by Chris de Freitas in a newspaper article titled ‘Emotion clouding underlying science of global warming,’ *New Zealand Herald*, Auckland, January 5, 2011, p. A11.

<sup>62</sup> See Al Gore, *an inconvenient truth*, London, Bloomsbury, 2006, for a counter to the sceptic’s view.

media.<sup>63</sup> Possibly, but not necessarily,<sup>64</sup> the most independent and authoritative source of current knowledge on climate change and its future global impacts is the United Nations' sponsored Intergovernmental Panel on Climate Change (IPCC). In the latest of its four assessments (2007) the IPCC has concluded that "most of the observed increase in the globally average temperature since the mid-20<sup>th</sup> century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations."<sup>65</sup> Although there is often unease over the accuracy of forecasts developed through computer generated climate modeling, the IPCC concluded that there was sufficient correlation between observed and modeled changes to climate to have a high degree of confidence that "[a]nthropogenic warming over the last three decades has had a discernible influence on many physical and biological systems. Other effects of ... climate change on natural and human environments are emerging, although many are difficult to discern due to adaptation and non-climatic drivers."<sup>66</sup> The report catalogues the key impacts of a predicted increasing global average temperature change ranging up to five degrees Celsius (relative to global mean average temperature for the period 1980-1999).<sup>67</sup> It also identifies the effect such changes are likely to inflict on various geographical regions from as early as 2020.<sup>68</sup>

Although the argument over the extent to which anthropogenic forcing is responsible for climate change is likely to rage for some time yet, it is an argument of no consequence to this thesis. What matters is whether or not climate change is occurring. On that point the IPCC, as the recognized global authority, has stated categorically that the world is currently in the throes of climate change. By accepting the IPCC's report this thesis is relieved of having to justify the occurrence of climate change.

The link between resource scarcity and violence has also come in for close scrutiny; particularly by the Peace and Conflict Studies Program University of

---

<sup>63</sup> Akasofu, *op. cit.*, p. 28.

<sup>64</sup> British researchers who have seen drafts of the Fourth Assessment Report of the IPCC (2007) claim that it was significantly watered down when governments became involved in writing it. For additional information see Pearce, Fred, 'Climate report 'was watered down,' *New Scientist*, Vol. 193, No. 2594, 10 March 2007, p. 10 or online web site [www.meridian.org.uk/whats.htm](http://www.meridian.org.uk/whats.htm).

<sup>65</sup> See Intergovernmental Panel on Climate Change, *Contributions of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers*, p.9, [IPCC Summary Report \(2007\).pdf](#) (20 August 2007).

<sup>66</sup> *Ibid.*

<sup>67</sup> *Ibid.*, p. 16.

<sup>68</sup> *Ibid.*, p. 13.



Toronto and the American Academy of Arts and Science. Based on the detailed analysis of sixteen case studies the program director, Professor Thomas Homer-Dixon, concluded that during the early part of the twenty-first century the world will experience a steady increase in the incidence of violent conflict caused, in part, by environmental scarcities.<sup>69</sup> Homer-Dixon believes that such violence would be the probable outcome of deteriorating social effects, such as impoverishment and migration, resulting from an unending series of scarcities caused by the continuing depletion and degradation of renewable resources such as forests, croplands, river water and wild fish stocks.

While depletion of renewable resources can provide illustrative examples of looming environmental catastrophes that humanity might have to grapple with, it is the diminishing availability of non-renewable resources that is the central pivot of this thesis. As with renewable resources, the global demand for many key minerals is growing at an unsustainable rate. According to the World Wildlife Fund (WWF) humankind consumed nearly one-third of the earth's available natural wealth in the twenty-five years between 1970 and 1995.<sup>70</sup> This study, released in 1998, revealed a significant decline in the availability or quality of many critical resources, including freshwater and fossil fuels. This led researchers to conclude that humanity will, in the near future, face a significant shortage of many vital resources.<sup>71</sup> As global consumption rises and environmental conditions deteriorate – amplified by climate change – the total supply of many resources will diminish rapidly and the price of whatever remains will inevitably rise.

In some instances scarcities will be ameliorated by exploiting new sources of supply, which may well include either or both Polar Regions, or the introduction of substitute materials. Some societies with the means to do so will simply pay a higher price for whatever they need or desire – as China and India are doing currently. However, neither substitute materials nor market forces can solve every resource problem and thereby avert all future resource conflicts. As Klare points out, some commodities such as water cannot be replaced by another substance and nor can many poor societies afford to pay for their resource needs. In these circumstances, conflict may arise between states over access to resources,

---

<sup>69</sup> Homer-Dixon, *Environment, Scarcity, and Violence*, *op. cit.*, p. 4.

<sup>70</sup> Klare, *op.cit.*, p. 18.

<sup>71</sup> *Ibid.*

and within states over resource entitlements. Furthermore, as prices rise, contending groups and political elites in resource wealthy countries will have a greater incentive to forcibly seize and retain control of non-renewable resources.<sup>72</sup> This conclusion is supported by Arthur Westing, of the Stockholm International Peace Research Institute (SIPRI),<sup>73</sup> who contends that human society depends for its very survival on resources derived from the environment and that warfare, being a prominent human activity, was one means by which access to these resources was achieved. According to Westing, once natural resources are in short supply, either globally or regionally, there is a high probability of the occurrence of interstate rivalries, disputes, and wars.

Whereas contemporary literature generally differentiates natural resources into either renewable or non-renewable, Westing categorizes them either as living or non-living. This removes, for example, the difficulty of how to categorize fresh water; a resource often categorized as either renewable, non-renewable or both. Since Westing's categorisation appears to be both the simplest and least confusing it will be used in this thesis.

Having established the strength of the climate change–resource scarcity–security nexus it is necessary to consider further one aspect of security's ontology. In the absence of an over-arching global authority, societies and states exist in a world conditioned by anarchy - a world where violence is likely to be both spontaneous and uncontrollable.<sup>74</sup> Neither realism nor idealism can adequately explain every international relations event. For example, neither belief anticipated the end of the Cold War nor could either adequately explain the rapid disintegration of the Soviet empire.<sup>75</sup> Whereas both realism and idealism tend to focus on material factors such as power or trade, a new theory, constructivism,<sup>76</sup>

---

<sup>72</sup> *Ibid.*, p. 20.

<sup>73</sup> See Westing, Arthur, H., 'Environmental factors in strategic policy and action: an overview,' in Arthur Westing (ed.) *Global Resources and International Conflict*, Oxford University Press, Oxford, 1986.

<sup>74</sup> See Wendt, Alexander, 'Anarchy is what states make of it: the social construction of power politics,' *International Organization*, Vol. 46, No. 2, 1992, p. 392.

<sup>75</sup> See Walt, Stephen M., 'International relations: One World, Many Theories', *Foreign Policy*, No. 110, Spring 1998, p. 41.

<sup>76</sup> J. Samuel Barkin holds that constructivism unlike idealism and realism is not a set of assumptions about how politics works but assumptions about how to study politics. As such it is compatible with a variety of political paradigms, including realism. Although often seen as closer to idealism than realism, constructivism enables scholars to study the relationship between normative structures, such as political morality, and the uses of power. Constructivism can provide a useful counter against those who assume that realism is only about the use of power in pursuit of

places considerably more emphasis on the impact of ideas. Instead of taking the state for granted and assuming that its principal goal is to survive, constructivist theory regards the interests and identities of states as highly malleable, the result of specific historical processes. Of particular relevance to constructivism is the prevailing discourse in society, because discourse reflects and shapes beliefs and interests and establishes accepted norms of behaviour. Thus, constructivism explains the end of the Cold War as being the outcome of former president Mikhail Gorbachev's transformation of Soviet foreign policy and the embracement of new ideas such as "common security."<sup>77</sup> Political constructivism referenced in this thesis is aligned to the 'applied' theoretical concepts espoused by Alexander Wendt<sup>78</sup> rather than the 'pure' or radical interpretations of the reality discourse that underpin Paul Watzlawick's book "The Invented Reality."<sup>79</sup>

Irrespective of its ontological profile, constructivism, like idealism and realism, has now developed numerous strands<sup>80</sup> with a theme common to all strands being the capacity of discourse to shape how political actors define themselves and their interests, and thereby modify behaviour. At the level of a state the political actors are the governing elite and it is they who seek to modify the behaviour of the citizenry. In order to achieve behavioural and attitudinal

---

a set of selfish goals, such as survival and material gain. See Barkin, J. Samuel, 'Realist Constructivism,' in Hans J. Morgenthau, revised by Kenneth W. Thompson and W. David Clinton, *Politics Among Nations: The Struggle for Power and Peace*, McCraw Hill, New York, 2005, p.598. However, it must be said that social discourse has in the past been used by states to draw their populace into the pursuit of selfish goals and no doubt in the future states will do so again. Both realism and constructivism have a role to play in this thesis.

<sup>77</sup> Walt, *op. cit.*

<sup>78</sup> See Wendt, Alexander, 'Constructing International Politics,' *International Security*, Vol. 20, No. 1, 1995, pp. 71-81.

<sup>79</sup> See Watzlawick, Paul (ed.), *The Invented Reality: How Do We Know What We Believe We Know?*, W. W. Norton, New York, 1984.

<sup>80</sup> Constructivist theory was first applied to international relations at the close of the Cold War by Nicholas Greenwood Onuf and, according to Stephen Walt it was a replacement for the discredited radical theories of Marxism. Onuf, along with fellow constructivist Fredrich Kratochwil, view society and the state as institutions governed by norms (decisions that shape society) and rules (acts that change society's behaviour) which are developed through discourse created by everyday use of language or speech acts. A third constructivist and the proponent who popularized the theory Alexander Wendt draws on sociological traditions to assert that international politics is a construct not a given, because identities and interests are constructed and supported by intersubjective practice. While the works of Onuf and Kratochwil appear to have little in common with that of Wendt, except the label, they all recognise other's contribution. See Zehfuss, Maja, *Constructivism in International Relations; The politics of reality*, Cambridge University Press, Cambridge, 2002, pp. 10-23. Intersubjectivity means a shared understanding. *Ibid.*, p. 120.

changes, the elite not infrequently turn events into security problems<sup>81</sup> by manufacturing threats so that the “state” can claim unto itself special rights. In the final analysis these rights are always defined by the state or its representatives. In describing the mechanism by which discourse is used to define security, Ole Wæver turned to language theory which thus enables “security” to be defined as a *speech act*. Simply put, if the state or the elite can through discourse convince their citizenry that a particular issue is a security problem then the issue can be securitized and the resources of the state mobilized accordingly. Therefore, providing the citizens are convinced that both climate change and resource scarcity will deleteriously affect their lives, both have the potential to be securitized.

A fundamental principle of constructivist social theory is that actors (people or states) act towards ‘others’ on the basis of what the ‘other’ means to them. States act differently towards friends than they do towards enemies, because friends do not pose the threat that enemies do. Thus, states construct social relationships amongst themselves based on a mutual feeling of amity or enmity. The disintegration of Yugoslavia provides a contemporary example of such a social construction. Kosovo’s declaration of independence in February 2008, with the tacit approval of numerous North Atlantic Treaty Organisation powers, created enmity between itself and Serbia over the loss to Serbia of territory, whilst simultaneously creating amity with Albania centred on historical kinship ties. While amity and enmity among states can be either inter-subjectively or exogenously initiated, both amity and enmity exert a strong pressure on states to coalesce into security collectives. It is this tendency that underpins Barry Buzan’s classical security complex theory (CSCT) and is the force behind regional security complex theory (RSCT).<sup>82</sup>

Regional security complexes (RSC) are, according to Buzan, clearly defined by a durable pattern of amity and enmity in the form of regional or geographically

---

<sup>81</sup> Although Wæver’s chapter is essentially constructivist he ascribes a realist definition to the term ‘security problems’ by maintaining these are “developments that threaten the sovereignty or independence of a state in a particularly rapid or dramatic fashion, and deprive it of the capacity to manage by itself. ... Such threats must therefore be met with the mobilization of the maximum effort” See Ole Wæver, ‘Securitization and Desecuritization’, in Ronnie D. Lipschutz (ed.), *On Security*, Columbia University Press, New York, 1995, p. 54. This definition makes the state the sole referent object by precluding all other security concerns from reaching this status; an interesting paradox.

<sup>82</sup> Buzan, *People, States and Fear*.

coherent patterns of security interdependencies.<sup>83</sup> The particular characteristics of a regional security complex are shaped by historical factors such as long-standing enmities or cultural linkage to a specific geographical region. Close geographic contiguity tends to generate more security interaction than between states located at some distance from each other. While the impact of geographical proximity on security interaction is most keenly felt in the military, political, societal and environmental sectors, this does not preclude a regional security complex from including states separated by a significant geophysical barrier or geographic distance. The question of geographical contiguity is discussed by Lake and Morgan who, unlike Buzan, maintain that close geographical proximity is not necessary for a state to be a member of a security complex.<sup>84</sup>

Security complexes are also discernable by the relative intensity of security interdependence amongst states in a complex and the security indifference between these states and surrounding states. Furthermore, the intensity of the security interdependence is generally decided by the domestic vulnerabilities, the nature of state-to-state relations, the level of interaction between a region and neighbouring regions, and the role played by great powers in the region.<sup>85</sup> The spread of a great power's influence from one security complex into another is the prime determinant in the creation of a security supercomplex. In the post-Cold War World, East and South Asia together form the Asian supercomplex.<sup>86</sup>

Not all the world falls within either a regional security complex or a super-complex. Currently, according to Buzan *et al*, Greenland is classified under security complex theory as an 'Insulator': a region that faces two regional security complexes, but is not strong enough to unify both into one.<sup>87</sup> Under a less common classification, Antarctica is described as an 'unstructured security region': a region formed when a country fails to display sufficient security interdependence with neighbouring states to create the essential structure of a regional security complex.<sup>88</sup>

---

<sup>83</sup> Buzan, *et al.*, 'Security complexes: a theory of regional security,' p. 45.

<sup>84</sup> See Lake, David A. and Patrick M. Morgan (eds.), *Regional Orders: Building Security in a New World*, Pennsylvania University Press, Pennsylvania, 1997, p. 30.

<sup>85</sup> Buzan, *et al.*, *Regions and Powers, op. cit.*, p. 51.

<sup>86</sup> *Ibid.*, p. 62.

<sup>87</sup> *Ibid.*, p. 41.

<sup>88</sup> The essential structure of an RSC embodies four variables: **a)** boundary, which delineates the RSC from its neighbours; **b)** anarchic structure, which means that an RSC must be comprised of

Classical security complex theory focuses primarily on the state, in which political and military sectors are the key elements of analysis. However, as previously noted, since the end of the Cold War other security sectors (economic, environment and societal) have assumed greater importance in the wider security debate. In recognition of this, Buzan and others posit that each of these sectors could create their own security complex whose boundaries may coincide with classical regional security complexes, may overlay a number of existing security complexes or even create one or more entirely new security complexes. It is this theoretical development that forms the basis of what has become known as sector security complex theory (SSCT).<sup>89</sup> By using the environmental derivative of sector security complex theory as an analytical lens, regions like the Arctic and Antarctica could assume a new significance. Climate change and natural resource scarcity offer a unique way of examining security interdependence between states that leaves possible the creation of entirely new security complexes. Thus, by applying an analytical dyad comprising classical security complex theory and sector security complex theory a more holistic view of regional security could be formed than if the same analysis was undertaken by using either dyadic constituent alone. It is possible for a sector security complex (SSC) to not only cover countries within a classical security complex, but also countries external to that security complex and not currently a member of it. Likewise, it is also possible for a sector security complex to include countries from within different regional security complexes and for those countries to be geographically distant from each other. To describe the latter situation Buzan coined the term ‘security constellation.’<sup>90</sup> An example of a climate change induced security constellation is the Alliance of Small Island States (AOSIS).<sup>91</sup> These micro-states are welded together by fear that rising sea levels will inevitably threaten their very existence. Thus, in the final analysis, the border of a sector security complex is just another artificial construct.

---

two or more autonomous states; c) polarity, which covers the power distribution among the states, and d) social construction, which covers the pattern of amity and enmity among states. Buzan *et al.*, ‘Security complexes: a theory of regional security,’ p. 53.

<sup>89</sup> Buzan *et al.*, *Security: A New framework for Analysis*, p. 169.

<sup>90</sup> Buzan *et al.*, ‘Conclusions,’ p. 201.

<sup>91</sup> *Ibid*, p. 202.

Neither the Arctic nor Antarctica warranted more than a scant mention by Buzan *et al* when explaining regional security dynamics in the post-Cold War World. This could imply that both regions were considered strategically irrelevant and likely to stay that way. However, there exists the possibility that under an alternate scenario both regions will be strategically and economically transformed to the detriment of their natural environment by the impact of climate change and the need to access the non-living resources they might harbour. In this thesis this alternate scenario is explored, which consequently might result in the formation of two polar sector security complexes — one representing the Arctic and the other Antarctica. Each scenario would reshape the contemporary security architecture for the ‘Northern Continental Rim States’ and ‘Southern Oceanic Rim States’<sup>92</sup> respectively, although a discussion on the manifestation of such reshaping lies beyond the scope of this thesis.

The Arctic is one region increasingly riven with both climatic and resource induced security concerns. In the Arctic, climate change is already seen by polar states as the harbinger of a new set of security problems centred on territory, sovereignty and access to unrecovered mineral resources. Indeed, the question of which country has sovereignty over the North Pole has become the central issue in a number of increasingly acrid interstate disputes.<sup>93</sup> Such disputes may well have remained submerged amongst a plethora of unresolved political/military issues had it not been for an amendment to the United Nations Convention on the Law of the Sea (UNCLOS). This amendment enables coastal states under certain circumstances to claim sovereignty to the very edge of their maritime continental shelf. It was this development that enabled Russia in August 2007 to unilaterally declare sovereignty over an extensive area of Arctic seabed; a claim strenuously condemned by all other Arctic rim states.<sup>94</sup> Thus, the Arctic, being a potential storehouse of energy and non-energy minerals,<sup>95</sup> could come to represent an

---

<sup>92</sup> The six Southern Oceanic Rim States are Argentina, Australia, Chile, India, New Zealand and South Africa.

<sup>93</sup> See Huebert, Rob, ‘Canadian Arctic security issues,’ *National Journal*, Spring 1999, pp. 203-229. For a more recent article on security issues bedevilling the Arctic see William Underhill, ‘Race begins to exploit the Earth’s last Frontier,’ *The New Zealand Herald*, Auckland, November 29, 2005, p. A12.

<sup>94</sup> See Harrington, Caitlin, ‘Eyeing up the new Arctic,’ *Janes Defence Weekly*, Vol. 45, No. 3, 16 January 2008, p. 24.

<sup>95</sup> See de Wit, Maarten J., *Minerals and Mining in Antarctica: Science and Technology, Economics and Politics*, Clarendon Press, Oxford, 1985.

extension of existing security complexes, an entirely new sector security complex, or even a supercomplex.

The geographical remoteness and an absence of an indigenous people, along with the stability engendered by the Antarctic Treaty regime, is a mark of difference between Antarctica and the Arctic. However, the first and third of these differences may be nothing more than a transitory illusion. A changing climate coupled with exponential population growth and unfettered economic prosperity has resulted in both China<sup>96</sup> and India<sup>97</sup> being blighted with an acute shortage of fresh water. Given that ice harvesting is now technically feasible and an activity not covered by the Antarctic Treaty, it is possibly only a matter of time before either or both countries turns their attention, along with their economic and technical resources, towards exploiting the continent's vast store of frozen water. By this action an Austral ice-security complex could become established. Should other minerals, especially hydrocarbons, be found under the ice in commercial quantities then additional sector security complexes could form.

Although such complexes may be the result of interstate cooperation encouraged by a benign global political environment, a more worrying prospect for states in close proximity to either pole would be the establishment of a security complex driven by enmity. Notwithstanding this alarming prospect one could picture an alternate geopolitical development occurring, a worst-case scenario, driven not by security interdependence between contiguous polar states, but by exogenous belligerent great powers seeking ownership of polar resources. Such a development could readily create a "shatterbelt" and hence the very real prospect of polar resource wars.

Defly put, shatterbelts are described as "...regions where military rivalries between outside great powers tie into local contentions and bring the possibility of conflict escalation."<sup>98</sup> In the Western Hemisphere, for example, the Soviet alliance with Cuba that challenged the United States and its Caribbean and Central American allies caused a shatterbelt to form in Middle America from 1960 until

---

<sup>96</sup> See Keyuan, Zou, 'China's Antarctic policy and the Antarctic Treaty System,' *Ocean Development & International Law*, Vol. 24, 1993, p. 249, and Ma Jun, *China's Water Crisis*, Eastbridge, Norwalk, 2004.

<sup>97</sup> See Joyner, Christopher C. 'Antarctica and the Indian Ocean States: The Interplay of Law, Interests, and Geopolitics,' *Ocean Development and International Law*, Vol. 21, 1990, p. 47.

<sup>98</sup> See Kelly, Philip, *Checkerboards and Shatterbelts: The Geopolitics of South America*, University of Texas Press, Austin, 1997, p. vii.



the late 1980s.<sup>99</sup> Although that shatterbelt collapsed with the disintegration of the Soviet Empire, the Cuban missile crisis is illustrative of how close great power tensions within a shatterbelt came to sparking a nuclear conflagration.

In this thesis, the Polar Regions will be examined through a new theoretical lens derived from a number of *essential elements* lifted out from several acknowledged, but disparate theories. Each of these disparate theories is itself an attempt to explain why states coalesce into security regions. The theory underpinning the thesis recognizes that while realism still abounds in an anarchic world, the political elite employ constructivist techniques to create national security issues within this anarchic political environment. Thus, both ideologies will become increasingly important in explaining a future which may await the Polar Regions.

The thesis applies the concepts underpinning security complex theory to explain how two security dynamics could shape both the Northern and Southern Hemispheres over the next twenty-five years. Unlike many predictions, the futurist scenarios embedded in this thesis could easily become self-fulfilling prophesies for the Arctic by 2035;<sup>100</sup> the date to which all predictions in this thesis are directed. Moreover, nascent rumblings concerning the need to exploit Antarctic resources suggest that the existing governance arrangements for that continent are unlikely to continue unchanged beyond the Antarctic Treaty's review date of 2048.<sup>101</sup>

Although classical security complex theory has for thirty years provided a useful explanation for traditional security relations within and between aggregations of states, sector security complex theory has no such heritage to call on and nor does there appear to have been any concerted attempt to create one. Even the authors of the theory have not applied it in an attempt to explain contemporary challenges to international security. Remedying this shortcoming,

---

<sup>99</sup> *Ibid.*

<sup>100</sup> See Walker, Shaun, 'Battle to control Arctic Resources,' *New Zealand Herald*, Auckland, September 24, 2010, A16. Another reason for choosing the year 2035 is provided by the recent (October 2010) release of the New Zealand Defence Forces' "Defence White Paper 2010" which is a blueprint of the strategic and defence challenges for New Zealand over the next twenty-five years. See Ministry of Defence, *Defence White Paper 2010*, Ministry of Defence, Wellington, November 2010, p. 4.

<sup>101</sup> See Chandler, Jo, 'China flags polar resource goals,' *The Age*, Melbourne, January 7, 2010, <http://www.theage.com.au/national/china-flags-polar-resource-goals-20100106-luc.html> (9 June 2010).

even in a limited way gives this thesis a unique character. This is a uniqueness also derived from the application of a composite (hybrid) theory to explain a not improbable future that awaits both the Arctic and Antarctica: two geopolitical regions often overlooked in the post-Cold War period by scholars of security studies.

The thesis examines how a combination of climate change and resource scarcity could transmogrify both Polar Regions and suggest that any unanticipated transformation could provide sufficient impetus for states to disregard their current pacific attitude towards these regions. If just one great power should seek to absent itself from the existing political provisions that govern either region, then in all probability other states will ‘bandwagon’ around this revisionist power so as to avail themselves of the spoils a new policy might afford them. This prospect becomes increasingly more likely as the existing rules-based international system that has provided the framework for interstate relations is itself being transformed to reflect the wishes and wants of the state and non-state actors imposing a new political order upon the world.<sup>102</sup>

This Introduction serves as an entry point into a thesis structured into three individual parts, each with its own theme. Each Part comprises an introductory chapter followed by subject chapters and closes with a concluding chapter. A brief conclusion – Chapter Sixteen – brings the thesis to a close. Part I, titled – *Towards a Single Theory* – and introduces the aforementioned disparate theories from which seven essential variables are drawn into a single “Hybrid” theory. Part II – *People, Climate and Resources* – examines the role a burgeoning global human population will have in influencing both the geophysical and geopolitical forces that will shape the world during most, if not all, of the twenty-first century with special emphasis on the Polar Regions. The final part, Part III – *The Thawing of Frozen Wealth* – describes both the historical and contemporary geophysical and geopolitical environments for the Arctic and Antarctica. By interweaving information garnered about the past and present, supplemented by conceivable future events, the ultimate chapter within this Part discusses a plausible scenario capable of explaining the strategic future of the Arctic and Antarctic regions.

---

<sup>102</sup> See National Intelligence Council, ‘Global Trends 2025: A Transformed World,’ *United States Government Printing Office*, November 2008, p. 80, [http://www.dni.govt/nic/NIC\\_2025\\_project.html](http://www.dni.govt/nic/NIC_2025_project.html) (21 November 2008).

## PART I

### Chapter Two

#### Introduction: Towards a Single Theory

Few people would dispute that the end of the Cold War had a profound impact on the whole pattern of international security, but even a decade into the twenty-first century the actual character of the post-Cold War security order still remains hotly contested. Since decolonisation, regional level security has become both self-directed and prominent in international politics, whilst the ending of the Cold War appears to have accelerated this process.<sup>1</sup> Regionalism is a natural corollary to the end of bipolarity and, without superpower rivalry intruding obsessively into regions local powers have more room to manoeuvre. The result is a new international security structure that is more regional than global in character.

#### Multifarious regionalism

There has never been any shortage of either authors or ideas on how to divide the world into regions. However, no purpose would be served by traversing these multifarious permutations of regionalism. Lamentably, political regions are often born out of either empirical thought with limited theoretical underpinning or scholarly theory that remains shy of empirical validity. A recent example of the former is a world divided into two hemispheres – Western and Asian – as proposed by Kishore Mahbubani.<sup>2</sup> This is a world not dissimilar to that proposed by ‘core-periphery’ exponents except with a twist, the juxtaposition of the West and Asia — Asia being the ‘core’ and the West or Western hemisphere the periphery. Of the second type one of the more notable theoretical divisions of the

---

<sup>1</sup> See Buzan, Barry and Ole Wæver, *Regions and Powers: The structure of International Security*, Cambridge University Press, Cambridge, 2003, p. 3.

<sup>2</sup> See Mahbubani, Kishore, *The New Asian Hemisphere: The irresistible Shift of Global Power to the East*, Pacific Affairs, New York, 2008. In this book the ‘West’ is defined as the United States, Europe and the Anglo-Saxon states of Australia, Canada, and New Zealand. By implication the remaining states are portrayed as ‘Asia.’

world into regions is the *Heartland* theory, first proposed by Sir Halford MacKinder in 1904, which he later revised in 1943. In his latter publication, which is a significant embellishment of the original theory, MacKinder divided the world into two diagonal sectors separated by an imaginary girdle-line that commences in the scorching Saharan desert of Africa's Atlantic coast before sweeping eastward across the steppes of Asia to terminate in forest wilderness of Canada and upper United States. Inside the girdle's northern realm lie the two competing geopolitical realms of the continental "Heartland" and "Midland Ocean" – Eurasia and Euro-American maritime countries respectively. Outside this girdle lie the other great world oceans and all the lands that drain to them.<sup>3</sup> Unfortunately, the ideological schism that developed between the two regions above the girdle-line after the Second World War gave lie to Mackinder's theory and his cherished hope that a balance of power in a latitudinal divided world would ultimately provide humanity with peace, happiness and freedom.<sup>4</sup> But as political-geographer Saul Cohen has noted, any chance that MacKinder's world had of becoming a reality ebbed away on a tide of sweeping changes to global economic and social conditions; the spread of advanced military technology and an ideology that did not totally embrace either Western capitalism or a Soviet-style command economy.<sup>5</sup>

Despite this draw-back, Mackinder's original theory continues to attract its adherents although its zenith of popularity occurred during the politically turbulent years of the 1930s. German geopolitical writers of the Nazi era proposed a tripartite division of the world into super regions that acknowledged American, European (German) and Japanese hegemony.<sup>6</sup> Although this division failed to materialize as a consequence of the Second World War, contemporary geopolitical thinkers have not entirely abandoned such a division but merely reconstituted the theory to take account of the contemporary international system. These thinkers have distorted MacKinder's theory to such an extent that 'world regions' are now only worthy of the title "Trading Blocs." In another

---

<sup>3</sup> See MacKinder, Sir Halford J., 'The Round World and the Winning of the Peace,' *Foreign Affairs*, Vol. 21, No. 4, July 1943, p. 602.

<sup>4</sup> *Ibid.*, p. 605.

<sup>5</sup> See Cohen, Saul B., 'A new map of global geopolitical equilibrium: a developmental approach,' *Political Geography Quarterly*, Vol. 1, No. 3, July 1982, p. 224.

<sup>6</sup> See O'Loughlin, John and Herman Van Der Wusten, 'Political Geography of Panregions,' *Geographical Review*, Vol. 80, No. 1, January 1990, p. 1.

contemporary permutation, Alpo Rusi proposed sub-dividing the world into numerous pan-regions centred on present and future great economic powers, for example a world pivoted around China, an enlarged European Union, the United States, Japan and India.<sup>7</sup> Yet other theorists believe that globalization portends a more restrictive world division of large interdependent hemispheres focused on just three economic powers; the United States, European Union and China. Parag Khanna recently suggested that given the fortunate geography of these great powers their true priority lay in establishing longitudinal self-sufficient pan-regions extending from the Arctic to Antarctica, thus creating their own hemispheres where every state within each hemisphere pays homage to their respective hegemon. However, this structure could see the current drive towards global economic interdependence falter or even worse, reverse direction, hardening competition amongst the pan-regions in manner “eerily similar to what Orwell envisioned in *1984*.”<sup>8</sup>

Notwithstanding the Doha trade negotiations championed by the World Trade Organisation (WTO), many states now prefer to place their economic survival on bi-lateral trade agreements that run counter to the notion of centred economic pan-regions. Nevertheless, pan-regions can have their origins in politics rather than economics. O’Loughlin’s defines a pan-region as “a large functional area linking core states to resource peripheries and cutting across latitudinally distributed environmental zones.”<sup>9</sup> This definition is obviously comprehensive enough to apply to both geo-economics and geopolitics. And in the immediate post-Cold War world both political-geographers and political scientists continue to speculate about ultimate division of the world given the sudden collapse of bi-polarism in favour of a uni-polar superpower, the United States. But since the future is anything but static, the concerns of yesterday are not necessarily those of tomorrow. Thus, in all likelihood post-Cold War era unilateralism will crumble before the forces of multilateralism with no single power being dominant.<sup>10</sup> This

---

<sup>7</sup> See Rusi, Alpo M., *Dangerous Peace: New Rivalry in World Politics*, Westview Press, Boulder, 1998, p. 142.

<sup>8</sup> See Khanna, Parag, *The Second World: Empires and Influence in the New Global Order*, Random House, New York, 2008, p. 337.

<sup>9</sup> O’Loughlin, *op cit.*, p. 1.

<sup>10</sup> See National Intelligence Council, ‘Global Trends 2025: A Transformed World,’ *United States Government Printing Office*, November 2008, p. 93, [http://www.dni.govt/nic/NIC\\_2025\\_project.html](http://www.dni.govt/nic/NIC_2025_project.html) (21 November 2008). Under this account the

scenario holds the possibility that the contemporary forces driving security interdependence might fracture into “[a] new world disorder.”<sup>11</sup> A disorder that would force states to coalesce into a series of security region for optimal protection against aggressive tendencies exhibited by other states and other security regions.

### **Creating security regions**

In the lexicon of international relations there are two dominant approaches to constituting a region. First is the ‘inside-out’ approach,<sup>12</sup> which attempts to delineate regions by the intensity of their cultural [civilization] interaction; a methodological approach favoured by Samuel Huntington.<sup>13</sup> Secondly, the more traditional ‘outside-in’ approach, which focuses on geopolitical or strategic landmarks such as mountain ranges, rivers and stretches of water.<sup>14</sup> Despite the primacy of this dyadic approach William Thompson found from a literature review there is a lack of consensus amongst theorists as to a theoretical or descriptive framework for defining a region.<sup>15</sup> That being so, expediency would suggest that a simple endorsement of Buzan’s restrictive description of a security region would suffice for this thesis, namely “...that a distinct and significant subsystem of security relations exists among a set of states whose fate is that they have been locked into geographical proximity with each other.”<sup>16</sup>

Although geographical closeness is often taken as a pre-requisite for the establishment of a region, proximity has become less important with every new development in global transportation and communications.<sup>17</sup> This finding is of particular importance when security considerations are viewed from a descending systemic setting – global, regional, national [state] and local – for then regions are

---

United States will have by 2025 forfeit its position as the world’s sole superpower in favour of being one, but only one, of a number of dominant powers.

<sup>11</sup> Carpenter, Ted Galen, ‘The New World Disorder,’ *Foreign Policy*, No. 84, Fall 1991, p. 24.

<sup>12</sup> See Neumann, Iver B., ‘A region-building approach to Northern Europe,’ *Review of International Studies*, Vol. 20, 1994, p. 53.

<sup>13</sup> See Huntington, Samuel P., *The Clash of Civilizations: Remaking of World Order*, Touchstone, New York, 1996, pp.26-27.

<sup>14</sup> Neumann, *op. cit.*, p. 56.

<sup>15</sup> See Thompson, William R., ‘The Regional Subsystem: A Conceptual Explication and a Propositional Inventory,’ *International Studies Quarterly*, Vol. 17, No. 1, 1973, p. 91.

<sup>16</sup> See Buzan, Barry, *People, States and Fear: An agenda for International Security Studies in the Post-Cold War Era*, Lynne Rienner, Boulder, 1991, p.188.

<sup>17</sup> See Wohlstetter, Albert, ‘Illusions of Distance,’ *Foreign Affairs*, Vol. 46, No. 2, 1968, pp. 242-255.

no more than a subsystem of the whole (global) system and need not represent a geographical region *per se*. Rather, regional subsystems are more likely to be formed through the interactions of national elites than through the physical closeness of states themselves. In this sense, it should only be necessary to employ the most minimal criteria in determining the boundaries of a security region – namely general proximity.<sup>18</sup> Lake and Morgan in their theoretical exposé titled “Regional Orders” question whether even general proximity is too restrictive a criterion, for they consider the United States a legitimate member of the European security region.<sup>19</sup>

This is a view not shared by Buzan and Wæver who claim that in the post-Cold War world global security can be best understood through the evaluation of relative power and mutual relationships within and between clearly defined regions. Unlike geo-strategists who argue their case from a geographical and power typology, Buzan and Wæver contend that an appropriate theoretical structure for analysis is one provided by regional security complex theory (RSCT).<sup>20</sup> This theory distinguishes between system level inter-actions of the highest or superpower level, where capabilities enable them to transcend distance, and the subsystem level interplay of great powers whose main security environment is their immediate region. Accordingly, the process of securitisation and hence the depth of security interdependence are more intense between countries within a regional security complex than outside of it. This does not deny the reality that security complexes may be extensively penetrated by a superpower, but acknowledges that regional dynamics retain a considerable degree of autonomy from patterns set by a superpower. However, in the closed architecture of the international system it is necessary to understand both the degree of independence and interaction within and between these two hierarchical levels.<sup>21</sup>

---

<sup>18</sup> Thompson, *op. cit.*, p. 96.

<sup>19</sup> See Morgan, Patrick M., ‘Regional Security complexes and Regional Orders,’ in David A. Lake and Patrick M. Morgan (eds.), *Regional Orders: Building Security in a New World*, Pennsylvania State University Press, University Park, PA, 1997, p. 28.

<sup>20</sup> In this thesis a “security region” and a “regional security complex” are considered to be synonymous unless a security complex is specifically identified as having been created the typology of “sector security complex.”

<sup>21</sup> Buzan and Wæver, *op. cit.*, p. 4.

Buzan and Wæver readily acknowledge that regional security complex theory is a blend of neo-realism and constructivism. From the former rise the ideas of bounded territoriality and the distribution of power, but with a regional rather than global emphasis. From constructivism, regional security complex theory draws heavily upon the securitisation theory first proposed by Ole Wæver which concentrates on the social processes through which security issues are created. In so doing there is an acceptance that securitisation is influenced by not one but a host of factors, many of which are political in origin. Unlike neo-realism, constructivism treats the distribution of power among states and the patterns of amity and enmity as independent variables. For its advocates, regional security complex theory offers a conceptual framework by which to catalogue regions according to certain characteristics thus providing a basis for comparative studies in regional security. Of equal importance, constructivism offers some powers of prediction by narrowing the range of possible futures for each given region.<sup>22</sup>

Although Buzan and Wæver have divided the world into numerous security regions a comprehensive explanation of that division is beyond the scope of this thesis. While this thesis is reliant upon regional security complex theory to provide a typological platform on which to build a “hybrid” theory to explain one of many security futures awaiting the Polar Regions, exempt of those states that constitute their respective temperate girdle. This thesis is not about restating Buzan’s regional security complex theory *per se*, but rather an enlargement of its theoretical precepts by incorporating appropriate tenets from regional orders theory, sector security complex theory, and the theories of geopolitics. This is undertaken in an attempt to gain an insight into the consequences a changing world might foist upon the Polar Regions once states begin to squabble over who has ‘dibs’ on these last frontiers of resource wealth. This is in keeping with Buzan’s suggestion that the “organisation [furthering] of empirical studies” is a useful purpose for regional security complex theory,<sup>23</sup> albeit in this thesis a modified version of the original theory.

---

<sup>22</sup> *Ibid.*

<sup>23</sup> *Ibid.*, p. 45. The bracketed word “furthering” has been added to Buzan’s quote as logical extension of Buzan’s intention.



## **The structure of Part II**

The chapters in Part II chart the development of a “hybrid” theory used to explore the security future awaiting the Polar Regions. Chapter Three is a shortened description of regional security complex theory ending with the identification of four essential elements that underpin the concept. The chapter also highlights how the specificity of geographic contiguity provides an inherent impediment to using the typology to explain the security situation that does not neatly fit within the strict methodological boundaries envisioned by the theory’s originator. It falls to Chapter Four to move the thesis beyond this methodological restriction. This is achieved in two ways. First, it takes from regional orders theory the precept that great powers can rightfully be a member of a region other than their own and secondly, the use of *security externalities* to describe those political-military pressures exerted on states, including great powers, which ‘force’ them to band together as a region security complex. This chapter, like subsequent chapters in Part II, endows the thesis with one additional essential element and it is the aggregation of these elements into a unique analytical structure that is different from those theories from which it evolved.

Chapter Five moves discussion beyond the classical approach to security complex theory by opening the analysis to a wider range of security sectors. The chapter explores to what extent regional security patterns are discernable in the environmental sector, given that natural resource scarcity is discussed under this rubric. What will become evident is that the security dynamics emanating from this non-traditional sector can generate significant regional formations or security complexes, the borders of which often lack synchronicity with those of traditional regional security complexes.

Political geography lacks resonance within classical security complex theory; mentioned but not emphasized except for the post-Soviet and South American regional security complexes. Nevertheless, it is the combination of politics and geography that commonly determines the attitude and behaviour of countries one to another, often forcing the coalescing of states into distinguishable security regions. Chapter Six discusses how internecine hostility can readily turn regions into “shatterbelts” triggering influences that drive states within these regions inextricably towards conflict.

Chapter Seven, as the ultimate chapter in this Part, draws seven essential elements into a theoretical amalgam to supplement and contextualize those theories from which they were drawn so as to build a credible scenario that represents the future security environment of the Arctic and Antarctica.

## Chapter Three

### Regional Security Complex Theory

#### The formation of regions

To recap, within regional security complex theory, a ‘region’ means “that a distinct and significant subsystem of security relations exists among a set of states whose fate is that they have been locked into geographical proximity with each other.”<sup>1</sup> In part, this subsystem arises from the fact that threats, particularly military ones, are felt most strongly when they emanate from a neighbouring state. The need to balance a threat usually, but not universally so, results in a clamour for increased military capabilities that can exacerbate an already existing security dilemma. Should insecurity amongst neighbouring states within a region persist then the region as a whole can sink ever deeper into a security dilemma with adverse consequences for national, regional and possibly systemic stability.

Power relations are but one element that defines regional security, for relations among states are also determined by patterns of amity and enmity. Amity and enmity are emotionally charged terms that have their origins in the universe of interpersonal interaction and thus should be used with caution when discussing interstate relations.<sup>2</sup> Relations among states can vary considerably from the extreme of total enmity where two belligerents are locked in a fight to the end to extreme amity where two or more states drop their guard completely as is the case amongst states within today’s European Union. Outside of these two extremes are interstate relationships that are based on neither amity nor enmity because states decide to take a neutral position of “going it alone” to avoid entanglement in the disputes of others or because they are too weak to affect an outcome at a regional or systemic level<sup>3</sup> - a characteristic displayed by some non-aligned countries. Unfortunately for humanity, enmity has shown itself to be particularly durable when it acquires an historical character between peoples, as between the Poles and Russians or the Japanese and Koreans.

---

<sup>1</sup> Buzan, Barry, *People, States & Fear: An agenda for International Security Studies in the Post-Cold War Era*, Lynne Rienner, Boulder, 1991, p. 188.

<sup>2</sup> See Wolfers, Arnold, *Discord and Collaboration*, John Hopkins Press, Baltimore, 1962, p. 25.

<sup>3</sup> *Ibid.*, p. 26.

Patterns of amity and enmity arise from a variety of issues that are not simple derivatives of power distribution. These range from specific and often historical incidents such as a disputed border, through ethnically related populations, and ideological groupings to age-old links between different societies. However, amity and enmity, be it at the interstate or interpersonal level, are most often created through social intercourse between the respective parties. Whilst both can be enduring neither condition is irreversible depending on the goodwill or otherwise of the parties.

Regional security subsystems reflect the patterns of amity and enmity that are substantially confined within a particular geographical area. To differentiate respective loci of amity or enmity Buzan coined the term *security complex*.<sup>4</sup> This term denotes both the character of the attribute that defines the interdependence of states – security – and the intensity of this interdependence since it is this characteristic that distinguishes a particular region from its neighbours. Therefore, security complexes stress the interdependence of rivalry as well as that of shared interests.<sup>5</sup> It is possible for a security complex to exist and function regardless of whether or not states involved recognize its existence.<sup>6</sup>

Identifying the borders that enclose a security complex is no different from identifying the borders of any artificially created geographical entity, for they are nothing more than a matter of personal judgement. In this instance, judgement pivots on a determination of the relative strengths of security interdependence among different countries. In some locations these strengths will be very strong as between Taiwan and the People's Republic of China while in other regions relatively weak as between states within the European Union. In regions where liberal democracies predominate, interdependence will generally be positive. Conversely, if authoritarian states prevail then interdependence will frequently be seen as negative. Interdependence is usually a function of local relationships, but should great powers become involved a collective of states can be bound together by a common threat. China's encroachment into the South China Sea has fused together a number of Asian littoral states to face what they perceive a common threat.

---

<sup>4</sup> Buzan, *op. cit.*, p. 190.

<sup>5</sup> *Ibid.*

<sup>6</sup> *Ibid.*, p. 192.

Given that security interdependence is shaped by the strength of amity and enmity between states, then security interaction between the same set of states will mimic that relationship. A security complex exists whenever a group of states are strongly focused on their relationship to the exclusion of security interactions with other non-involved neighbours. The boundaries between groups of states are usually defined by relative indifference, characterized by benign security perceptions and weak interaction.<sup>7</sup> Strong insecurities link India and Pakistan and place them within the same complex, while relatively weak links between Pakistan and China suggests the existence of a boundary between two complexes – South Asian and East Asian regional security complexes respectively.<sup>8</sup>

### **The characteristics of a security complex**

Insecurity among small states is not the deciding factor defining a security complex, of greater significance is the palpable fear that is mutually felt between two or more “major” states. Unless they are powers with a global reach, such states will inevitably be a close neighbour. Closeness does not universally signify the presence of a state of enmity for, as with any grouping of states, individual countries can find the bonds of amity too strong to break. It is shared common values that bind countries of the EU together, and although such bonds are more tenuous than the political elite would desire<sup>9</sup> they are strong enough to overcome disintegrative pressures exerted by the internal anarchic dynamics of this particular regional subsystem. This is quite unlike previous historical eras when European great powers were seduced by anarchic forces created by age-old enmities born of hegemonic aspirations.

Both rhetorically and in practice the global community of states is organized into numerous security complexes that mirror the global hierarchy of power. Buzan’s original theory envisaged that the lowest hierarchical level would be composed of states whose power does not extend beyond their immediate neighbourhood. This lack of power restricts the security dynamic to within a group of immediate neighbouring countries. A higher level complex will contain

---

<sup>7</sup> *Ibid.*, p. 193.

<sup>8</sup> See Buzan, Barry and Ole Wæver, *Regions and Powers: The structure of International Security*, Cambridge University Press, Cambridge, 2003, Map 2, p. xxvi.

<sup>9</sup> See Field, Catherine, ‘No one is celebrating as the EU turns 50,’ *New Zealand Herald*, Auckland, June 25, 2008, p. B2.

one or more great powers – those states whose force extends beyond their immediate environs or those states whose power is great enough to impinge on several regions turning them into a vast “local environment.”<sup>10</sup> Great powers can also penetrate adjacent regional security complexes by making security alignments with states inside a regional security complex. Such linkage between regional and global security patterns is a natural occurrence in an anarchic system but one not to be overstated. Normally, patterns of conflict stem from factors indigenous to a region and external powers cannot usually define, securitize, desecuritize or reorganize a region at will.<sup>11</sup>

Nevertheless, an analysis of international security cannot be rendered to a simple dyad of levels and hence neither can regional security complex theory. In their contemporary theoretical opus Buzan and Wæver have synthesized the essential elements of a regional security complex (RSC) into four variables:

1. *boundary, which differentiates the RSC from its neighbours;*
2. *anarchic structure, which means that the RSC must be composed of two or more autonomous units;*
3. *polarity, which covers the distribution of power among the units; and*
4. *social construction, which covers the patterns of amity and enmity among the units.*<sup>12</sup>

As with levels of analysis, the type of complexes likely to be formed are not a mere dyad of lesser and greater powers, but are multifarious structures differing one from another in recognition of the influence exerted on a region by the predominant power or powers. In redefining the established regional security complex categorisation, Buzan and Wæver have drawn a distinction between *standard* and *centred* regional security complexes.

A standard regional security complex is broadly Westphalian in character with two or more powers and with a primarily military-political schema. All standard regional security complexes are anarchic in structure. Polarity in standard regional security complexes is determined by regional powers (e.g., Iran

---

<sup>10</sup> Buzan, *People, State & Fear*, *op. cit.*, p. 195.

<sup>11</sup> Buzan, *et al.*, *Regions and Powers*, *op. cit.*, p. 46.

<sup>12</sup> *Ibid.*, p. 53.

or Saudi Arabia or both in the Persian Gulf given the demise of Iraq as a regional power post-2003) and may be uni-, bipolar or even multipolar in character. A unipolar standard regional security complex is centred on a single regional power, for example, South Africa fulfils that role in the Southern Africa regional security complex. A standard regional security complex differs from centred complexes because in the former the security dynamic of the region is not dominated by a unipolar power at its geographical centre. Amity and enmity will shape the structure of a standard regional security complex; it may be a centre of conflict, a security regime, or even a security community: a response determined by patterns of rivalry, balances, alliances, concerts or friendships. Within standard regional security complexes the most important security relationships are those that exist between the regional powers since they determine the behaviour patterns of minor powers and the prospects for penetration by global powers.<sup>13</sup>

Centred regional security complexes come in one of three forms. The first two of these are special derivations of a unipolar regional security complex in which power is centred on either a great power (e.g., Russia in the Commonwealth of Independent States) or on a superpower (e.g., the United States in North America), instead of a regional power. The expectation in these instances is that these powers will dominate their immediate region turning it unipolar in character by preventing the rise of another competing regional centre of power, such as the Ukraine, or Canada or Mexico respectively.<sup>14</sup> The third form of centred regional security complex is structurally very different involving a region put together by an institution rather than by a single power. The European Union is one such institution, for it hangs halfway between being a region in the form of a highly developed security community and being a great power in its own right with pretensions of becoming a superpower. This form creates a problem within regional security complex theory methodology since the theory assumed that a process of securitisation would occur between actors – which invariably meant states – within a region. Notwithstanding this assumption the methodology is sufficiently robust to incorporate the development of a security community for such institutions are marked by the processes of desecuritisation, where actors cease treating each other as a security problem and start acting as friends. States

---

<sup>13</sup> *Ibid.*, p. 55.

<sup>14</sup> *Ibid.*

within the EU still compete and feel challenged by each other from time to time, but issues are resolved by political means so they don't become a question of security.<sup>15</sup> The EU has shown that as an institution it can act as if it was a single Westphalian-type state by securitizing threats against its wellbeing, a point demonstrated by a common commitment to the "War on Terror" and its military involvement in the pacification of the Balkans post the Cold War.

Regional security complex theory acknowledges that not all regional security complexes are entirely homogeneous in character which accounts for the presence of *subcomplexes* or 'half-levels' within a regional level.<sup>16</sup> Subcomplexes are essentially no different from a regional security complex except that they are firmly embedded within a larger complex. However, while they do represent a distinctive arrangement of security interdependence they are unable to escape the wider patterns that define the regional security complex as a whole. This is true of the post-Soviet complex with the Caucasus region forming a subcomplex of two parts. North Caucasus is located within the Russian Federation and includes among other states Chechnya and Dagestan, while the South Caucasus consists of the independent states of Armenia, Azerbaijan and Georgia. Besides the Russian Federation, the Caucasus as a group, are the object of external interest emanating from Turkey, Iran and the United States. These two subcomplexes fuse into one region most clearly via the border-straddling provinces such as South Ossetia (formally in Georgia) and North Ossetia (in Russia).<sup>17</sup> Subcomplexes are not a necessary trait of regional security complexes, but they are not uncommon either, especially when the number of states within a complex is large.<sup>18</sup>

It is also possible for regions not to fit within the category of either a standard or centred regional security complex, but to lie somewhere in between. These cases arise from having a number of systemic level powers scattered throughout the system. The greater the number of systemic powers there are in the system the less room there is for standard regional security complexes. This scattering of systemic powers creates two possibilities other than centred complexes: *great power security complexes*, and *supercomplexes*. In the

---

<sup>15</sup> *Ibid.*, p. 56.

<sup>16</sup> *Ibid.*, p. 51.

<sup>17</sup> *Ibid.*, p. 419.

<sup>18</sup> *Ibid.*, p. 52.



contemporary unipolar world represented by a single superpower and four great powers both possibilities are evident in Asia.<sup>19</sup>

In a great power security complex the polarity of a region is defined by the presence of two or more great powers. Historically, this has been the case in Europe, but it is now evident in East Asia where China and Japan form the core of a great power security complex. These complexes differ from ordinary regional security complexes in two ways. First, their dynamic directly affects the global balance of power in ways not expected of standard complexes. Certain aspects of great power security complexes resemble those of standard complexes, for example, with regard to polarity, amity-enmity and boundaries. But because their dynamics involve systemic level powers, great power security complexes have become a part of today's global security dynamic. In the contemporary polarity system, or any approximation of it, the existence of a great power security complex as a subset of the global polarity equation not only shapes the options available to those powers directly involved, but for all other powers throughout the system. Where two or more great powers share a complex then the dynamics between them, whether amity or enmity, will prove to be a significant influence on the global security dynamic. If the great powers are all in centred regional security complexes then the regional level does not directly affect how they react to each other, however, trouble within a centred complex might weaken the power of a major state relative to its peers.<sup>20</sup> Secondly, actions involving great powers in one regional security complex might *spillover* regional boundaries and affect adjacent regions. It is natural for great powers to develop a capability that enables them to project their power into an adjacent region and under certain circumstances they can be expected to do so. A recent notable example of power projection occurred in August 2008 when Russia, acting as guarantor against renewed Georgian hegemony over South Ossetia and Abkhazia sent military forces across the border to 'punish' Georgia for its clumsy attempt to reincorporate these two 'breakaway' regions within the Georgian state proper. While Russia's action was a revivification of classic great power politics abhorred by liberal democracies, in the idiom of regional security complex theory it confirmed the maintenance of the status quo by blocking an external

---

<sup>19</sup> Buzan, *People, States & Fear*, *op. cit.*, p. 59.

<sup>20</sup> *Ibid.*

transformation of the post-Soviet regional security complex by a combination of Euro-American powers.<sup>21</sup>

Inter-regional interaction can be expected from great powers in the form of sustained and substantial security dynamics. Rather than expecting such security dynamics to be as weak as are those between members within a standard regional security complex they are likely to be strong, reflecting a vigorous relationship between like powers. This interaction could spillover into other regions one or more of which might be centred on another great power, thus binding these separate complexes into a *supercomplex* with one or more great powers at its core. As a consequence, instead of there being three levels (state, regional and global) to consider, a fourth level, *super-regional*, may be added in place of the weak inter-regional one. In a supercomplex the inter-regional relationships are strong and on-going, but not usually strong enough as to override the regional dynamics created within a penetrated complex – as is the case in South Asia where, as of 2008, the United States has contemporaneous security relationships with both Pakistan and India, but has failed to turn historical enmity into contemporary amity. Nonetheless, should inter-regional interactions become sufficiently strong enough to override regional dynamics then spillover will subordinate previous patterns of regional security dynamics and constituent regional security complexes within the supercomplex will undergo external transformation, merging to form a new and larger complex.<sup>22</sup> States within a supercomplex, like those in a subcomplex, have no need to be awarded dual membership.

### **An absence of security complexes**

Regional security complex theory presupposes that the security map of the world will be covered by a patchwork of security complexes. However, this is not the case. There exists the possibility that some states at the local level do not generate a pattern of security interdependence although they are ‘normal’ in the sense that they possess autonomy to make their own policies and have sufficient power

---

<sup>21</sup> If the membership of NATO had been expanded to include Georgia as proposed by the United States, then the post-Soviet RSC would have been externally transformed creating a new and adverse security dynamic for the Russian Federation, a situation Moscow had counselled against since the “Rose Revolution” of 2003 and the birth of liberal democracy in Georgia.

<sup>22</sup> Buzan *et al.*, *Regions and Powers*, *op. cit.*, p. 61.

capabilities to engage other members of the international system. In consideration of this phenomena, there are two conditions under which regional security complexes do not, or cannot, form - *overlay* and *unstructured*. Buzan and Wæver maintain that overlay occurs when:

*... great power interests transcend mere penetration, and come to dominate a region so heavily that the local patterns of security relations virtually cease to operate. It usually results in the long-term stationing of great power armed forces in the region, and in the alignment of the local states according to the patterns of great power rivalry. The strongest examples of overlay are European colonisation of Africa, Asia, and the Americas, and the situation of Europe itself during the Cold War when the classical European security dynamic was overlaid by superpower rivalry. [Nonetheless], [t]he term overlay will not be applied to dynamics [within] regions although the pattern in a centred RSC in some ways can be seen as analogous because a great (or super) power dominates a region. But since it is a power [of] the region, the region has not succumbed to extra-regional dynamics and therefore the situation is not designated overlay.<sup>23</sup>*

Buzan and Wæver consider that David Lake and Patrick Morgan's book titled "Regional Orders" is methodologically close to their own for it takes regional security complex theory as its starting point and tries to study specifically security-defined regions.<sup>24</sup> Methodology similarities are also acknowledged by Lake and Morgan both of whom are mildly critical of classical security complex theory because, in their view, it is a theory still firmly rooted in the Cold War period and consequently fails to recognize the security architecture of the post-Cold War era. For particular criticism, Morgan singles out the concept of 'overlay' which he suggests was driven by the prospect of global-level conflict and the foreign policy concerns of the then superpowers. In the absence of Cold War bipolarity and superpower rivalry overlay or the penetration of regions by either the Soviet Union [Russia] or the United States is no longer the concern it once was and hence should be withdrawn from the argot of regional security

---

<sup>23</sup> *Ibid.*, p. 62.

<sup>24</sup> *Ibid.*, p. 78.

complex theory.<sup>25</sup> Morgan's comments hold credence only with regard to Buzan's original theory since his later work contains no evidence of overlaid states.

An unstructured security region is created if either or both of the following determinants are present:

...[F]irst, where local states have such low capability that their power does not project much, if at all, beyond their own boundaries; and, second, where geographical isolation makes interaction difficult (for example, islands separated by large expanses of ocean). Either condition can result in insufficient generation of security interdependence to form the structure of an RSC. Low capability of course amplifies the effect of geographical insulators, and high capability reduces it. But even for capable actors it makes a difference whether one's borders are defined by seas (Britain, New Zealand) or high mountains (Spain), or by open plains (Poland). Parts of sub-Saharan Africa and the Pacific after decolonisation illustrate this condition.<sup>26</sup>

Whereas overlay in a security region is defined by external powers, an unstructured region is defined by a collective of states either too weak in power to generate security interdependence at the regional level, by a continent without states (Antarctica), or by the vacant space left over when the global map of all legitimate security regions has been identified. Unstructured regions are able to change into *pre-complexes* when a set of bilateral security relationships has the potential to bind states together into a regional security complex, although such bonds are not currently sufficiently numerous enough to achieve that end.<sup>27</sup> In the same way *proto-complexes* come about when there is sufficient security interdependence to delineate and differentiate it from its neighbours, but the dynamics within the region are still too weak for the region to be accorded the status of a full-fledged regional security complex.<sup>28</sup>

Map 1, although a simplification of that proposed by Buzan and Wæver, reflects the contemporary division of the world into numerous regional security

---

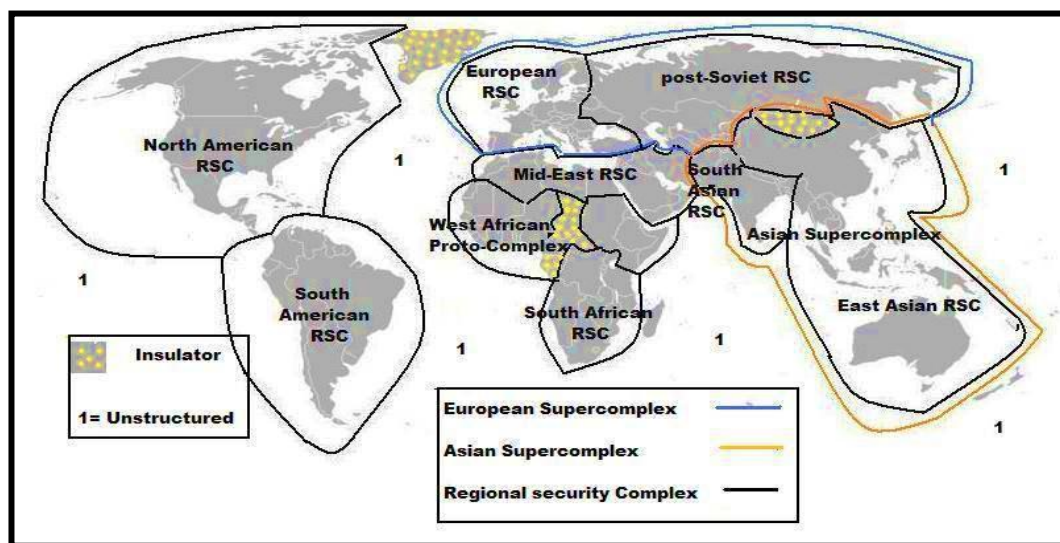
<sup>25</sup> See Lake, David A. and Patrick M. Morgan, *Regional Orders: Building Security in a New World*, Pennsylvania State University Press, Pennsylvania, 1997, p. 28.

<sup>26</sup> Buzan *et al.*, *Regions and Powers*, *op. cit.*, p. 63.

<sup>27</sup> *Ibid.*, p. 64.

<sup>28</sup> *Ibid.*

complexes. This thesis will not attempt to explain either the common and unique security characteristics of each security complex for this could never be anything more than an iteration of Buzan and Wæver. Of greater importance is whether this map can be modified to represent an indicative portrait of how the world might be regionalized by mid-century.



**Map 1.** A simplified map of patterns of regional security post-Cold War. Adapted from Buzan and Wæver, *Regions and Powers*, p. xxvi.

### Conjectural methodology

Regional security complex theory provides not only a framework explaining regional security in both its historical and contemporary context it also offers the possibility for creation of a series of predictive scenarios. Such analysis must take as a given the current structure of the international system and then assess what form possible changes might take. As is usual in such analysis, identifying which one of a number of probabilities will represent a future situation depends not only on the global politics of the time, but more significantly upon the foreign policy orientations of the great powers. Scenario analysis inevitably traverses a broad range of possibilities and in so doing consideration must be awarded to what options for change are likely to present themselves in the future. Accordingly, Buzan and Wæver considered the most likely options to be:

*An unstructured region has the possibility of becoming an RSC or getting overlaid. It is hard to imagine an unstructured region leaping straight to integration [EU] without passing through one condition or the other.*

*A standard RSC can undergo internal or external transformation or get overlaid. It is more difficult to imagine it unravelling back to an unstructured region, though not impossible (as, for example, if plague or environmental disaster greatly weakens all of the units), or moving directly to integration. An RSC in security community form has the possibility of building itself into a centred RSC, and possibly a new actor, by creating institutions. A centred great or superpower RSC, or a unipolar standard one, might do the same, probably more coercively, by becoming an empire. Conversely, either form could unravel back to standard multipolar mode, as happened to the Soviet empire. If an RSC contains subcomplexes, then these serve as markers for a possible split if the overarching issues tying the subcomplexes together fade away.<sup>29</sup>*

This would not prevent an overlaid security region from being transformed into any of the other regional security types depending on the depth and character of the changes induced in it by the experience of overlay.

Countries that are an aggregation of what were once separate states can disintegrate, as happened to the Soviet Union, Yugoslavia, Czechoslovakia and Pakistan. If states are large then the most likely outcome is the creation of new regional security complexes, but if the actor is small insufficient security interdependence will exist for the creation of a complex. While it is unlikely that disintegration will result in the creation of an unstructured region, elements of an overlay or annexation cannot be discounted.<sup>30</sup> Such changes can manifest themselves in either an internal or external transformation thereby altering the dynamics within an regional security complex.

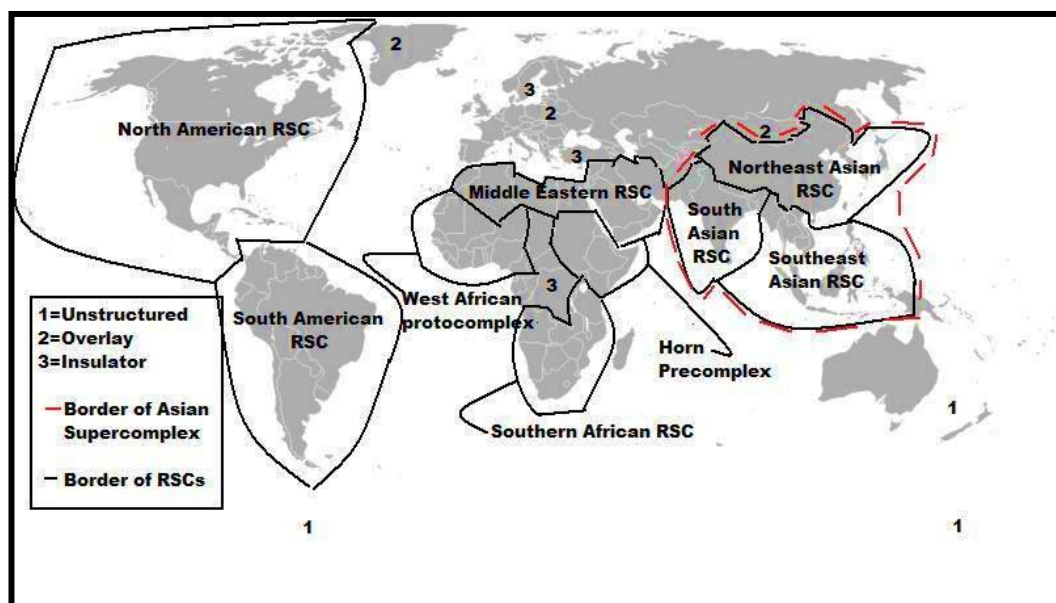
As with all scenario analyses, predictive regional security complex theory is not offered as a means to provide only a single scenario, but to narrow the range of relevant scenarios in any specific instant. As a generalisation, a unique set of conditions will usually produce one scenario that best represents that situation and is worthy of further development, in other words a process of self-reinforcement

---

<sup>29</sup> *Ibid.*, pp. 66-67.

<sup>30</sup> *Ibid.*

occurs. At crucial points of historical change, for example the end of the Cold War, preconceived restrictions fall away and numerous scenarios become possibilities, although ultimately the future will show that most were not realistically viable.<sup>31</sup> Bearing this disclaimer in mind the, Map 3, which contains elements of both Maps 1 and 2, is as likely a scenario as any other at reflecting the global security environment twenty-five years hence. However, given this lengthy timeframe all the scenarios have an equal probability of correctly representing the mid-century international order, and thus the final choice is a subjective one.



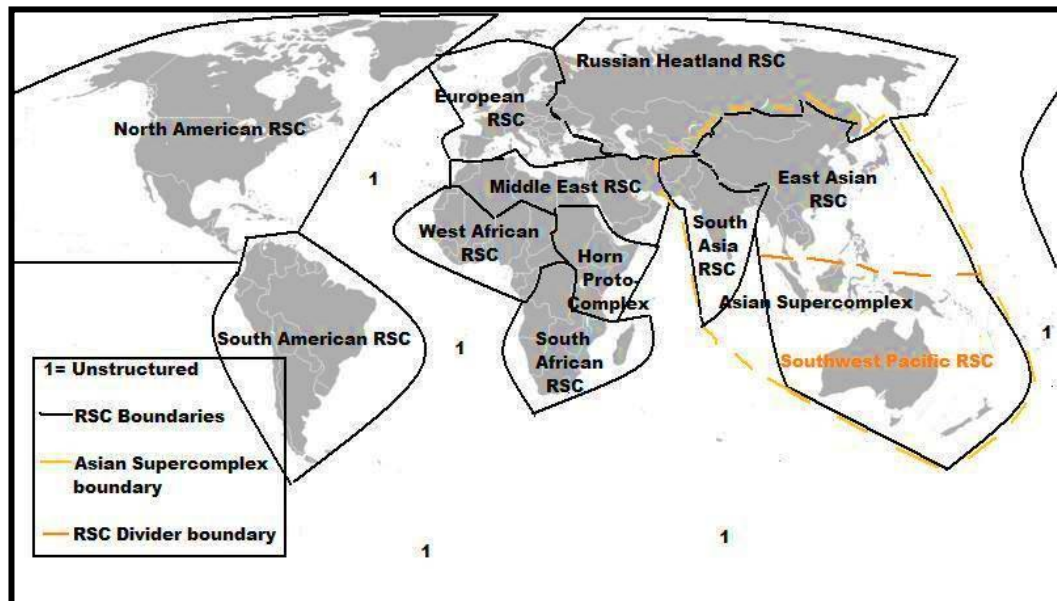
**Map 2.** A simplified map of patterns of regional security during the Cold War. Adapted from Buzan *et al.*, *Regions and Powers*, *op. cit.*, p. xxv.

Given that this thesis revolves around an attempt to explain the likely security implications the future might impose on Polar Regions, it is not proposed to discuss plausible mid-century regional security dynamics for regions other than the Polar Regions.

In a divided world, global regionalisation could more closely resemble MacKinder's geopolitical precepts than Buzan and Wæver's post-Cold War patterns of regional security complexes, although a combination of the two

<sup>31</sup> *Ibid.*, p. 70.

concepts might best represent future regionalism. Indeed, the resultant theoretical product would dovetail neatly with the tenets underpinning Regional Orders.<sup>32</sup>



**Map 3.** Possible patterning of regional security for the Middle Twenty-First Century.

It is difficult to separate the political/military regional configuration depicted in Map 3 from environmental factors such as climate change and natural resources depletion as both of these factors are already having a significant impact on regional security dynamics. Since the determinative nature of these two environmental factors will become apparent in Part III only a very brief explanatory comment is warranted at this juncture.

The security implications of climate and resource wars have recently been likened in magnitude to either World War of the twentieth century.<sup>33</sup> Just one of many illustrative but speculative outcomes of these twin threats concerns, yet again, the demise of the sovereign state and the consequential rise of warlordism within a state fated to become a future great power - Mexico.<sup>34</sup> Under this particular scenario the United States would, as the result of climate chaos and

<sup>32</sup> Under regional security complex theory, the United States could penetrate or overlay the European complex, but not become an integral member because of geographical separation. However, no such restriction applies when regions are constructed using the theory of Regional Orders and thus the United States is clearly able to belong to the security complexes of Europe and the Middle East. See Lake and Morgan, *Regional Orders*, *op.cit.*, p.11.

<sup>33</sup> See Mabey, Nick, *Delivering Climate Security: International Security Response to a Climate Changed world*, The Royal United Services Institute, Whitehall Paper 69, Routledge, Abingdon, 2008, p. 2.

<sup>34</sup> See Dyer, Gwynne, *Climate Wars*, Scribe Publications, Carlton North, Victoria, Australia, 2008, p. 79.



water and food shortages beyond its southern borders, re-establish geographical separation by metaphorically creating impenetrable barriers reminiscent of the European walled cities of the Middle Ages. The major difference between the two ‘cities’ is that the United States would separate itself from Latin America’s climate and resource fed chaos by a moat filled with anti-personnel mines and razor wire ‘ramparts’ patrolled by remote-sensor automatic machine guns.<sup>35</sup>

### **Polar regional thumbnails**

By 2050 there exists the possibility that an environmental calamity will have overtaken either or both Polar Regions.<sup>36</sup> A changed security dynamic is a likely outcome, but as the character of a security dynamic cannot be quantified in advance, it is impossible to accommodate it within the framework of classical regional security complex theory. Therefore, before embarking upon a thumbnail portrait of the polar regional security complexes there is merit in making some general observations about the Polar Regions.

First, post-World War II decolonisation reduced the prevalence of overlay, a characteristic that has totally disappeared with the demise of Cold War antagonisms. Thus, the Cold War overlay of Greenland is not a feature in either contemporary or predictive scenarios. Suzerainty rather than overlay might be a characteristic of the twenty-first century international system. Secondly, insulators, those regions that separate regional security complexes one from another, e.g. contemporary Greenland, are an unlikely feature of predictive scenarios. The numerical decline in the number of insulators in predictive scenarios is one of the likely consequences of North Atlantic Treaty Organisation (NATO)’s continued geographical expansion. NATO’s appetite for eastward expansion into the Caucasus region<sup>37</sup> and Moscow’s growing influence within the Levant<sup>38</sup> are but two examples of where geopolitics is challenging the existence of insulator states and contemporary regions. Finally, unstructured regions will

---

<sup>35</sup> *Ibid.*, p. 85.

<sup>36</sup> For a book dedicated to examining environmental calamities occurring in the high Arctic region see Kister, Chad, *Arctic Melting*, Common Courage Press, Monroe, 2005. Significant changes underway on the Antarctic continent are chronicled by David Spratt and Philip Sutton in *Climate Code Red: the case for emergency action*, Scribe Publications, Carlton North, 2008, pp.28-32.

<sup>37</sup> Lucas, *The New Cold War*, *op. cit.*, p. 173.

<sup>38</sup> See Matthews, Owen and Sami Kohen, ‘Heading Both Ways,’ *Newsweek*, Vol. CLII, No. 13, September 29, 2008, p.38.

similarly be reduced in both number and extent as a consequence of the increasing number of great power security complexes. Besides the Polar Regions, the world's maritime domains are also becoming fading remnants of what were once unstructured regions.

### **Arctic region**

Like most maps of the world, Buzan and Wæver portray the surface of the world as a Mercator's projection,<sup>39</sup> showing the earth as a rectangle on which the northern hemisphere has North America to the left, Europe in the centre and Asia on the right. Under this format both the northernmost and southernmost ten to twenty degrees of latitude are not shown because it is generally assumed that these are places of little interest and the shape and area of what land there is would be badly distorted by the projection.<sup>40</sup> Compounding the geographical distortion evident in Buzan and Wæver's maps is the failure to identifying the precise northern boundaries for any Arctic-rimmed security complex. From a review of their maps one might assume that the northernmost border of the three northern regional security complexes would be circumscribed by a line that touches the northern extremities of Greenland, Franz Josef Land and Ellesmere Island.<sup>41</sup> Given that only water and ice extend beyond this demarcation line then the Arctic Ocean might, under regional security complex theory, be categorized as an unstructured region. Conversely, in the absence of any confirmation to the contrary, the northern extent of these regional security complexes might be delineated by the outer limit of their respective Exclusive Economic Zones. The area beyond this outer territorial boundary might then be categorized as an unstructured region.

Sovereignty over Arctic territory is an increasingly vexed question facing all Arctic-rim states as testified by the many contemporary maritime border disputes. Such disputes might have been circumvented had states adopted a 1907 proposal

---

<sup>39</sup> On Mercator's projection the scale at the equator is expanded according to the secant of the latitude. This represents an expansion factor of 2 at 60°, so that Russia and Canada appear larger than they really are compared to the United States, Western Europe, China and India. The expansion reaches a factor of 3 at beyond 70°, and a factor of 8.8 at the latitude of the northern tip of Greenland.

<sup>40</sup> See Lindsey, George, *Strategic Stability in the Arctic*, Adelphi Papers 241, The International Institute for Strategic Studies, London, 1989, p. 3.

<sup>41</sup> Buzan *et al.*, *Regions and Powers*, *op. cit.*, pp. xxv & xxvi.

by the Canadian Senator, Pascal Poirier to divide the region along the following lines:

*A country whose possession today goes up to the Arctic regions, will have a right, or should have a right, or has a right to all the lands that are to be found in the waters between a line extending from its eastern extremity north, and another line extending from the western extremity north. All lands between the two lines up to the North Pole should belong and do belong to the country whose territory abuts up there.*<sup>42</sup>

Poirier's proposal, while being reminiscent of a pan-region concept favoured by geo-politicians, would also have dispelled any doubts over the appropriate categorisation of the Arctic within regional security complex theory methodology, for an Arctic so divided would become part of the sovereign territory of each Arctic-rim state.

By 2035 the regional security complex theoretical arrangement covering the maritime Arctic may or may not have evolved beyond today's status quo. If the current situation persists, then in the absence of any interstate agreement over the division of the maritime Arctic, the region will remain unstructured and open to the vagaries of global power politics and national interests. Already the non-existence of an agreement continues to facilitate serious security challenges for all Arctic-rim countries, the direct result of many non-polar states such as China and Japan increasing both their interest in and their activities within the area.<sup>43</sup>

Conversely, if there is a region-wide change in attitude towards the sanctity of territorial sovereignty that encourages the endorsement of the United Nations Convention on the Law of the Sea (UNCLOS), in particular Article 76, then the peaceful division of the Arctic is achievable. Regrettably, international law may not possess sufficient authority to force such a division given that the antagonistic politics of hydrocarbons has already stamped its presence on the region. Even before there is adequate evidence to conclude that any country of either 'Western' or 'Eastern' persuasion is seeking hegemony over the region's maritime oil and

---

<sup>42</sup> See Caldwell, Nathaniel French, *Arctic Leverage: Canadian Sovereignty and Security*, Praeger, New York, 1990, p. 7.

<sup>43</sup> See Huebert, Robert, 'Canadian Arctic Security: Preparing for a Changing Future,' *Behind the Headlines*, Vol. 65, No. 4, July 2008, p. 15.

gas reserves the rhetoric is about a “new Cold War” in the Arctic.<sup>44</sup> A division of the Arctic Ocean amongst littoral states, no matter how achieved would result in the creation of a supercomplex, comprising the United States, European Union and Russia. Given existing interstate hostilities enmity rather than amity is the likely force that would bind these states into such a complex.

There is also a third security scenario based on the continuing decline of the European Union in terms of absolute power<sup>45</sup> and a weakened position of the United States and Russia relative to Third World rising powers. If these changes coincide with any extension to the maritime Exclusive Economic Zone of Arctic-rim countries becoming an intractable international problem, then the Arctic could be penetrated by non-Arctic countries attempting to exploit the region’s energy resources. Evidence exists that this is already occurring as witnessed by China’s unannounced Arctic incursions<sup>46</sup> and South Korea developing polar capability and year-round presence on the Arctic island of Spitsbergen.<sup>47</sup> Compounding these unwelcome foreign incursions is a rise in belligerency between certain Arctic-rim states as witnessed by the recent Norwegian-Russian dispute over the Svalbard Archipelago.<sup>48</sup> In a world increasingly bereft of resources, inter- and intra-regional interest in the Arctic will intensify invariably leading to an increase in international tension<sup>49</sup> which may result in the creation of an entirely new and yet unforeseen regional security dynamic. Regional security complex theory would

---

<sup>44</sup> See Lackenbauer, P. Whitney, ‘An Integrated Approach to Canada’s Arctic,’ *Behind the Headlines*, Vol. 65, No. 4, July 2008, p. 21.

<sup>45</sup> See Bolton, John, ‘Mr President, the foreign policy priorities,’ *New Zealand Herald*, Auckland, November 6, 2008, p. A15.

<sup>46</sup> China, like a number of other states, does not accept that Canada has exclusive sovereignty over the Arctic Archipelago. This was demonstrated in 1999 when much to the Canadian’s dismay a Chinese government research vessel arrived unannounced at Tuktoyaktuk, east of the Mackenzie Delta. See ‘Breaking the ice,’ *The Economist*, August 21, 2004, p. 34.

<sup>47</sup> South Korea intends to have built by 2011 its first icebreaker to undertake research in both Polar Regions. South Korea currently has a research station situated on the high Arctic island of Spitsbergen in the Svalbard Archipelago. See ‘Korean Icebreaker will assist Polar Research,’ *Antarctic*, Vol. 26, No. 3, 2008, p. 46.

<sup>48</sup> See Fish, Tim, ‘Russia deploys to Arctic as relations with Norway cool,’ *Jane’s Defence Weekly*, Vol. 45, No. 30, 23 July 2008, p. 12.

<sup>49</sup> Denmark (acting on behalf of Greenland) has an unresolved dispute with Canada over the ownership of Hans Island. This small uninhabited island lies in the maritime passage separating Greenland from the Canadian territory of Ellesmere Island. See Huebert, Rob, ‘The Return of the “Vikings,”’ in Berkes, Fikret, Rob Huebert, Helen Fast, Micheline Manseau, and Alan Diduck (eds.), *Breaking Ice*, University of Calgary Press, Calgary, 2005, pp. 319-336. See also disputes catalogued in ‘Drawing lines in melting ice,’ *The Economist*, August 18, 2007, pp. 47-48; Graff, James, ‘Fight for the Top Of the World,’ *Time*, No. 38, October 1, 2007, pp. 20-27; and Harrington, Caitlin, ‘Eyeing up the new Arctic,’ *Jane’s Defence Weekly*, Vol. 45, No. 3, 16 January 2008, pp. 22-27.

have difficulty accommodating such a new dynamic, especially when the principal protagonist states aren't contiguous with either each other or the Arctic maritime region. Hypothetical validation of such a scenario could be derived from the theories of Regional Orders or geopolitics, since neither theory holds geographical contiguity as a mandatory premise.

### **The Antarctic region**

Antarctica's strategic options are at the same time similar and different to those of the Arctic Ocean region. Similarity occurs because neither region is comprised of an individual country or a collective of states, consequently territorial sovereignty in both regions remains obscure. Dissimilarity is the result of a significant strategic difference between these regions; the contemporary lack of military activity in Antarctica due to countries honouring both the 'spirit' and 'intent' of the Antarctic Treaty. In contrast to the benign southern polar region, the strategic stability of the Arctic has been under constant challenge since the close of World War II and although this challenge abated during the initial decade and a half of the post-Cold War era, it has resurfaced with a resurgent Russia.

Buzan and Wæver give scant recognition to the strategic importance of Antarctica and fail to acknowledge that interstate violence has visited the region on several occasions. However, they do acknowledge that Antarctica could potentially become a locus for future conflict especially between Argentina and Chile.<sup>50</sup> This prospect does not require all scenarios to have interstate violence at their core, for peace in all probability will continue its rein for as long as the Antarctic Treaty remains uncontested.

The Antarctic Treaty permits the status quo scenario to remain in force until mid-century. Under regional security complex theory Antarctica is an unstructured region due to its geographical isolation that makes interaction between the continent and other global regions difficult. Such isolation has taken Antarctica beyond the domain of commercial exploitation into its own unique category, that of a frigid open-air scientific laboratory. Hence it is conceivable, although unlikely, that prior to the review of the Treaty this situation will be consummated by making Antarctica into a world park under the aegis of the

---

<sup>50</sup> Buzan and Wæver, *Regions and Powers, op. cit.*, p. 316.

United Nations or a special purpose international institution.<sup>51</sup> A modification of this nature would prevent the creation of a continental state, the rise of a number of sovereign states within its continental perimeter or even the division of the continent into a provinces governed by existing claimant states. Without one of these alternatives becoming established Antarctica will fail to create a security dynamic or security environment predisposed to give rise to a regional security complex.

In the contemporary world the establishment of either a single or multiple states is unimaginable, while absorption into the territorial framework of existing claimant countries is equally as unlikely since neither Argentina nor Chile will forego their claim nor accept a condominium as a resolution to their territorial dilemma.<sup>52</sup> This would also leave unresolved the status of the unclaimed sector known as Marie Byrd Land. Given the probable existence of hydrocarbon and other mineral deposits within this sector a flurry of sovereignty claims would ensue if the Treaty should fail, thus making resolution impossible. Notwithstanding this assertion, if a new claimant state had global primacy then it might prevail over the wishes of the international community as might some unique form of international institutional arrangement. If the former alternative became reality then a standard regional security complex or a series of pre-complexes might evolve. However, should the latter alternative triumph then a centred institutional regional security complex not dissimilar to the European Union could be a likely outcome.

A second tenable scenario is one that denies the continuance of the Treaty beyond 2048. In the absence of a treaty both Argentina and Chile would immediately sue for exclusive recognition of their respective claim to Antarctica as a natural extension of their sovereign territory. Neither is likely to give way to

---

<sup>51</sup> New Zealand has twice attempted to gain international recognition for Antarctica as a World Park, but neither attempt was done for altruistic or scientific reasons. The reason behind an attempt during the 1950s was to gain national security on the 'cheap' thus lessening investment in the defence force, while during the 1970s a similar attempt was sparked by the prospect that Third World states would exploit the continent for its mineral wealth to the detriment of New Zealand's position in Antarctica.

<sup>52</sup> See Glassner, Martin Ira, 'The view from the near north—South Americans view Antarctica and the Southern Ocean geopolitically,' *Political Geography Quarterly*, Vol. 4, No. 4, October 1985, pp.331-335. This thesis has adopted a definition for the term *condominium* that means joint rule or sovereignty. Condominium is often suggested as an appropriate form of rule for territories whose ownership is in dispute, for example the Falkland Islands. See Bogdanar, Vernon (ed.), *The Blackwell Encyclopaedia of Political Science*, Blackwell, Oxford, 1991, p. 129.

the other's claim nor to that of the third claimant – Great Britain – whose claim predates and overlaps the other two. International recognition of the existing seven claims over Antarctic territory is equally as doubtful given that many non-claimant countries have already established a permanent presence on the continent, seemingly in anticipation of sharing in the continent's mineral wealth. Antarctica would become a landmass without any sovereign states, but a continent penetrated by many states. Under this scenario Antarctica would fall outside the theoretical strictures of regional security complex theory.

Currently, a lack of geographical contiguity rather than amity and enmity is the crucial determinant that inhibits any prospect of a classical regional security complex forming beyond the existing Exclusive Economic Zones in the Arctic Ocean and in Antarctica. Hence both regions are correctly described as *unstructured*. Predictive regional security complex theory provides no theoretical typology capable of describing these two regions in 2035, for Buzan and Wæver presumably never foresaw their theory being the basis of a regional security forecast more than two decades hence. Notwithstanding this restriction, the theory does provide a foundation on which other complementary theories can be overlaid to provide a companion of useable and useful security theories suitable for describing the security future of both Polar Regions.

Of the three principal tenets of regional security complex theory, amity and enmity being human vagaries remain the most permanent and least contentious parameter. The remaining two tenets of geographical proximity and primacy of the state in international relations<sup>53</sup> are more problematic. At a cursory level the first of these two tenets appear to impose a limitation the usefulness of predictive regional security complex theory, although its amelioration is the topic of the next chapter. As for the remaining tenet, its very nebulosity renders it but a minor topic and thus not mentioned in subsequent chapters.

---

<sup>53</sup> Indeed humanity may be on the cusp of a new international order unfolding for according to the NIC “The trend towards greater diffusion of authority and power that has been occurring for a couple of decades is likely to accelerate because of new global players, the worsening institutional deficit, potential expansion of regional blocs, and enhanced strength of non-state actors and networks. ... The diversity in type of actor raises the likelihood of fragmentation occurring over the next two decades [by 2025] particularly given the wide array of transnational challenges facing the international community.” See National Intelligence Council, ‘Global Trends 2025,’ *op. cit.*, p. x.

## Chapter Four

### Regional orders

#### Security orders<sup>1</sup>

Admiral Sir Reginald Custance (RN) reminds readers of his book, *A Study of War*, that “[t]he underlying assertion is that when armed force is used instead of moral suasion security is reached through battle or the threat of battle.”<sup>2</sup> Although Custance was known to take his enthusiasm for offensive action to imprudent lengths, in truth, he was correct to maintain that any evocation of looming violence made by one country against another inevitably heightened the sense of insecurity within the recipient country. In spite of a general wisdom so often espoused that threats travel more rapidly over shorter rather than longer distances, history is replete with examples that show threats to national security do not necessarily diminish with distance. The implied threat made by a former United States president G. W. Bush against Iran, Iraq and North Korea – the “Axis of Evil” – post-September 11, 2001 was as palpable in each of those states as was the threat posed by a resurgent China to Vietnam prior to their border war of 1979. Indeed, the threat or use of force has always been a part of a great power’s foreign policy.<sup>3</sup> The principal difference between these two examples is that the “Axis of Evil” states are separated from the mainland United States by many time zones, while China and Vietnam (sharing a common border) are locked within the same time zone. In neither case did geographical contiguity or the lack thereof spare either Vietnam or Iraq from invasion by a more powerful and determined adversary.

---

<sup>1</sup> Suggestions have proliferated as to how states can best pursue the management of international politics to achieve order and security. Patrick Morgan situates such pursuits along a continuum of management structures - ranging in succession from integration, to pluralistic security communities, collective security, great-power concerts and, finally, to power restraining power. This is a hypothetical ladder up which regional security complexes may climb in pursuit of an appropriate security management structure. Europe, for example, has now established the most pacific of all regional security orders - integration. See Morgan, Patrick M., ‘Regional Security Complexes and Regional Orders,’ in David A. Lake, and Patrick M. Morgan (eds.), *Regional Orders: Building Security in a New World*, Pennsylvania State University, University Park, PA., 1997, p. 32.

<sup>2</sup> The quotation from *A Study of War* was cited in Gray, Colin S., *Modern Strategy*, Oxford University Press, Oxford, 1999, p. 90.

<sup>3</sup> See Engler, Mark, *How to rule the world: the coming battle over the global economy*, Nation Books, New York, 2008, p. 298.



Geographical contiguity has also become less important in an era of instant communications and rapid mass air transportation and given that these changes are of considerable import then they should find expression in any revision of the orthodoxy of regional security complex theory. Buzan and Wæver's insistence on geographical contiguity has become an impediment in the use of regional security complex theory to explain future security dynamics of either Polar Region, hence a hybrid methodology is required.

The basis for such a methodological development is provided by David Lake and Patrick Morgan through the typology of "Regional Orders." These authors have neatly side-stepped the need to precisely describe a security region by adopting, with modifications, Buzan's regional security complex as their basic unit of analysis. Lake and Morgan also subscribe to the constructivists' definition that regions are socially created entities that take on meaning and importance because states perceive themselves as cohabitating a common area and sharing a common future.<sup>4</sup> With this description to the forefront these authors have redefined what constitutes a regional security complex within contemporary international politics. To wit, it is:

*...a set of states continually affected by one or more security externalities that emanate from a distinct geographic area. In such a complex, the members are so interrelated in terms of their security that actions by any member, and significant security-related developments inside any member, have a major impact on the others.*<sup>5</sup>

Although, under this definition, geography remains an important binding agent that welds states within a nominated region together, geographical proximity is not a necessary precondition for membership of a regional security complex.

Contemporary regional security complexes often have one or more dominant members, customarily great powers able to project force over distance, but which are not geographically located within the region that is the loci of the complex. There is little doubt that the United States belongs to the European

---

<sup>4</sup> See Lake, David D. and Patrick M. Morgan, 'The New Regionalism in Security Affairs,' in Lake, and Morgan, *Regional Orders: Building Security in a New World*, p. 12.

<sup>5</sup> *Ibid.*

security complex, as well as that of the Middle East, although geographically it is separated from both. Involvement by the United States in both complexes goes beyond mere politico-military penetration. Lake and Morgan have not wavered in their belief that contiguity is not a prerequisite for membership of a security complex for they maintain:

*...geography defines the physical area from which security externalities radiate, not the set of states that may be members of a regional security complex.<sup>6</sup>*

However, geographical contiguity remains a contentious issue for Buzan and Wæver, who remain unequivocal in their assertion that geographical proximity is central to all applications of regional security complex theory.

Lake and Morgan do not question the claim that threats to security and acts of violence emanate more frequently from neighbouring rather than distant states. Nor do they dispute that for most states military strength falls off sharply with distance. However, they remain convinced that provision must be made for the possibility that “members of a regional security complex [are] not located in that neighbourhood.”<sup>7</sup> Such a situation would arise when a distant state (usually a great power) has obviously become enmeshed in a web of security relations in response to externalities impacting on or emanating from of a geographical region of interest, other than its own. The concept of externalities lies behind the ability to dispense with geographical membership criteria whenever a discursive factor distorts the relationships embedded within a complex. This is a more permanent characteristic of a complex than that which arises from temporary penetration by a powerful external actor. The question then turns on what characteristics an external state needs to exhibit to be considered a member of a distant complex. Lake and Morgan posit that an “outside” state becomes an “inside” member when:

- It has the greatest military strength or nearly so;
- Regularly deploys its military force to an area for many years;
- Is a party to important alliances within the area;

---

<sup>6</sup> *Ibid.*, p. 13.

<sup>7</sup> *Ibid.*, p. 29.

- Participates in most if not all important negotiations about conflict and security in an area;
- Fights in major wars there;
- And by some member states is seen as the greatest threat they face.<sup>8</sup>

If these are the deciding criteria for an “outside” state to be accepted as an “inside” member, then Lake and Morgan are correct in asserting that:

*...for detecting the members of any RSC we must use the active durable presence of important military forces, major security commitments, and profound security involvement over a lengthy period (something like two or more decades) to supplement a geographical criterion.<sup>9</sup>*

Acceptance of the above would suggest that “[a] regional security complex has a geographical location, but this is not necessarily an exact guide to its members.”<sup>10</sup> Put another way, the geographical area is where security relationships of consequence are located, while the members of the complex are those states who are deeply enmeshed in those relationships. Thus, each state inside a region will see its security interactions influenced by the actions taken by other members within a specific geographical location, rather than with states that are not participants in those interactions. Hence, membership and geography define a regional security complex and accounts for why some “outside” states become “insiders” while other states remain on the outside. It explains not only why the United States is a member of the European security complex, but also why no European state is a member of the North American security complex. It also explains why the United States is a member of the East Asian security complex, but not a member of the South Asian security complex. In the latter case this may change if the United States fails to extricate itself in the future from Afghanistan.

Nevertheless, there is an inherent weakness with this framework. It permits any number of security complexes to overlap, vary with issues, events or the

---

<sup>8</sup> *Ibid.*, p.30

<sup>9</sup> *Ibid.*

<sup>10</sup> *Ibid.*

perceptions of what are deemed relevant externalities.<sup>11</sup> Perceptions, as history often shows, change very rapidly. Hence identification of a security complex can be problematic given that not every actor or analyst's situational perception necessarily coincides. This weakness has been seized upon by Buzan and Wæver to question the theoretical validity underpinning regional orders.

Assuredly, Buzan and Wæver's methodology differs from the economicist formulation<sup>12</sup> favoured by Lake and Morgan. At the centre of this difference lies the issue of levels of analysis and whether regional security complex theory is weakened by the intermingling of global and regional levels. If this is viewed as typologically untenable then the theory underpinning regional orders must fail. In contrast, Buzan and Wæver "insist that regions are defined exclusively [of the global level] and that external powers are treated in terms of penetration or overlay, not members of the RSC as such."<sup>13</sup> Under this concept the United States during the course of the Cold War overlaid Western Europe and ever since the close of World War II has successfully penetrated East Asia, however, in neither case has it become a member of the respective regional security complex. In making this case, Buzan and Wæver appear to have discarded any semblance of logic for surely, after six decades of maintaining a considerable military presence in both Europe and East Asia, being the principal guarantor of peace in "Western" Europe and having spilled blood in a war on the Korean Peninsula, the United States has earned the right to be an "inside" member of both regional security complexes. In both of these examples the actions of the United States are a close match of the "insider/outsider" criteria identified by Lake and Morgan.

### **The Malvinas/Falkland Islands conundrum**

Both sets of authors hold strong convictions as to their respective approach to the question of contiguity but, having considered both sides to this argument the thesis author prefers the pragmatic approach (Lake and Morgan) over the purist approach (Buzan and Wæver) as to which states should or should not be included in which regional security complex. Notwithstanding this election, the decision by Buzan and Wæver to gloss over the unique geopolitical situation of the

---

<sup>11</sup> *Ibid.*

<sup>12</sup> See Buzan, Barry and Ole Wæver, *Regions and Powers: The Structure of International Security*, Cambridge University Press, Cambridge, 2003, p. 80.

<sup>13</sup> *Ibid.*

Malvinas/Falkland Islands weakens their argument. The Malvinas/Falkland Islands is an archipelago in the South Atlantic whose sovereignty Islanders have sworn to Great Britain but whose ownership is fiercely contested by Argentina. In terms of regional security complex theory these islands during the Cold War were subsumed within the South American regional security complex but not within the Southern Cone subcomplex;<sup>14</sup> an interesting oversight or intentional exclusion. This omission held little consequence until 1982 when the Argentine military, at the behest of an unpopular military junta, invaded these islands to correct what the Argentineans perceived as an historical injustice. The outcome was war and a victory to Great Britain. As a corollary of this war Great Britain turned the Falkland Islands into a fortified “strategic gatekeeper” from which it can extend its military power, in particular airpower, over the South Atlantic, and the western approaches to the Drake Passage and the Antarctic Peninsula.<sup>15</sup>

Cessation of the Cold War did not significantly alter the patterns of regional security<sup>16</sup> in South America and even today the Malvinas/Falkland Islands remain excluded from the Southern Cone subcomplex. What has not remained the same after 1982 is the arrival within the region of another great power besides the United States, a resurgent Great Britain. Since the 1982 war Great Britain has exerted a significant military and political presence in littoral South America, primarily below latitude 45° south.

It can be argued that the Malvinas/Falkland Islands represent nothing more than a remnant of Britain’s colonial past; a colony of British immigrants in the South Atlantic. If that were the case then this archipelago would, under regional security complex theory, be considered nothing more than territorial possession overlaid by a European metropolitan power and thus excludable from both the Southern Cone subcomplex and the South American regional security complex. It is only when a group of states are released from an overlay that alternate security dynamics can exert a regional influence that can result in the formation of a

---

<sup>14</sup> The Southern Cone subcomplex comprises the states of Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay.

<sup>15</sup> Child, Jack, *Antarctica and South American Geopolitics: Frozen Lebensraum*, Praeger, New York, 1988, p. 28.

<sup>16</sup> During the Cold War period there was general acceptance of Ecuador, Bolivia, Uruguay and Paraguay as buffer states, with the latter three separating an antagonistic Brazil from an equally antagonistic Argentina. In keeping with all other continents in the post-Cold War era South America is free of buffer states. Buzan and Wæver, *op. cit.*, p. 316 and p. xxvi.

security complex.<sup>17</sup> Such dynamics may not be evident immediately, for as Walter Little argues from the Latin American case, a ‘working out’ period is necessary after decolonisation in order for states to sort out relationships. For Latin America that period was more than half a century.<sup>18</sup> Such a lengthy gestation period was not afforded to either India or Pakistan, for the South Asian security complex sprang into existence nearly fully formed in 1947. For individual states that were once colonies, the date of independence marks their transition to membership of a security complex.<sup>19</sup> For example, in the case of Belize, a British colony in Latin America since 1776, its inclusion in the Central American subcomplex and North American regional security complex was realized on independence from Great Britain in 1981.

However, Britain’s presence in the South Atlantic is no mere penetration or overlay, for the Falkland Islands are a distant possession of metropolitan power. If, as Buzan and Wæver maintain, this island group is an integral member of the South American regional security complex, then *ipso facto* Great Britain must also be a member of the same complex. Why the Malvinas/Falkland Islands is not a member of the Southern Cone subcomplex given its membership of the South American regional security complex is not explained by Buzan and Wæver, though that may have more to do with the island group not being a sovereign entity in its own right or a province of Argentina than with geographical contiguity. There is of course an alternate explanation; that inclusion of the islands, given they extend British sovereignty deep into the South Atlantic, would turn the Southern Cone subcomplex into a great power regional security complex with distant Great Britain at its geopolitical centre.<sup>20</sup>

There is also an interesting comparison to be drawn between the Malvinas/Falkland Islands and the Galapagos Islands. The latter are considered

---

<sup>17</sup> See Buzan, Barry, *People, States & Fear: An Agenda for International Security Studies in the Post-Cold War Era*, Lynne Rienner, Boulder, 1991, p. 205.

<sup>18</sup> See Little, Walter, ‘International conflict in Latin America,’ *International Affairs*, Vol. 63, No. 4, 1987, pp. 593-594.

<sup>19</sup> Buzan and Wæver, *Regions and Powers*, *op. cit.*, p. 279.

<sup>20</sup> In the year 2008, Great Britain spent twice as much on its armed forces as the combined military spending of all Southern Cone countries. See Hellman, Christopher and Travis Sharp, ‘The FY2009 Pentagon Spending Request – Global Military Spending,’ *Centre for Arms Control and Non-Proliferation*, February 22, 2008, <http://www.armscontrolcentre.org/policy/securityspending/article/fy09> (12 February 2009).

integral to the Andean subcomplex<sup>21</sup> although they are nearly one thousand kilometres west of the South American mainland, while the former are denied inclusion within the Southern Cone security subcomplex though they are only half that distance from the eastern shore of South America. The only feasible explanation for the inclusion of the Galapagos Islands within a subcomplex and for the Malvinas/Falkland Islands exclusion is that the former are a possession of a South American state (Ecuador) while the latter are not. These unwelcome aberrations highlight the frailty of the purist approach central to any classical interpretation of regional security complex theory.

The Malvinas/Falkland Islands example is a testament to the ability great powers possess to infiltrate and become an “inside” member of a security complex though they share no contiguous border with any member state. Even though distance imposes a significant cost on membership - £143 million per year (2007) in the case of the Malvinas/Falkland Islands<sup>22</sup> – it is a cost that has not deterred Great Britain from maintaining membership of the South American regional security complex. Notwithstanding that costs will increase year-by-year Great Britain shows no inclination to turn the Falkland Islands over to the Argentinians. Therefore, some exogenous factor must weigh more heavily than membership costs with the British Parliament. Although a number of factors may account for the attitude adopted within the British Parliament, one factor that should not be overlooked is the one expressed in 1740 by Lord Anson:

*The Falkland Islands, even in time of peace, might be of great consequence to this nation, and in time of war would make us master of the seas.*<sup>23</sup>

In the future, the need to source resources from Antarctica could easily turn the continent from a zone of peace to one of interstate conflict. If that became the reality then the state that has sovereignty over the Malvinas/Falkland Islands

---

<sup>21</sup> The Andean subcomplex comprises the states of Colombia, Ecuador, French Guiana, Guyana, Peru, Suriname and Venezuela.

<sup>22</sup> See Brown, Colin, ‘Old foes still as far apart as ever,’ *New Zealand Herald*, Auckland, April 3, 2007, p. B3. Indeed, such aspirations may again turn to violence for in a briefing note to the British Members of Parliament by the House of Commons library it was alleged that “the claims to the disputed islands are rising again in Argentina” and that “More recently the Argentinian Government has adopted a more aggressive stance.” *Ibid.*

<sup>23</sup> Quote cited in Hastings, Max and Simon Jenkins, *The Battle for the Falklands*, Michael Joseph, London, 1983, p. 61.

along with those islands that comprise the Scotia Arc holds a significant strategic advantage over other states, for its military forces could prevent or inhibit the transit of belligerent forces through the South Atlantic to the southern continent.

### **Creating an Antarctic regional security complex**

The twist that the Malvinas/Falkland Islands impose on regional security complex theory deepens with acceptance that great powers are capable of becoming an “inside” member of a distant regional security complex. This manoeuvring becomes central in mounting a challenge to the accepted wisdom that only sovereign states can coalesce into a regional security complex. Buzan and Wæver use particularly interesting nomenclature to describe the political entity<sup>24</sup> upon which regional security complexes are centred:

*Within terms of RSCT, RSCs define themselves as structures of the international system by the relative intensity of security interdependence among a group of **units**, and security indifference between that set and surrounding **units**.*<sup>25</sup> (Emphasis added)

Hence the pivotal question becomes what are the characteristics of the political entity known as a “unit?” Obviously, in accordance with constructivist ontology a “unit” can assume any characteristics defined by its creator. It is also possible to take advantage of Buzan and Wæver’s lack of preciseness to create a new typology that allows for the creation of security complexes by other than sovereign states. That typology could then be tested against the tenets of classical security complex theory.

---

<sup>24</sup> Buzan and Wæver maintain that in order to qualify as an RSC, “a group of states or **other entities** must possess a degree of security interdependence sufficient both to establish them as a linked set and to differentiate them from surrounding security regions.” (emphasis added) Buzan and Wæver, *op. cit.*, p. 49.

<sup>25</sup> Buzan and Wæver, *Regions and Powers, op. cit.*, p. 53. Buzan describes the term “unit” elsewhere as “*Units*, meaning actors composed of various subgroups, organizations, communities, and many individuals and sufficiently cohesive and independent to be differentiated from others and to have standing at the higher levels (e.g. states, nations, transnational firms).” See Buzan, Barry, Ole Wæver and Jaap de Wilde, *Security: A New Framework for Analysis*, Lynne Rienner, Boulder, 1998, p. 6. On the levels of analysis hierarchy “units” stand below “international systems” and “international subsystems” but above “subunits” and “individuals.” *Ibid.* By logical extension, the terms “units” and “other entities” permits the possibility that political, economic, environmental or societal structures other than sovereign states can coalesce into an RSC, provided a level of security interdependence exists between constituent members.



Buzan and Wæver accept that the Malvinas/Falkland Islands are a member of the South American regional security complex even though this archipelago is not a state in its own right but a dependency of Great Britain. Therefore, by logical extension, any terrain, even territory without an autonomous government or centre of power, provided it possesses defined geographical boundaries and can provoke an intensity of security interdependence could become a “unit” and consequently an “inside” member of an security complex. That a “unit” can metamorphose beyond the sovereign state is evidenced by the European Union; a multilateral institution at the centre of its own complex.

Extending regional security complex membership criteria to include political entities other than states raises the conceptual possibility that Antarctica could be a regional security complex in its own right. This concept is worthy of deeper examination by comparing the empirical characteristics of a notional Antarctic security complex with the four variables that represent the essential structure of a regional security complex:

- *Boundary, which differentiates the RSC from its neighbours*  
The Southern Ocean clearly differentiates Antarctica from all other neighbourhood security complexes.
- *anarchic structure, which means that the RSC must be composed of two or more autonomous units*  
Prior to the advent of the Antarctic Treaty, Antarctica was divided into eight segments, seven of which are under claim by Western-orientated metropolitan states. (To date no claim over Antarctic territory has been withdrawn)
- *Polarity, which covers the distribution of power among the units*  
The list of claimant countries comprises two great powers – France and Great Britain; one middle power – Australia and four minor powers – Argentina, Chile, New Zealand and Norway.
- *Social construction, which covers the pattern of amity and enmity among the units*  
In terms of regional security complex theory, Antarctica could be seen as a standard RSC divided into two subcomplexes; one

covering the Antarctic Peninsula — incorporating the segments claimed by Argentina, Chile and Great Britain — bound together by a pattern of enmity, while over the remainder of the continent the predominant pattern is amity.

Through the use of a Malvinas/Falkland Islands analogy it is possible to create a scenario under which Antarctica assumes the character of a continental-sized standard regional security complex, not unlike that of either Africa or South America. One reason why this has not occurred in the post-Second World War era is that local security interdependence ceased once the seven claimant states yielded to a political overlay proposed by a much more powerful state — the United States — under the guise of the Antarctic Treaty.

### **Externalities**

The two sets of authors also differ markedly as to whether regional security complexes are mutually exclusive or overlapping. As mentioned above, Buzan and Wæver take the position that regional security complexes are mutually exclusive and distinguished from each other by degrees of relative security connectedness or indifference.<sup>26</sup> Lake and Morgan, through their reliance on externalities, have created a methodology under which any number of security complexes can overlap when triggered by different causal factors. If externalities lie behind the involvement of great powers in distant complexes then an understanding of the nature and use of externalities is crucial.

‘Externalities,’ which is an uncommon term within the security lexicon, is as familiar an idiom to economists as is the notion of the ‘market place.’ The market place is a mechanism that facilitates the exchange of goods and services for money. Market place transactions identify a monetary amount that a seller is offering and a buyer is willing to accept. Both the buyer and the seller are seeking ‘value for money’ in their own terms. By definition, the market price ignores the externalities in any transaction, namely those costs to other parties that the seller need not take into account and the benefits parties other than the buyer can enjoy. These are the costs and benefits that exist outside of the transaction and are

---

<sup>26</sup> Buzan and Wæver, *Regions and Powers, op. cit.*, p. 49.

commonly called the ‘social costs and benefits.’<sup>27</sup> According to Cornes and Sandler there is a strong temptation to avoid giving an explicit definition of ‘externalities’ for it provides a fertile source of controversy. However, in their book they are persuaded to define externalities and does so by deferring to a definition developed several decades prior by J. E. Meades:

*An external economy (diseconomy) is an event which confers an appreciable benefit (inflicts appreciable damage) on some person or persons who were not fully consenting parties in reaching a decision or decisions which led directly or indirectly to the event in question.*<sup>28</sup>

Lake and Morgan appear to have seized upon Meade’s non-specificity as to what constitutes externalities<sup>29</sup> as the conduit through which to introduce the concept of externalities into the security environment.

Lake categorizes a regional system as a set of states joined by at least one transborder, and affected by an externality that emanates from within a specific geographical area. If a local externality poses a real or potential threat to the physical safety of persons or governments in other states it produces a regional security system. Not all externalities pose a threat to physical security but, where they do, they bind a set of states into a regional security complex. Simply put, externalities can be either costs (negative externalities) or benefits (positive externalities) that do not accrue only to the actor that created them.<sup>30</sup> This spread of externalities from the originating actor or state to adjacent actors or states is known as *spillover* or the *neighbourhood effect*.<sup>31</sup> The broadness of interpretation as to what constitutes externalities is the feature of Meade’s essay that enables

---

<sup>27</sup> See Lichfield, Nathaniel, ‘Towards Social Valve for Money,’ in Donald Miller and Domenico Patassini (eds.), *Beyond Benefit Cost Analysis: Accounting for Non-Market Values in Planning Evaluation*, Ashgate, Aldershot, 2005, p. 117.

<sup>28</sup> See Cornes, Richard and Todd Sandler, *The Theory of Externalities, Public Goods and Club Goods*, Cambridge University Press, Cambridge, 1996, p. 39.

<sup>29</sup> *Ibid.*

<sup>30</sup> Lake, David A., ‘Regional Security Complexes: A Systems Approach,’ in Lake and Morgan, *Regional Orders: Building Security in a New World*, p. 49. Lake gives as a classic example of an externality “...a manufacturer who releases pollutants into a river and thereby imposes costs on downstream users of that common resource, who must either pay to purify the water or forgo its otherwise valuable use.” *Ibid.*

<sup>31</sup> The concept that externalities can flow between actors or across borders is found in the economic theory of *public good*, which in turn has a similarity to the theory behind the “tragedy of the commons.” Cornes and Sandler, *op. cit.*, pp. 52-63.

Lake to maintain that the concept explains the origin of interstate security dilemmas.<sup>32</sup>

The essential point being made by Lake is that states do not receive the full cost or benefit when producing either negative or positive security externalities. With externalities, the regional or “social” costs or benefits are greater than the national costs or benefits. Therefore, each state exhibits a tendency towards reducing these greater social costs or capturing greater social benefits through interstate co-operation. Nevertheless, it is national returns that guide state policy. Individual states will seek to manage their interstate relations up to the point where the private marginal cost of one less unit of negative externality or one more unit of positive externality is equal to the private marginal benefit of obtaining that unit. In the absence of an effective agreement between relevant states negative security externalities will be overproduced, since the originating state does not bear the full social cost of its actions but does bear the private cost of modifying its behaviour. The corollary is also true, for positive security externalities will be under produced since states must pay the private cost of production for which it does not receive the full social benefit.<sup>33</sup>

Externality is also a concept found in geopolitics. For political geographers where “everything is related to everything else, but near things are more related,”<sup>34</sup> externalities tend to travel more quickly over shorter than longer distances. Externalities (variously referred to as neighbourhood effects, third party effects or free-rider costs and benefits) pose a problem because of their effect on political power structures, the level of equity within a political system, and have a propensity to generate conflict within society. For example, implicit within the question of equity is the allocation of resources; how should scarce public resources be allocated across diverse public ends? In human societies allocation problems often engender conflict between actors with diverse preferences, especially when such difference cannot be resolved by the current political

---

<sup>32</sup> Lake, *op. cit.*, p. 49.

<sup>33</sup> *Ibid.*, p. 52.

<sup>34</sup> See Tobler, W. R., ‘A Computer Movie Simulating Urban Growth in the Detroit Region,’ *Economic Geography*, Vol. 46, No. 2, June 1970, p. 234.

regime; a situation made more complicated when there is involvement of an external actor.<sup>35</sup>

David Mares, in an exposition on regional conflict management, has catalogued the role security externalities have played in turning Latin America into a security complex on three different levels: international, regional and domestic. At the international level, the United States is a great power that, irrespective of Latin American wishes, identifies Latin America as being within its sphere of influence. From its hegemonic position the United States has insisted on a unilateral right to “defend itself” in the Western Hemisphere. Consequently, United States’ defence interests produce fundamental security externalities for each and every Latin American state.<sup>36</sup> A second externality dates from the colonial days: the incidence of disputed territorial borders means that the resolution of one border conflict has an impact on the others. While many border disputes have been diplomatically or militarily settled, the majority of Latin American states still have a territorial dispute with at least one neighbour.<sup>37</sup> The third security externality arises from the highly stratified social structure in Latin America and the interconnectedness of their economies. Because states in the region are an interlocking community, when there is revolutionary upheaval in one state then the elite in the rest of Latin America begin to worry. These worries can be exacerbated by a United States willingness to act militarily raising the spectre of a domestic conflict becoming internationalized.<sup>38</sup>

Security externalities display three dimensions that can affect regional security. First, they differ in magnitude, in terms of the cost they impose on other states. The greater the cost the more likely states will alter their behaviour, organizing either to capture positive or mitigate negative effects. Secondly, externalities will inevitably affect some states more than others. Intensity may be governed by factors like geography, proximity, preference, desire for a certain level of security, even technology. Intensity will ultimately determine whether states lean towards individual or collective action when solving problems. Finally,

---

<sup>35</sup> See Cox, Kevin R. and David R. Reynolds, ‘Locational Approaches to Power and Conflict,’ in John Agnew (ed.), *Political Geography: A Reader*, Arnold, London, 1997, p. 13.

<sup>36</sup> See Mares, David R., ‘Regional Conflict Management in Latin America: Power Complemented by Diplomacy,’ in David A. Lake and Patrick M. Morgan (eds.), *Regional Orders: Building Security in a New World*, Pennsylvania State University Press, Pennsylvania, 1997, p. 198.

<sup>37</sup> *Ibid.*, p.199.

<sup>38</sup> *Ibid.*

states face numerous security externalities. Each externality holds the potential to create a new security complex that may or may not cover an aggregation of the same states. Thus, there exists a high probability that a state will be a member of a number of security complexes brought into existence by an equal number of discrete externalities.<sup>39</sup> As each complex forms it will overlay others to a lesser or greater extent, which is an illustration of an *overlapping cleavage* as defined by Cleavage Theory. A basic proposition of the theory of cleavages asserts that if the cleavages in society overlap, then conflictual behaviour – violence – at the societal [interstate] level is relatively likely. The theory also maintains that if the same people [states] hold opposing positions in one dispute after another, then the severity of conflicts is likely to increase.<sup>40</sup>

It is the last of these dimensions that most concerns Buzan and Wæver. They see that this approach invariably leads to the unmanageable multiplication of issues and hence security complexes, which can only be contained by taking a narrow (military) definition of security. Buzan and Wæver also raise the analytical difficulty of sifting through each issue to determine the respective composition of each security complex.<sup>41</sup> However, their argument is undermined through an acknowledgement that regional security complexes might not always be identical in each security sector<sup>42</sup> i.e. in the military, environmental, economic, societal and political sectors. Non-security issues within the environmental, economic and societal sectors may or may not metamorphose into security externalities. If they should do so, then any resulting security complex may not be conterminous with any existing politico-military security complex.<sup>43</sup> In the next chapter this caution will be shown to hold true, but it is also a reality in contemporary security architecture. Finally, in terms of prediction, Buzan and Wæver believe that the ‘exclusive’ approach inherent in classical regional security complex theory holds advantages over regional orders because it creates a comprehensive picture of the world’s regional security complexes, including their borders and insulator states.<sup>44</sup> However, in an increasingly interrelated world where security complexes might

---

<sup>39</sup> Lake, *op. cit.*, p. 53.

<sup>40</sup> See Axelrod, Robert, *Conflict of Interest: A Theory of Divergent Goals with Applications to Politics*, Markham, Chicago, 1970, p. 159.

<sup>41</sup> Buzan and Wæver, *Region and Powers*, *op. cit.*, p. 81.

<sup>42</sup> Buzan, *et al.*, *Security*, *op. cit.*, p. 166.

<sup>43</sup> Lake, *op. cit.*, p. 57.

<sup>44</sup> Buzan and Wæver, *Regions and Powers*, *op. cit.*, p. 82.

form in a number of sectors maintaining the intrinsic clarity of the purist approach appears impossible.

### **Intervention by great powers**

The methodology required to expand the essential composition of regional security complex theory to enable the development of a “hybrid” theory capable of explaining the formation of polar security complexes turns on the notion that states can and will intervene in regions that are not their own. As the American invasion of Iraq demonstrated, great power interventions are hazardous and often motivated by extra-regional and domestic political factors rather than by tightly-bounded regional security concerns. Similarly, disengagement from a region is equally driven by these factors, as illustrated by America’s protracted withdrawal from Iraq.

Unlike minor powers, great powers possess the military capability to cast their influence well beyond their immediate region and into distant security complexes whenever it suits their interests. According to Lake, the willingness of great powers to manage regional conflicts and contribute to the creation of regional order is contingent upon how deeply great powers are affected by the security externalities emanating from a particular area. Great powers that are full members of a distant regional security complex will be affected by the character of both security and non-security externalities emanating from that region in ways nearly identical to those experienced by the region’s non-great powers. Difficulties arise, however, if a great power is embedded in more than one regional security complex for then precedent and reputation often dictates actions. Great powers may be more interventionist in one region in order to deter conflict within other areas of interest, or less interventionist for fear that acting in a particular manner might set an unwelcome precedent for action in an area of lesser concern.<sup>45</sup>

Again, according to Lake, great powers that are “outside” the regional security complex are unlikely to intervene in the region except when prompted by compelling internal or external reasons. Even when non-security externalities affect great powers in important ways and international co-operation is possible,

---

<sup>45</sup> Lake, *op.cit.*, p. 64.

great powers that are unaffected by regional security externalities have no incentive to pay the cost of mitigating such externalities. Nevertheless, under global unipolarity or multi-polarity unaffected great powers might choose to intervene, but their actions will be driven by internal factors which may not necessarily be conducive to the establishment of order and stability within a region.<sup>46</sup>

### **Synthesizing a theory**

There are two foundational tenets to classical security complex theory: geographical contiguity and a pattern of relations characterised by amity and enmity. Patterns of amity and enmity are likely to be a common thread woven through any synthesis of any alternate theory to traditional security complex theories: It hold true for this synthesis. The remaining tenet, geographical contiguity, shall be replaced by accepting the arguments mounted by Lake and Morgan that a great power can become an “inside” member of a regional security complex if the externalities emanating from a region are sufficiently strong and enduring so that the external power’s presence becomes synonymous with that region. Local externalities, even non-security externalities can, metamorphose into an international security incident drawing great powers ever deeper into a region with the possibility of turning a standard or centred regional security complex into either a uni- or multi-great power security complex or even a supercomplex.

Based on a synthesis of the “useful” theoretical elements of both classical regional security complex and regional orders theories the ‘interim’ theory below provides a pathway towards the development of a “hybrid” theory that could explain the future security dynamics for Polar Regions. Further extensions of this theoretical construct will occur in subsequent chapters. Accompanying this theoretical extension is an enlargement of the essential structure defining a regional security complex by amending Buzan’s second variable and by adding a fifth.

1. *boundary, which differentiates the RSC from its neighbours;*

---

<sup>46</sup> *Ibid.*, p. 65.



2. *anarchic structure, which means that the RSC must be composed of two or more autonomous units, but geographical contiguity is not a mandatory requirement;*<sup>47</sup>
3. *polarity, which covers the distribution of power among the units;*
4. *social construction, which covers the patterns of amity and enmity among the units; and*
5. *the intensity of security externalities on both regional and non-regional units.*

While classical regional security complex theory remains substantially unchanged, the amendment to the second and the addition of the fifth element does facilitate the evolution of polar security complexes. Such evolution can move polar security complexes into or out of one of three structural configurations:

- *maintenance of the status quo, which means that there are no significant changes to its essential structure;*
- *internal transformation, means that changes to the essential structure occur within the confines of its existing outer boundary. This could mean changes to the anarchic structure (through regional integration); to polarity (because of disintegration, merger or conquest); to the dominant patterns of amity/enmity (because of ideological reorientation, changes in leadership) or local externalities (because of changing rainfall patterns, discovery of natural resource deposits).*
- *external transformation, which means that the outer boundary expands, or contracts, changing membership of the security complex, and most likely transforming the essential structure in other ways. This could result from the merging of two security complexes. Transformation would also occur if a distant great power become embedded or disengaged in a regional security complex as the result of the presence or absence of security externalities.*<sup>48</sup>

---

<sup>47</sup> There is no longer a mandatory requirement for geographical contiguity as a determinative factor in any configuration of a regional security complex.

<sup>48</sup> Adapted from Buzan and Wæver, *Regions and Powers, op. cit.*, p. 53.

### **Polar regional thumbnail sketch**

There is no shortage of externalities emanating from either Polar Region. Common to both, for example, is the externality represented by access to natural resources which in the Arctic has assumed a security dimension not currently found in Antarctica. If there is no resolution to the territorial claims lodged under UNCLOS III then the lure of hydrocarbon deposits presumed to lie along the Lomonsov Ridge<sup>49</sup> in a region beyond established Exclusive Economic Zones, might draw not only the Arctic rim powers into a resource imbroglio, but also more distant states with a craving to secure access to petroleum reserves. Although no single sovereign state can form in the high Arctic Ocean, the presence of many militarily capable states within that locality could give impetus to the creation of an institutional arrangement to moderate antagonistic overtures exhibited by one power towards another. Interestingly, such action could of itself create a “phantom” region that would take on the characteristics of a multi-great power regional security complex, not dissimilar to the European regional security complex but, more probably it would result in a geopolitical “shatterbelt.”

Antarctica is not immune from the externalities that exist elsewhere in the world for example, biospheric degradation resulting from climate change and ozone depletion. Countries could seek to mitigate one effect of global climate change, i.e. water scarcity, by harvesting ice in Antarctic. In that case much of the environmental cost (pollution) of such harvesting would be borne by the Southern Oceanic Rim States rather than the state harvesting the ice, particularly if it was a northern hemisphere state. Until such an event occurs one can only speculate as to the characteristics and intensity of externalities and the resulting behaviour of affected and unaffected states. A possible outcome could be the military enforcement of sovereignty claims by claimant countries or the “invasion” of Antarctica by distant powers that wilfully disregard all sovereignty claims as they seek to secure unencumbered access to natural resources.

The onset of changes to both the environmental and geophysical character of both Polar Regions is indicative of a need to explore further methodology amendments to regional security complex theory. Having resolved the matter of geographical

---

<sup>49</sup> See Harrington, Caitlin, ‘Eyeing up the new Arctic,’ *Janes Defence Weekly*, Vol. 45, No. 3, 16, January 2008, p. 24.

contiguity there is yet another immediate impediment to developing a comprehensive security complex theory – specifically, the question of whether the environmental issues in the broadest sense of that term, could come to represent causal factors leading to the creation of individual security complexes. If such a cause can be proven then the resulting complex would, in all likelihood, be more latitudinal and less longitudinal in orientation. This latter orientation is often geographically governed and ethno-culturally determined, yet it remains counterintuitive to the latitudinal character of regions and zones found in the natural world. Such a distinction might have remained irrelevant but for the impact of climate change and its suggestive revision of contemporary latitudinal climatic belts. Since classical regional security complex theory cannot resolve this dilemma, it is necessary to consider an alternative methodology such as that provided by sector security complex theory.

## Chapter Five

### A Non-traditional Approach to Security Complex Theory

#### The latitudinal natural world

A latitudinal world has at its foundation the geography of life on Earth. This concept is rooted in ecology — a scientific model first developed in the nineteenth century by Ernst Haeckel, who was also responsible for its name *eco*, taken from the Greek word meaning “household” and *logy*, the Greek word for “study.” Ecology, then, means the study of one’s house.<sup>1</sup> This chapter is, therefore, a vision of how and why “one’s house” – the state – could come to be imperilled in the foreseeable future by any one of a number of non-traditional security threats.<sup>2</sup> This chapter is predicated on the notion that ecological or environmental degradation will not become a securitized referent object as perceived by numerous commentators but, rather, a causal factor that will heighten security interdependence between states locked within a geographic region and between that region and adjacent regions. The very presence of security interdependencies assures the establishment of a security complex, but that complex is unlikely to be an exact geographical replica of a region created under classical security complex theory.

#### The natural order

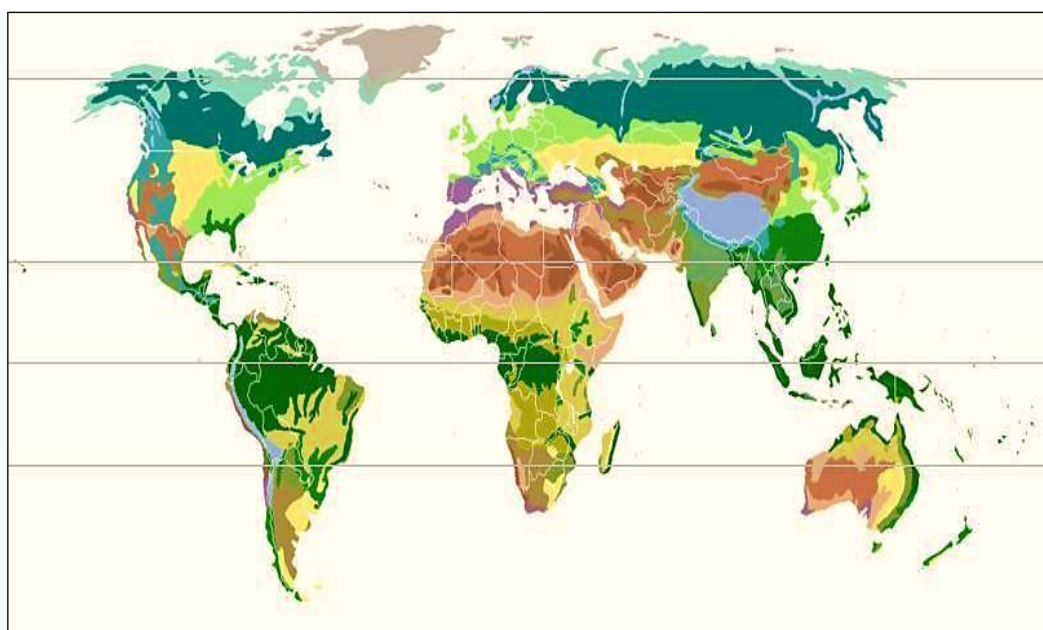
Living organisms are generally restricted to areas where available habitats – local environments - and potential lifestyles fit their adaptations. The greater the difference among habitats, the greater is the differences among the organisms that inhabit them. In the terrestrial environment the major life zones, or biomes, are largely defined by climate. Each biome is a relatively distinct ecosystem, both climatically and geographically defined, with similar plants and animals

---

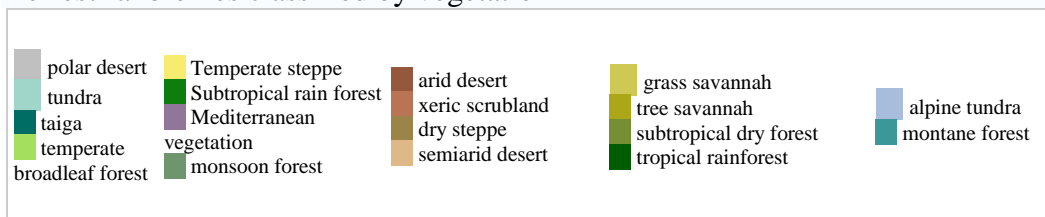
<sup>1</sup> See Solomon, Eldra Pearl, *et al.*, *Biology*, Saunders College Publishing, Fort Worth, 1993, p. 1108.

<sup>2</sup> Sir David King, The United Kingdom government’s former chief scientific adviser, predicts that “...population growth, natural resources dwindling, and seas rising due to climate change, the squeeze on the planet will lead to more conflict.” Randerson, James, ‘UK’s ex-science chief predicts century of ‘resource’ wars,’ *The Guardian*, 13 February 2009, <http://www.guardian.co.uk/environment/2009/feb/13/resource-wars-david-king/print> (9 June 2009).

regardless of where it occurs on Earth. The boundaries separating each biome are determined by climate more than any other factor.<sup>3</sup> For example, the tundra biome located immediately below the Arctic polar desert is colder, and has a shorter growing season with fewer types of vegetation, than the more temperate biomes. Like temperature, rainfall is an important climatic factor in defining the location of biomes, producing the communities of desert, grassland and forest in increasing order of precipitation.<sup>4</sup>



Terrestrial biomes classified by vegetation



**Map 4.** The world's major terrestrial biomes are distributed primarily in accordance with temperature and precipitation. These factors are the principal determinants behind the predominant latitudinal orientation displayed by all terrestrial biomes.

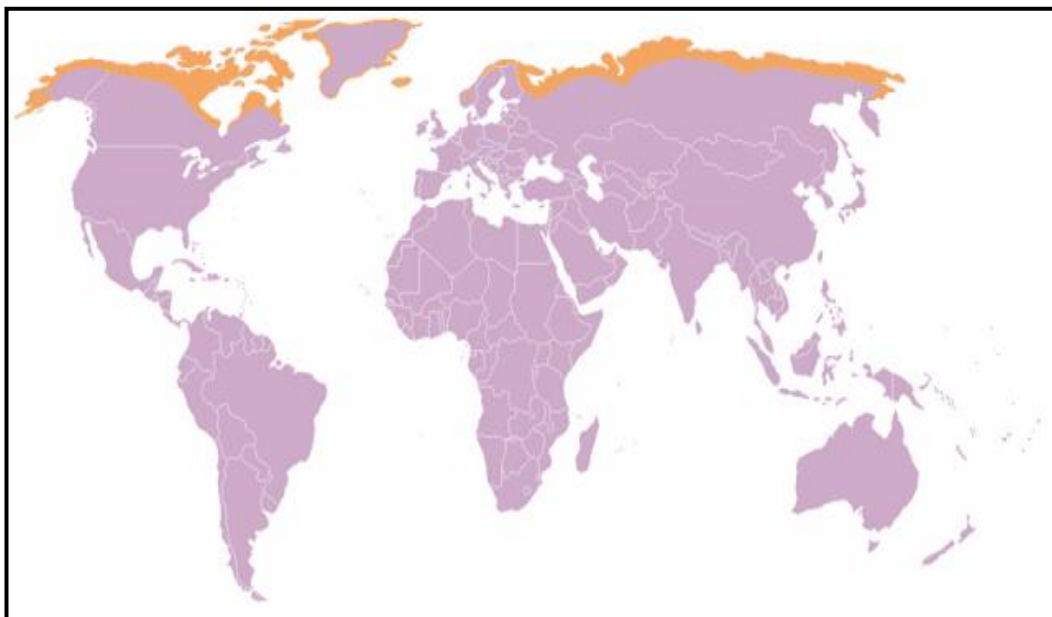
Map source: <http://en.wikipedia.org/wiki/biomes>

This latitudinal order is evident at both Polar Regions, but more so in the Arctic where the tundra forms a discernible geobotanical zone between the boreal forests of more temperate zones and the botanically bare polar desert of the highest

<sup>3</sup> Solomon, *op.cit.*, p. 1110.

<sup>4</sup> *Ibid.*

northern latitudes. Indeed, the tundra biome, being an oversimplified stratification of a botanical region, can be further divided along the six degree Celsius July isotherm into the Arctic and sub-Arctic tundra sub-regions.<sup>5</sup> One former Soviet Union researcher (A. A. Grigofyev) maintained that along this border there occurs an essential change in the character of the atmospheric circulation and the radiation balance which affects every aspect of this physico-geographical complex.<sup>6</sup> The plants that dominate the Arctic tundra differ in one fundamental way from all other plants on earth: they are able to carry on metabolic and reproductive processes at a growing season temperature only slightly above or even below zero degrees Celsius.<sup>7</sup> If, as posited by other researchers, the Arctic growing seasons are becoming longer and warmer, then the tundra may become extinct as a unique biome or become subsumed into an expanding taiga zone. Furthermore, this once pristine and relatively isolated region is now subject to considerable disturbance, due mostly to increasing human populations and the use of industrial equipment and motor vehicles.<sup>8</sup>



**Map 5.** Latitudinal distribution of the Arctic tundra biome (orange) across Arctic-rim countries.  
A Source: <http://en.wikipedia.org/wiki/file:800px-map-Tundra.png>

<sup>5</sup> See Aleksandrova, V. D., *The Arctic and Antarctic: their division into geobotanical areas*, Cambridge University Press, Cambridge, 1980, p. 89.

<sup>6</sup> *Ibid.*

<sup>7</sup> See Billings, William Dwight, 'Introduction: Challenges for the Future: Arctic and Alpine Ecosystems in a Changing World,' in Walter C. Oechal, *et al.* (ed.), *Global Change and Arctic Terrestrial Ecosystems*, Springer, New York, 1996, p. 1.

<sup>8</sup> *Ibid.*

The Antarctic tundra biome is primarily located within an oceanic rather than a continental environment. As a geobotanical zone, the Antarctic tundra occurs along the 'warmer' reaches of the Antarctic Peninsula as well as on many Antarctic and sub-Antarctic islands, including South Georgia, the South Sandwich Islands, Macquarie, Prince Edward and the Kerguelen Islands. Aleksandrova considers that, like the Arctic, the Antarctic tundra biome can be divided into two distinct circumpolar, geobotanical sub-regions. The more temperate of these, located beyond the northern limits of where ice-flows and icebergs are found all year round, is aptly named the region of sub-Antarctic cushion plants. With a few exceptions these islands conform to what has been described as "the subantarctic province of peatbogs with cushion plants."<sup>9</sup> Such a description is not intended to deny the existence of fields of knee-high tussock grass (*Poa*) on the many Subantarctic Islands scattered across the Southern Ocean.<sup>10</sup> The other sub-region is comprised of the continent proper and immediate offshore islands all of which are surrounded year-round by ice-flows. Although this sub-region amounts to a polar desert it is not completely devoid of either nonvascular plants or algae and on the Antarctic Peninsula, where favourable environmental conditions permit, two flowering plants species have become established.<sup>11</sup>

Common to the tundra biome in both Polar Regions is the presence of permafrost—the "fortifier" that binds these ecosystems together.<sup>12</sup> Permafrost can be defined as terrain where the temperature is continuously below zero degrees Celsius in both winter and summer. At one extreme, permafrost may be ground that froze during a winter and survived frozen through the following summer and into the next winter and at the other extreme it includes terrain which has been frozen for millions of years.<sup>13</sup> Embedded within the permafrost are large white ice sheets (*Poyslons*) upon which a succession of tundra vegetation has clustered in a cyclic sequence that never reaches a stage of complete stability. The continued existence of the tundra is dependent on permafrost and its pattern of ice wedges. Should these ice wedges warm to temperatures above freezing by increased soil temperature, exposure to warmer air and flowing water due to climate change or

---

<sup>9</sup> Aleksandrova, *op.cit.*, p. 171.

<sup>10</sup> See Sugden, David, *Arctic and Antarctic: A Modern Geographical Synthesis*, Basil Blackwell, Oxford, 1982, p. 109.

<sup>11</sup> Aleksandrova, *op.cit.*, p. 180.

<sup>12</sup> Oechal, *op. cit.*, p. 3.

<sup>13</sup> Sugden, *op. cit.*, p. 90.

human disturbance such as by motor vehicles, the result is accelerated erosion (*thermokarst*) due to melting permafrost.<sup>14</sup> Significantly, and as a consequence of human activity (anthropogenic-forced climate change), an increase in permafrost temperature across the Alaskan Arctic tundra was reported as far back as the early 1980s by Lachenbruch and Marshall.<sup>15</sup> Thermokarsting is not solely an Alaskan issue, for melting permafrost is now an increasingly common environmental characteristic found throughout the tundra biome from Canada across Siberia to Greenland.<sup>16</sup>

Anthropogenic changes now occurring within the Arctic tundra are not unique, for over the centuries humans have fundamentally altered global patterns of biodiversity and ecological processes. As a consequence, vegetation forms predicted to only occur in each biome are now rarely unique to those biomes. Anthropogenic altered biomes have come to provide an alternate view of the natural world, one that is based on global patterns of sustained direct human interaction with ecosystems including agriculture, forestry, human settlement and urbanisation. The term, ‘anthropogenic biomes,’ is an acknowledgement that an irreversible coupling now exists between human society and ecological systems particularly at the global level. The concept also offers a view as to how humankind might best live in harmony with a tainted biosphere.

In common with natural biomes, anthropogenic biomes possess both latitudinal and longitudinal dimensions. However, it is only when the third dimension, elevation, is added that the biome becomes the biosphere. The importance of this additional dimension to non-traditional security studies should not be understated especially if the referent object to be secured adjourns from the state to the individual. That situation is likely to occur, for example, if climate change follows the catastrophic path predicted by some commentators, including the well-known British scientist James Lovelock.<sup>17</sup> The methodology known as

---

<sup>14</sup> Oechal, *op. cit.*, p. 3.

<sup>15</sup> See Lachenbruch, Arthur H. and B. Vaughan Marshall, ‘Changing Climate: Geothermal Evidence from Permafrost in the Alaskan Arctic,’ *Science*, Vol. 234, No. 4777, November 7, 1986, pp. 689-696.

<sup>16</sup> See Lyans, Mark, *High Tide: How Climate Crisis is Engulfing our Planet*, Harper Perennial, London, 2004, p. 77.

<sup>17</sup> See Lovelock, James, *The Vanishing Face of Gaia: A Final Warning*, Penguin, Camberwell, 2009. pp. 23-45. According to Lovelock “...in a few decades the Earth could cease to be the habitat of 7 billion humans; it will save itself as it dispatches all but a few of those who now live in what will become the barren regions. Those who leave for the cooler, still fertile regions have a



“critical security studies” (CSS) is built on the notion that the individual is the true reference for security; an idea encapsulated under the rubric of “human security.”<sup>18</sup> However, since individualism differs markedly from any sense of methodological collectivism and a focus on collectives (states), critical security studies as a typology will not be discussed further. Like the individual, each and every state can be endangered by a raft of non-traditional threats (threats that do not emanate directly from either the political or military sectors), including those originating from within the biosphere, for example acid rain and ozone depletion. Again, the typology supporting this distinctive approach is not developed further in this thesis. A more fitting methodology is one that acknowledges that non-traditional threats, particularly environmental threats, primarily serve to heighten interstate security interdependence along both the latitudinal and longitudinal axis: a process that is likely to redefine the perimeter of contemporary security regions. Consequently, in the future, security complexes are likely to follow the boundary dictates of security regions and these will demonstrate a greater latitudinal orientation than is currently evident in classical regional security complex literature.

### **Moving beyond classical security complex theory**

Even at the height of the second Cold War (1979-1989) dissatisfaction was mounting over the narrow view imposed on security studies by an academic obsession with military and nuclear affairs. This dissatisfaction was fuelled by the rise of the economic and environmental agendas in international relations during the 1970s and 1980s and was sustained by concerns with ethnic identity and transnational crime in the 1990s. Latterly, these issues have been supplanted by concerns over the spread of diseases (global pandemics) and a rise in religious fundamentalism. The placing of more and more issues under the security rubric brought forth a counter-reaction and a plea from numerous academics to restrict security studies to issues centred on the threat of, or use of, military force. The crux of the argument behind this counter movement was that any definitional widening would sufficiently endanger the intellectual integrity of “security” that

---

better chance of surviving, and if enough of us are saved this way it could benefit Gaia as well.”  
*Ibid.*, p. 55.

<sup>18</sup> See Buzan, Barry, Ole Wæver and Jaap de Wilde, *Security: A New Framework for Analysis*, Lynne Rienner, Boulder, 1998, p. 35.

its essential meaning could become void.<sup>19</sup> This argument no doubt gave voice to hidden political concerns that securitizing non-military issues would have an undesirable and counterproductive effect on the entire fabric of social and international relations.<sup>20</sup>

Protagonists on each side of this debate are unwavering in their views, especially the traditionalists who continue to push forward the conventional argument centred on the enduring primacy of military security. Stephen Walt, as one of the more strident traditionalists, argues that the main focus of security studies concerns the phenomenon of war and as an academic discipline security may simply be defined as the “study of the threat, use, and control of military force.”<sup>21</sup> He continued his argument by saying that security “...explores the conditions that make the use of force more likely...and the specific policies that states adopt in order to prepare for, prevent, or engage in war.”<sup>22</sup> Arguably, these phrases are common to whatever cause lies behind a call to arms, be that threat from traditional or non-traditional sources. Despite the strength of the non-traditional argument, Walt’s strong disposition towards the traditional is further illustrated through his argument that if:

*...non-military phenomena can also threaten states and individuals, some writers have suggested broadening the concept of “security”...but this prescription runs the risk of expanding “security studies” excessively; by this logic, issues such as pollution, disease, child abuse, or economic recessions could all be viewed as a threat to security. Defining the field in this way would destroy its intellectual coherence and make it more difficult to devise solutions to any of these important problems.*<sup>23</sup>

For Walt, non-traditional problems are matters of societal well-being to be solved through the political process rather than by military means. Notwithstanding the persuasiveness of Walt’s arguments, Peter Hough echoes the view of many

---

<sup>19</sup> See Deudney, Daniel, ‘The Case against Linking Environmental degradation and National Security,’ in Ken Conca and Geoffrey D. Dabelko (eds.), *Green Planet Blues*, Westview, Boulder, 2004, pp. 304-306.

<sup>20</sup> Buzan, *et al.*, *op. cit.*, p. 2.

<sup>21</sup> See Walt, Stephen M., ‘The Renaissance of Security Studies,’ *International Studies Quarterly*, Vol. 35, No. 2, 1991, p. 212.

<sup>22</sup> *Ibid.*

<sup>23</sup> *Ibid.*, p. 213.

twenty-first century security commentators by maintaining that today many “non-military issues can become ‘securitized’ and hence privileged with ‘national security’ status.”<sup>24</sup>

Like Hough, all “wideners” appear vociferous in their views that non-traditional threats deserve recognition within the security genre. Nina Græger, for one, is convinced that environmental degradation and security are now so intertwined that this inseparable combination has become part of ‘high politics’ in many Western countries.<sup>25</sup> Other “wideners” might suggest that in the contemporary world, the economic crisis of 2008-2009 has eclipsed both terrorism and the curtailment of nuclear proliferation as paramount security threats. At a United States Senate intelligence committee hearing on February 12, 2009, retired Admiral Dennis Blair, as Chairperson of the United States National Intelligence Council, pronounced that “[t]he primary near-term security concern of the United States [is] the global economic crisis and its geopolitical implications.”<sup>26</sup> In linking “economic crisis” and “geopolitical implications,” Admiral Blair has followed a well-trodden, but restrictive path, which allows ‘widening’ only inasmuch as it links concern over the threat or actual use of force between the dominant political actors – states. Interestingly, John Chipman recognizes both sides of the traditional/non-traditional schism, but maintains that:

*...the structuring element of strategic analysis must be the possible use of force.... Non-military aspects of security may occupy more of the strategist’s time, but the need for peoples, nations, states or alliances to procure, deploy, engage or withdraw military forces must remain a primary purpose of the strategic analyst’s inquiry.*<sup>27</sup>

---

<sup>24</sup> See Hough, Peter, *Understanding Global Security*, Routledge, London, 2004, p. 16. That security studies should be “widened” to include issues arising from non-traditional threats to security, such as global environmental degradation, was first proposed by two American scholars during the 1980s. Both Richard Ullman and Jessica Mathews wrote what many commentators consider as seminal essays on the topic of non-traditional threats to national security. See Ullman, Richard, ‘Redefining Security,’ *International Security*, Vol. 8, No. 1, 1983, pp. 129-153 and Mathews, Jessica Tuchman, ‘Redefining Security,’ *Foreign Affairs*, Vol. 68, No. 2, 1989, pp. 162-177.

<sup>25</sup> See Græger, Nina, ‘Environmental security?’ *Journal of Peace Research*, Vol. 33, No. 1, 1996, p. 111.

<sup>26</sup> See Hosenball, Mark and Michael Hirsh, ‘There’s a World of Trouble Out There,’ *Newsweek*, Vol. CLIII, No. 10, March 9, 2009, p. 38.

<sup>27</sup> See Chipman, John, ‘The Future of Strategic Studies: Beyond Grand strategy,’ *Survival*, Vol. 34. No. 1, 1992, p. 129.

In so saying, Chipman has moved beyond the traditional/non-traditional argument in two respects. First, he acknowledges that non-traditional issues may cause a military response. Secondly, he moves away from state centrism by acknowledging the role other political actors as strategic users of force have upon the international system, while simultaneously acknowledging the increasing importance non-military threats. The use of plural nouns is also interesting for it can imply that the legitimate use of force remains the prerogative of the collective rather than the individual.<sup>28</sup>

The mention of security issues arising from other than the traditional sectors provides an opportunity to move security complex theory beyond its classical origin. Buzan *et al* propose “sector security theory” as a way of identifying specific types of social interactions that provide an alternate focus for security studies. This is succinctly described as follows:

*...the military sector is about relationships of forceful coercion; the political sector is about relationships of authority, governing status, and recognition; the economic sector is about relationships of trade, production, and finance; the societal sector is about relationships of collective identity; and the environmental sector is about relationships between human activity and the planetary biosphere.*<sup>29</sup>

As this chapter is directed towards environmental issues<sup>30</sup> and their influence over the politico-military polity, there is no need for a detailed examination of the causal importance of the remaining sectors. In undertaking such a truncated analysis it is helpful to keep to the forefront the idea that national security is about the ability of states to maintain their independent identity and their functional integrity. It should also be acknowledged that national security is a conservative concept inasmuch as it relates to existing states, usually to the exclusion of all other political actors.

---

<sup>28</sup> *Ibid.*, p.113.

<sup>29</sup> Buzan, *et al.*, *Security*, p. 7.

<sup>30</sup> In this thesis the term “environmental issues” embraces not only environmental degradation and destruction of ecosystems and habitats, but also the impending scarcity of freshwater, fisheries, productive farmland and forests, along with climate change and the depletion of both energy and mineral resources. In embracing such a broad category of non-traditional security threats this thesis follows a prescription laid down in Mohamed Suliman’s book – *Ecology, Politics and Violent Conflict*. See Suliman, Mohamed (ed.), *Ecology, Politics and Violent Conflict*, Zed Books, London, 1999.

The number of non-military issues that possess a high probability of developing into interstate threats worthy of a military response appears to be rapidly increasing. Although journal articles and books continue to be written about the strong empirical evidence linking, for example, climate change with security, these same articles fail to provide evidence that climate change has in fact induced the establishment of any inter-state regional security structures. According to Buzan *et al* this can be explained by the observation that regional structures are determined by whether the relevant units are fixed or mobile and whether threats and vulnerabilities are close or distant. If units are not fixed or if threats are moderated by distance then regionalizing logic is generally weak.<sup>31</sup> Even if discrete regions are created within each sector it remains an open question as to whether such regions will be a geographical replica of each other, i.e. do they pivot around the same loci and within the same geographical perimeter. This is unlikely in every case.

As deserts move northwards beyond latitude 30° North, a result of a climate change initiated shift of the northern Hadley Cell,<sup>32</sup> their societal impact will be increasingly felt within each European Mediterranean state. Indeed, since 1979 there has been a poleward expansion in each hemisphere of the Hadley Cell of between 2.0 to 4.5 degrees. In the northern hemisphere this movement is occurring at the rate of approximately 1.4 kilometres per year.<sup>33</sup> The perimeter of the new 'environmental security' region formed in response to the externality that is desertification will not coincide precisely with the current European regional security complex. However, a similar movement of the desert biome on the North American continent would not create an 'environmental' security region. It might, however, intensify the security interdependence between states within the North American regional security complex.

---

<sup>31</sup> Buzan, *et al.*, *Security*, p. 16.

<sup>32</sup> The Hadley Cell, by definition, is the circulation by the trade winds of an air mass in the atmosphere roughly bounded by latitudes 30° North and 30° South. Changing patterns observed in Hadley Cells circulation since the 1950s are attributed to climate change induced oceanic warming. See Quan, Xiao-Wei, Henry F. Diaz and Martin P. Hoerling, 'Change of the Tropical Hadley Cell since 1950,' *NOAA-CIRES*, Boulder, Colorado, USA, March 24, 2004, <http://www.cdc.noaa.gov/people/quan.xiaowei/PDF/HCPaper.pdf> (21 May 2009). The National Oceanic and Atmospheric Administration (NOAA) predict the movement of the cells beyond the 30° latitude North, thereby causing increasing desertification in the Mediterranean littoral European states. See Kolbert, Elizabeth, 'Outlook: Extreme,' *National Geographic*, Vol. 215, No. 4, April 2009, p. 63.

<sup>33</sup> See Isaac, Joanne and Steve Turton, 'Expansion of the tropics: Evidence and implications,' *James Cook University*, July 2009, p. 3.

Buzan *et al* maintain that there are two means by which regional security complex theory<sup>34</sup> can be applied to sectors other than the politico-military or to actors other than states. The first and most obvious means is by adopting a social constructivist approach to understanding how an issue becomes securitized, i.e. by a *speech act* as discussed in Chapter 1. The second way is by adopting one or other of two structural approaches:

1. Homogeneous complexes. *This approach retains the “classical” assumptions that security complexes are concentrated within specific sectors and are therefore composed of specific forms of interaction among similar types of units (e.g., power rivalries among states). This logic leads to different types of complexes that occur in different sectors (e.g., military complexes made up predominantly of states, a societal complex of various identity-based units, and the like).*

2. Heterogeneous complexes. *This approach abandons the assumption that security complexes are locked into specific sectors. It assumes that the regional logic can integrate different types of actors interacting across two or more sectors (e.g., states + nations + firms + confederations interacting across the political, economic, and societal sectors).*<sup>35</sup>

The choice between these alternatives is determined by the purpose to which any analysis is directed and which alternative represents the ‘best fit.’ Selecting either alternative does not by itself deny that under changed circumstances the original choice can be forsaken for the other.

Buzan *et al* opted for the homogeneous alternative for no other reason than that they wished to explore the as yet poorly understood security dynamics of each sector and because it represented for them the best methodological fit.<sup>36</sup> The advantage of the heterogeneous approach is that it facilitates keeping an entire multi-sector picture in a single frame and enables the tracking of inevitable spillovers between sectors. This could become important in understanding how the adverse impact of climate change in one state might result in deterioration in traditional security relations between itself and adjoining states. A contemporary

---

<sup>34</sup> Buzan, *et al.*, *Security*, p. 16.

<sup>35</sup> *Ibid.*

<sup>36</sup> *Ibid.*, p. 17.

illustration of the effect of inter-sector spillover is visible along the five thousand kilometre border separating India from Bangladesh. Here, the environmental effects of climate change combined with the societal effects of poverty have ‘forced’ India to construct a border fence policed by the military so as to contain the flow of Bangladeshi climate refugees and illegal migrants, which New Delhi perceive to represent an existential threat to India’s security.<sup>37</sup>

Conversely it is also possible for changes in climate to eliminate the cause behind a deterioration of relations between two countries. A low-lying uninhabited island known as New Moore Island in India and South Talpatti in Bangladesh, which was situated at the mouth of the Hariabhanga River, has been a continuing source of dispute since between these two countries ever since Bangladesh secured independence from Pakistan in 1971. This island, which was never more than two metres above sea level, is no longer visible on satellite imagery and hence its disappearance offered an opportunity to resolve territorial dispute that has bedevilled interstate relations for forty years. However, its disappearance may also represent a harbinger of worst things to come for the many islets that dot the Sundarbans delta. Over the past decade sea has been rising by approximately five millimetres a year, whereas prior to the turn of the century the sea rose by around three millimetres per year. Indeed, several islands in the Bay of Bengal have been abandoned causing thousands of “climate-change” refugees to seek refuge within and beyond their home country.<sup>38</sup>

Ultimately, attention becomes focused on where security dynamics are predominantly located – is it at the global, regional or local level? To answer that question consideration has to be given to the cause-effect nature of those issues responsible for securitisation; these are what have become known as the “facilitating conditions” for securitisation.<sup>39</sup> Answers to these questions ultimately rest on understanding the socialisation of the securitisation process: a process which also explains how sector issues can be turned into security externalities – the essence of the Regional Orders typology.

---

<sup>37</sup> See Thottam, Jyoti, ‘A Great Divide,’ *Time*, Vol. 173, No. 6, February 16, 2009, pp. 21-25.

<sup>38</sup> See Buncombe, Andrew, ‘Disputed island gobbled up by sea,’ *New Zealand Herald*, Auckland, March 26, 2010, p. A18.

<sup>39</sup> Buzan, *et al.*, *Security*, p 17.

### **The character of environmental security**

The central actor in contemporary environmental security is not necessarily the state. Unlike in either the military or political sectors there is no universal acceptance as to what or whom the security actor is, what represents a legitimate referent object or what constitutes an existential threat. The environmental security agenda is also dogged by the uncertainty as to whether it exists as a separate legitimate typology. Some analysts, such as Myers, describe environmental security as the “ultimate security,”<sup>40</sup> while others, such as Duedney, see environmentalism as the “ultimate threat” causing decay of the national security mindset and institutions.<sup>41</sup> The ultimate complication besetting the environmental sector is the variety of issues now included under its rubric, although some issues might be more appropriately included in one of the other security sectors. Given the lack of universal acceptance in the allocation of particular issues to specific security sectors Buzan *et al's* review of the environmental security literature is telling as to the diversity encompassed within this single topic. The issues which they include are:

- *Disruption of ecosystems* which includes climate change, depletion of the ozone layer, loss of biodiversity, deforestation, desertification, erosion in all forms, and various forms of pollution.
- *Energy problems* include depletion of natural resources, pollution resulting from the use and transportation of energy resources, and scarcities and uneven distribution.
- *Population problems* include unrestricted human population growth, excessive resource consumption, pandemics, politically and socially uncontrollable migration, and unmanageable urbanisation.
- *Food problems* include poverty, famines, over consumption and diseases related to these conditions, loss of fertile soils and water resources and their scarcities and uneven distribution.
- *Economic problems* which includes the protection of unsustainable production methods, societal instability inherent in the pursuit of economic growth, and structural asymmetries and inequalities.

---

<sup>40</sup> *Ibid.*, p. 71.

<sup>41</sup> Cited in Ken Conca and Geoffrey D. Dabelko (eds.), *Green Planet Blues*, *op cit.*, 2004, p. 312.



- *Civil strife* includes war-related environmental damage on one hand and violence resulting from environmental degradation on the other.<sup>42</sup>

In the absence of unanimous acceptance as to those issues that can be legitimately securitized, environmental problems continue to be politicized at the behest of affected individual or groups of states. Such politicisation is often a response to pressure being applied by community groups, non-governmental organisations (NGOs) and issue-specific institutions. While some international environmental issues are readily and amicably resolved through negotiation, as epitomised by the “Agreement Between the Government of the United States of America and the Government of Canada on Air Quality” (an agreement by the United States to reduce air pollution including acid rain),<sup>43</sup> a similar agreement pursued by the Nordic states has been vigorously resisted and its mitigation impact severely curbed by pollution emitting states. In the latter case, the resultant agreement offers little or no protection to individual or state victims of European transboundary acid rain.<sup>44</sup>

The overriding problem to creating a linkage between environmental issues and security revolves around determining the referent object’s location on the level of analysis continuum — is the object to be secured the individual, the state, humanity or the global environment.

Environmentalists maintain that the environment *per se* or some strategic portion of it is the only acceptable referent object. James Lovelock takes a most radical view of environmental security in suggesting that the Earth or, to use his parlance, “Gaia,” is under threat of being seriously damaged by the activities of humankind.<sup>45</sup> Lovelock’s view would render Earth *per se* the referent object. Notwithstanding environmentalists’ views another concern can be detected; that the environment remains a threat to civilisation and hence humanity is the referent

---

<sup>42</sup> Buzan, *et al.*, *Security*, p. 74.

<sup>43</sup> See United States Environmental Protection Agency, ‘Agreement Between the Government of the United States of America and the Government of Canada on Air Quality,’ <http://www.epa.gov/airmarkets/progsregs/usca/agreement.html> (26 May 2009).

<sup>44</sup> See Porter, Gareth and Janet Welsh Brown, *Global Environmental Politics*, Westview Press, Boulder, 1996, pp. 69-72. Interestingly, these authors suggest that this lack of universality could have been resolved if states had agreed to a New Zealand initiative calling for a “global legislative organization” for the environment that could take effective action “even if ... unanimous agreement has not been achieved.” *Ibid.*, p. 176.

<sup>45</sup> See Lovelock, James, *The Revenge of Gaia*, Basic Books, New York, 2006, p. xvi.

object. In an attempt to bridge these two views Buzan suggests that the security of human collectives in the environmental sector is about “the maintenance of the local and the planetary biosphere as the essential support system on which all other human enterprises depend.”<sup>46</sup> Such a concept puts the focus on humanity’s symbiotic relationship with the environment: a relationship in which humanity is utterly dependent upon the environment for its wellbeing and today’s anthropogenic biosphere has become utterly dependent on humanity for its care. This interpretation would be anathema to Lovelock who considers that Gaia’s immediate imperilment could be vanquished if humankind vanished.

None of these views hold the state as an actor of any importance with regard to environmental security although, arguably, this was tenuously implied by Buzan. Porter and Brown maintain that the most important roles played by state actors in global environmental politics are those relating to the process of regime formation. This view dovetails neatly with their belief that no country can increase its own security without at the same time increasing the security of other countries. Such a paradigm assumes that major threats to global security come not from individual states but from global problems shared by the entire international community.<sup>47</sup> Hence, for Porter and Brown security is best provided for at the global level. Thus, the prime purpose of international environmental regimes is to prevent conflicting political interests turning into security threats. Even so, the unwillingness found within the Euro-Atlantic community to politicize, let alone securitize, transboundary acid-rain speaks volumes of the difficulties likely to be experienced in gaining any semblance of universal securitisation of environmental issues.

### **Towards an environmental security complex**

Despite the difficulties experienced by the Nordic states in resolving the issue of transboundary acid rain, there is little doubt that the contemporary environmental security agenda was conceived of as global. Its emergence was not the result of the globalisation of local problems but the realisation that seemingly harmless individual or local practices can have global consequences. This contrasts with the

---

<sup>46</sup> See Buzan, Barry, *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*, Lynne Rienner, Boulder, 1991, pp. 19-20.

<sup>47</sup> Porter and Brown, *op. cit.*, p. 28.

development of other security agendas which evolved out of the globalisation of problems that were historically local in character; for example, in the military sector, it was only during the twentieth century that warfare became a global phenomenon. There exists a strong sense that environmental degradation is a universal problem that can only be effectively managed on the basis of co-operation between all peoples, or at the very least a significant percentage of the world's states. However, this is not entirely true for many environmental problems retain a local or regional focus—the acid rain that is a highly visual blight on the environment of many Euro-Atlantic countries is a non-issue for people living in the Southwest Pacific.

Threats and vulnerabilities emanating from within the environmental sector are most frequently issue specific and seldom universal. Moreover, as Buzan *et al* maintain, causes and effects may be located at different levels and in different regions. Few global events have the total character of a potential nuclear winter but some, such as climate change, will affect every corner of the Earth albeit not to the same degree.<sup>48</sup> Geographically disparate states with the potential to be affected to the same degree by an identical environmental problem i.e. sea-level rise, might well be drawn to form a political constellation out of mutual security concerns. Indeed, small island states have good reason to consider sea-level rise as an existential threat for the sea has already swallowed the Carterat Islands northeast of Papua New Guinea.<sup>49</sup> It is little wonder then that twelve Pacific Island states have called for a United Nations General Assembly resolution that declares climate change to be a threat to international peace and security.<sup>50</sup> If successful, their action would represent the first step towards securitisation of climate change. But irrespective of their success, their action acknowledges the existence of a sub-systemic lens through which regional environmental vulnerabilities and resultant security threats can be identified and their political impact assessed.

---

<sup>48</sup> Buzan *et al.*, *Security*, p. 85.

<sup>49</sup> See MacFarquhar, Neil, 'Refugees Join List of Climate-Change Issues,' *New York Times*, May 28, 2009, <http://www.globalpolicy.org/social-and-economic-policy/the-environment/climate-change/> (9 June 2009).

<sup>50</sup> *Ibid.*

In the contemporary world, it can be argued that the rising scarcity of two natural resources seen as crucial to humanity – water and oil – could cause states to coalesce into regional security structures.

Approximately sixty per cent of all freshwater is contained within the world's 263 international river basins.<sup>51</sup> While water scarcity seldom leads to formal declarations of war, in the fifty years between 1948 and 1999 there were 1,831 reported instances where water became the source of interstate friction. The majority of these interactions – sixty-seven per cent – were resolved cooperatively, but twenty-eight per cent resulted in some level of interstate confrontation. In the remaining five per cent, water ultimately proved to be an insignificant conflictual factor.<sup>52</sup> In the period between the years 2000 and 2003 fourteen out of twenty-four disputes over water resulted in some level of violent confrontation.<sup>53</sup> The result of a recent research project concluded that the sharing of international rivers does seem to be associated with interstate conflict although there is no conclusive evidence that sharing a river basin is a major issue whenever conflicts occur.<sup>54</sup>

Though not exclusively a Middle Eastern problem, the shortage of water in this arid region has further heightened already existing tensions between many of the region's states. This has created a new sub-set within the political genre known as hydro-politics – a major issue for states like Turkey, Syria and Iraq.<sup>55</sup> Water security links these states' national security inevitably raising the level of

---

<sup>51</sup> See Pochat, Victor, *Dams & Development programme-International Policy in Shared River Basins*, United Nations Environmental Programme, <http://www.unep.org/dams/files/Condependium/Report-inter.rivers.pdf> (14 June 2009).

<sup>52</sup> See Barnaby, Wendy, 'Do nations go to war over water?' *Nature*, Vol. 458, 19 March 2009, p. 282.

<sup>53</sup> See Gleick, Peter H., *The World's Water 2004-2005*, Island Press, Washington, D.C., 2004, pp. 249-252. A selection of the disputes identified by Gleick is used here to illustrate both their geographic spread and the level of violence present. India, in the year 2000 water riots in Gurjarat State over the failure by authorities to provide potable water resulted in three deaths and injuries to 20 protesters. In 2001, water supplies to the city of Kumanovo in Macedonia were cut off for twelve days during conflict between ethnic Albanian and Macedonian forces. Again in 2001, the United States military bombed the hydroelectric facility at Kajaki Dam in Helmand province of Afghanistan, cutting off electricity for the city of Kandahar and, during the 2003 United States-led invasion of Iraq, water systems were reportedly damaged or destroyed by the warring parties and major dams became military targets for the U.S. forces. During the Iraq War extensive segments of the country's water reticulation system, including the water supply for Baghdad, were intentionally damaged or destroyed. *Ibid.*

<sup>54</sup> See Toset, Han Petter Wollebæk, Nils Petter Gleditsch and Håvard Hegre, 'Shared rivers and interstate conflict,' *Political Geography*, Vol. 19, 2000, p. 993.

<sup>55</sup> See Schulz, Michael, 'Turkey, Syria and Iraq: A Hydro-political security Complex,' in Lief Ohlsson (ed.), *Hydro-politics: Conflicts over Water as a Development Constraint*, Zed Books, London, 1995, p. 92

intraregional security interdependence. National security has come to possess an environmental dimension.

Even though Schulz cites Buzan when defining the key characteristics of a *hydropolitical security complex*, he displays a superficial understanding of the nuisances of sector security complex theory as he relies primarily on a simple definition of amity and enmity and security interdependence when determining the existence of a security complex.<sup>56</sup> Accordingly, a hydropolitical security complex is formed when the above characteristics exist amongst states that are geographically either ‘owners’ or ‘users’ of a river in a region and consequently regard that river as a major security issue. Riverine issues of concern generally involve dams, reduced water flow, salinization and hydroelectricity. The Euphrates-Tigris Rivers link Turkey, Syria and Iraq in a hydropolitical security complex,<sup>57</sup> while the Jordan, Yarmuk, Litani and the West Bank aquifer connects Jordan, Syria, Israel and Lebanon plus the West Bank Palestinians in another *hydro security complex*.<sup>58</sup> Other examples of emerging hydro security complexes encompass Angola, Zambia, Namibia, Botswana, Zimbabwe, Tanzania, Malawi and Mozambique over the Zambezi River; Lesotho, South Africa, Botswana and Namibia over the Orange River;<sup>59</sup> Egypt, Ethiopia and Sudan over the Nile River;<sup>60</sup> India and Pakistan over the Indus, Jhelum, Chenab, Ravi, Beas and Sutlej Rivers; Cambodia, [China], Laos, Thailand and Vietnam over the Mekong River and Argentina and Brazil over the Paraná River.<sup>61</sup> It is not difficult to find numerous other examples.

Theoretically, a hydropolitical security complex can form whenever two or more states share a common river basin. Buzan *et al* have endorsed this concept without reservation, while Schulz in acknowledging the typology has tempered his acceptance of it. Put succinctly, Schulz supports the formation of hydropolitical security complexes under the general precepts embodied in sector

---

<sup>56</sup> *Ibid.*, p. 97.

<sup>57</sup> *Ibid.*, p. 96.

<sup>58</sup> Buzan *et al.*, *Security*, p. 90. In relevant literature, ‘hydropolitical security complex’ and ‘hydro security complex’ are interchangeable terms.

<sup>59</sup> See van Wyk, Jo-Ansie, ‘Towards water Security in Southern Africa,’ *African Security Review*, Vol. 7, No. 2, 1998, <http://www.iss.co.za/ASR/7N02/VanWyk.html> (13 May 2009).

<sup>60</sup> Buzan *et al.*, *Security*, *op cit.*, p. 90.

<sup>61</sup> See Ohlsson, Leif, ‘The Role of Water and the Origins of Conflict,’ in Lief Ohlsson (ed.), *Hydropolitics: Conflicts over Water as a Development Constraint*, Zed Books, London, 1995, p. 21. For no obvious reason Ohlsson overlooked including China as an interested state in any conflict over the water of the Mekong River.

security complex theory but with a twist: security subcomplexes can form within the larger hydropolitical security complex provided the causal factors have no direct relationship to security over water supplies—ethnicity or religion being the most likely extraneous causes.<sup>62</sup> It is wrong for Schulz to use the term “subcomplex” in this context for the causal factors of ethnicity and religion are most likely to create separate security complexes that will overlay the original hydropolitical security complex. An overlapping cleavage situated within a region that is itself an overlapping cleavage. Furthermore, Schulz does not place hydropolitical security complexes within any overarching regional security complex, an oversight also attributable to Buzan *et al.*<sup>63</sup>

Buzan and Wæver acknowledge water scarcity and access to water across Turkey, Syria and Iraq contributed to the creation of the Levant security subcomplex. On the other hand, they preclude water as a causal factor that frames the security dynamics of the Gulf security subcomplex. Both subcomplexes are firmly embedded within the Middle Eastern regional security complex even though both possess their own unique set of security interdependencies not found elsewhere in the parent security complex. Should Iraq have been a member of both subcomplexes then it is impossible for the Turkey, Syria, and Iraq triangle to be conceived as a hydropolitical security complex or even a subcomplex. This possibly explains why the presence of a hydropolitical subcomplex was not specifically commented upon by Buzan and Wæver.<sup>64</sup> With Iraq embedded in the Gulf subcomplex and Turkey and Syria in the Levant subcomplex, access to water creates a unique security dynamic that fuses these three states into the Euphrates-Tigris hydropolitical security complex. This unique security structure would super-impose itself over the existing regional security subcomplexes.

This illustration creates a useful model by which to judge whether the presence of non-traditional causal factors will create a unique security complex. If security interdependence within a regional constellation of states alters to reflect the presence of a new causal factor, then this will result in the establishment of an

---

<sup>62</sup> Schulz, *op. cit.*, p. 106.

<sup>63</sup> Buzan *et al.*, *Security*, p. 90.

<sup>64</sup> See Buzan, Barry and Ole Wæver, *Regions and Powers: The Structure of International Security*, Cambridge University Press, Cambridge, 2003, p. 112.

entirely new security complex.<sup>65</sup> Any new security complex established will tend not to replace an existing complex providing the causal factors that gave rise to the original complex remain valid. Given the wide menu of both traditional and non-traditional issues that can lead to the creation of a security complex, any region is likely to resemble a collage of overlapping cleavages or security maps. Likewise, when states or regions face more than one security externality a complex pattern of relationships is similarly created. The greater the number of externalities present the more “dense” the regional security environment becomes: alternatively, the fewer the number of externalities the “thinner” the security environment.<sup>66</sup> In the future, analysts will be required to skilfully fashion a coherent national security collage that represents a multiplicity of seemingly disparate security cleavages.

The strategic significance of hydrocarbons is currently immeasurably higher than that of water. Regional conflict, civil war, insurgency and terrorism are foreseen as the most persistent and widespread threats to the global flow of petroleum in the early decades of the twenty-first century.<sup>67</sup> Violent upheaval in one form or another has afflicted nearly every oil-producing region raising the likelihood of either superpower or great power intervention. As hydrocarbons reserves become depleted intense competition among the major powers for possession and distribution of energy resources will lead to larger conflicts. According to Michael Klare, if there is a single prize that could provoke “great-power warfare on a grand scale today, it is the vast untapped energy reserves of the Persian Gulf and the Caspian Sea areas.”<sup>68</sup> Three great powers, the United States, Russia and China, are in competition for control over the global flow of hydrocarbons from both of these increasingly important oil-producing regions.<sup>69</sup> All three states have either deployed combat forces to these regions or have established military ties with receptive local governments. As the global demand

---

<sup>65</sup> Naturally, the social conditions of amity and enmity must also be present. Buzan would also maintain that geographical contiguity must also be present, although this thesis argues that is not a necessary precondition for the establishment of a regional security complex.

<sup>66</sup> See Lake, David A., ‘Regional Security Complexes: A Systems Approach,’ in David A. Lake and Patrick M. Morgan (eds.), *Regional Orders: Building Security in a New World Order*, Pennsylvania State University Press, Pennsylvania, 1997, p.53.

<sup>67</sup> See Klare, Michael, *Blood and Oil*, Penguin Books, London, 2005, p.146.

<sup>68</sup> *Ibid.*, p. 147.

<sup>69</sup> See Cornell, Svante E. and Maria Sultan, ‘The Asian Connection: The New Geopolitics of Central Asia,’ *Caspian Brief*, Cornell Caspian Consulting, December 2000, p. 8.

for petroleum increases and more countries, such as India, begin to rely on both the Middle East and Central Asia for their energy requirements, all three states can be expected to reinforce their strategic position and to attempt to thwart their rivals.<sup>70</sup>

Global energy needs are expected to rise by forty-five per cent between 2006 and 2030, with almost half of the growth in demand coming from India and China.<sup>71</sup> Within a decade China is expected to take half of Saudi Arabia's planned oil output with the majority being shipped through the Strait of Malacca. India, over the same time period, will draw ninety per cent of its petroleum needs from the Persian Gulf region.<sup>72</sup> Both states now find themselves competing for the same energy resources<sup>73</sup> and their respective continued access to the region's oil and natural gas reserves has become a matter of national security<sup>74</sup> to which each has dedicated an increasing amount of political and military resources.

Energy security is but one factor that has caused both India and China to increase their military presence throughout the Indian Ocean. An equally important factor is the protection of sea lines of communications (SLOC) given each country's burgeoning economic interdependence with many African states. The importance of unfettered access to the Indian Ocean is evidenced by China's "string of pearls" strategy under which a series of naval facilities are being constructed in friendly states along the ocean's northern seaboard.<sup>75</sup> In response, India is undertaking the construction of new mainland naval facilities in addition to establishing military facilities on the Andaman and Nicobar islands. These latter naval stations create a "metal chain" capable of blocking the western entrance to the Strait of Malacca.<sup>76</sup> Establishment of these respective military facilities has created an interesting strategic juxtaposition. While the Indians bemoan their "Hormuz dilemma" whereby their oil imports through that strait are

---

<sup>70</sup> Klare, *op. cit.*, p. 147.

<sup>71</sup> See Kaplan, Robert D., 'Centre Stage for the Twenty-first Century: Power Plays in the Indian Ocean,' *Foreign Affairs*, Vol. 88, No. 2, March/April 2009, p. 20.

<sup>72</sup> *Ibid.*

<sup>73</sup> Lall, Marie, 'India's Energy Juggling Act,' *Far Eastern Economic Review*, Vol. 170, No. 5, June 2007, p. 47.

<sup>74</sup> Klare, *op.cit.*, p. 162.

<sup>75</sup> Kaplan, *op.cit.* p. 22.

<sup>76</sup> *Ibid.*, p. 23. China's anxieties will undoubtedly increase further with the recent launch of India's first locally designed nuclear-powered missile armed submarine, the lease of a Russian Akula-II class nuclear-powered submarine and the long awaited and yet to be delivered refitted Russian aircraft carrier the *Admiral Gorshkov*. See Bedi, Rahul, 'Nation stays under radar with sub,' *New Zealand Herald*, Auckland, July 17, 2009, p. A20.



placed at possible risk of interdiction by the Chinese navy stationed in ports along Pakistan's Makran coast, the Chinese bemoan their "Malacca dilemma" which requires their oil imports to pass through a strategic adversary's "metal chain."<sup>77</sup>

China's military modernisation programme not only poses a perceived threat for India but also for Japan; Asia's third great power. Japan and China have competing maritime claims in the East China Sea and over the Diaoyu/Senkaku Islands that are located astride a prospective oil field.<sup>78</sup> Any development of China's naval capabilities that included operation of a large deck carrier – such as the recommissioning of an ex-Soviet aircraft carrier<sup>79</sup> – would likely provoke considerable apprehension in Japan in relation to the former state's intentions. As with China, Japan is dependent upon the Middle East for some eighty-seven per cent of its oil needs.<sup>80</sup> On-going naval expansion would prompt Japanese fears that China would gain a stranglehold over its own oil lifeline in the Malacca Strait and surrounding waters. Mutual concern over sea-lane protection has the potential to extend Chinese-Japanese rivalry into Southeast Asia and beyond.<sup>81</sup> Moreover, there is intense rivalry between China and many Southeast Asian states over sovereignty of the South China Sea and prospective maritime oil fields.

The layering of a *petropolitical security complex* over the contemporary patterns of Asian regional security creates a more complex security portrait. Map 6 represents a conceptual sketch of the resultant regional security complex. Convergence of these two complexes will create a series of new political and security dynamics, especially through new roles and alignments amongst the region's great powers and between such powers and the only remaining superpower, the United States. As petro-scarcity deepens and states take measures to ensure continued access to supplies, further militarization within the petropolitical security complex appears inevitable and interstate conflict a distinct possibility.

---

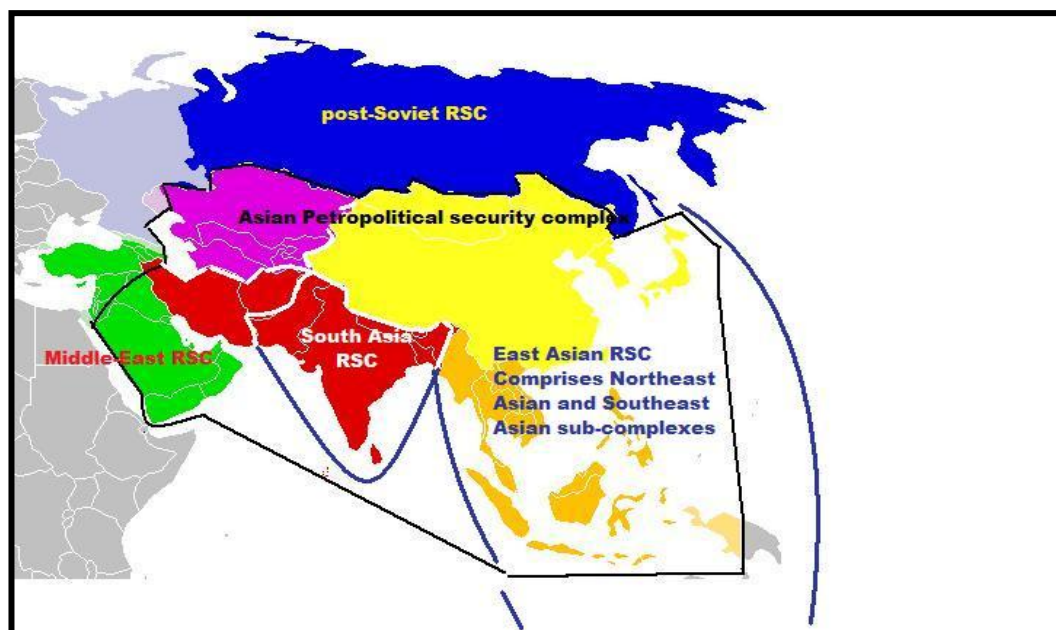
<sup>77</sup> Kaplan, *op. cit.*, p. 21.

<sup>78</sup> See Buszynski, Leszek, 'Sino-Japanese Relations: Interdependence, Rivalry and Regional Security,' *Contemporary Southeast Asia*, Vol. 31, No. 1, April 2009, p. 156.

<sup>79</sup> See 'Another go at being friends,' *The Economist*, Volume 398, No. 8716, January 15, 2011, p. 26.

<sup>80</sup> Buszynski, *op. cit.*, p. 160.

<sup>81</sup> *Ibid.*, p. 161.



**Map 6.** Conceptual map of Asian petropolitical security complex overlaid on a diagram of post-Cold War Eurasian military-political regional security complexes. A characteristic of these security cleavages are their distinctive latitudinal orientation.

### **Environmental degradation-security complex**

Maps can be compiled for virtually every cause of environmental degradation.<sup>82</sup> A map, for example, can be constructed from the research undertaken by Arthur Westing into the impact environmental degradation has wrought on the arid upland region in the Horn of Africa. This is a region covering Ethiopia, Sudan, Eritrea, Djibouti and Somalia, as well as a portion of northern Kenya – see Map 7 – which has long been a perennial contender for the position of the most belligerent region in the world.<sup>83</sup> As a result of his study, Westing has labelled this sector of Africa an ‘ecogeographical region.’<sup>84</sup> On the Horn of Africa, environmental degradation is human-induced as a result of a burgeoning human population that far exceeds the ability of the land to produce a sufficiency of food and fuel. Croplands, rangelands, forestlands and wildlands are being utilized far beyond their sustainable yield. In this region environmental degradation has

<sup>82</sup> Buzan *et al.*, *Security*, p. 90.

<sup>83</sup> See Molvær, Reidulf K., ‘Environmentally Induced Conflict? A discussion based on Studies from the Horn of Africa,’ *Bulletin of Peace Proposals*, Vol. 22, No. 2, 1991, p. 176.

<sup>84</sup> See Westing, Arthur H., ‘Environmental Security and its Relation to Ethiopia and Sudan,’ *Ambio*, Vol. 20, No. 5, August 1991, p. 169.

historically provided a trigger for both intra-<sup>85</sup> and interstate conflict.<sup>86</sup> Westing, in his use of the term ‘ecogeographical region’ has applied a security twist to an ecological term commonly used to describe the subdivision of a landscape into its constituent ecosystems.<sup>87</sup> However, according to Westing an ecogeographical region can also be formed when a region’s occupants share a common concern over environmental degradation and exhibit a willingness to put aside any political or other enmities that prevent the forming of a common regional security outlook.<sup>88</sup> Westing, being a forest ecologist turned peace researcher, naturally displays a preference for the peaceful resolution of transborder environmental degradation through the establishment of a Horn of Africa security community.<sup>89</sup> However, this requires a level of amity that is currently absent from the region. The presence of enmity rather than amity does not render invalid the concept of a Horn ecogeographical region or ecogeographical regions as an analytical methodology within the security genre.

Westing has also noticed that “[m]any ecogeographical regions overlap one or more national boundaries.”<sup>90</sup> This is an interesting observation. Since Westing accepts that ecogeographical regions display a heightened level of security interdependence and display amity or enmity, two of the essential elements for the establishment of a security complex, then it is reasonable to accept the proposition that an ecogeographical region can metamorphous into a *ecogeographical security complex*. Thus, methodologically, an ecogeographical security complex should be treated no differently from a politico-resource security complex: just as with the latter, the former security complex type is capable of overlaying either single or multiple classical regional security complexes. As with other overlay process ecogeographical security regions can craft a latitudinal extension to existing classical regional security complexes. The ‘Horn’ ecogeographical security region

---

<sup>85</sup> See United Nations Environmental Programme, ‘Environmental Degradation Triggers Tensions and Conflict in Sudan,’ 22 June 2007, <http://www.unep.org/Documents/Multilingual/Default.Print.asp?DocumentID=512&ArticleID=512> (21 October 2009).

<sup>86</sup> See Fre, Zeremariam, ‘Full Circle,’ in Olivia Bennett (ed.), *Greenwar: Environment and Conflict*, Panos Publications, London, 1991, p. 134.

<sup>87</sup> See Van Neil, Thomas G., ‘Classification of vegetation and Analysis of its Recent Trends at Camp William, Utah, Using Remote Sensing and Geographic Information System Techniques,’ *Utah State University*, 1995, <http://www.gis.usu.edu/~doug/Grads/TomVanNeil.html> (27 October 2009).

<sup>88</sup> Westing, *op. cit.*, p. 169.

<sup>89</sup> *Ibid.*, p. 171.

<sup>90</sup> *Ibid.*, p. 169.

provides an overlaying cleavage across all of the Horn and a portion of the Central Africa regional security complexes.

Along African's Atlantic seaboard another ecogeographical region has formed comprising just two states; Mauritania and Senegal – see Map 7. Conflicts between these two countries, as well as intrastate conflict between different ethnic groups within each state, are narrowly related to availability of and entitlement to water from the Senegal River.<sup>91</sup> However, the underlying causal factor behind the enmity displayed between these states is the unstoppable expansion of the Sahara desert.<sup>92</sup> In common with many other sectors of North Africa, desertification in this region is directly attributed to human-induced ecological changes such as deforestation and over-grazing of pastures, combined with an unprecedented growth in human population, a changing climate and misguided development policies.<sup>93</sup>

The Senegal River valley which marks the border between these states has become the site of forced relocation of each other's citizens, as each country, in denial of historical precedents, reserves unto its own citizens the fertile land over which it can exercise sovereignty. Forced relocations are considered a form of 'ethnic cleansing' and their continued occurrence has created a deep political rift between these neighbouring states, which on occasions has led to their respective armies facing each other across the Senegal River.<sup>94</sup> Whereas the Horn ecogeographical region overlies two regional security complexes, in the Senegal Basin the ecogeographical security region is superimposed upon the north-western sector of the West African regional security complex.

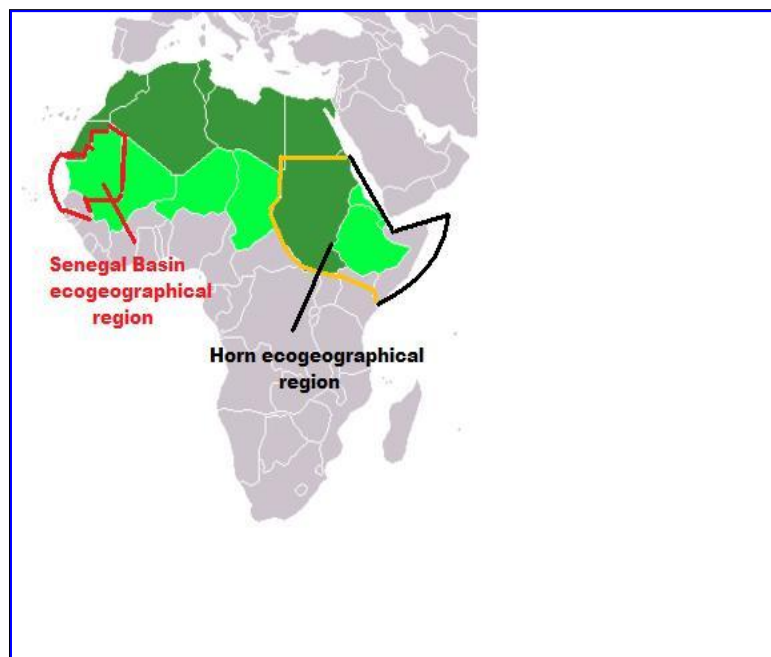
---

<sup>91</sup> See Libiszewski, Stephan, 'International Conflicts over Freshwater Resources,' in Mohamed Suliman (ed.), *Ecology, Politics and Violent Conflict*, Zed Books, London, 1999, p. 135.

<sup>92</sup> *Ibid.*

<sup>93</sup> *Ibid.*, p. 136.

<sup>94</sup> *Ibid.*, p. 137.



**Map 7.** A Depiction of the North Africa ecogeographical regions as described by Westing and Libiszewski.

Another way of drawing maps of regional environmental security problems is by linking issues. As a result of an ill-conceived policy implemented by the former Soviet Union, Central Asia is confronted with “[t]he greatest single, man-made ecological catastrophe in modern history” or “ecocide.”<sup>95</sup> Dehydration of the Aral Sea due to the provision of water to irrigate a burgeoning cotton industry could trigger an “eco-domino effect,”<sup>96</sup> an environmental externality that could ultimately create a region of ecological degradation extending from Scandinavia to the Black Sea.<sup>97</sup>

Climate change, in exacerbating environmental degradation, heightens further the incidences of both political instability and the prospect of armed conflict. Climate change induced shortages of water, food and energy, plus a general deterioration in human health, will precipitate transborder migration by hundreds of millions of people.<sup>98</sup> For states, climate refugees, like other forms of unregulated and unwanted migration, pose a significant security risk that amplifies political tension within recipient state and between recipient and donor

<sup>95</sup> See Feshbach, Murray and Alfred Friendly, *Ecocide in the USSR: Health and Nature Under Siege*, Basic Books, New York, 1992, p. 88.

<sup>96</sup> *Ibid.*, p. 87.

<sup>97</sup> Buzan *et al.*, *Security*, p. 90.

<sup>98</sup> See Smith, Dan and Janani Vivekananda, ‘A Climate of Conflict: The links between climate change, peace and war,’ *International Alert*, November 2007, p. 15.

states.<sup>99</sup> Unregulated human migration is certainly an existential security threat in the societal sector, but it can also represent a threat in the economic and environmental sectors if the newcomers overburden a fragile environment or compete for scarce resources. Consequently, climate refugees can come to represent a contributory factor in the establishment of security complexes. Since whole continents can be severely affected by climate change,<sup>100</sup> continent-wide “climate change” security complexes are a clear possibility.

In Africa, a contemporary assemblage of climate change vulnerabilities is likely to worsen over the course of the twenty-first century. Should current climate change trends continue then the Sahel and southern Africa could experience increased warming of between three to six degrees Celsius before the twenty-second century. As a consequence, precipitation patterns across the continent will be dramatically affected possibly declining by more than twenty per cent compared to 1990 levels. Another dire prediction for Africa is that by 2020 continental-wide climate change will cause somewhere between 75 and 250 million people to be exposed to severe water stress.<sup>101</sup> Since African societies are unlikely to be able to adapt to either of these changes the outlook for Africa’s human population is grim.

If it is at all possible a more calamitous climate change future appears to await Africa. According to the Hadley Centre, a part of the United Kingdom Meteorological Office, by the year 2055, the average global temperature will have risen by four degrees Celsius unless greenhouse gas emissions are immediately curtailed. Unlike northern Europe or North America, where temperatures are expected to increase by up to sixteen degrees Celsius, the average temperature throughout the African continent will increase by just five to twelve degrees Celsius. Even so such an increase will aggravate the problem of food and water scarcity which many African societies are already experiencing,<sup>102</sup> with a lateral

---

<sup>99</sup> Buzan *et al.*, *Security*, p. 137.

<sup>100</sup> Smith and Vivekananda, *op. cit.*, p. 44.

<sup>101</sup> See Organisation for Economic Cooperation and Development, ‘Climate Change and Africa,’ *Briefing Paper No. 1*, September 2007, <http://www.oecd.org/dataoecd/17/20/39921733.pdf> (22 October 2009).

<sup>102</sup> See Barley, Shanta, ‘A World 4°C Warmer,’ *New Scientist*, Vol. 204, NO. 2728, 3 October 2009, pp. 14-15.

band of countries comprising Mozambique, the Democratic Republic of Congo, and Tanzania being the most affected.<sup>103</sup>

The outcome of these predictions could be reminiscent of the mid-1985 drought when a famine swept across Africa, from the Atlantic to the Horn and south to Mozambique and the South African bantustans.<sup>104</sup> An entire continent was on the brink of collapse. It was said that at least 35 million Africans in more than twenty countries had insufficient food to live on, that 10 million had abandoned their homes and farms in search of food and water and many abandoned their countries.<sup>105</sup> In the developing world famines usually are the result of either prolonged adverse weather conditions – severe drought - or specific grain production and marketing policies.<sup>106</sup> The 1985 African drought was the outcome of climate variability and the progressive reduction of precipitation over the previous two decades which reached its nadir during the mid-1980s.<sup>107</sup>

Just as it is possible to construct maps representing hydro- and petro-security complexes, similar maps can also be constructed to portray a series of countries united by wind erosion and/or lack of rainfall that together form a specific category of environmental security complex.<sup>108</sup> If the impetus forcing coalescing is sufficiently widespread and intense as it was in Africa during the 1970s and 1980s, then it is possible for a whole continent to form a *continental climatic security complex*. If environmental facilitating conditions force countries through the ‘securitisation’ end-point of the politicisation-securitisation continuum then they are likely to create a *climatic shatterbelt* before taking the ultimate step of engaging in conflict with neighbouring states. Buzan *et al.*, citing Hylke Tromp, argue that environmental conflicts will express themselves along the traditional

---

<sup>103</sup> See Renton, Alex, ‘Suffering the Science: Climate change, people, and poverty,’ *130 Oxfam Briefing Paper*, July 2009, p. 16. [www.oxfam.org](http://www.oxfam.org) (7 July 2009).

<sup>104</sup> See Timberlake, Lloyd, *Africa in Crisis*, Earthscan, London, 1988, p.1.

<sup>105</sup> *Ibid.*

<sup>106</sup> See Elmekki, Abdel-Galil, ‘Food Crises: Their Roots in a Country’s Political and Developmental Crises,’ in Mohamed Suliman (ed.), *Ecology, Politics and Violent Conflict*, Zed Books, London, 1999, p. 238.

<sup>107</sup> See United Nations Development Programme, ‘A Primer on Climate Change Adaptation in the Drylands of Africa,’ *UNDP Report*, September 2008, p. 10.

[http://www.undp.org/drylands/docs/drought/ADDF3/Background\\_Paper\\_for\\_ADDF3.doc](http://www.undp.org/drylands/docs/drought/ADDF3/Background_Paper_for_ADDF3.doc) (23 October 2009).

<sup>108</sup> Buzan, *et al.*, p. 90.

fault lines in society.<sup>109</sup> That being the case then it is conceivable for the African continent to fracture along some non-environmental exogenous tension lines into a number of classical regional security complexes as shown on Map 3. Alternatively, Africa could form part of a new and much larger complex as the continent's indigenous people are forced into other geographical regions such as Europe, thereby creating an Afro-European supra-continental security complex.

### **Towards a composite theory**

In combining two complexes into a single cleavage map there is little danger of any mutual linkages becoming lost or obscured. In the above examples, with states being the referent object, what was created was a large homogeneous complex. However, as the number of security complexes increases so does the complexity, and with it the possibility that some important feature or features will be misinterpreted or misplaced reducing the overall value attributable to the composite picture. Non-state actors, either in the role of referent object or securing agent, present a challenge best met by a heterogeneous than a homogeneous methodological approach.

Based on a synthesis of the “useful” theoretical elements of regional security complex, regional orders and sector security analysis a further element in a composite theory is discernible. This sixth element is included to account for the role non-traditional sector issues can play alongside the military and political sectors in the creation of security complexes. The inclusion of this sixth element is at best tentative, for the issues that are likely to create a sector security complex may be better classified under the rubric of *security externalities* than as a separate genre. Irrespective of which classification rubric is chosen, it should be noted that sector specific security complexes differ in origin from classical regional security complexes and since it is the former that is the dominant security structure identified in this thesis, the term “security complex” has been adopted to cover both classical and sector security complexes.

1. *boundary, which differentiates the SC from its neighbours;*

---

<sup>109</sup> *Ibid.*, p. 84.



2. *anarchic structure, which means that the SC must be composed of two or more autonomous units, but geographical contiguity is not mandatory;*
3. *polarity, which covers the distribution of power among the units;*
4. *social construction, which covers the patterns of amity and enmity among the units;*
5. *the intensity of security externalities on both regional and non-regional units; and*
6. *issues formed within non-traditional sectors can legitimately create security complexes providing elements 1 to 4 are met.*

*N.B. Element #5 is not an absolute pre-requisite since for major powers non-traditional issues can elicit a similar response to that of 'externalities'*

In the future, defence planning will have to wrestle with the regional impact of a multiplicity of security complexes formed from a rising number of both traditional and non-traditional security threats and changing security interdependencies. While classical security complex theory is capable of explaining how military-political issues coalesce together to create regional security complexes, a new interpretation of Buzan's typology is required when analysing and mapping complexes created by non-traditional issues. Non-traditional security complexes can take a number of forms ranging from subcomplex to supercomplex to supracomplex. They can form within existing regional security complexes or overlap a number of complexes or transform a complex into an entirely new international system.<sup>110</sup> At least conceptually, security regions in the future will

---

<sup>110</sup> The notion that a security complex can be considered as a sub-global system was mooted by Barry Buzan in 1991. See Buzan, Barry and Richard Little, 'The Idea of "International System": Theory Meets History,' *International Political Science Review*, Vol. 15, No. 3, 1994, p. 239. Buzan and Little cite and endorse Bull and Watson's formulation of an international system as a "group of independent political communities [...] form a system, in the sense that the behaviour of each is a necessary factor in the calculation of the others." *Ibid.*, p. 232. This definition fits well with the conceptualisation of a continent or even geographically more expansive non-traditional security complex as discussed in the chapter. Furthermore, Buzan and Little maintain that a single global international system is a relatively modern concept (within the last two centuries) since for "...the last 6000 years, the planet has contained several international systems functioning more or less independently." *Ibid.*, p. 239. The United States National Intelligence Council accepts that by 2025 a collection of international systems will have replaced today's (2009) Western-orientated system. See National Intelligence Council, "Global Trends 2025: A Transformed World," *United States Government Printing Office*, November 2008, p. 82, [http://www.dni.gov/nic/NIC\\_2025\\_project.html](http://www.dni.gov/nic/NIC_2025_project.html) (23 November 2008). This Council also expects further fragmentation of the international system as a consequence of international criminal networks managing the world's resources-especially global energy, mineral and other strategic markets. *Ibid.*, p. 88.

consist of a cluster of complexes, each being a response to different security issues resulting in a security constellation of geographically contiguous and/or disparate states located within one or more international orders. Finally, security complexes spawned out of environmental degradation, especially climate change, will display the same strong latitudinal bias as natural biomes: a characteristic absent from classical regional security complex theory. Although the “hybrid” theory so far developed could at its present level of development be used to explain the future security architecture of the Polar Regions, grafting on one further element will usefully strengthen the overall methodology and account for the propensity of states to resolve foreign policy issues through warfare. Unlike previous theoretical amendments this new element, shatterbelts, comes from a geopolitical, rather than security ontology.

## Chapter Six

### The Politics of Geography

The six essential elements assembled from the review of security complex literature have their origins in the social sciences rather than a geographic ontology. Further development of the “hybrid” theory necessitates correction of this inadequacy, for in the end, all of the future state and non-state actors likely to exert increasing influence over the poles are geographically separated from these respective regions. Given that the future security of the Arctic and Antarctica is the crucial point to which this thesis is directed, then the role geography plays in determining events arising from the political/military sectors warrants a detailed examination.

Geography’s role in determining outcomes on the battlefield remains beyond question. However, no matter how much technology changes or whatever the differences in population or resources are, there are certain strict rules of warfare that should to be observed. Sun Tzu, a Chinese ruler and strategist who lived in the Confusion era, more than 2,400 years ago, had determined certain rules of war even before the time of Alexander the Great. Sun Tzu’s strategic acumen forms the basis of a small acclaimed book, *The Art of War*.<sup>1</sup> Of the thirteen chapters in this book, four chapters deal specifically with the relationship between geography and military affairs. This relationship may assume a tactical guise when, for example, a general commanding one of the opposing forces makes use of the nuisances of terrain to gain a victory on the battlefield.<sup>2</sup> More importantly for this thesis, geography can also assume a strategic dimension highlighted by Sun Tzu’s as the “focal ground.”<sup>3</sup> Sun Tzu explains the focal ground as “[t]he area which is at the junction of three states is focal. He who gets control of it will gain the support of surrounding states.... On focal ground, make allies of those states.... And I should consolidate my alliances.”<sup>4</sup>

---

<sup>1</sup> See Hauzhang Tao, *Sun Tzu: The Art of War*, Wordsworth, Ware, Hertfordshire, 1993.

<sup>2</sup> *Ibid.*, p. 71.

<sup>3</sup> *Ibid.*, p. 72.

<sup>4</sup> *Ibid.*

Focal ground is considered to be outside of one's own territory, but it is strategically most important. The state that occupies it first will be the state that ultimately finds itself in the most favourable position. By definition, since the focal ground is outside one's boundary, it need not be contiguous and can be some distance away. Under one interpretation of Sun Tzu's writings the "[f]ocal ground is a junction which extends in all directions. Take hold of it first and the others will obey you. It gives security to get but is dangerous to lose."<sup>5</sup> This passage mentions also the wisdom of alliances and allies, clearly illustrating that Sun Tzu intended to adopt the full breath of geopolitical and geo-economic means to gain support from the state in which the focal ground is situated.<sup>6</sup>

According to Sun Tzu's explanation of focal ground, a number of strategically important locations for the Cold War protagonists were identified by Hauzhang: the Strait of Gibraltar, the Suez Canal and the Strait of Bosphorus—the three passages to the Mediterranean Sea; the Strait of Malacca, between Indonesia and Malaysia; the Panama Canal in Central America; and Persian Gulf and Gulf of Mexico—one each in the eastern and western hemispheres.<sup>7</sup> However, a natural link between these two hemispheres, Drake's Passage, warranted no mention.

Both Cold War superpowers committed much political effort and treasure to the pursuit of bringing these focal grounds and the states that surround them within their sphere of influence. While the Soviet Union was unable to permanently garner any of these focal ground within its ideological orbit, it did persuade Turkey with a billion dollar "aid" package to grant a right of passage for the aircraft carrier *Kiev* through the Straits of Bosphorus into the Mediterranean Sea in contravention of an international treaty.<sup>8</sup> What the Soviet Union achieved was in line with Sun Tzu dictum: "One should attach enough importance to giving aid...."<sup>9</sup> This interpretation of Sun Tzu's principle would locate the historical origins of "geopolitics" in China some twenty-four centuries prior to the conceptual theory, popularly attributed to the Englishman, Sir Halford Mackinder.

---

<sup>5</sup> *Ibid.*, p. 73.

<sup>6</sup> *Ibid.*

<sup>7</sup> *Ibid.*, p. 74.

<sup>8</sup> *Ibid.*

<sup>9</sup> *Ibid.*

### Defining geopolitics

Geopolitics is an ontology that theorists along with international relations practitioners either embrace or detest. For some commentators it is an ideology that can explain every machination behind the actions taken by states in the international arena, while for others, there are no “ideologies...as whimsically all-encompassing, as romantically obscure, as intellectually sloppy, and as likely to start a third world war as the theory of “geopolitics.”<sup>10</sup> This dialectic could be responsible for Colin Flint suggesting that the very concept of geopolitics was “up for grabs” now that the causes and goals of territorial conflicts have become progressively broader.<sup>11</sup>

There is no universally accepted definition of “geopolitics.” One definition put forward is that the term arose out of the study of “[S]tates in the context of global spatial phenomena, in an attempt to understand both the bases of State power and the nature of States’ interactions with one another.”<sup>12</sup> A more crisp definition is offered by Philip Kelly who suggests that “geopolitics signifies the impact of certain geographical factors on a country’s foreign policy.”<sup>13</sup> However, this definition seemingly devalues the role of political power, which is an issue picked up by Colin Gray in his iteration of Saul Cohen’s definition that geopolitics refers to “the relation of international political power to the geographical setting.”<sup>14</sup> On a continent that still strongly subscribes to the geopolitical ontology – South America – the relationship between geography and politics is encompassed in the term ‘political geography.’<sup>15</sup> A cynical definition of this term is offered by Klaus Dodds, who considers political geography “a form geographical reasoning rather than as a rigid policy mindset [which] can indicate how political, scientific and media elites “manufacture” a place and then use that construction to justify or legitimate their ... policies or claims to territory.”<sup>16</sup>

---

<sup>10</sup> See Clover, Charles, ‘Dreams of the Eurasian Heartland,’ *Foreign Affairs*, Vol. 78, No. 2, March/April 1999, p. 1.

<sup>11</sup> See Flint, Colin, *Introduction to Geopolitics*, Routledge, London, 2006, p. 17.

<sup>12</sup> See Glassner, Martin Ira and Chuck Fabrer, *Political Geography*, Wiley, Hoboken, N.J., 2004, p. 270.

<sup>13</sup> See Kelly, Philip, *Checkerboards & Shatterbelts: The Geopolitics of South America*, University of Texas Press, Austin, 1997, p. 1.

<sup>14</sup> See Gray, Colin S., ‘The continued primacy of geography,’ *Orbis*, Vol. 40, No. 2, Spring 1996.

<sup>15</sup> See Child, Jack, *Antarctica and South American Geopolitics: Frozen Lebensraum*, Praeger, New York, 1988, p. 22.

<sup>16</sup> See Klaus, Dodds, *Geopolitics in Antarctica: Views from the Southern Ocean Rim*, Wiley & Sons, Chichester, 1997, p. xiv.

Dodds' definition gives geopolitics a constructivist's twist by way of the speech act typology.

The most workable definition of geopolitics is the one proposed by Streusand as "the study of international relations from a spatial or geographic perspective."<sup>17</sup> Because of its brevity this definition deserves an expansive description as provided by Kelly and Child.

*Geopolitics [i]s the impact on foreign and security policies of certain geographical features, the more important among these being locations among countries, distance between areas, and terrain, climate, and resources within states. Geopolitics might also be described as the relationship between power politics and geography. The usefulness of geopolitical analysis derives in part from the formation of broad linkages or theories among these geographic features and policies, linkages that bring insight to international relationships. Geopolitics...represents one method for studying foreign and strategic affairs, and it relates as much to planning for peace as it does to military involvement.<sup>18</sup>*

This is a salient description within the context of this thesis, for it locates within the geopolitical ontology two essential geophysical elements – climate or climate change and natural resources – both of which are assuming an increasing importance in the development of contemporary interstate relations.<sup>19</sup> These two elements have historic import for Halford MacKinder refers both climate and resources, either explicitly or implicitly, in his 'three Rs' expression of the pivotal factors that gave the *Heartland* its critical importance – resources, railways and remoteness.<sup>20</sup>

---

<sup>17</sup> See Streusand, Douglas E., 'Geopolitics versus Globalization,' in Douglas E., Streusand, *Globalization and Maritime Power*, 2002, p. 42, [http://www.ndu.edu/inss/books/Books\\_2002/Globalization\\_and\\_Maritime\\_Power\\_Dec\\_0](http://www.ndu.edu/inss/books/Books_2002/Globalization_and_Maritime_Power_Dec_0) (22 July 2009).

<sup>18</sup> See Kelly, Philip and Jack Child, 'Geopolitics, Integration, and Conflict in the Southern Cone and Antarctica' in Philip Kelly and Jack Child (eds.), *Geopolitics of the Southern Cone and Antarctica*, Lynne Rienner, Boulder, 1988, pp. 2-3.

<sup>19</sup> See 'Testing their metal,' *The Economist*, Vol. 393, No. 8654, October 24, 2009, pp. 69-70.

<sup>20</sup> See O'Hara, Sarah, Michael Heffernan and Georgina Endfield, 'Halford MacKinder, The Geographical Pivot', and British Perceptions of Central Asia,' in Brian W. Blouet (ed.), *Global Geostrategy: MacKinder and the Defence of the West*, Frank Cass, Oxon, 2005, p. 90.

### A chronology of geopolitics

Although it might be possible to argue that geopolitics is a relic bequeathed to the here-and-now by Sun Tzu, as an analytical approach its formal origins go back no further than the latter half of the nineteenth century. The origin of geopolitics<sup>21</sup> is attributed to the German geographer Friedrich Ratzel (1844-1904) who having fallen under the influence of Social Darwinism used similes and metaphors from biology in order to compare the state with an organism. Ratzel's theory on the organic state can be summarized thus:

*The State is land, with man on the land, linked by the State and conforming to natural laws, with development tied to the natural environment. Therefore, States, like plants and people, do not do well in deserts or polar regions. States need food in the form of **Lebensraum** (living space) and resources, and they constantly compete for them. They live through stages of youth, maturity, and old age, with possible rejuvenation. The vitality of a State can generally be gauged by its size at a given point.*<sup>22</sup>

(Emphasis in the original)

Unlike Ratzel, who was known to be a careful scientist, Rudolf Kjellén (1864-1922) being inspired by the former's work in political geography, but in contravention of good scientific practice, insisted flatly that the state was an

---

<sup>21</sup> Although political geography has long been considered as an essential part of geography it has remained one of the less-developed parts. In the past European geographers found a much more congenial spirit of co-operation amongst members of their profession when they concentrated on aspects of geography in which differences of opinion did not arouse nationalist sentiments. American geographers, on the other hand, living in a single state, regarded its division into forty-eight arbitrary units of little importance, thereby failing to recognize that this was far from true of the differences among independent states. A revision of these viewpoints was forced upon geographers by the events of World War I. Although lacking the specific methodologies to analyse these events in detail, several American geographers were instructed by their government to make a study of European territorial problems. Subsequently some of these geographers were stimulated to publish studies on political geography, however, none turned this field into an area of specialisation. It was only during the inter-war years when a few younger geographers concentrated on political geography, initially making it a sub-set of political science, and then as their numbers grew, a discipline in its own right. See Hartshorne, Richard, 'What is political Geography?' in W. A. Douglas Jackson (ed.), *Politics and Geographic Relationships*, Prentice-Hall, Englewood Cliffs, N.J., 1964, p. 52.

<sup>22</sup> Glassner and Fahner, *op. cit.*, p. 270.

organism. Moreover, Kjellén, like Ratzel, saw the state in a condition of constant competition with other states, where larger states would extend their power over smaller ones until ultimately the world would comprise only a few very large and extremely powerful countries. Kjellén is credited with being the originator of the terms *Geopolitik* and *Autarky*,<sup>23</sup> while his political philosophies were seized upon as state building tools by all three Second World War Axis powers.<sup>24</sup>

While Ratzel and Kjellén concentrated their attention on the state, other scholars were attempting to discern global patterns of development and behaviour. The first was Alfred Thayer Mahan (1840-1914), a United States naval historian. Mahan argued that control of sea lanes to protect commerce and wage economic warfare was very important for any state. He also advocated for a large navy. Mahan's glimpse of the world at the end of the nineteenth century is revealing for it differs little from that portrayed a decade later by the Englishman Halford Mackinder. Mahan recognized a core area in Asia and Russian the domination of which he anticipated would result in a struggle between Russian land power and British sea power. Mahan presumed that British sea power would be able to contain Russian expansionism. What is more, well before the turn of the twentieth century Mahan was predicting that the containment of Russia and control over China would become the joint concern of the United States, Great Britain, Germany and Japan.<sup>25</sup>

Contrary to Mahan, who placed primacy on sea power, the Englishman Sir Halford John MacKinder (1861-1947) felt that the great age of naval warfare was over and that changing technology, especially railways, had altered the existing relationship between sea and land power in favour of land power. In 1904, Mackinder read a paper to the Royal Geographical Society in London entitled "The Geographical Pivot of History." This paper has become the seminal essay on global geopolitics and is still discussed and evaluated today more than a century later. MacKinder's paper can be précised thus: there is a Eurasian core area that, protected by inaccessibility from naval forces, could shelter a land power that might come to dominate the world from its continental fortress. This Eurasian core MacKinder termed the *Pivot Area*, which he later renamed the "Heartland."

---

<sup>23</sup> *Ibid.*, p. 271.

<sup>24</sup> *Ibid.*

<sup>25</sup> *Ibid.*, p. 273.



Two geographical characteristics of this region are; its rivers drain into the Arctic and distances to warm oceans are great, with only the Baltic and Black Seas offering passageways for sea power penetration and these are easily defended. To MacKinder the Eurasian territory — an area he later termed the “World Island,” conceptually comprised Eurasia and Africa – would become the centre of great a power that would dominate East and South Asia, as well as Europe. Within this spatial agglomeration MacKinder presumed there would be substantial resources, certainly sufficient to sustain a power of world significance.<sup>26</sup>

The greatest threat to the “World Island” MacKinder argued lay in Eastern Europe for it was an “open door” to the “Heartland.” Thus MacKinder formulated his now famous hypothesis:

*Who rules East Europe commands the Heartland*  
*Who rules the Heartland commands the World-Island*  
*Who rules the World-Island rules the World*<sup>27</sup>

In 1924, MacKinder acknowledged both the passing of a previous era and the lesson learned from World War I with a little known counterhypothesis to his Heartland theory. In this counterhypothesis Mackinder conceded that the potentialities of the Heartland could be balanced in the future by Western Europe and North America, which would “constitute for many purposes a single community of nations.”<sup>28</sup> The ocean – the North Atlantic – that separated the two halves of this community he simply termed the “Midland Ocean.”<sup>29</sup>

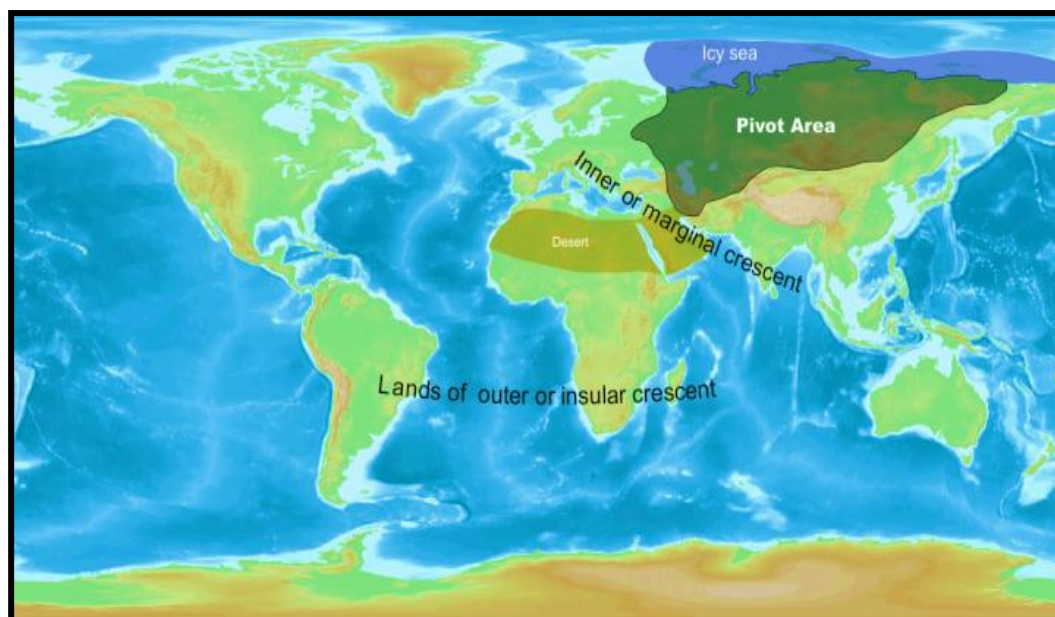
---

<sup>26</sup> See MacKinder, Halford J., ‘The Geographical Pivot of History,’ cited in Ó Tuathail, Gearóid, Simon Dalby and Paul Routledge (eds.), *The Geopolitics Reader*, Routledge, London, 2006, pp. 34-38.

<sup>27</sup> Halford J. MacKinder, 1919, *Democratic Ideals and Reality: A Study in the Politics of Reconstruction*, cited in Glassner and Fahrer, *op. cit.*, p. 274.

<sup>28</sup> Halford J. MacKinder, *The Nations of the Modern World*, George Philip & Son, London, 1924, p. 251.

<sup>29</sup> *Ibid.*



**Map 8.** MacKinder's pivot area.

Source: <http://www.Wikipedia.org/wiki/Geopolitics>

Among MacKinder's many critics was a United States citizen of Dutch origins Nicholas John Spykman (1893-1943), a professor of international relations at Yale University. Spykman found two basic weaknesses with MacKinder's theories. First was MacKinder's over-emphasis on the power potential of the Heartland when its importance was greatly reduced by significant internal transportation difficulties and by access through barriers that surround it. Second, the real power potential of Eurasia lay not within the Heartland but, in what MacKinder termed the "Inner or Marginal Crescent." Spykman called this region the *Rimland*.<sup>30</sup> a region vulnerable to sea and land powers and thus it must operate in both modes. Also, historically, alliances have always been concluded among Rimland powers or between Heartland and Rimland powers. In recognition of these concerns Spykman proposed his own dictum:

*Who controls the Rimland rules Eurasia;*

*Who rules Eurasia controls the destinies of the world.*<sup>31</sup>

<sup>30</sup> Glassner and Fahrer, *op. cit.*, p. 275.

<sup>31</sup> *Ibid.*

At the conclusion of the Second World War Spykman advocated that the Allies base their post-war policy on preventing any consolidation within the Rimland. While there is no evidence that George Kennan — originator of the Cold War “containment” policy favoured by the United States — ever read Spykman, a derivative of the Rimland policy was fundamental to the anticommunist position taken by the Western powers during the Cold War.<sup>32</sup>

During the inter-war years (1918-1939) a new school of geopolitics developed in Germany, and chief among its originators was Karl Haushofer (1869-1946). Haushofer, who became a professor of geopolitics through sponsorship of the Nazi Rudolf Hess, believed in two concepts which he drew together to form his version of Kjellén’s *geopolitiks* or the ‘physical structure of the State.’<sup>33</sup> First, was that certain aspects of politics can be learned as if they were a science and secondly, the prefix *geo* was used to rid politics of “arid theories and senseless phrases which might trap our political leaders into hopeless Utopias:”<sup>34</sup> the prefix relates politics to the soil. Haushofer drew upon the theories of those geopoliticians that preceded him to which he added German chauvinism, some wilful ambiguity and mysticism to create a case for German expansionism. The notion of *Lebensraum* was drawn from Ratzel, but distorted to justify as “natural” Germany’s growth at the expense of its weaker neighbours, particularly Czechoslovakia and Poland.<sup>35</sup> Haushofer believed that if Germany was to become a great power then it had to emerge out of the narrowness of its present living space and into the freedom of the world. And that this task had to be approached scientifically using the methodologies of geopolitics to study the problems of boundaries, human settlement and migration. He firmly believed in a phrase awarded to his academic mentor Erich von Drygaslski that “We [the German people] must see foreign nations as they really are, not as we would like them to be.”<sup>36</sup> Realism should trump idealism every time!

In 1943, MacKinder was asked to consider whether his strategic concept of a “Heartland” had lost any import under conditions of modern warfare. Upon reflection he felt that the map of the original Heartland lacked a certain

---

<sup>32</sup> *Ibid.*

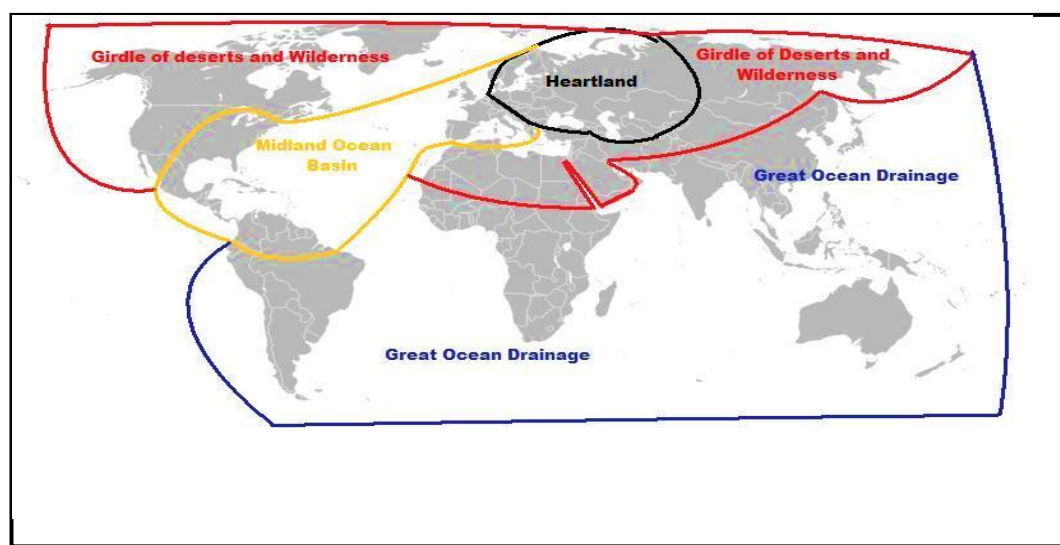
<sup>33</sup> *Ibid.*, p. 271.

<sup>34</sup> See Haushofer, Karl, ‘Why Geopolitiks?’ cited in Ó Tuathail *et al.*, p. 40.

<sup>35</sup> Glassner and Fahrer, *op. cit.*, p. 275.

<sup>36</sup> Ó Tuathail *et al.*, *op. cit.*, p. 41.

preciseness which he rectified with a more detailed description. The territory of the Soviet Union is equivalent to the Heartland except that there was now no eastward projection beyond the Lena River — the territory stretching eastward from the river to the Pacific Ocean MacKinder called “Lenaland.”<sup>37</sup> While the Heartland concept is seen as MacKinder’s great contribution to geopolitics he is responsible for another geographical division of the world base on a dividing girdle whose pivot point was the North Pole.



**Map 9.** MacKinder’s world divided by a latitudinal girdle.

Source: Author.

The above map is a stylized illustration of the division of the world into two major regions; the regions of Deserts and Wilderness and Great Ocean Drainage. In Africa and Asia the dividing girdle tracks the southern limit of the desert biome, while in North America it marks out the lower extremities of the montane and taiga biomes. In replicating biological schisms MacKinder’s geopolitical division of the world tends to follow a natural latitudinal patterning.

The importance of MacKinder’s geographical division in the immediate post-World War II era rests on which side of the girdle economic resources must be directed in order to garner greatest global prosperity. For MacKinder the answer was obvious, the area within the desert/wilderness realm for “lest a whole

<sup>37</sup> See MacKinder, Sir Halford J., ‘The Round World and the Winning of the Peace,’ *Foreign Affairs*, Vol. 21, No. 4, p. 597.

civilization should deliquesce into chaos.”<sup>38</sup> The prospect for those on the other side of the girdling line was not necessarily bleak, for MacKinder foresaw that China would ultimately bring prosperity to that region.

Also in the immediate Post-World War II era there occurred an interesting irony: Americans vilified geopolitics as a Nazi enterprise resulting in its virtual disappearance from academic studies,<sup>39</sup> while at the same time the United States government was developing its role as a world power guided by the strategic tenets of geopolitics. This resurgence of geostrategy was led by Alexander P. de Seversky (1894-1974) who strongly advocated the use of airpower now that “the twilight of sea power”<sup>40</sup> was imminent. Seversky was an isolationist who urged the withdrawal from overseas bases as they represented nothing more than costly luxuries. His geopolitical theory is notable for its emphasis upon the Polar Regions as new zones of conflict and his use of a map drawn on an azimuthally equidistant projection centred on the North Pole to show clearly just how close the United States and Soviet Union really were. This map illustrated the vast areas of air dominance displayed by both superpowers and how these areas overlapped over the North Pole in what de Seversky called the “Area of Decision.”<sup>41</sup> As a result of this “new” world view the United States and Canada constructed three lines of radar stations and airbases in the vast wilderness of Alaska and Northern Canada.

### **Futurecasting geopolitic**

Given the vilification of geopolitics at the end of World War II it is not surprising that some commentators sought to consign the ontology to the dustbin of history. This certainly would have occurred if major interstate wars had no future as maintained by Christopher J. Fettweis in his double claim that “at the upper levels of international relations geopolitical analysis is already as obsolete as major war itself.”<sup>42</sup> (Emphasis in the original.) Fettweis does however, subscribe to a more contentious theory that during the twenty-first century the world will divide into two zones, one of peace and prosperity, the other represented by “turmoil”

---

<sup>38</sup> MacKinder, *Around the World*, *op. cit.*, p. 603.

<sup>39</sup> Flint, *op. cit.*, p. 21.

<sup>40</sup> Glassner and Fahrer, *op. cit.*, p. 277.

<sup>41</sup> *Ibid.*

<sup>42</sup> See Fettweis, Christopher J., ‘Revisiting MacKinder and Angell: The Obsolescence of Great Power Geopolitics,’ *Comparative Strategy*, Vol. 22, 2003, p.119.

displayed as political instability and communal violence. These two zones will inevitably clash as evidenced by the terrorism of September 11<sup>th</sup> 2001, which stands as a contemporary example of the struggle between the “haves” and “have-nots.” Therefore, instead of being concerned with MacKinderian geopolitics politicians should concern themselves with relations of those states within this zone of turmoil, rather than those between great powers.<sup>43</sup> Fettweis’ contentions have failed to find favour as evinced by the Cold War, when foreign policy for many Western countries followed a United States lead to ensure, in terms of classic geopolitics, “that no single power would dominate the Eurasian landmass.”<sup>44</sup> These geopolitical concepts did not occur by accident; rather, “[f]rom Harry S. Truman to George Bush, the overarching vision of U.S. national security was explicitly geopolitical and directly traceable to the heartland theory of MacKinder.”<sup>45</sup> During the Cold War geopolitics was resurrected as an academically acceptable discipline, while, moreover, in the popular media any overseas foreign policy controversy was, by virtue of its geographical location, “geopolitical.” Henry Kissinger and Zbigniew Brzezinski, both of whom have served as a National Security Adviser to the White House, are credited with geopolitics academic resurrection, which should come as no surprise since both were formally educated in Europe where great importance was attached to both geopolitics in international affairs and geostrategic analysis in the pursuit of foreign policy goals.<sup>46</sup> That geopolitics continues to captivate America’s politico-military polity was demonstrated twice during the presidency George Bush Junior, first with the Afghan War of 2001, and secondly the invasion of Iraq in 2003.

Futurecasting geopolitics into the twenty-first century is open to a surfeit of criticism. However, that prospect has not dissuaded numerous commentators from predicting the future. For ardent scholars of geopolitics, such as Colin Gray, the future is but a natural extension of the past. He finds compelling the idea that major wars will arise when and if powers of the ‘Midland Ocean,’ pre-eminently the United States, endeavour to deny Eurasian powers global domination. Under this scenario the most probable menace will come from an axis of China and

---

<sup>43</sup> *Ibid.*

<sup>44</sup> See Daalder, Ivo H., ‘The End of Atlanticism,’ *Survival*, Vol. 45, No. 2, Summer 2003, p. 149.

<sup>45</sup> Gray, *op. cit.*

<sup>46</sup> See Lee, Oliver M., ‘The Geopolitics of America’s Strategic Culture,’ *Comparative Strategy*, Vol. 27, 2008, p. 267.

Russia. However, there is a possibility, be it remote, that an axis could be established between China and EU-Europe. Should that occur Gray foresees both Japan and India being forced into an alignment with a new United States led maritime coalition, perhaps with Russia as a weak continental partner. Conversely, from another geopolitical perspective, it could be argued that the great continental powers of Eurasia could forge a strategic alliance for the expressed purpose of humbling a hegemonic America.<sup>47</sup> With all of these variations MacKinder's theory holds true.

The United States National Intelligence Council would find little disagreement with Gray's views, for by 2025 the Council expects that a single "international community" of states will no longer exist and power will be dispersed amongst many emerging states thereby weakening traditional Western alliances. Rather than emulating Western models of political and economic development, many countries are expected to be attracted to China's alternative model of "state capitalism." The adoption of that model will exacerbate the transfer of relative wealth and economic power from the West to the East, a process now firmly underway.<sup>48</sup> This point was emphasised by attendees at the Group of 20 Pittsburgh Summit in 2009, when they laid stress on the rising importance of this emerging-states economic forum relative to the older Western-dominated G-7.<sup>49</sup> It is conceivable that as a result of states investing in their economic wellbeing, global geopolitical stability will increase. However, the transfer of wealth could strengthen states such as Russia that are bent on challenging Western order.<sup>50</sup>

Notwithstanding geopolitics traditional roots, a number of geopoliticians view the twenty-first century through a different lens, foreseeing the rise of non-traditional problems as the biggest threat to global harmony. For these adherents,

---

<sup>47</sup> See Gray, Colin S., *Another Bloody Century: Future Warfare*, Weidenfeld & Nicolson, London, 2005, p. 150. Little difference is detectable between the views of Gray and those for example of Thomas Barnett and Michael Ignatieff, See Barnett, Thomas P.M., 'The Pentagon's New Map', and Ignatieff, Michael, 'The American Empire: The Burden,' both cited in Ó Tuathail, Gearóid, Simon Dalby and Paul Routledge (eds.), *The Geopolitics Reader*, Routledge, London, 2006, pages 151-154 and 155-163 respectively.

<sup>48</sup> See Reuters *et al.*, 'Power shifts to emerging nations,' *Weekend Herald*, Auckland, September 26, 2009, p. A20.

<sup>49</sup> *Ibid.* Group of 20 or G-20 comprises the world's twenty most industrialized states. G-7 or Group of Seven is comprised of the seven highly industrialized Western States.

<sup>50</sup> See National Intelligence Council, "Global Trends 2025: A Transformed World," *United States Government Printing Office*, November 2008, p. iv, [http://www.dni.govt/nic/NIC\\_2025\\_project.html](http://www.dni.govt/nic/NIC_2025_project.html) (23 November 2008).

nascent threats are represented by pandemics, bioterrorism, environmental degradation, climate change, nuclear fallout, ozone-layer depletion and violent competition over natural resources. Thus, geopolitical emphasis is moving away from its traditional military/political dimension to an environmental prescription in recognition of the explicit geographical danger these threats present.<sup>51</sup> In identifying these new geopolitical threats Simon Dalby shows insight by commenting that “[m]ost of them have imprecise geographies; they are only sometimes mapped, but are always understood as threats out there somewhere that threaten our well-being in the supposed safe domestic spaces of our lives and communities.”<sup>52</sup> This is the new agenda of global security in the age of geopolitical terror and bio-anxiety.<sup>53</sup> Although each of these new geopolitical threats is the subject of an increasing library of academic works, a review of which is beyond the scope of this thesis except those works concerned with climate change and the scarcity of natural resources.

Of these two topics, natural resources have become the focus of a recently established sub-genre of geopolitics known as “geo-economics.” The geo-economics typology can be defined as the study of the spatial, temporal and political aspects of economics and resources. It is under this rubric that commentators suggest that a state’s foreign policy should not be governed by the wanton historical precepts of the Cold War, since the world has entered an era of economic conflict, especially over resources.<sup>54</sup> Indeed, there is in geo-economic literature a preponderance of references to existing or looming resource imbroglios that have or will bring world powers into economic conflict. These conflicts are the result of attempts by private or state-owned organisations, with or without state support, to secure unto them alone or deny competitors access to natural resources in a foreign country. That such competition exacerbates tensions between competing countries is evidenced by the friction that exists between

---

<sup>51</sup> See Ó Tuathail, Gearóid, ‘General Introduction: Thinking Critically about Geopolitic,’ in Ó Tuathail, Gearóid, Simon Dalby and Paul Routledge (eds.), *The Geopolitics Reader*, Routledge, London, 2006, p. 4.

<sup>52</sup> See Dalby, Simon, ‘The Geopolitics of Global Dangers: Introduction,’ in Ó Tuathail *et al.*, *op. cit.*, p. 177.

<sup>53</sup> *Ibid.*

<sup>54</sup> See Stewart, Thomas A., ‘The New Face of American Power,’ *Fortune Magazine*, July 23, 1993, [http://money.cnn.com/magazines/fortune/fortune\\_archive/1993/07/26/78121/index.htm](http://money.cnn.com/magazines/fortune/fortune_archive/1993/07/26/78121/index.htm) (20 August 2009). Also see Luttwak, Edward N., ‘From Geopolitics to Geo-Economics: Logic of Conflict, Grammar of Commerce,’ *National Interest*, No. 20, Summer 1990, pp. 17-23.



China and the United States over Africa's oil reserves,<sup>55</sup> China and Japan over access to Siberian oil<sup>56</sup> and Russian claims to the Arctic seabed in an attempt to deny other Arctic-rim states access to potentially significant reserves of oil and other minerals.<sup>57</sup>

The geo-economics of natural resources has recently assumed an alternate guise that has given the typology, at least for the present, a less confrontational facade. One of the lingering effects of the 2007-08 food-price crises is the proliferation of farmland acquisitions in developing countries by developed states seeking to ensure their own future food security. Increased pressures on natural resources, water scarcity, export restrictions imposed by producer countries when food prices were high, and growing distrust in the functioning of regional and global markets has pushed states short of land and water to find alternate means of producing food for home consumption. While such acquisitions hold the potential to inject much-needed capital into local agriculture and the economy of poor rural areas in host countries there exists a danger that these land purchases will have a detrimental impact on poor local people, who risk losing access to and control over land on which they depend.<sup>58</sup> As the number of such land purchases increases throughout the Third World, the United Nations has expressed concern that the ghost of colonialism - "neo-colonialism"<sup>59</sup> - will again plague Africa where Malthusian worries are gaining credence.<sup>60</sup> "Land grabbing" is not without a violent face as demonstrated during 2009 when the Malagasy people violently overthrew of their government, in part, to prevent one million hectares of land being leased for 99 years to the South Korean firm Daewoo Logistics.<sup>61</sup> Should

---

<sup>55</sup> See Engdahl, F. William, 'Darfur? It's the Oil, Stupid...', May 20, 2007, <http://www.engdahl.oilgeopolitics.net> (20 August 2009).

<sup>56</sup> See Bin, Yu, 'China-Russia Relations: One Year Later: Geopolitics or Geoeconomics?' [http://csis.org/files/media/isis/pubs/0203qchina\\_russia.pdf](http://csis.org/files/media/isis/pubs/0203qchina_russia.pdf) (20 August 2009).

<sup>57</sup> See Cohen, Ariel, 'Russia's race for the Arctic,' *The Heritage Foundation*, August 8, 2007, <http://www.heritage.org/Press/Commentary/ed080807a.cfm?> (20 August 2009).

<sup>58</sup> See von Braun, Joachim and Ruth Meinzen-Dick, "Land Grabbing" by foreign Investors in Developing Countries: Risks and Opportunities,' *International Food Policy Institute*, Policy Brief 13, April 2009, <http://www.ifpi.org/pubs/bp/bp013.asp> (24 July 2009).

<sup>59</sup> See Borger, Julian, 'Rich World buys rights to the fields of the poor,' *The Guardian Weekly*, Sydney, November 28-December 4 2008, p. 1.

<sup>60</sup> See Paarlberg, Robert L., 'Rice Bowls and Dust Bowls,' *Foreign Affairs*, Vol. 75, No. 3, May/June 1996, p. 127.

<sup>61</sup> Ploch, Lauren, 'Madagascar's 2009 Political Crisis,' *Congressional Research Service*, CRS Report for Congress, May 18, 2009, p. 8, <http://www.crs.gov> (21 August 2009). The contract with Daewoo Logistics raised ethical concerns about allocating almost half of the country's arable land for export crops while Madagascar continues to import rice, a basic staple of the Malagasy diet, *ibid.*

the violence that marked Madagascan political crisis become endemic in other African states that are either contemplating or have signed similar land-transfer arrangements i.e. Angola, Egypt, Kenya, Sudan and Tanzania,<sup>62</sup> to name but five host countries, then Sub-Sahara Africa may once again become a geopolitical “shatterbelt” reminiscent of the 1970s-80s.

### **Shatterbelts**

A lesser known concept within the geopolitical ontology is that of “Shatterbelts” also known as “Crush Zones” or “Shatter Zones.” The concept likely originated with Mahan who studied a belt of weak Middle Eastern and Asian states lying between latitudes 30° and 40° North which, due to their perceived wealth in natural resources, attracted the competition of extra-regional powers—notably Great Britain and Russia.<sup>63</sup> MacKinder ascribed the same term to those states in East and Central Europe, which after the cessation of the First World War hostilities were unlucky enough to be geographically located between Russia and Germany.<sup>64</sup> A similar ascription was also awarded to this same rim of states by George Hoffman nearly forty years later in an attempt to ensure that Western powers did not overlook the economic and human resource importance of those states to the Soviet Union in any forthcoming East-West conflict.<sup>65</sup> Eastern Europe continues to be judged a “shatterbelt,” or “crush zone,” for the same reasons the region earned that title in the ninetieth century – great power rivalry and the delimitation of the eastern boundary of ‘Europe.’<sup>66</sup> Indeed, the 2008 Georgian-Russia War was indicative of the continuing instability that festers within this particular shatterbelt.

A matter worth considering is whether in the twenty-first century the typology of “shatterbelts” will have universal application beyond the thin rim of countries that edge the eastern border of continental Europe. To provide that

---

<sup>62</sup> Von braun and Meinzen-Dick, *op.cit.*, Table 3. The other seven countries involved are Democratic Republic of Congo, Ethiopia, Malawi, Mali, Mozambique, Nigeria and Zambia.

<sup>63</sup> See Hensel, Paul R. and Paul F. Diehl, ‘Testing empirical propositions about shatterbelts, 1945-76,’ *Political Geography*, Vol. 13, No. 1 January 1994, p. 34.

<sup>64</sup> See Kelly, Philip L., ‘Escalation of regional conflict: testing the shatterbelt concept,’ *Political Geography Quarterly*, Vol. 5, No. 2, April 1986, p. 161.

<sup>65</sup> See George W. Hoffman, ‘The shatter-belt in relation to the East-West conflict,’ *The Journal of Geography*, Vol. LI, No. 7, October 1952, pp. 265-275.

<sup>66</sup> See O’Loughlin, ‘Ordering the “Crush Zone”: Geopolitical Games in Post-Cold War Eastern Europe,’ University of Colorado, Boulder, p. 3, [jobno@colorado.edu](mailto:jobno@colorado.edu) (10 July 2009).

answer and how the typology might apply to the polar situation, there is a need to both define and situate shatterbelts within a quarrelsome global security landscape.

The starting point in this typological exploration is a determination of an acceptable definition. According to Philip Kelly, “shatterbelts,” as a traditional geopolitical term does not frequently appear in the literature of either geopolitics or political science, but when it does, it refers to a distinct type of geographical region from which local turmoil escalates into serious conflict among major external powers.<sup>67</sup> Because of the typology’s impreciseness it has for a long period of time been ignored as a means of explaining international tension and strife in regions other than Eastern Europe, for instance in East Asia, in the Middle East or Southeast Asia. Nevertheless, for the political geographer shatterbelts are of particular interest. A large proportion of interstate wars seemingly originate from within these unstable regions: for example, in the twentieth century, World Wars I and II, the Korean War and the Vietnam conflict. Moreover, since the end of the Second World War, most conflicts have occurred in the Third World where great power competition along with political and economic depression still persists. Frequently these zones of tension are strategically positioned, often located close to great power territories or allies and are regions in which local or international power vacuums are a common tradition.<sup>68</sup>

Having undertaken a review of both historical and contemporary literature Kelly proposed a new and ‘improved’ definition of a shatterbelt. It was his view that any new definition should stress that the colliding interests of major powers in a region pose a risk conflict escalation.<sup>69</sup> Regions need exhibit only the necessary amounts of depression, ethnic fragmentation, colonialism, border disputes, strategic resource reserves or transportation chokepoints for eligibility as a shatterbelt. If these features represent “why” shatterbelts are created, then the “how” occurs when major powers decide to oppose one another within a regional context. History shows that powerful states seriously compete for control of certain regions whenever they perceive it is within their national interest to do so,

---

<sup>67</sup> Kelly, ‘Escalation of regional conflict,’ *op. cit.*, p. 161.

<sup>68</sup> *Ibid.*, p. 162.

<sup>69</sup> *Ibid.*, p. 172.

despite the possibility that such competition might escalate towards global war. External involvement generally occurs when they perceive that a particular territory contains strategic resources, transportation benefits, certain defensive positions, sensitive political ties or vital economic benefits for themselves, their allies or more importantly for their competitors.<sup>70</sup>

Nevertheless, serious competition among great powers for regional control does not of itself create a shatterbelt. Such competition is usually linked to spheres of influence or to some form of military alliance, for without either a shatterbelt will not emerge. For these linkages to occur states within a region must be fragmented politically or acutely depressed in order to provide external powers with opportunities for establishing alliance footholds. Historically, it is only when competition within a specific region occurs that shatterbelts come into existence.<sup>71</sup>

Kelly, having considered the above factors felt that the traditional shatterbelt concept remained too imprecise and inflexible for clear application within the context of international conflict. Hence he developed an 'improved' definition:

*A shatterbelt is a geographic region for whose control Great Powers seriously compete. Great Powers compete because they perceive strong interests for doing so and because opportunities are presented for establishing alliance footholds with states of the region. Consequently, a high potential exists for escalation of conflict to major power warfare. A shatterbelt originates when rival Great Power footholds are present in an area.*<sup>72</sup>

Application of this definition led Kelly to identify six regions as shatterbelts: the Middle East, sub-Saharan Africa, Southeast Asia, East Asia, South Asia and Central (Middle) America.

Possibly because of the criticism his 'improved' definition attracted,<sup>73</sup> Kelly, barely a decade later, when discussing the geopolitics of South America, dispensed with the notion that shatterbelts are conceived through an alliance

---

<sup>70</sup> *Ibid.*, p. 173.

<sup>71</sup> *Ibid.*

<sup>72</sup> *Ibid.*, p. 176.

<sup>73</sup> Hensel, and Diehl, *op. cit.*, p. 36.

between local states and competing powerful sponsors. His definition of a shatterbelt now became:

*[R]egions in which two strategically important countries compete for control, with a resulting two-tiered structure of interrelated regional and strategic conflicts. Shatterbelts pose a danger of escalation, of wars that might spread elsewhere, and of smaller countries prompting serious confrontation between their larger, strategically important sponsors.*<sup>74</sup>

Even this definition would not appease Hensel and Diehl for it lacks clarity as to the mechanisms that lead to the creation of shatterbelts. From a review of current literature, Hensel and Diehl discerned three prevailing theme. First, shatterbelt regions are composed of ‘weak’ states; being fragmented in terms of race, language, religion and nationality, and also seen as economically underdeveloped. Secondly, Shatterbelt regions are seen as being fragmented themselves. States in these regions are often mutually antagonistic, leaving them unwilling to cooperate economically, politically and militarily. Shatterbelts often exhibit substantial conflict both within and between states in the region. Finally, shatterbelts are the site of substantial foreign military and economic involvement, typically attracting the presence of at least two competing major powers.<sup>75</sup>

Another exponent of the shatterbelt typology is the American geographer Saul Cohen who, drawing on the concepts of Mahan, MacKinder, Spykman and de Seversky, conceived the entire world as being divided into geostrategic realms and geopolitical regions. Unlike Buzan’s division of the world that changed significantly after the Cold War, Cohen’s concepts have remained relatively unaltered for more than four decades.

Cohen describes the two geostrategic realms as:

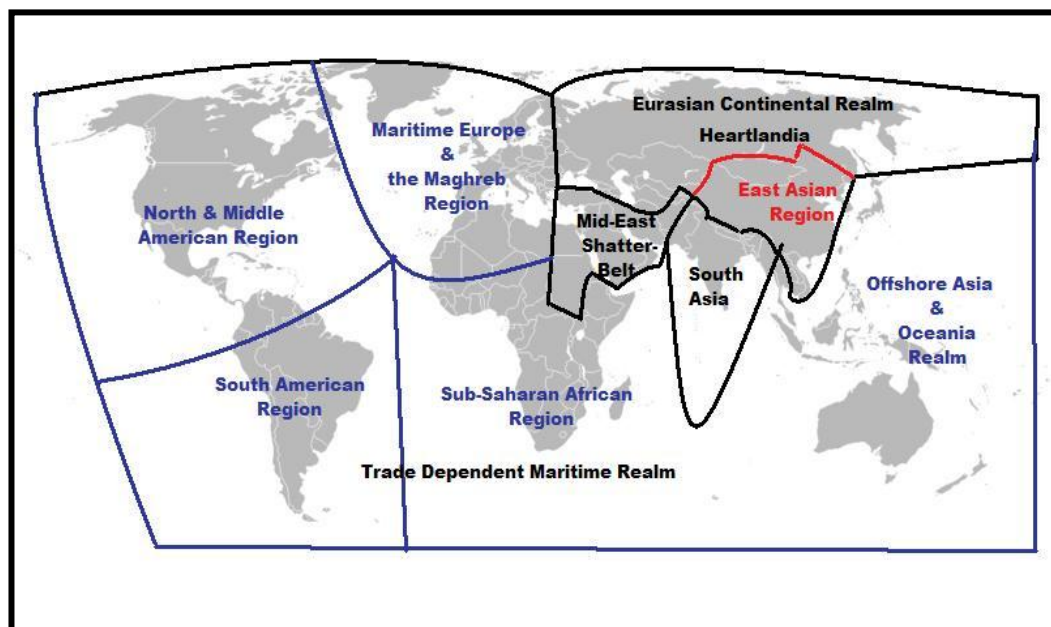
*One is the trade-Dependent Maritime realm, centring on the North Atlantic Basin with outliers in South America and the Western Pacific. The other is the Eurasian Continental realm. It focuses on the Eurasian Heartland and also encompasses Central Europe and the East Asian*

---

<sup>74</sup> Kelly, *Checkerboards & Shatterbelts*, *op. cit.*, p. 33.

<sup>75</sup> Hensel, and Diehl, *op. cit.*, p. 36.

mainland. Neither of geostrategic realms has an intrinsic strategic advantage over the other. South Asia is the only geopolitical region that is relatively independent of the two realms....<sup>76</sup>



**Map 10.** Geostrategic realms and geopolitical regions: End of the twentieth century<sup>77</sup>

Source: Author.

In Cohen's hierarchical structure the highest level is occupied by geostrategic realms, which are arenas of strategic place and movement. Two characteristics mark a difference between them; the Maritime suggests an open trading orientation, whereas the Continental is inner-orientated. The Maritime realm also has a global reach comprised of five, second tier or geopolitical regions while the Eurasian Continental realm comprises just two. Geopolitical regions are fashioned by many of the same elements that help shape regional security complexes; geographical contiguity, migration, and political, cultural, military and economic interaction.<sup>78</sup> At the close of the twentieth century the seven geopolitical regions are North and Middle America; South America, Maritime Europe and the Maghred, Sub-Saharan Africa, Heartlandia, East Asia and Offshore Asia and

<sup>76</sup> See Cohen, Saul B., 'Asymmetrical States and Global Geopolitical Equilibrium,' *SAIS Review*, Vol. 4, No. 2, 1984, p. 195.

<sup>77</sup> Simplified version of map proposed by Cohen. See Cohen, Saul B., 'Geopolitics in the New World Era: A New perspective on an Old Discipline,' in George J. Demko and William B. Wood (eds.), *Reordering the World: Geopolitical Perspectives on the 21<sup>st</sup> Century*, Westview Press, Boulder, 1999, p. 49.

<sup>78</sup> Cohen, *Geopolitics in the New World Era*, *op. cit.*, p. 48.

Oceania.<sup>79</sup> There is a third level of hierarchy comprised of states, which are ordered according to their power positions and functions in the international system.<sup>80</sup>

In common with his division of the world into realms and regions, Cohen's "operational" definition for shatterbelts has also remained largely unchanged for forty years. It is:

*[S]trategically-orientated regions which are politically fragmented areas of competition between the Maritime and Continental realms.*<sup>81</sup>

According to Cohen the distinguishing features of the shatterbelt are firstly, they represent a "playing-field" used by two or more competing major powers<sup>82</sup> from different geostrategic realms.<sup>83</sup> Secondly, shatterbelt regions and their boundaries are fluid and any change in the geopolitical map can lead to their creation, extinction or reappearance.<sup>84</sup> Finally, in what might be best considered as an extension rather than a contradiction of the first distinguishing feature, Cohen suggests that shatterbelts can be created in a region, for example the Middle East, if it becomes "highly fragmented internally" due to the presence of belligerent regional powers, or when "outside powers cannot guarantee against continued turbulence."<sup>85</sup> Just like Kelly, Cohen has identified possession of oil reserves, intraregional migration and economic capital flows, along with access to fresh water as major contributing factors that drive regions towards political fragmentation and creation of shatterbelts.<sup>86</sup>

---

<sup>79</sup> *Ibid.*, p. 49.

<sup>80</sup> *Ibid.*, p. 50.

<sup>81</sup> See Cohen, Saul B., 'Global Geopolitical Change in the Post-Cold War Era,' *Annals of the Association of American Geographers*, Vol. 81, No. 4, 1991, p.567.

<sup>82</sup> As of 1999, Cohen identifies five major powers: China, European Union, Japan, Russia and United States; he also identifies as 2<sup>nd</sup> Order Powers: Algeria, Argentina, Australia, Brazil, Canada, Egypt, India, Indonesia, Iran, Iraq(?), Israel, Mexico, Nigeria, Pakistan, Poland, South Africa, South Korea, Thailand, Turkey, Ukraine, Venezuela and Vietnam. Embedded within this list are proto-major powers which in the future may well create new and as yet unforeseen shatterbelt regions. A proposition endorsed by Cohen in *Geopolitics in the New world Era*, *op. cit.*, p. 47.

<sup>83</sup> *Ibid.*, p. 54.

<sup>84</sup> *Ibid.*

<sup>85</sup> Cohen, 'Global Geopolitical Change,' *op. cit.*, p. 568.

<sup>86</sup> *Ibid.*

Neither Kelly's nor Cohen's shatterbelt concept has met universal acceptance. It can be argued Kelly's definitions are too broad, for if applied as intended it would encompass the majority of the Third World. Kelly concedes that his original definition takes in "literally all contested regions where escalation to global conflict could transpire."<sup>87</sup> The stumbling-block with Cohen's concept is its total reliance on the acceptance of the 'geostrategic realm/geopolitical region' nomenclature which has not found favour in a world where the notion of spheres of influence is considered obsolete, even reprehensible.<sup>88</sup> Nevertheless, Cohen's contention that shatterbelt wars were more likely to occur between states that occupy the 'rimland' dividing the geostrategic realms is analogist to Samuel Huntington's 'fault line wars' between clashing civilisations.<sup>89</sup> Just as with Kelly and Cohen's theories, Huntington's concept is not without its critics.

The deriding of his essay *The Coming Anarchy* has not inhibited Robert Kaplan from searching for another geopolitical prescription to explain what he perceives as the forthcoming struggle over territory and resources. In a 2009 essay, Kaplan maintains that geography defines the perimeter of no less than five unstable early twenty-first century "shatter zones." The first of these is MacKinder's heartland of Eurasia which will become a shatter zone as the states within its perimeter proceed to war over territory to accommodate a burgeoning and violent urban population that is unable to feed itself.<sup>90</sup> Notwithstanding this looming shortage of agricultural land both Russia and the Ukraine have either sold or placed on long-term lease some 600,000 hectares and 400,000 hectares respectively to foreign organisations.<sup>91</sup>

To the south of the Eurasian shatter zone lie three equally unstable regions: the Fertile Crescent shatterbelt comprised of Jordan, Lebanon, Syria and Iraq linked together by religious enmities.<sup>92</sup> Then there is the Arabian Peninsula shatterbelt where a densely populated heavily-armed Yemen covets the wealth and *Lebensraum* afforded by Saudi Arabia.<sup>93</sup> At the region's extremity lies the Persian Plateau shatter-belt comprised of Iran and the Caspian Sea states, where

---

<sup>87</sup> Kelly, 'Escalation of regional conflict,' *op. cit.*, p. 174.

<sup>88</sup> Classner and Fahrer, *op. cit.*, p. 279.

<sup>89</sup> See Huntington, Samuel P., *The Clash of Civilizations and the Remaking of World Order*, Simon & Schuster, New York, 1996, p. 208.

<sup>90</sup> See Kaplan, Robert D., 'The Revenge of Geography,' *Foreign Policy*, May/June 2009, p. 101.

<sup>91</sup> Von braun and Meinzen-Dick, *op.cit.*, Table 3.

<sup>92</sup> Kaplan, *op.cit.*, p. 104.

<sup>93</sup> *Ibid.*, p. 103.



the inimical politics of oil and pipelines determine interstate relations.<sup>94</sup> Christopher Fettweis would concur with Kaplan that the Caspian region is destined to become a twenty-first century shatterbelt given that the region will transform itself into a “new Saudi Arabia” in the coming decades.<sup>95</sup> Kaplan’s fifth shatterbelt is the Indian Subcontinent, where artificial borders delineated by a departing colonial power do not reflect regional geography and continue to create insecurity and division.<sup>96</sup> The future of each of these shatter zones remains uncertain and conflict is likely especially if the history of great power intervention is repeated.

### **Shatterbelts as the loci for conflict**

In the ontology of geopolitics the term ‘shatterbelt’ generally refers to a geographical region that is historically plagued by conflict. Moreover, shatterbelt regions are often blamed for a large proportion of major power wars. Not surprisingly, Hensel and Diehl maintain that shatterbelts act as the catalyst that drives conflicts higher up the ‘escalatory’ ladder thereby making disputes more dangerous whilst broadening their scope. In their view shatterbelts could offer a way of “understanding how geography can provide the bases for conflict as well as condition state behaviour in that conflict.”<sup>97</sup> Such theoretical observations are less deterministic than those espoused by Kelly. Based on his empirical analysis of twentieth-century major power wars, Kelly is emphatic that “shatterbelts clearly tend to be war-prone.”<sup>98</sup> During the period from 1900 to 1983 seventeen out of nineteen major power wars occurred in shatterbelts<sup>99</sup> and these figures do not include either the Gulf War (1991) or the Yugoslavian ‘Wars of Disintegration’ that occurred throughout much of the 1990s. Nor does Kelly’s figure include either of the two major wars of the twenty-first century – the Afghanistan conflict and the Iraq War - both of which originated in the Middle East shatterbelt.

---

<sup>94</sup> *Ibid.*, p. 105.

<sup>95</sup> See Fettweis, Christopher J., ‘Sir Halford MacKinder, Geopolitics, and Policymaking in the 21<sup>st</sup> Century,’ *Parameters*, Summer 2000, <http://www.carlisle.army.mil/usawc/parameters/00summer/fettweis.htm> (22 July 2009).

<sup>96</sup> Kaplan, *op. cit.*, p. 102.

<sup>97</sup> Hensel and Diehl, *op. cit.*, p. 34.

<sup>98</sup> Kelly, *op. cit.*, p. 176.

<sup>99</sup> *Ibid.*, p. 172.

Kelly makes several other observations about the nexus between shatterbelts and conflict. First, he echoes Hensel and Diehl in maintaining that shatterbelts tend to propel turmoil onto the stage set by great power military rivalry. In this escalatory process great powers find it difficult to resist intervening in local affairs especially when they perceive their national interests to be in jeopardy. In doing so, the likelihood of large-scale warfare increases. Secondly, shatterbelts once they emerge usually do not peacefully atrophy. What's more, as their existence becomes prolonged their spread worsens conditions both locally and internationally. Shatterbelts are largely negative contributors to international peace reflecting a stalemate amongst great powers unless some states loses patience and commit increased resources towards achieving a military solution. Finally, because shatterbelts are prominent escalators of conflict, they merit greater attention than they are currently afforded.<sup>100</sup>

In a more comprehensive statistical analysis than that undertaken by Kelly, van der Wusten and Nierop explored the role played by 'second-tier' powers – regional power centres – in exacerbating conflict along borders of geopolitical regions. From their analysis they concluded that shatterbelts exhibit a higher level of violence than non-shatterbelt regions for all types of conflict and that participation in violence becomes more pronounced over time.<sup>101</sup> Additionally, these authors concluded that shatterbelt regions do matter and that states along the borders of geopolitical regions are likely to be conflict-prone.<sup>102</sup>

Historically, intervention in the affairs of another state was generally considered a prerogative that great powers accepted as theirs alone. Citing research undertaken by J. H. Leurdijk, van der Wusten and Nierop show that during the decades since the Second World War minor powers have intervened in the affairs of another country twice as frequently as great powers – 19 out of 27 cases. Such interventions could have been at the side of a great power, but in no less than one third of all interventions no great powers were involved.<sup>103</sup> Furthermore, intervention appears to be a shatterbelt phenomenon executed by minor powers. Interestingly, it is not those second-order powers identified by

---

<sup>100</sup> *Ibid.*

<sup>101</sup> See van der Wusten, H. and T. Nierop, 'Functions, roles and form in international politics,' *Political Geography Quarterly*, Vol. 9, No. 3, July 1990, p. 225. These authors categorised organised violence as either civil war, interstate war or militarized disputes.

<sup>102</sup> *Ibid.*, p.227.

<sup>103</sup> *Ibid.*

Cohen that solely fulfil the role of intervener, for in 11 out of 27 cases the intervening state was one not included on Cohen's list.<sup>104</sup>

Just like the previous authors, Hensel and Diehl found that most studies of shatterbelts largely relied on impressionistic accounts of their effect on the international system. These accounts presumed, rather than rigorously tested, the hypothesis that states in shatterbelt regions were fragmented internally, and that there was substantial conflict both within and between these states. As a result of their more 'rigorous' examination Hensel and Diehl concluded in respect to interstate conflict that shatterbelt regions were between two and two and a half times more likely to experience militarized conflict than non-shatterbelt regions. Similarly, shatterbelts were more prone to full-scale wars than other regions.<sup>105</sup> Furthermore, interstate wars in shatterbelt regions tend to last longer and be bloodier than conflicts occurring in non-shatterbelt regions.<sup>106</sup> These findings generally replicate previous studies of intrastate conflict which show shatterbelts are more likely to experience extra-systemic wars and civil wars rather than non-shatterbelt regions.<sup>107</sup> Also, shatterbelt conflicts are likely to last up to four times longer than in other regions.<sup>108</sup> The authors' final conclusion was that the prospect of foreign intervention was twice as likely in extra-systemic wars, four times as likely in interstate wars and six times as likely in civil wars occurring in a shatterbelt region than in any other region.<sup>109</sup> However, foreign intervention did not necessarily include major powers as an intervening party.

These studies failed to conclusively ascertain why shatterbelts produce longer and more deadly conflicts. Hensel and Diehl suggest that this may be a function of a conflicts intractability, the political dynamics existing between states within shatterbelts, the provision of arms and other forms of aid by foreign sponsors, or the lack of will by the predominant major power in the region to arbitrate between minor power states.<sup>110</sup> Therefore, since the world continues to be politically unstable shatterbelt regions are expected to be a feature of the international system well into the twenty-first century.

---

<sup>104</sup> *Ibid.*, p. 228.

<sup>105</sup> Hensel and Diehl, *op. cit.*, p. 44

<sup>106</sup> *Ibid.*, p. 45.

<sup>107</sup> *Ibid.*

<sup>108</sup> *Ibid.*, p. 46.

<sup>109</sup> *Ibid.*

<sup>110</sup> *Ibid.*, p. 49.

Kelly's improved definition of a shatterbelt – see page 119 – seemingly encompasses the salient elements pertinent to a geopolitical understanding of both Polar Regions in the foreseeable future. Adoption of this definition is the result of several considerations. First, given that climate change and access to resources will impact on both regions the likelihood that two or more strategically important countries becoming involved in geopolitical manoeuvrings to gain territorial control of either regional “global common” is not easily dismissed. Certainly this appears to be what fate holds for the Arctic. Secondly, the presence of numerous minor powers with ambition to secure similar access rights as great powers poses a danger that existing disputes over sovereignty – and there are many - could escalate into serious state-upon-state confrontations that could ultimately draw in the great powers. Finally, the potential exists for the centre of such confrontations to move away from the Polar Regions and metamorphose into a broader continental or systemic conflict.

### **Shatterbelts: where MacKinder meets Buzan**

Regional security complex theory and geopolitics are not mutually exclusive ontologies [typologies] for geography plays a crucial role in determining attitudes of countries toward the need to (de)securitize in order to balance against aspirations of neighbouring states. Regional security complex theory maintains that the closer states are to each other the more heightened their level of security interdependence becomes and if this dynamic is exacerbated by lingering enmities then states tend to seek security through military preparedness which may find its ultimate expression in a region-wide arms dilemma. Upward cascading of arms purchases does not of itself mean interstate war, but if a region lies within a shatterbelt, then that likelihood of war occurring is significantly increased. The Russian-Georgian War is a recent illustrative example of a war in a shatterbelt where an arms dilemma occurred. A point also worth noting is that this war was restricted to a small geographical area and did not involve other states from within the same regional security complex as the two protagonists.

Geopolitics shows deterministic tendencies in two regional security complexes. In Russia, geographical vastness has provided generations of Russian with an identity anchor and any geographical reduction to the original, ethnically Russian European possessions, would create an intolerable situation where the

resultant state would be “Russian, but not Russia.”<sup>111</sup> Obviously, in order to prevent such a situation from occurring geopolitical considerations weigh heavily on all Russian foreign policy decisions taken especially in the presence of perceived existential threats i.e. the eastward expansion of the North Atlantic Treaty Organisation (NATO). The post-Soviet regional security complex is riven with geopolitical manoeuvrings related to alliance choices, shifting patterns of loyalties, meddling in the domestic affairs of other countries and the struggle for control over natural resources and transportation routes particularly in the “near abroad,” which creates instability within this complex and between it and adjoining security complexes.<sup>112</sup>

The South American regional security complex is the other complex cleaved by geopolitical overtones concentrated around boundary issues and weak political control over a vast, thinly-populated hinterland by states whose authority remains concentrated along a coastal margin.<sup>113</sup> During the 1970s this situation was of concern because as states gradually conquered vast tracks of wilderness and spread their transportation infrastructure the natural barriers that historically separated them disappeared permitting an increase in interstate interactions which lead to an increase in interstate violence. In the northern part of the continent this was evidenced by a tendency for some of the longstanding border disputes to become more manifest, whilst Southern Cone countries moved in the opposite direction.<sup>114</sup> However, on a continent where geopolitics governs international relations, nothing is as it seems. If an Argentine suggestion had been adopted that “more accurately” reflected certain historical and geographical circumstance then the Southern Cone area would be replaced by a “new” geopolitical region that excluded Brazil.<sup>115</sup> Such a structure might well lead to the resumption of past animosities between Brazil and Argentina and the resurrection of the historic Spanish-Portuguese La Plata shatterbelt.

---

<sup>111</sup> See Buzan, Barry and Ole Wæver, *Regions and Powers: The Structure of International Security*, Cambridge University Press, Cambridge, 2003, p. 408.

<sup>112</sup> *Ibid.*, p. 414.

<sup>113</sup> *Ibid.*, p. 313.

<sup>114</sup> *Ibid.*

<sup>115</sup> See Ceresole, Norberto, ‘The South Atlantic: War Hypothesis,’ in Philip Kelly and Jack Child (eds.), *Geopolitics of the Southern Cone and Antarctica*, Lynne Rienner, Boulder, 1988, p. 61. The countries included in this proposed geopolitical arrangement are Uruguay, Paraguay, Bolivia, Peru, Chile and Argentina.

As discussed in Chapter Four, Argentina is located within both the South American regional security complex and the Southern Cone subcomplex, while the Malvinas/Falkland Islands are a constituent of the former they are not incorporated into the latter. Whereas regional security complex theory unnecessarily complicates an analysis of this region, geopolitics provides simple description of interstate relations in the South Atlantic Ocean. Within Argentina there remains simmering discontentment concerning the loss of sovereignty over the Malvinas and their continued “occupation” by Great Britain. An Argentine institutional view located the 1982 Falkland Island conflict within the broader global context of deteriorating Cold War East/West relations. In this context the South Atlantic was perceived by NATO as a weakness that the Soviets might exploit to threaten the West’s hegemony over the North Atlantic.<sup>116</sup> Thus the need for Great Britain to retain sovereignty over its South Atlantic archipelago stems from the security threat posed by the Soviet fleet and was related to a strategic view that “whoever dominates South Atlantic traffic will dominate northern maritime Europe and the ‘U.S. Atlantic.’”<sup>117</sup> The influence of MacKinder on such Argentine geostrategic thinking is obvious.

What is also evident is that the South Atlantic – a geographical rectangle extending east from Argentina to Southern Africa and then south to Antarctica – had, in Argentinean geostrategic thinking, become indistinguishable from Argentina’s own continental space (Patagonia) and that Great Britain’s “occupancy” of the Malvinas/Falkland Islands had transformed the region as a whole into a shatterbelt.<sup>118</sup> Norberto Ceresole is clear about the detrimental effect that this shatterbelt has had on the future of Argentine security with his assertion that “[a] shatterbelt in the interior of our national space is the clearest possible threat to our real interests in that space and is the clearest and most precise factor which threatens our security.”<sup>119</sup> This view no doubt lies at the heart of Argentine disgruntlement with the current geopolitical arrangement in the South Atlantic and portends of a war yet to come.

Shatterbelts will continue to evolve within, overlap or supersede regional security complexes whenever the geostrategic elements that give rise to their

---

<sup>116</sup> *Ibid.*, p. 55.

<sup>117</sup> *Ibid.*, p. 56.

<sup>118</sup> *Ibid.*, p. 57.

<sup>119</sup> *Ibid.*

establishment dominate interstate relations. It is also feasible for the shatterbelt typology to offer a geopolitical explanation of interstate relations in geographical regions where a regional security complex is absent.

Regional security complex theory is not an all-encompassing analytical explanation of every security problem for it can only help to explain security problems within the context of the relevant security complex as a whole. For example, in practice it could not be used to explain or justify what Buzan considers to be a ‘misguided’ idea, the establishment of the Indian Ocean as a Zone of Peace.<sup>120</sup> According to Buzan, the Indian Ocean *per se* is in no sense a maritime security complex, and given that it is bounded by five non-maritime regional security complexes there is no prospect of it containing all the divergent interests within and across its notional boundaries.<sup>121</sup> However, a different picture emerges if the Indian Ocean is viewed through a geopolitical lens.

Notwithstanding Buzan’s concerns, Ceresole, citing Bernard Cohen, contends that globally there are three great geopolitical “world” of which one has formed around the Indian Ocean basin and that between these three “worlds” shatterbelts exist.<sup>122</sup> The immediate importance to this thesis of Cohen’s geostrategic vision lies in his affirmation that the Indian Ocean can be considered a shatterbelt which, according to Buzan and Wæver is an *unstructured* security region.<sup>123</sup> Since the high Arctic and Antarctica are also unstructured security regions then the implication arising from this Indian Ocean example is clear - there is nothing germane to either the geopolitical or security complex ontologies which prevent a combination of regional security complex and shatterbelt typologies being applied to either region. If in the future either Polar Region became the centre of or incorporated into a regional security complex, then a section,<sup>124</sup> rather than the whole, could at the same time become a shatterbelt providing appropriate typological criteria are met. It is difficult to conceive of an

---

<sup>120</sup> Buzan, Barry, *People, States and Fear: An agenda for International Security Studies in the Post-Cold War Era*, Pearson, Harlow, 1991, p. 225.

<sup>121</sup> See Buzan, Barry, ‘Naval power, the law of the sea, and the Indian Ocean as a Zone of Peace,’ *Marine Policy*, Vol. 5, No. 3, July 1981, p. 198.

<sup>122</sup> Kelly and Child, *op. cit.*, p. 57.

<sup>123</sup> Buzan and Wæver, *op. cit.*, p. xxvi.

<sup>124</sup> It is easy to accept that should the Antarctic Treaty be rescinded, for whatever reason, that the Antarctic Peninsula could become a location of a shatterbelt given that it is claimed as sovereign territory by Argentina, Chile and Great Britain, all of whom have shown to be unaccommodating, even aggressive, towards the others in the pursuit of legitimizing their claim to this sector of Antarctica.

entire regional security complex being a shatterbelt since the former typology describes the process by which states become welded into a regional group through security interdependence, while the latter typology identifies a congealing of states that are on the cusp of war.

Ceresole may be proved correct in his assertion that Argentina, having become disenchanted with its position on the margin of the Western-orientated Trade Dependent Maritime Realm, will, along with many other countries in the “South” align itself with the Eurasian Continental Realm, although one that no longer pivots around the defunct Soviet empire<sup>125</sup> but on Asia’s rising superpower – China. If this scenario should come to pass at the same time as both realms attach importance to Antarctica’s geostrategic location or to its mineral wealth, then the next war in the South Atlantic might be fought not between states but between geostrategic realms in a manner foreseen by MacKinder.

In the twenty-first century the nomenclature of geostrategic realms has been superseded by geopolitical regions. This change became necessary as a means of differentiating the twin realms of MacKinder’s era from the contemporary multipolar world with its multiplicity of geopolitical regions.<sup>126</sup> Given that shatterbelts are most likely to form along the boundaries of adjoining geopolitical regions<sup>127</sup> Cohen’s geopolitical map of the twenty-first century displays just how important both Polar Regions could become.

Map 11 illustrates that the boundaries of all but one geopolitical region (East Asia) converge at either pole; three at the Arctic and four at the Antarctic respectively. If, as a consequence of climate change, the current international interest in the mineral wealth and transportation opportunities in the Arctic is indicative of the future, then the both Polar Regions can expect heightened interest in territorial “ownership” rights. The sponsors of such inquiry are initially likely to be the regional second-order powers,<sup>128</sup> especially if there is an absence of great power interest. Intrusion by great powers often exacerbates tensions over sovereignty forcing regional states to choose between the great powers thereby

---

<sup>125</sup> Kelly and Child, *op. cit.*, pp. 63-66.

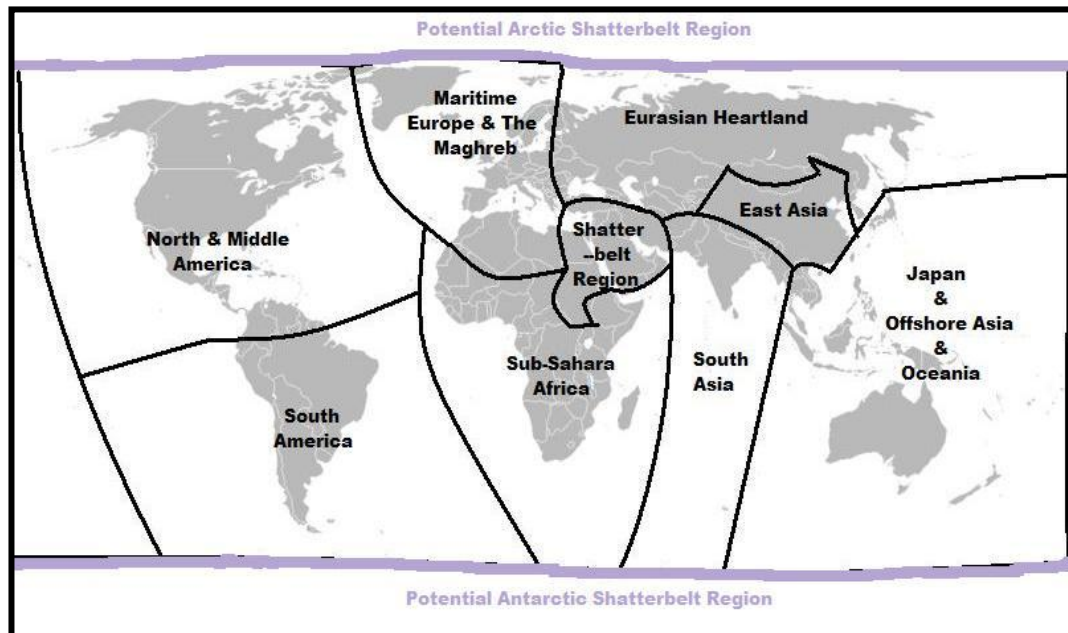
<sup>126</sup> Demko and Wood, *Reordering the World, op.cit.*, p. 57.

<sup>127</sup> *Ibid.*, pp. 53-55.

<sup>128</sup> For a list of Cohen’s major and 2<sup>nd</sup> order powers see Note 79. However, it is inevitable that a different clutch of great and second-order powers will arise during the course of the 21<sup>st</sup> century resulting in a change to global power polarity and consequently the shape and location of geopolitical regions. Cohen’s division of the world must therefore be considered transitory.



creating a milieu beneficial to the rise of a shatterbelt. If this dynamic was sufficiently strong and enduring then it could force a transformation upon regional security complexes as states realign their allegiances to reflect a new regional political order.



**Map 11.** Geopolitical regions in the twenty-first century.<sup>129</sup>

Source: Author.

### **Towards a composite theory**

Three related security typologies have been examined in order to garner together a suite of the “useful” theoretical elements to form the essential structure of a “hybrid” theory. The seventh element defines an extreme point along the security continuum where security against state-on-state aggression appears to be failing and interstate relations become progressively directed towards war. In that context, such wars will likely occur along the unstable margins between geopolitical regions (realms) and involve the constituent states within each region (realm) just as MacKinder intuited. It appears inevitable that both Polar Regions, being loci from which the majority of these unstable margins radiate across the globe, will mirror the margin’s instability and proclivity for conflict. It is this

<sup>129</sup> This map was adapted from one prepared by Cohen. *Ibid.*, p. 57.

convergence that likely to make both poles two of the more significant “focal grounds” of the twenty-first century.<sup>130</sup>

Shatterbelts, like politico-resource security complexes, will tend to be overlay classical regional security complexes imposing a further complexity upon an already complicated over-lapping cleavage of regional security interests. The seven elements that now describe the essential structure of the “hybrid” theory are:

1. *boundary, which differentiates the SC from its neighbours;*
2. *anarchic structure, which means that the SC must be composed of two or more autonomous units, but geographical contiguity is not mandatory;*
3. *polarity, which covers the distribution of power among the units;*
4. *social construction, which covers the patterns of amity and enmity among the units;*
5. *the intensity of security externalities on both regional and non-regional units; and*
6. *issues formed within non-traditional security sectors can legitimately create security complexes providing elements 1 to 4 are met.*
7. *competition for control over a geographic region by strategically important states is indicative of a ‘shatterbelt region’ that can overlay security complexes, unstructured security regions or a grouping of the two.*

*N.B. Element #5 is not an absolute pre-requisite since for major powers non-traditional issues can elicit a similar response to that of ‘externalities.’*

The role of the final chapter in Part II is to draw together all seven elements into a theory with the intention of identifying those facilitating conditions that in the future might transform the Arctic and Antarctica into a security complex.

---

<sup>130</sup> Since the high Arctic has been designated as ‘the Area’ that lies ‘beyond the limits of national jurisdiction’ by the United Nations sponsored International Seabed Authority, it is conceivable that a government could employ military force to assert a claim over an area that can otherwise only be classified as ‘no man’s land.’ See Howard, Roger, *The Arctic Gold Rush: The New Race for Tomorrow’s Natural Resources*, Continuum, London, 2009, p. 18. Antarctica might be similarly viewed as ‘no man’s land,’ with all the connotations that phrase implies, by militarily strong natural resource deficient countries given that its legal status under international law is yet to be resolved. See Prior, Stuart, ‘Antarctica: View from a Gateway,’ *CSS Working paper 5/97*, Centre for Strategic Studies, Victoria University of Wellington, 1997, p. 7.

## Chapter Seven

### Conclusion: A Compendium of Theories

There is no shortage of theories purporting to explain the ontology of International Relations. According the *International Relations Theory* web site there exist no fewer than one hundred and two separate theories purporting to explain events and phenomena common to world politics.<sup>1</sup> Indeed, some commentators such as the American emeritus professor Ole R. Holsti maintain that certain international relations theories have been shown to be more ideational rather than material; being less of a theory than an approach through which to gain an understanding of inter-state relations.<sup>2</sup> Holsti cites constructivism as an example. As an approach, constructivism has been used to analysis the origins, the consequences of norms and culture in a broad range of settings. And it might well offer a fruitful contribution to the persisting debates on the “democratic peace” thesis.<sup>3</sup> Moreover, Holsti maintains that constructivism bears considerable resemblance to the venerable social science dictum that individuals perceive their environment through the lenses of belief systems<sup>4</sup> and therefore “[i]t is what we think the world is like, not what it is really like, that determines our behaviour.”<sup>5</sup> Even if this image is in some sense “wrong” so that the “truth” and the image of the “truth” don’t coincide “it is always the image, not the truth that immediately determines behaviour.”<sup>6</sup> Constructivism is considered an attempt by a contemporary

---

<sup>1</sup> See *International Relations Theory*, 7 February, 2009, <http://www.irththeory.com/know.htm> (1 October 2009).

<sup>2</sup> See Ole R. Holsti, ‘Theories of International Relations,’ p. 20, [www.duke.edu/~pfeaver/holsti.pdf](http://www.duke.edu/~pfeaver/holsti.pdf) (2 October 2009).

<sup>3</sup> *Ibid.* Essentially the “democratic peace” theory posits that democracies are more peaceful than non-democracies. However, the results of academic studies into the efficacy of this theory are inconclusive. One study has concluded that since 1789 no wars have been fought strictly between independent states with democratically elected governments. While another study found that between 1816 and 1965 democratic governments have not been noticeably more peace-prone or passive. See Mingst, Karen, *Essentials of International Relations*, W. W. Norton, New York, 1999, p. 11.

<sup>4</sup> Holsti, *op. cit.*, p. 20.

<sup>5</sup> See Boulding, Kenneth, ‘National Images and International System,’ *Journal of Conflict Resolution*, Vol. 3, No. 2, June 1959, p. 120.

<sup>6</sup> *Ibid.*

generation of political scientist to refine, if not redefine, international relations theory into an acceptable “image,” just as their predecessors had sought to do.<sup>7</sup>

Despite Holsti’s disparaging comments about constructivism, whether or not something qualifies as a theory often depends on where it originated, for there is no universal definition. Europeans often use the term to describe anything that organizes a field systematically, structures questions and establishes a coherent and rigorous set of interrelated concepts and categories. However, on the other side of the Atlantic, the Americans often demand that a theory meticulously explains phenomena or is able to generate testable hypotheses of a causal nature.<sup>8</sup> This lack of uniformity is compounded by an impression that international relations, like other social sciences rests on a shakier theoretical foundation than does the natural sciences.<sup>9</sup> Such foundational uncertainty results in some international relations theory for example, “offensive realism,” remaining provisional in the sense that it is a hypothesis that can never be categorically proved no matter how many times the results of an experiment agree with the theory, for there is no certainty that the next result will not contradict the theory. It is easy to disprove a theory for all that is needed is a single observation that disagrees with a theory’s premise.<sup>10</sup> Perhaps all social science theories can never obtain a theoretical status greater than that of a hypothesis.

In its simplest form a theory is nothing more than a model, or a restricted part thereof, plus a set of rules that relate quantities in the model to observations made. It exists only in the human mind.<sup>11</sup> Furthermore, as Stephen Hawking maintains a good theory must satisfy two requirements: It must accurately describe a large class of observations on the basis of a model that contains just a few arbitrary elements and it must also make definite predictions about the result of future observations.<sup>12</sup> Occam’s “razor test” provides a process by which the first of these requirements can be achieved, for it high-lights those arbitrary elements that make no difference to the observable predictions of the theory and

---

<sup>7</sup> *Ibid.*

<sup>8</sup> See Buzan, Barry and Ole Wæver, *Regions and Powers: The Structure of International Security*, Cambridge University Press, Cambridge, 2003, p. 83.

<sup>9</sup> See Mearsheimer, John J., *The Tragedy of Great Power Politics*, Norton, New York, 2001, p. 7.

<sup>10</sup> See Hawking, Stephen and Leonard Mlodinow, *Briefer History of Time*, Alfred A. Knopf, 2005, p. 19.

<sup>11</sup> *Ibid.*, p. 18.

<sup>12</sup> *Ibid.*

henceforth should be eliminated.<sup>13</sup> Contemporary reductionism has shortened Occum's dictum to nothing more than "keep it simple;"<sup>14</sup> a common aphorism in today's world. The second requirement appears to remove any abstract element from a theory, which might be appropriate for a natural law but, as Holsti suggests this is difficult for international relations theories since each theory is reductive and essentialist to a different degree, relying on different sets of assumptions.<sup>15</sup> 'Natural' laws do not exist in the political realm.

Every international relations theory has its limitations and critics and both become accentuated when a theory is used to speculate on the future. While some critics may consider theoretical venturing beyond the here-and-now as foolhardy, a point fervently disputed by John Mearsheimer,<sup>16</sup> others consider that the nature of uncertainty compels theoretical visionaries to imagine a world fifteen, twenty-five, even fifty years into the future.<sup>17</sup> Furthermore, as political phenomena are highly complex in character, political predictions would be impossible without theoretical tools. However, this is not to suggest that any 'new' theories will not include some error, for all forecasting is guilty of that shortcoming. In spite of this inadequacy, predictions do help others make sense of world events as they unfold, while at the same time, helping those with a contradictory view frame their own ideas more clearly. Trying to anticipate a new event is a good way to test international relations theories, since theorists do not have the benefit of hindsight so cannot therefore adjust their theory fit the evidence, for no evidence is yet available.<sup>18</sup> This thesis maybe considered reckless in character for it uses an untried theory in an attempt to anticipate the occurrence of international relations events at least two decades into the future.

As mentioned previously, the concept of securitisation is the main theoretical tool for mapping regional variations. An objectivist theory of security uses one's own awareness of events to fits regional proceedings into a general theory to explain what governs the behaviour of actors. A securitisation-based

---

<sup>13</sup> William of Ockham was a 14<sup>th</sup> century English logician and Franciscan friar whose principle states that the explanation of any phenomenon should make as few assumptions as possible. See Gibbs, Phil, 'Occams Razor,' 1996, <http://maths.ucr.edu/home/baez/physics/General/occam/html> (5 October 2009).

<sup>14</sup> *Ibid.*

<sup>15</sup> See [http://en.wikipedia.org/wiki/Ole\\_Holsti](http://en.wikipedia.org/wiki/Ole_Holsti) (2 October 2009).

<sup>16</sup> Mearsheimer, *op. cit.*, p. 7.

<sup>17</sup> See Toffler, Alvin, *Future Shock*, Pan Books, London, 1970, p. 415.

<sup>18</sup> Mearsheimer, *op. cit.*, p. 8.

theory accepts that the security agenda is about different issues in different regions; where the actors differ, as does the relative importance of different security sectors. It avoids prejudices about how people ‘should’ react. Securitisation also has a meta-theoretical function to ensure that one does not infer mechanically from objective factors, the characteristics of regional security dynamics because ‘security’ is a political battleground upon which is fought out what matter as security issues and thus what issues will be addressed in the security genre.<sup>19</sup> Additionally, securitisation can be used to identify key security issues. In most regions there is but a few issues worthy of detailed security analysis through which turning or tipping points are exposed, and actors, politics and decisions become open to scrutiny rather than remaining hidden from view.<sup>20</sup> In relation to the past, the present and not least the future this thesis will high-light crucial events and political decisions rather than permitting them to being lost within some larger materialist generalisation.

Securitisation is often too broad a conceptual mechanism for detailed analysis of regional security dynamics; that is a task requiring a finer theoretical method. For Buzan the chosen methodology was regional security complex theory, while for Lake and Morgan it was regional orders. Others, for example, Schulz and Westing chose the typologies of hydropolitics and ecoregionalism respectively to explain how securitisation can occur in the environmental arena. In this thesis it is a “hybrid” model, a synthesis of applicable theoretical tenets from those theories discussed in preceding chapters. This synthesized theory is no mere folding of theories one into another, for that might well imply that some level of oversight occurred when theoretical incompatibilities arose. Lake and Morgan’s conflation of the global and regional levels of analysis into a single methodology is considered by Buzan and Wæver as a “blindness” arising from a fundamental misunderstanding of what is a regional security complex.<sup>21</sup> Hopefully the “hybrid” theory is robust enough to fend off a similar criticisms; for they are easy laid and difficult to refute.

The soundness of the “hybrid” theory rests on the authority of those theories from which it drew its essential elements. Its strength lies in its ability organize

---

<sup>19</sup> Buzan and Wæver, *op. cit.*, p. 86.

<sup>20</sup> *Ibid.*

<sup>21</sup> *Ibid.*, p. 80.

the analytical enquiry around those elements that define a security complex no matter the origin of the facilitating conditions. Although it is impossible to dispense with the essential elements, for they lie at the very heart of the “hybrid” theory, they can be reduced to a two sentence descriptor without losing their individual import.

*A security complex is a set of states that are so interlinked by one or more security externalities that their security problems cannot be reasonably considered independently from one another. Intrusion of outside adversarial great powers into a security complex would transform the complex into a shatterbelt and bring the possibility of conflict escalation.*

Because *security externalities* can arise from both traditional and non-traditional issues and create a security complex, *essential element 6* is considered superfluous. The revised six essential elements are:

1. *boundary, which differentiates the SC from its neighbours;*
2. *anarchic structure, which means that the SC must be composed of two or more autonomous units, but geographical contiguity is not mandatory;*
3. *polarity, which covers the distribution of power among the units;*
4. *social construction, which covers the patterns of amity and enmity among the units;*
5. *the intensity of security externalities on both regional and non-regional units; and*
6. *competition for control over a geographic region by strategically important states is indicative of a ‘shatterbelt region’ that can overlay security complexes, unstructured security regions or a grouping of the two.*

There are three further riders that warrant stating. All theories encounter anomalies because they simplify reality by emphasizing certain factors while ignoring others. This criticism will no doubt be levelled at the “hybrid” theory. On some occasions simplification is acceptable because resolution of an anomaly would create an anomaly of even great significance. If Buzan and Wæver had accepted Great Britain as an integral member of the South American regional

security complex, then the very concept of *overlay* in the post-Cold War world became questionable which would have weakened the whole regional security complex typology. Like most theories, the “hybrid” theory will be incapable of providing a satisfactory answer to every question posed of it, because there will be situations where the theory could explain several possible outcomes. Thus the “hybrid” theory might be classified by social scientists “indeterminate,”<sup>22</sup> a description commonly attributed to broad-gauged theories.

Additionally, the “hybrid” theory is descriptive in character. It will seek to define one future, out of a menu of possible futures that await the Polar Regions. The selection of a particular scenario is driven by a conflation of global natural resource scarcities and the adverse effects of climate change. The theory, however, is not prescriptive for it does not seek to advise what actions and policies states should adopt in order to address the scenario portrayed.

---

<sup>22</sup> Mearsheimer, *op. cit.*, p. 11.



## PART II

### Chapter Eight

#### Introduction: People, Climate and Resources

**T**wo definitions for the word scenario, or *scaena* in Latin, are ‘sequence of imagined, usually future, events’ and ‘details of scenes.’<sup>1</sup> By combining these two definitions one could construed to the meaning of scenario to be “a vision of a conceivable future.” This as a definition differs little from that generally adopted by defence and business strategic planners, for them, scenario means “a plausible description of how the future may develop based on a set of assumption about key drivers.”<sup>2</sup> Climate, energy, economic and societal concerns are all disciplines that are frequently subjected to scenario analysis, with each possessing its own set of drivers.<sup>3</sup> Scenario analysis, in the context of this thesis, is an analytical tool that permits one to model possible alternate paths within a political-security environment so as to assess their respective diplomatic and war risks. The methodology constructed in Part I represents the analytical tool to identify a single security scenario out of a litany of security portraits from a multitude of possible futures that await the Arctic and Antarctica by the year 2035. That single security scenario is predicated on two key drivers – a progressively warming global climate and increasing scarcity of natural resources. Other than the scenario discussed in this thesis no attempt has been made to discuss a range of possible alternate scenarios.

At the global, regional and local levels, depletion of natural resources and environmental degradation, i.e. climate change, results from the interface of population pressures, extreme wealth and extreme poverty. The material-intensive and pollution-loaded consumption habits, plus the production activities of the wealthy Northern countries are responsible for most of the world’s greenhouse

---

<sup>1</sup> See Thompson, Della (ed.), *The Concise Oxford Dictionary of Current English*, 9<sup>th</sup> edition, Oxford University Press, Oxford, 1995, p. 1233.

<sup>2</sup> See Ministry for the Environment, ‘Developing the Scenarios,’ *Environmental stewardship for a prosperous New Zealand*, May 2004, <http://www.mfe.govt.nz/publications/climate/effects-impacts-may04/html/page5.html> (11 November 2009).

<sup>3</sup> *Ibid.*

gas emissions, solid and hazardous waste and other forms of environmental pollution. High-income countries also generate a disproportionate amount of the worldwide demand for fossil fuels, non-fuel minerals, grain, meat, fish, fresh water and tropical hardwoods.<sup>4</sup>

Developing countries, particularly those with rapidly growing but impoverished populations, also overburden the environment. People living in poverty frequently live in the most fragile ecological areas where they overexploit croplands, pastures, forests, fisheries and water resources in order to eke out a living.<sup>5</sup> These fragile ecological areas, which represent seventy-three per cent of the global landmass, have a very limited ability to sustain high population densities and are acutely vulnerable to degradation, erosion, flooding, fires, land subsidence and climatic change.<sup>6</sup> Many people have been forced to migrate to marginal rural areas due to overcrowding on better land.<sup>7</sup> An alternate consequence of ecological despoliation is the migration of people from the rural hinterland to the urban fringes of cities to become unwanted impoverished squatters.

Estimates place the number of squatters worldwide at about a billion (2005) or slightly less than one in every six human beings on the planet. And this number is on the rise. Every day, close to two hundred thousand people leave their ancestral homes in rural regions and move into the cities, leading to doubling in number within 25 years. The best guess is that by 2030 there will be two billion squatters — one in four people on earth.<sup>8</sup> The arrival of hordes of both economic and ecological (environmental) migrants has turned many Third World metropolitan regions or agglomerations into conurbanations, megacities or megalopolises.<sup>9</sup> The withering away of central government influence over

---

<sup>4</sup> See Kahl, Colin H., 'Demography, Environment and Civil Strife,' in Lael Brainard and Derek Chollet (eds.), *Too Poor for Peace? Global Poverty, Conflict and Security in the 21<sup>st</sup> Century*, Brookings Institution Press, Washington, D.C., 2007, p. 60.

<sup>5</sup> *Ibid.*

<sup>6</sup> *Ibid.*

<sup>7</sup> See Kaplan, Robert D., 'The Coming Anarchy,' *the Atlantic online*, February 1994, p. 22.

<sup>8</sup> See Neuwirth, Robert, *Shadow Cities: A billion squatters, a new urban world*, Routledge, Abington, 2005, p. 9.

<sup>9</sup> See Gillett, Jack, *Population*, Hodder Murray, London, 2005, 107. The terms 'metropolitan' and 'agglomerations' are understood to mean as 'places where the masses congregate' whereas the terms 'megalopolis' describes the "largest of all urban areas;" 'conurbation,' a very large urban area inclusive of at least one major city; and a 'megacity,' is a super-city that has a population of at least five million people, *Ibid.*, p. 108. The top nine Third World megacities as at 2005, in order of population size (millions), are: Mexico City (18.7); São Paulo (18.3); Mumbai (18.2); Delhi

shantytowns is compensated by a rise in tribal and regional domains, the unchecked spread of disease and the growing pervasiveness of war.<sup>10</sup>

If there is a single thread that weaves together the dyadic opposites of poverty and prosperity then that must be the ever changing dynamics of human population on this overcrowded planet.

## Population

In the twenty-first century the following lament sounds all too familiar:

*One thing is sure: the Earth is more cultivated and developed now than ever before; there is more farming but fewer forests, swamps are drying up and cities springing up on an unprecedented scale. We have become a burden to our planet. Resources are becoming scarce and soon Nature will no longer be able to satisfy our needs. It will come to pass that disease, hunger, flood and war will reduce the excessively large numbers of the human species.<sup>11</sup>*

This statement dates from the year 200 BC and is attributed to the Roman politician Quintus Septimus Tertullianus. Fortunately, Tertullianus' prediction has to date been proved wrong, however it may be a prophecy on the cusp of coming true.

Future trends in population size is an invaluable measure when projecting global and national demands for food, water and energy and the environmental impact of the rising consumption of natural resources. Current world projections suggest that from a figure of 6.7 billion in July 2007, the global population will reach 9.2 billion by 2050.<sup>12</sup> While past projections made by United Nations have deviated from the actual figure by less than four per cent, the recent rapid decline

---

(15.1); Shanghai (14.5); Kolkatta (14.3); Buenos Aires (12.6); Dhaka (12.6) and Karachi (11.6). See Münz, Rainer and Albert Reiterer, *Overcrowded World? Global Population and International Migration*, Haus Publishing, London, 2009, p. 179.

<sup>10</sup> Kaplan, *op. cit.*, p. 21.

<sup>11</sup> Leisinger, Gil and James Milner, *Protracted Refugee Situations: Domestic and international security implications*, Adelphi Paper 375, Routledge, Oxon, 2005, p. 1. Cited from D. Gale Johnson, "The Growth of Demand Will Limit Output Growth for Food over the Next Quarter Century," Office of Agricultural Economics Research, University of Chicago, Chicago, IL, 22 August 1998.

<sup>12</sup> See United Nations, *World population Prospects: The 2006 Revision*, Department of Economic and Social Affairs, ESA/P/WP. 202, 2007, p. 1.

in fertility has resulted in more recent projections being slightly too high.<sup>13</sup> Although acknowledging the decline in fertility rate, some commentators' readily predict that by the end of the twenty-first century global population will have grown to around 9.5–10 billion.<sup>14</sup>

Future population growth is very dependent on which path human fertility follows – see figure 1. To achieve the medium variant, fertility throughout the world would have to decline from 2.55 children per woman (2006) to just over two children per woman in 2050. Should fertility remain about half a child above two then by 2050 global population will be 10.8 billion. A fertility path half a child below two will lead to a population of 7.8 billion by mid-century. Growth in world population is likely to be concentrated in just a few countries, generally today's most populous. During the period 2005-2050, eight countries – India, Nigeria, Pakistan, the Democratic Republic of the Congo, Ethiopia, the United States, Bangladesh and China, in order of incremental population growth – are expected to account for almost half the projected worldwide population increase.<sup>15</sup>

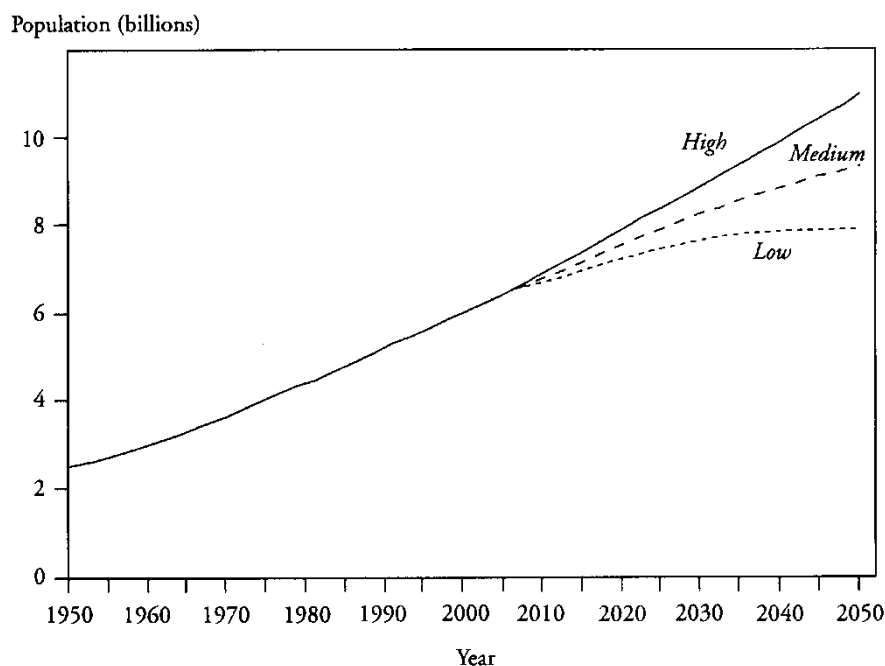


Figure 1. World Population, 1950-2050.

Source: Leisinger *et al.*, *op. cit.*, p. 3, based on United Nations Population Division, *World Population Prospects: The 2000 Revision*, New York, 2001.

<sup>13</sup> See Bongaarts, John and Rodolfo A. Bulatao (eds.), *Beyond six Billion: Forecasting the World's Population*, Committee on Population, National academy Press, Washington, D.C., 2000, p. 4.

<sup>14</sup> Münz and Reiterer, *op. cit.*, p. 8.

<sup>15</sup> United Nations, *op. cit.*, p. 2. Interestingly, Goldman Sachs projects that by 2050 income per capita basis

Future population growth and changes in the age composition of the population is driven by changes to four causal drivers. First, in most developing countries, the number of births per woman is still beyond that required for each generation to exactly replace itself; that is above 2.1 births per woman. Nevertheless, birth rates in these countries are projected to decline to those commonly found in the developed countries by 2020 as global fertility rate dip to below replacement level.<sup>16</sup> Second, in tandem with a fall in fertility is a decline in mortality, as life expectancy continues to rise worldwide. Although, many people living in the developed world have come to expect that they will live longer, this is a trend is also apparent throughout most of the developing world. However, there is a difference between these two worlds, for the transition to longer life expectancy is moving at a more rapid pace in the developing world than it did in the developed world.<sup>17</sup>

Third, the number of people globally born in one country but resident in another has increased from 75 million in 1965 to 120 million in 1990. Currently, the number of foreign-born constitutes slightly over two per cent of world population, a proportion that has stayed stable for at least thirty years as the global population size has risen correspondingly.<sup>18</sup> One type of international migration that is especially problematic for host countries to accommodate has been sudden surges in migrants that often result from political, economic and environmental crises. These ‘demographic quakes’ bring about sudden and extreme changes in population growth rates which no existing methodology can predict nor foretell what the demographic response to such an event might be.<sup>19</sup>

Fourth, even if the number of births per woman approximated a replacement level of two and future mortality levels remain unchanged, the world population would still grow because of the high ratio of young to old people. With at least half the world’s population under the age of 27, this ‘youthful’ population is expected to account for more than half of global population growth to 2050.<sup>20</sup>

---

<sup>16</sup> See ‘Go forth and multiply a lot less,’ *The Economist*, Vol. 393, No. 8655, October 31<sup>st</sup> 2009, p. 29.

<sup>17</sup> Bongaarts and Bulatao, *op. cit.*, p. 7.

<sup>18</sup> *Ibid.*, p. 8.

<sup>19</sup> *Ibid.*, p. 9. Recent data indicates that more than half of the world’s 10.5 million non-national refugees, plus a further 20 million internal refugees and displaced people now live in increasingly overcrowded, overburdened cities. See Buncombe, Andrew, ‘Cities swollen by refugee flood,’ *New Zealand Herald*, Auckland, December 9, 2009, p. A20.

<sup>20</sup> Bongaarts and Bulatao, *op. cit.*, p. 3.

This “youth bulge” will become a double edged sword, for in the emerging Third World economic powers this youth bulge will mature into a “worker bulge” especially when these new powers can provide an educated workforce and a business friendly environment for investment. Conversely, if employment conditions don’t change drastically in weak states, particularly Iraq, Yemen, Afghanistan and Pakistan, youth bulge will force young men to migrate, thereby externalizing volatility and violence.<sup>21</sup>

Growth in human population and economic wealth are simultaneously transforming the world of the twenty-first century by trigger six Earth-changing trends.<sup>22</sup> First, the sustained period of economic growth since the Second World War has, through the process of globalisation, now reached most parts of the world making humanity on average richer in terms of income per person.<sup>23</sup> There exists now an economic convergence between the peoples of the First and Third Worlds and movement towards the global alignment of standard of living.<sup>24</sup> Second, the global population and the overall growth of the world economy will rise in tandem. Not only will each person produce more output on average, but by mid-century there will be more people producing more. The scale of the world’s economic production is therefore likely to be several times greater than today.<sup>25</sup> Third, the rise in income will be greatest in Asia so that by 2025 the world will be split into several financial hubs of which Asia will be the most important.<sup>26</sup> Fourth, the way humanity lives is fundamentally changing as increasing numbers of rural people move into urban areas. According to the United Nations Commissioner for Refugees the mid-point between urban and rural dwelling was crossed in 2008, and is now on a one-way path to a predominantly urban civilisation.<sup>27</sup> Fifth, the overall impact of human activity on the natural environment is producing multiple environmental crises. Never before in history

---

<sup>21</sup> See National Intelligence Council, November 2008, ‘*Global Trends 2025: A Transformed World*,’ United States Government Printing Office, p. 22, [http://www.dni.govt/nic/NIC\\_2025\\_project.html](http://www.dni.govt/nic/NIC_2025_project.html) (23 November 2008).

<sup>22</sup> See Sach, Jeffrey D., *Common Wealth: Economics for a Crowded Planet*, Penguin, New York, 2008, p. 19. Gross world product is the sum of the gross domestic products of every country in the world, has risen by a remarkable eight times since 1950. There remains a significance amount of economic growth yet to come given both the continuing growth in global population and continuing rise in personal income. *Ibid.*, p. 17.

<sup>23</sup> *Ibid.*

<sup>24</sup> *Ibid.*, p. 19.

<sup>25</sup> *Ibid.*, p. 17.

<sup>26</sup> National Intelligence Council, *op. cit.*, p. 12.

<sup>27</sup> Buncombe, *op. cit.*, p. A20.

has the magnitude of human economic activity been large enough to change fundamental natural processes on a global scale, including the climate itself.<sup>28</sup> Sixth, the gap between the richest and the poorest is widening because the poorest billion people inhabit a group of states so enmeshed in poverty that they have fallen behind other developing countries and are likely to economically fall apart.<sup>29</sup> This is not contradictory to the notion that on average the poor are getting rich, but an illustration of the intransigence of global inequality. Poverty rather than prosperity is the most common theme permeating these six challenges.

### **Poverty**

Poverty has a multiplicity of meanings: poverty can mean hunger; lack of shelter; being sick with no access to a doctor; not having a job and in fear of the future or worst of all being powerlessness.<sup>30</sup> Notwithstanding these different definitions, the economic standard for measuring poverty in low-income countries is the number of people living on US\$1.25 per day in 2005 purchasing power parity terms (PPP).<sup>31</sup> Under this measure there are 1.4 billion people in the developing world (one person in four) who are living in poverty down from 1.9 billion (one person in two) in 1981.<sup>32</sup> In middle-income developing countries, such as those in Central Asia, the poverty line rises to US\$2.00 per day in the year 2000 purchasing power parity terms.<sup>33</sup>

Extreme poverty exhausts governing institutions, depletes natural resources, weakens leaders and squashes any residual hope held by the citizenry, while also fuelling a volatile mix of desperation and instability. Poor, fragile states may explode into violence or implode imperilling their citizens, regional neighbours, and the wider world community as livelihoods are crushed, investors flee and ungovernable territory spawns global threats such as terrorism, trafficking, environment devastation and disease.<sup>34</sup> Yet, if poverty leads to insecurity then the

---

<sup>28</sup> Sach, *op. cit.*, p. 18.

<sup>29</sup> See Collier, Paul, *The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It*, Oxford University Press, New York, 2007, p. 3.

<sup>30</sup> World Bank, 'Bringing Poverty and Distributional Lens to Help Tackle Global and National Development,' 2009, <http://go.worldbank.org/K7LWQUT9LO> (17 November 2009).

<sup>31</sup> *Ibid.*

<sup>32</sup> *Ibid.*

<sup>33</sup> *Ibid.*

<sup>34</sup> See Brainard, Lael, Derek Chollet and Vinca LaFleur, 'The Tangled Web: The poverty-Insecurity Nexus,' in Lael Brainard and Derek Chollet (eds.), *Too Poor for Peace? Global*

destabilizing effects of conflict along with demographic and environmental challenges increase difficulties leaders, institutions and external organisations face in promoting human development.<sup>35</sup> A typical civil war leaves a country fifteen per cent poorer than it might otherwise have been, and may result in as many as thirty per cent more people living in absolute poverty.<sup>36</sup> Research also suggests that thirty-six per cent of all civil wars will ultimately reignite.<sup>37</sup>

Likewise, research shows that there is a link between the risk of war and initial levels of income: halving the starting income in a country doubles the risk of civil war.<sup>38</sup> Another cause of civil war is slow economic growth, or worse, economic stagnation or decline. A typical low-income country faces a risk of civil war of approximately fourteen per cent in any five year period. But each percentage point added to the economic growth rate reduces the risk of civil war by a percentage point.<sup>39</sup> Research also confirms the presence of a third risk factor that of a high dependence on exports of primary commodities such as oil, diamonds and the like. An otherwise typical country whose exports of primary products account for ten per cent of its gross domestic product (GDP) has an eleven per cent chance of being at war. Should primary product exports eventually reach thirty per cent of GDP then the probability of civil war could reach as high as thirty-three per cent.<sup>40</sup>

A perplexing question is why the risk of conflict is higher in poorer countries? Some commentators suggest that it is because the poor have little to lose or as a columnist for *The Economist* wrote, "...it is easy to give a poor man a cause."<sup>41</sup> Poverty is especially intense in low-income countries where high fertility rates have resulted in a large youth population or "youth bulge." Almost

---

*Poverty, Conflict and Security in the 21<sup>st</sup> Century*, Brookings Institution Press, Washington, D.C., 2007, p. 4.

<sup>35</sup> *Ibid.* p. 2.

<sup>36</sup> See 'The global menace of local strife,' *The Economist*, Vol. 367, No. 8325, May 24, 2003, pp23-25.

<sup>37</sup> See Walter, Barbara F., 'Does Conflict Beget Conflict? Explaining Recurring Civil War,' *Journal of Peace Research*, Vol. 41, No. 3, 2004, p.371. Between 1945 and 1996 of the 58 cases of civil war that ended 22 ultimately experience renewed warfare (*Ibid*).

<sup>38</sup> Collier, *op. cit.*, p. 19.

<sup>39</sup> *Ibid.*, p. 20.

<sup>40</sup> *Economist*, *op. cit.*

<sup>41</sup> *Ibid.*



sixty per cent of the world's poor are under 25 years old.<sup>42</sup> Research has linked youth bulges to conflict risk, which lends support to the argument that poverty increases the opportunities for rebellion because large numbers of youth provide a readily available supply of potential rebel combatants.<sup>43</sup> Today's "youthfully" countries form a crescent stretching from the Andean region of Latin America across sub-Sahel Africa, the middle-East and Central Asia and the through the northern states of South Asia. However, by 2025, the number of countries in this "arc of instability" is project to decline by up to forty per cent owing to waning fertility and maturing populations. The majority of the "youth bulge countries" expected to linger beyond 2025 will be located in sub-Saharan Africa, the Arabian Peninsula, Afghanistan and scattered among the Pacific Islands.<sup>44</sup> For these countries there is no escaping this "conflict trap,"<sup>45</sup> at least in the short to medium term.

Tragically, poverty and insecurity are mutually reinforcing, with poverty playing a complex role by facilitating both the emergence and spread of transnational security threats. Poverty significantly increases the risk of conflict, which in turn provides a fertile breeding ground for such threats. It also can create conditions at the local and state level that are conducive to transnational threats. If a state becomes incapable of preventing or containing such threats, adverse conditions can be created within and beyond state boundaries that exacerbate poverty. This sets in motion what Susan Rice evocatively calls a "doom spiral,"<sup>46</sup> where poverty fuels threats that contribute to deeper poverty, consequently intensifying those threats.

The commonly held wisdom that any progress towards stopping wars, civil conflict and violence requires a reduction in poverty is not without its sceptics.

---

<sup>42</sup> See Rice, Susan E., Corinne Graf and Janet Lewis, *Poverty and Civil War: What Policymakers Need to Know*, Global Economy and Development Working Paper #02, The Brookings Institution, Washington, D.C., December 2006, p. 10.

<sup>43</sup> *Ibid.*, p. 11.

<sup>44</sup> National Intelligence Council, *op. cit.*, p. 21.

<sup>45</sup> The "conflict trap" arises when a country's starts its independence with three economic characteristics that globally make states prone to civil war: low income, slow growth and dependence upon primary commodity exports. The risk that such a country will fall into civil war in any five-year period is nearly one-in-six. Once war begins, the economic damage incurred undoes growth achieved during the preceding period of peace, lowers even further income levels, and denies universal access to export revenues. These are the contributing factors that all but doom a country to further periods of political and societal instability and the real prospect of violence erupting again in the future. Collier, *op.cit.*, p. 32-33.

<sup>46</sup> See Rice, Susan E., 'The Threat of Global Poverty,' *The National Interest*, Vol. 83, Spring 2006, p. 81.

Miguel *et al.* using rainfall as a measure of economic growth found that exogenous economic shocks have a strong statistical correlation to civil conflict, i.e., civil war is related to sudden changes in income. This correlation is particularly evident in economies that largely rely on rain-fed agriculture. Furthermore, in sub-Saharan Africa, Miguel *et al.* established a statistical correlation between weather shocks and income growth and between short-term economic fluctuations and civil conflict.<sup>47</sup> While these findings are pertinent to Africa they may possess indicative relevance of what to expect elsewhere in the world.<sup>48</sup> Additional findings were that GDP growth is significantly negatively related to the incident of civil conflict in sub-Saharan Africa over the period 1981 to 1999. This relationship proved to be extremely strong for a five per cent drop in annual income growth increased the likelihood of conflict in the following year by over twelve percentage points – which amounts to an increase of more than one-half in the likelihood of civil war.<sup>49</sup> Most interestingly, the impact of weather shocks on civil conflict is *not*<sup>50</sup> significantly different in richer, more democratic, more ethnically diverse or mountainous African countries or in countries with a range of different social and political institutional characteristics.<sup>51</sup>

If the Intergovernmental Panel on Climate Change is correct in predicting that the twenty-first century will be characterized by weather extremes becoming more frequent, more widespread and/or more intense,<sup>52</sup> then the findings of Miguel and his cohorts represent a stark warning of looming climate change conflicts.

### **Prosperity**

The book, *North-South: A programme for Survival*, published in 1980 by an independent commission chaired the former Chancellor of the Federal Republic of Germany Willy Brandt, contained a set of bold reforms, which despite of the

---

<sup>47</sup> See Miguel, Edward, Shanker Satyanath and Ernest Sergenti, 'Economic Shocks and Civil Conflict: an Instrumental Variables Approach,' *Journal of Political Economy*, Vol. 112, No. 4, 2004, p. 726.

<sup>48</sup> *Ibid.*, p. 744.

<sup>49</sup> *Ibid.*, p. 727.

<sup>50</sup> Italics were used in the original article.

<sup>51</sup> *Ibid.*

<sup>52</sup> See Intergovernmental Panel on Climate Change, 2007, *Contributions of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers*, p.9, IPCC Summary Report (2007), p. 17.

misgivings of the North, would, if implemented, have lifted the peoples of the South out of the economic morass that still characterizes the poor underdeveloped Third World. Tenor of the report suggested that reforming the international community would make the “world a less unequal and a more just and inhabitable place.”<sup>53</sup> Despite the good intentions embedded within the report’s rhetoric, little has changed in thirty years. The fortunes of the world’s three wealthiest individuals equal the combined gross domestic product of all fifty-one poorest countries. These fifty-one countries represent a mere 0.4 per cent of world trade. The most affluent twenty per cent of the global population earn approximately one hundred times as much as the poorest twenty per cent. Also, the most affluent twenty per cent consume eighty-five per cent of all goods that are manufactured for private consumption.<sup>54</sup> While there remains a wide gap between those people existing in poverty and those living in prosperity the future for the world’s poor is likely to progressively improve as the number of middle-class countries grow in number.<sup>55</sup>

There are a number of measures used to determine the extent of the poverty/prosperity gap, with the most common being an interstate comparison of income per capita, based on purchasing power parity.<sup>56</sup> Using data included in a survey undertaken by Goodman Sachs in 2007 the extreme of poverty is represented by Zimbabwe with an income per capita of \$188.00 and the extreme of prosperity represented by Qatar with an income per capita of \$80,870.00. Estonia (\$21,094) and Portugal (\$21,652) straddle the survey mean of \$21,254.00. Although the survey population is small (N=71), sixty per cent of the countries surveyed had an income per capita less than the mean. In a reflection of the South/North poverty/prosperity divide no ‘Third World’ state other than the petro-states of the Persian Gulf (with a range of \$23,243 - 80,870) and Singapore (\$49,714) had a per capita income in excess of the average. One G8 state, Russia

---

<sup>53</sup> See Brandt Commission (Independent Commission on International Development Issues), *North-South: A Programme for Survival*, Pan Books, London, 1980, p. 77.

<sup>54</sup> Münz and Reiterer, *op. cit.*, p. 261.

<sup>55</sup> See Wilson, Dominic and Raluca Dragusanu, ‘The Expanding Middle: The exploding World Middle Class and Falling Global Inequality,’ *Goldman Sachs Economic Research*, Global Economic Paper No. 170, July 7, 2008.

<sup>56</sup> Purchasing power parity (PPP) theory uses the long-term equilibrium exchange rate of two countries to equalize their purchasing power. The concept was developed in 1918 by the Swedish economist Karl Gustav Cassel (1866-1945) and is based on the theory that, in an ideally efficient market, identical goods should have only one price. See [http://en.wikipedia.org/wiki/Purchasing\\_Power\\_Parity](http://en.wikipedia.org/wiki/Purchasing_Power_Parity) (2 December 2009).

(\$14,692), fell below the survey mean.<sup>57</sup> As the number of people living in ‘extreme poverty’ – less than a \$1000.00 per year<sup>58</sup> – continues to decline globally towards a projected nadir of six per cent of the world’s population by 2015 an adverse paradox could arise in that a greater number of “wealthy” people will deplete global resources more quickly ultimately sending greater number of people into poverty. Only a radical change in an attitude towards personal wealth creation by rich Western states will prevent such a paradox from becoming a reality.

Another methodology for quantifying the poverty/prosperity gap is to examine each country’s ecological footprint. Ecological footprint analysis is an accounting technique that enables an estimate to be made of the resource consumption and waste assimilation requirements of a defined human population or economy in terms of a corresponding productive land area.<sup>59</sup> The direct correlation between lifestyle and the area land required to satisfy that lifestyle is clear: greater the levels of resource consumption and waste generated, larger the land area needed for a community to sustain itself. The ecological footprint of an average Canadian, that is the amount of land required from nature in the late twentieth century to support a typical individual’s lifestyle, is approximately 4.3 hectares.<sup>60</sup> For a typical citizen of the United States that requirement increases to 5.1 hectares.<sup>61</sup> The footprint for the Netherlands equals 3.3 hectares per individual.<sup>62</sup>

It is revealing to note that in countries where poverty is prevalent the ecological footprint is significantly reduced. For example, in India the land required to compensate for a typical individual’s lifestyle is a mere 0.4 hectare.<sup>63</sup> This is four times less than both the average global footprint of 1.8 hectares and the 1.5 hectares of ecologically productive land “available” to each person on

---

<sup>57</sup> Wilson and Dragusanu, *op. cit.*, p. 18.

<sup>58</sup> In 1985 three billion or half of humanity in existed on less than \$2.00 a day (in terms of 1985 PPP). See Leisinger, Klaus M., Karin M. Schmitt and Rajul Pandya-Lorch, *Six Billion and Counting: Population Growth and Food Security in the 21<sup>st</sup> Century*, International Food Policy Research Institute, Washington, D.C., 2002, p. 9.

<sup>59</sup> See Wackernagel, Mathis and William E. Rees, *Our Ecological Footprint: Reducing Human Impact on the Earth*, New Society, Gabriola Island, BC, 1996, p. 9.

<sup>60</sup> *Ibid.*, p. 11.

<sup>61</sup> *Ibid.*, p. 85.

<sup>62</sup> *Ibid.*, p. 95.

<sup>63</sup> *Ibid.*

Earth.<sup>64</sup> Indeed, if every person on Earth lived like the average Canadian or American then no fewer than three planet Earths are needed to sustain life.<sup>65</sup> Alternatively, human population would need to decrease to 5.8 billion if globally people are to enjoy North American material standards.<sup>66</sup> If humanity's numbers increase as is anticipated reaching nine plus billion by 2050 then each global citizen will have slightly less than one hectare of ecologically productive land, assuming there is no further soil degradation.

Yet another methodology to quantify the global poverty/prosperity gap is to examine each state's carbon footprint. Although a carbon footprint can be defined in various ways, generally it is considered to be "the measure of the greenhouse gases, measured in units of carbon dioxide, produced by human activities."<sup>67</sup> Carbon foot-printing is a useful method by which individuals and organisations can conceptualize their personal or organisational contribution to global warming. However, to undertake a more exhaustive analysis that links greenhouse gas emissions to consumption categories of goods and services – a more useful measure when considering the poverty/prosperity continuum – then more expansive definition than that given above is warranted. A more expansive definition would also overcome methodological and categorisation difficulties often experienced when undertaking cross-country comparisons. Hertwich and Peters provide such a definition, defining the carbon footprint "...as the greenhouse gases (GHGs) CO<sub>2</sub>, methane, nitrous oxide, and fluoride emitted in the production of goods and services used for final consumption and GHG emissions occurring during the consumption activities themselves...."<sup>68</sup>

While the Hertwich and Peters' analysis does not include all world states, it is detailed enough to show a strong correlation between carbon footprints and per capita consumption expenditure. Statistical patterning demonstrates that CO<sub>2</sub> increases strongly with expenditure, while other GHGs increase at a lesser rate. In summation, these authors determined that as countries became wealthier their

---

<sup>64</sup> *Ibid.*, p. 13.

<sup>65</sup> *Ibid.*

<sup>66</sup> *Ibid.*, p. 14.

<sup>67</sup> See Walser, Maggie L., 'Carbon Footprinting,' *Encyclopaedia of Earth*, August 23, 2008, [http://www.eoearth.org/article/carbon\\_footprint](http://www.eoearth.org/article/carbon_footprint) (30 November 2009). A slightly more extensive definition can found on web site <http://www.sbmtd.gov/GraphicElement/WhatisaCarbonFootprint.pdf> (1 December 2009).

<sup>68</sup> See Hertwich, Edgar G. and Glen P. Peters, 'Carbon Footprint of Nations: A Global, Trade-Linked Analysis,' *Environmental Science & Technology*, Vol. 43, No. 16, 2009, p. 6414.

carbon footprint increased by fifty-seven per cent for each doubling of consumption.<sup>69</sup> Of the various consumption categories nutrition was the most important with food accounting for nearly twenty per cent of GHG emissions, followed by mobility for private households (17%), of which almost half is caused by fuel combustion by private motorists, and then by manufactured products which comprises thirteen per cent of the carbon footprint.<sup>70</sup>

The total emissions analysed by Hertwich and Peters for the year 2001 amounted to 24.7 gigatonnes (Gt) of carbon dioxide and 9.5 Gt of carbon dioxide equivalents of non-CO<sub>2</sub> greenhouse gases.<sup>71</sup> Within this figure the per person carbon footprint ranges from a low of 0.7 tCO<sub>2e</sub>/p for Malawi to 33.8 tCO<sub>2e</sub>/p for Luxembourg,<sup>72</sup> with a mean of 9.4 tCO<sub>2e</sub>/p which lies between Korea at 9.2 tCO<sub>2e</sub>/p<sup>73</sup> and 9.5 tCO<sub>2e</sub>/p for Hungary.<sup>74</sup> Of the seventy countries surveyed thirty-eight (54%) fall below the mean, the majority of which are developing states. Of the countries that comprise the Organisation for Economic Cooperation and Development (OECD) or “wealthy” Western countries, just four countries Korea, Poland (8.7 tCO<sub>2e</sub>/p), Slovakia (8.0 tCO<sub>2e</sub>/p) and Turkey (4.6 tCO<sub>2e</sub>/p)<sup>75</sup> fail to exceed the global mean. Like ecological footprinting, carbon footprinting can be used to show how much humanity needs to reduce consumption, improve technology, or change behaviour to achieve sustainability. The methodology also revealed that chronic material inequality persists between high and low-income countries, which need to be corrected if humanity is to evade the fate that has already befallen Afghanistan.<sup>76</sup>

For almost every person throughout the world development implies an improvement in personal living standards. In the wealthy states this continues to be tied to the market economy, social protection, an efficient production of industrial goods and services, and the individualisation of lifestyles. Happiness in

---

<sup>69</sup> *Ibid.*, p. 6415.

<sup>70</sup> *Ibid.*, p. 6417.

<sup>71</sup> *Ibid.*, p. 6415.

<sup>72</sup> *Ibid.*, p. 6416.

<sup>73</sup> *Ibid.*

<sup>74</sup> *Ibid.*

<sup>75</sup> *Ibid.* It should be noted that Iceland was excluded from Hertwich and Peters' analysis; no reason was given for this exclusion.

<sup>76</sup> According to a recent survey (April 2009) Afghans overwhelming see poverty and unemployment as the main reason behind the ongoing conflict in their country. See BBC NEWS, 'Afghans 'blame poverty for war,' 18 November 2009, [http://newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/2/hi/south\\_asia/8363151](http://newsvote.bbc.co.uk/mpapps/pagetools/print/news.bbc.co.uk/2/hi/south_asia/8363151) (1 December 2009).

the contemporary First World tends to be measured in terms of personal career and consumption opportunities, larger living space, cars, travel opportunities and even secondary residences. This lifestyle has resulted in significantly higher energy and non-energy resource consumption, as well as an enlargement of both the ecological and carbon footprints. The ecological costs of contemporary Western lifestyles are high and prosperity continues to be sought with little regard for its impact on others. For many in the Third World, over consumption by Western societies offers nothing but hunger, squalor, disease and an early death, so it is little wonder the world is on the cusp of mass migration.<sup>77</sup>

The real quandary for the twenty-first century is how to satisfy an entirely legitimate desire among the global population for universal prosperity. If such prosperity is associated with the attainment of a Western-style of living, then resource consumption makes that reality almost unimaginable. Münz and Reiterer make a pertinent enquiry when they ask how the world will meet the desires of 1.5 billion Chinese or a similar number of Indians to have one or two cars per family, generous living space, energy consumption at Western levels, and individual mobility?<sup>78</sup> It is impossible to apply globally the lifestyle currently enjoyed by the wealthy developed world. Today's comparatively high consumption of energy and other resources by 6.8 and soon to be more than nine billion people makes a universal Western lifestyle impossible, especially since even more modest desires remain unfulfilled. Without a change in lifestyles and resource consumption by wealthy Western countries, a life of dignity for everyone is hardly imaginable!<sup>79</sup>

The conundrum that besets the wealthy developed states is how to temper expectations of prosperity of the world's poorest inhabitants without creating an environment that threatens their national interests while their citizens maintain a lifestyle that lead to and now prolongs global inequalities. While Western societies would dearly love to believe that they can be islands of stability and prosperity in a global sea of poverty and unrest, history continues to prove otherwise. Any overseas economic crisis that leads to a collapse of state authority has adverse consequences for Western countries.<sup>80</sup> Likewise, the very notion that

---

<sup>77</sup> See Münz and Reiterer, *op. cit.*, p. 269.

<sup>78</sup> *Ibid.*

<sup>79</sup> *Ibid.*, p. 270.

<sup>80</sup> See Sachs, Jeffrey D., 'The Strategic Significance of Global Inequality,' *The Washington Quarterly*, Vol. 24, No.3, p. 188.

developing countries will remain true to traditional values and committed to largely Western-created institutional arrangements<sup>81</sup> may yet prove to be flawed precipitating conflict. As inequality continues to dog the world the arguments of a risk assessment consultancy firm ring true for a variety of causal factor besides pandemic diseases, for “... sufferers from AIDs may not scruple to commit violent crimes because they have little reason to fear the consequences. In some case ... travellers from the developed world are attacked not only because that are potentially lucrative targets but because they are seen as the cause of the poor[’s] economic circumstances.”<sup>82</sup>

Part II comprises two subject chapters each one examining how resource scarcity and climate change, either separately or in combination, might be used as a pretext for interstate conflict. During the course of the twenty-first century a resurgence of mercantilism cannot be lightly discarded as a scarcity of resources becomes more pronounced and resource nationalism increases the risk of great power confrontations, even as early as 2025.<sup>83</sup> This situation appears destined to worsen as global wealth moves away from Western states to the emerging middle-income countries with their burgeoning middle class population, which could, by 2030, add an additional two billion consumers to those in the West that already enjoy a surfeit of material wealth.<sup>84</sup> Like the inequality between rich and poor, the inequality between resource supply and consumerist demand could readily spark what some commentators call “resource wars:” the topic of Chapter Nine.

Chapter Ten – on probable future “climate wars” – examines the just one consequence of climate change on security, the exacerbation of resource scarcities, particular water. It will also mention one consequence of resource scarcity the rise of climate refugees as a uniquely twenty-first century phenomena. By 2035, worries over the effects of climate change may be more significant than any physical change wrought by a changing climate. Perceptions of a rapidly degrading biosphere might cause countries to take unilateral actions to secure resources, territory and other interests. Willingness to engage in multilateral co-operation depends on a number of factors, particularly the behaviour of other

---

<sup>81</sup> See Powles, Michael, ‘The China Threat – myth or reality?’ *New Zealand International Review*, Vol. XXXV, No. 1, p. 22.

<sup>82</sup> See Cohen, Amon, ‘Unhealthy rise in danger,’ *Financial Times*, November 21, 2000, p. 16.

<sup>83</sup> National Intelligence Council, *op. cit.*, p. v.

<sup>84</sup> Goldman Sachs, *op. cit.*, p. 3.



countries, the economic context and the importance of the interests to be defended or won. Although the science associated with climate change predictions remains contested as evidenced by the furore born out of the emails stolen from the University of East Anglia's Climate research Unit,<sup>85</sup> a drastic cutback in allowable carbon dioxide emissions could plunge both the developed and developing world into a recession or worse<sup>86</sup> or even war.<sup>87</sup>

Already, resource scarcities and climate change are shaping the security architecture in the Arctic and although this combination is not currently a seminal influence in Antarctica that may not be so by 2035.

---

<sup>85</sup> See Associated Press, 'Examining the climate change emails – word by word,' *New Zealand Herald*, Auckland, December 14, 2009, p. A17.

<sup>86</sup> National Intelligence Council, *op. cit.*, p. 54.

<sup>87</sup> See United Nations, *Security Council Holds First-Ever Debate on the Impact of Climate Change on Peace, Security, Hearing Over Fifty Speakers*, United Nations Security Council, SC/9000, 17 April 2007.

## Chapter Nine

### Scenario Driver – Resource Scarcity

Earth is a small celestial body of finite natural resources.<sup>1</sup> Although some resources – lesser in number - self replenish and are thus continuously available, the consumption of the remainder – those resources incapable of self-replenishment – ensures their on-going consumption will eventually lead to exhaustion. In the contemporary world, even resources that self-replenish by naturally occurring processes are being jeopardized by human activity and their present abundance, at least in an unpolluted form, can no longer be globally assured.<sup>2</sup> Inevitably, resource depletion, when coupled with human induced resource pollution, will cause comprehensive resource scarcity; historically a catalyst of armed conflict.

As mentioned in Chapter One the nomenclature used throughout this thesis shall categorise natural resources as either living or non-living. However, there is, as suggest by Thomas Homer-Dixon, an additional resource category, those resources such as the atmosphere, ozone layer and oceans which are neither living nor non-living, but a ‘medium’ held in common by all life forms on Earth.<sup>3</sup> The fundamental problem associated with this latter category of resources is that of determining who holds the responsibility for ensuring their on-going availability and the mechanism for holding any responsible party accountable.<sup>4</sup> In the absence of assignable accountability and responsibility such resources, frequently known as the ‘global commons,’ often succumb to what has been described as the “tragedy of the commons.”<sup>5</sup>

---

<sup>1</sup> See Meadows, Dennis L., ‘Preface,’ in Dennis L. Meadows, William W. Behren III, Donella H. Meadows, Roger F. Naill, Jrger Randers and Erich K. O. Zahn (eds.), *Dynamics of Growth in a Finite World*, Wright-Allan Press, Cambridge, Massachusetts, 1974, p. vii.

<sup>2</sup> See Foresight, *The Future for Food and Farming (2011)*, The Government Office for Science, London, 2011, p. 12.

<sup>3</sup> See Homer-Dixon, Thomas, ‘Environmental Scarcity and Intergroup Conflict’, in Michael T. Klare and Yogesh Chandrani (eds.), *World Security Challenges for a New Century*, St. Martin’s Press, New York, 1998, p. 343.

<sup>4</sup> See Falkenmark, Malin, ‘Global Water Issues Confronting Humanity’, *Journal of Peace Proposals*, Vol. 27, No. 2, 1990, p. 189.

<sup>5</sup> See Joyner, Christopher C., *Governing the Frozen Commons*, University of South Carolina Press, Columbia, 1998, p. 25.

Garrett Hardin in his famous essay “The Tragedy of the Commons” explains the dynamics of a tragedy within the setting of an old-world English village commons green. The green, open to all villagers, is able to sustain a cattle herd providing it is a stable population. Unfortunately, the cattle population increases as each individual herdsman rationally seeks to maximise his own gain. Quite naturally, a herdsman could reason that he will benefit from every additional cow that he grazes on the common space, with the cost of that use being dissipated amongst all of the herdsmen. But each additional cow actually contributes to the progressive deterioration of the commons. Other herdsmen following the same logic add their own cows seeking to optimise their personal gain. In this way, a rational individual action leads to irrational collective action bringing about the inefficient use and eventual destruction of the commons.<sup>6</sup> Thus, irrespective of their original good intentions, humankind in the absence of genuine cooperation and enforcement mechanisms are inclined towards misuse and eventual abuse of such areas. In the contemporary world such misuse and abuse has resulted in significant change to the physical distribution and/or chemical composition of global resources.

Of the other two categories of resources, non-living resources—many of which also fall into the category of non-renewable resources—provide the indispensable infrastructure upon which all living organisms depend for their existence and well-being. The primary non-living resources are land, fresh water<sup>7</sup> and minerals. Living resources are those resources that are renewable and thus manageable, such as staple food crops and marine fisheries.<sup>8</sup> However, before discussing each category of resource it is necessary to comment on those processes that give rise to resource scarcity.

While it is impossible to diminish the importance to society of any single resource there are a small number that are essential to human existence and as such have historically been a contributing cause to many intra-state and inter-state conflicts. However, in any scramble over access to natural resources Georgescu-Roegen’s poignant reminder “... that of all the necessities of life only the purely

---

<sup>6</sup> *Ibid.*, p.29.

<sup>7</sup> Falkenmark is one of but a few commentators who identify water as a finite resource. *Ibid.*, p. 188.

<sup>8</sup> See Westing, Arthur (ed.) *Global Resources and International Conflict*, Oxford University Press, Oxford, 1986, p. 6.

biological are absolutely necessary for survival” should not be overlooked.<sup>9</sup> Regrettably, since this enjoinder is continually forsaken a direct causal relationship between non-essential life-supporting resources and armed conflict has progressively become established. How that nexus impacts on the international community for each category of resource is discussed in this chapter, with an emphasis given to those resources that could plausibly be found in either Polar Region. Emphasis is likewise placed on how the militarization of those resources by one or more states could plausibly result in interstate hostilities in the future, especially once supply insecurities mount towards mid-century.

### **Resource scarcity**

For any country or the world as a whole a natural resource is in short supply when demand, created by need or desire, exceeds availability. The dilemma of natural resource insufficiency or scarcity, according to Westing, arises out of one or both of two broad reasons: *a*) when either population numbers or human aspirations grow too rapidly or are already too large, yet deny containment; and *b*) when natural resources become degraded through misuse, for example inappropriate agricultural practices that lead to soil erosion or by harvesting living resources beyond their capacity to replenish themselves.<sup>10</sup> The causal explanation that gives added emphasis to reason *b*) is that it occurs for the same reason identified in *a*); a global burgeoning in the human population. Robert North, however, considers that the scarcity, as a concept, explicitly embodies a strong future dimension since it occurs specifically when “future apparent demand exceeds future apparent supply” or more precisely when there is a “mismatch between *apparent rates of change* of supply and demand.”<sup>11</sup> (Emphasis in the original) Westing made no mention of this particular aspect to resource scarcity.

However, there is a meshing of all three features in an investigation undertaken as phase one of the 1970s Club of Rome’s Project on the *Predicament of Mankind*. This imperfect, oversimplified and incomplete computer model, examined, under different scenarios, the inter-relationship of five variables –

---

<sup>9</sup> See Georgescu-Roegen, W, *The Entropy Law and the Economic Process*, Harvard University Press, Cambridge, MA., 1971, p. 277.

<sup>10</sup> Westing, *op. cit.*, p. 4.

<sup>11</sup> See North, Robert C., Towards a Framework for the Analysis of Scarcity and Conflict, *International Studies Quarterly*, Vol. 21, No. 4, 1977, p. 569.

accelerating industrialisation, rapid population growth, widespread malnutrition, depletion of renewable resources, and a deteriorating environment – on growth for the next hundred years.<sup>12</sup> Results of these computer analyses did not bode well for the future of mankind for it high-lighted that if growth trends in world population, industrialisation, food production, and resource depletion continued unchanged, a limit to global growth would be reached within the next one hundred years (approximately 2070), with the most probable outcome being a rather sudden and uncontrollable decline in both population and industrial capacity. The analysis also indicated that global ecological and economic stability was possible if desired by the world's populace, but work to obtain that outcome would need to be started immediately (1974).<sup>13</sup>

Two decades later, the inaction of global society to suitably respond to this advice sparked a new vocabulary and quantitative measures for discussing 'overshoot'; growth beyond the carrying capacity of the Earth.<sup>14</sup> Wackernagel and his colleagues measured the *ecological footprint* of humanity and compared it to the theoretical "carrying capacity" of the planet. These researchers concluded that resource use by humankind had overshoot the sustainable carrying capacity of Earth by some twenty per cent. Measured this way, the last time Earth could sustain humanity was during the 1980s.<sup>15</sup> If there is no paradigmatic shift in the conventional approach to economic development and providing humanity's global ecological footprint continues to grow then the world is inviting an eco-catastrophe and resultant geopolitical chaos.<sup>16</sup>

Yet another way of measuring the closeness of this potential eco-catastrophe has been proposed by Peter Viousek and his colleagues of Stanford University who have estimated that humanity has appropriated nearly forty per cent of the terrestrial biological product; twelve per cent has been destroyed outright and a further twenty-seven per cent is used either directly or co-opted each year. Consider these statistics alongside the discernable trend in world population – an

---

<sup>12</sup> See Meadow, Donella H., Dennis L. Meadows, Jørgen Randers and William W. Behrens III, *Limits to Growth*, University Books, New York, 1974, p. 21.

<sup>13</sup> *Ibid.*, p. 24.

<sup>14</sup> See Wackernagel, Mathis and William Rees, *Our Ecological Footprint: Reducing Human Impact on the Earth*, Gabriola Island, New Society, B.C, Canada, p. 54.

<sup>15</sup> See Wackernagel, Mathis, *et al.*, 'Tracking the ecological overshoot of the human economy', *Proceedings of the Academy of Science*, Vol.99, No. 14, 2002, p. 9269, <http://www.pnas.org/cgi/doi/10.1073/pnas.142033699> (2 August 2006).

<sup>16</sup> Foresight, *op. cit.*, p. 24.

increase by one and a half times midway through the twenty-first century – plus a consequential increase in the per capita consumption of energy and natural resources and Herman Daly's 'full-world' economics has a poignancy that cannot be ignored.<sup>17</sup> Parkin concludes that since the forty per cent of human economy already appropriated was the most easy to acquire little time remains for humanity to initiate corrective action.<sup>18</sup>

Thirty years has lapsed since the inaugural meeting of the Club of Rome and little has altered to change its original premise that exponential population growth and attendant consumption of national resources, when combined with an explosion in atmospheric pollutants, chiefly carbon dioxide will inevitably result in an ecological calamity. According to Meadows *et al.* humanity squandered these thirty years in a futile but well-intended debate that has resulted in half-hearted responses to pressing global ecological challenges. Does the humanity have another thirty years to dither about its response? Meadow's thought not!<sup>19</sup> As exponential growth in human population pushes against the finite limit of resource availability inequalities will be created increasing the potential for a militarization of society and widespread conflict.<sup>20</sup> Such notions are predicated on there being no new and as yet unexploited resource reservoirs to mitigate these shortages. Consequently the impact of the Arctic and Antarctica, as resource rich reservoirs, on the availability of many natural resources has not been explored in detail.

Modern views concerning the influence of natural resources restrictions on the economic fabric of states simply confirm the original scarcity theories developed by Thomas Malthus and David Ricardo during the first quarter of the nineteenth century and later elaborated on by John Stuart Mill.<sup>21</sup> These classical economists predicted that scarcity of natural resources (land) would eventually lead to diminishing social benefit from increasing economic effort, which inevitably would lead to the cessation of economic growth. The Malthusian version of scarcity rests on the assumption that the stock of agricultural land was

---

<sup>17</sup> See Parkin, Sara, 'Environmental Security', in Patricia Fara, Peter Gathercole and Ronald Laskey (eds.), *The Changing World*, Cambridge University Press, Cambridge, 1996, p. 141.

<sup>18</sup> *Ibid.*

<sup>19</sup> See Meadows, Donella, Jørgen Randers and Dennis Meadows, *Limits to Growth: The 30 Year Update*, Chelsea Green Publishing, White River Junction, Vermont, 2004, pp. xv-xvi.

<sup>20</sup> *Ibid.*

<sup>21</sup> See Barnett, Harold J. and Chandler Morse, *Scarcity and Growth*, John Hopkins Press, Baltimore, 1963, p. 51.

finite and once this limit was reached, continuing population growth would require increasing intensity of cultivation and, consequently, would result in diminishing returns per capita. The Ricardian version viewed diminishing financial returns as a reflection of the quality of successive plots land brought within the margin of profitable cultivation. Mill's contribution was the extension of Malthusian and Ricardian theories beyond their agrarian origins to cover other natural resources and the resulting doctrine of diminishing returns per capital.<sup>22</sup> In the contemporary world the effect of these theories is less evident due to scientific innovation and resource substitution. But even science has its limitations.

Scarcity emerges from a number of different considerations some are entropic – physical in character – while others are essentially psychological, economic, and political and thus have an anthropogenic heritage.<sup>23</sup> Entropic scarcity is an important interlocutor in any discourse on the origins of scarcity and thus warrants greater discussion. Entropy, in this context, has a dimorphic quality in that it is used to ascribe environmental scarcity to renewable,<sup>24</sup> although not necessarily living resources, while denying a similar ascription to those resources that are non-renewable and thus non-living.

Environmental scarcity, Homer-Dixon maintains, can arise in three ways: through a reduction in the supply of a key resource (*supply-induced scarcity*), through an increase in demand (*demand-induced scarcity*) and through a change in the relative access of different groups to a resource (*structural scarcity*).<sup>25</sup> Of these three, the first occurs as the result of environmental degradation or resource depletion, both of which decrease the physical availability of a particular resource. The second is attributed to growth in human population, but it may also occur as the result of a change in consumption patterns, nevertheless, both inevitably boost demand for resources. Finally, structural scarcity is caused by a severe imbalance in the distribution of wealth and power that results in some groups in society gaining a disproportionate quantity of a resource and as a consequence the rest of society has share an amount that is insufficient to sustain their livelihood. The causal link between these forms of resource scarcity and violent conflict has been

---

<sup>22</sup> *Ibid.*

<sup>23</sup> North, *op. cit.*, p. 570.

<sup>24</sup> See Homer-Dixon, Thomas F., 'Environmental Scarcities and Violent Conflict: Evidence from Cases', in Ken Conca and Geoffrey D. Dabelko (eds.), *Green Planet Blues*, Westview Press, Boulder, 2004, p. 292.

<sup>25</sup> Klare and Chandrani, *op. cit.*, p.48.

extensively document. Such conflict tends to be persistent, diffuse and most frequently sub-national.<sup>26</sup>

Violent conflict – however described – is not usually the result of a single cause no matter how traumatic, but an amalgam of a multiplicity of factors, many of which are social in character and bring with them a historical or contemporary context. Environmental scarcity is just one such factor although, in some instances, as discussed below, it became the tipping factor that ignites conflict. Ecological degradation is the most frequently cited contributing factor of environmental conflict, although its causal sponsorship is not universally accepted.<sup>27</sup> However, the weight of evidence indicates that ecological degradation when it does occur in developing countries, especially in Africa, does lead to conflict. Reidulf Molvær, examined the causal link between severe ecological degradation in the Ethiopian highlands, due to adverse climatic conditions and unsustainable agricultural practices (overgrazing), and violent conflict between rural communities. So severe had cropland degradation become throughout the highlands that many agriculturalists were forced to leave their ancestral land and join their nomadic lowland brethren as eco-refugees migrating between rural areas even sometimes crossing international borders. With each migratory wave that crossed an Ethiopian border the chance of social conflict developing into interstate war was considerably heightened and threatened to destabilise the Horn of Africa: indeed, transnational movement of eco-refugees pushed Ethiopia into war with Somalia in 1977.<sup>28</sup>

Africa also provides an example a causal link between *demand induced* scarcity and violent conflict. In late 1991, Kenya experienced a wave of rural ethnic violence over a large portion of the Rift Valley, Nyanza, and Western Provinces. By the end of 1993, at least 1500 people had been killed and more than 300,000 displaced, many of whom migrated to towns and cities. The origins of the ethnic strife can be traced to the 1980s when population and environmental pressures led to an acute scarcity of arable land, increasing rural economic marginalisation and substantial rural-to-urban migration. As Kenya's urban

---

<sup>26</sup> Conca and Dabelko, *op. cit.*, p. 300.

<sup>27</sup> See Fairhead, James, 'International Dimensions of Conflict over Natural and Environmental Resources', in Nancy Lee Peluso and Michael Watts (eds.), *Violent Environments*, New York, Cornell University Press, pp. 231-236.

<sup>28</sup> See Molvær, Reidulf K., 'Environmentally Induced Conflicts? A discussion based on Studies from the Horn of Africa', *Bulletin of Peace Proposals*, Vol. 22, No. 2, 1991, pp.175-188.



population soared and social and economic problems worsened the public call for political change grew louder. In an attempt to deflect such calls, the Moi government along with its ethnic allies orchestrated acute violence between various tribal groups who have farmed the Rift Valley, Nyanza, and Western Provinces since the colonial period. Thus demographic and environmental stresses provided both the incentive and the opportunities for the state to instigate inter-group violence.<sup>29</sup>

Staying with Africa, it is possible to examine how *structural scarcity* became one of a multiplicity of factors behind the genocide that blighted Rwanda in 1994. This is a classic example of where, in a country of small land holdings, a small but 'prosperous' rural elite declined to subdivide their farms to provide arable land for a burgeoning rural population out of fear of being left with too little land to support themselves. By taking this action the elite, often the elders in the community, committed an ever increasing proportion of their youth to perpetual poverty and hunger. Inability within the community to resolve this issue gave rise to a class of hungry landless young people prone to using acute violent to resolve grievances, who, in 1994, readily enlisted in the warring militias and proceeded to kill each other.<sup>30</sup>

Homer-Dixon's frequent use of intra-state conflict cannot disguise the fact that the sovereign ownership of land and the use to which that land can be put often creates tension between states, which can result in hostilities; the Sino-Indian War of 1962 being an example of a war over an ill-defined border and the land and resources encompassed within.<sup>31</sup> Conflicts over resources other than land are discussed under the relevant sub-chapter heading throughout the remainder of this chapter. The first of the resource categories to be discussed are the 'non-living' resources whose scarcity, either directly or indirectly, might impose a new security configuration firstly on the Arctic but ultimately on Antarctica. After this discussion the focus turns to those 'living' resources whose rising scarcity could equally imperil the Polar Regions.

---

<sup>29</sup> See Kahl, Colin H., 'Population Growth, Environmental Degradation, and State-Sponsored Violence,' *International Security*, Vol. 23, No. 2, 1998, pp. 93-94.

<sup>30</sup> See Diamond, Jared, *Collapse How Societies Choose to Fail or Succeed*, New York, Viking, 2005, pp. 322-325.

<sup>31</sup> See Sidhu, Waheguru Pal Singh and Jing-dong Yuan, *China and India: Cooperation or Conflict*, Lynne Rienner, Boulder, 2003, pp. 13-17.

## Non-living resources

### Fresh water

Of twelve ecosystems under threat, possibly the most important, is fresh water.<sup>32</sup> Fresh water while recyclable is a finite non-living resource upon which all life-forms depends. The world has a total of 1.4 billion cubic kilometres of water of which approximately ninety-seven per cent is saline. Of the remaining three per cent, which is fresh water, nearly two-thirds is locked away as ice or in deep fossil water aquifers.<sup>33</sup> Currently, humans withdraw around 3,500 cubic kilometres of fresh water a year from various sources, chiefly rivers. Of this amount approximately a third or 1,400 cubic kilometres is returned to source, often in a polluted condition.<sup>34</sup> Agricultural use accounts for seventy-three per cent of all fresh water consumption much of which is wasted, the result of primitive irrigation methods or other water management inefficiencies. Demand for fresh water has increased eight-fold since the beginning of the twentieth century<sup>35</sup> and consumption is growing at a rate of two to three per cent annually.<sup>36</sup>

Although, the cycling of water between the atmosphere and land surface generally ensures that there is a worldwide surfeit of fresh water there are great differences between geographical regions. Much of Europe, large parts of the United States, the Ganges basin in India, and the North-Western provinces of China are facing an uncertain future as virtually all of their river runoff is being used.<sup>37</sup> In many dry and poor countries, rapid population growth has reduced per capita water availability to a level below those required to meet basic household, industrial, and agricultural needs. Should climate change cause significant a shift in rainfall patterns, some regions may no longer face water shortages while others could suffer ruinous drought.

Water resources have rarely been the sole cause of violent conflict or war, indeed, water is more often a source of co-operation. Thus it is tempting to narrow the definition of “security” so as to exclude water from any debate over

---

<sup>32</sup> Millennium Assessment Board, *op. cit.*, p. 16.

<sup>33</sup> See Bulloch, John and Adel Darwish, *Water Wars: coming Conflicts in the Middle East*, Victor Gollancz, London, 1993, p. 21.

<sup>34</sup> See Homer-Dixon, Thomas, ‘Environmental and Demographic Threats to Canadian Security’, *Canadian Foreign Policy*, Vol. 2, No. 2, 1994, p. 12.

<sup>35</sup> Bulloch and Darwish, *op. cit.*, p. 21.

<sup>36</sup> Homer-Dixon, *op. cit.*, p. 12.

<sup>37</sup> *Ibid.*, p. 13.

international security, or to require security threats to be reduced to a single causal issue. Either approach not only misrepresents the connection between water and security, but it would also mislead the political elite and public in their search for ways to reduce tensions and conflict. Indeed, there is a long and informative history of tensions and conflicts over water resources, with no fewer than 103 conflicts over water having been catalogued since 3000 BC.<sup>38</sup> What causes the security situation to become so precarious is the fact that many key sources of water are shared by two or more countries. Typically, these sources are large river systems like the Nile and Indus that rise in one country then pass through one or more others before exiting to the sea through yet another country. The Nile, for example, is shared by no fewer than nine countries, while the Jordan River is shared by three and the Indus River system is divided between two nuclear-armed powers.

As mentioned in Chapter Five there are 263 shared river basins. These river basins cover approximately forty-five per cent of the earth's land area, excluding Antarctica. No fewer than 145 states depend on shared river systems for at least some portion of their freshwater supply, and a good number of these states are almost wholly dependent on such systems.<sup>39</sup> Where two or more states share such an invaluable resource the potential always exists for antagonistic interstate relations to develop especially should water become an increasingly scarce commodity due to the impact of climate change. In such situations there always exists the opportunity for a hydro-security complex to develop. In the Nile River system tensions over water, particularly between Egypt, Sudan and Ethiopia, could draw into the region the United States and China, potentially turning a hydro-security complex into a shatterbelt.

### **Non-hydrocarbon minerals**

Global deficiencies of non-fuel minerals, coupled with their uneven worldwide distribution can lead to unlikely and potentially unstable alliances, to national rivalries, and ultimately war. As with both land and water, wars over minerals

---

<sup>38</sup> See Gleick, Peter H., 'Environment & Security: Water Conflict Chronology Version 2004-2005', in Peter H. Gleick (ed.), *The World's Water 2004-2005*, Island Press, Washington, D.C., 2004, pp. 234-255. Note that Chapter Five of this thesis identifies a number of conflicts where water is accepted as the principal or significant facilitating condition for the securitisation.

<sup>39</sup> See Klare, Michael T., *Resource Wars: The New Landscape of Global Conflict*, Metropolitan Books, New York, 2001, p. 146.

extend back to the earliest civilizations. It has been suggested that the Greeks initiated the Trojan War (*circa* 1200 BC) to ensure their access to a source of tin, necessary in the manufacture of bronze.<sup>40</sup>

Modern industry, particularly defence-orientated industries, needs assured access to certain minerals and denial of access remains a potent cause of conflict. Even, within this category, commonly known as ‘strategic minerals,’ the most noteworthy of which are those minerals where supply is highly concentrated to a limited number of countries from whom major military-industrial powers must draw their imports. The most critical of all minerals, even in times of peace, need to be stockpiled as insurance against access denial or disruption to supply. The Strategic and Critical Materials Stock Piling Act (1946) in the United States mandates that a “stockpile of strategic and critical materials be maintained to decrease and preclude, where possible, dependence upon foreign sources of supply in times of national emergency.”<sup>41</sup> As a rising economic superpower China recently (2006) accepted the necessity of establishing its own strategic reserve of key minerals in part to ensure continuance of China’s economic development, but also in part to safeguard national security. In a quest to establish these reserves the Chinese are reported to be aggressively seeking out exploration and mining rights to mineral deposits in countries as diverse as Australia, Brazil, Canada, Chile and Zimbabwe.<sup>42</sup>

China’s aggressive global search for mineral reserves is without doubt being driven by the knowledge that its own mineral reserves have dramatically decreased by its economic growth.<sup>43</sup> In this respect China’s experience is not unlike that of the United States. At the beginning of the twentieth century, the United States was producing fifteen per cent more material (excluding food and

<sup>40</sup> See Ager, D, ‘Ore that launched a thousand ships’, *New Scientist*, 20 June 1985, pp. 28-29.

<sup>41</sup> See United States Department of Defense, *Strategic and Critical Materials Report to the Congress*, Washington, D.C., March 31, 2006, p. 1. The United States National Defense Stockpile inventory was valued at \$US1.59 billion as at September 30, 2005. Of the inventory metals represent 47% by commodity-type with an estimated value of \$US1.18 billion. The below metals are considered critical to the military/ industrial wellbeing of the United States and are held in varying quantities in the strategic stockpile: Aluminium; Antimony; Beryllium; Cadmium; Chromium; Cobalt; Columbium; Fluorspar; Germanium; Lead; Manganese; Palladium; Platinum; Tantalum; Thorium (REE); Tin; Tungsten; and Zinc. Besides these metals an increasing quantity of Diamond Stone is being stockpiled.

<sup>42</sup> See Associated Press, ‘China to set up strategic reserves for copper, uranium, other minerals’, May 10, 2006, <http://www.tradingcharts.com/futures/4/9/78557194.html> (11 May 2006).

<sup>43</sup> See Ministry of Land and Resources, ‘China’s Exploitable Mineral Resources Decreasing’, *People’s Daily Online*, 17 January 2002, [http://english.peopledaily.com.cn/200201/17/print20020117\\_88826.html](http://english.peopledaily.com.cn/200201/17/print20020117_88826.html) (2 June 2006).

gold) than it consumed, while exporting substantial quantities of minerals. That export surplus disappeared over the following fifty years and by the early 1950s the United States experienced a nine per cent deficit. By the late 1970s the material deficit was approaching twenty-five per cent—or, excluding petroleum, about fifteen per cent.<sup>44</sup> The origin of these figures was the United States Congress Office of Technology Assessment, but since this government agency was disestablished in 1995, no current statistics are available.

In an era where high-technology is synonymous with economic growth and prosperity a group of “rare” minerals, in that they are not found in high concentrations, have grown significantly in importance. Rare earth elements (REE)<sup>45</sup> have many applications given their unique nuclear, metallurgical, chemical, catalytic, electrical, magnetic and optical properties. Unfortunately these properties are highly specific, in that substitutes are either inferior or unknown. As dependence on REE grows, so does insecurity within industrialized countries whose use of REE is high i.e. the United States, especially since the major global suppliers of REE (at least ninety per cent of world output) reside in China.<sup>46</sup> According to the United States Geological Survey, Western States have in relocating their REE production to China failed to recognize the true strategic value of these minerals and their increasing importance in defence and aerospace applications, which include jet engines, electronic countermeasures, underwater mine detection, antimissile defence and space-based satellite power and communication systems.<sup>47</sup> Although China will remain at least for the foreseeable future the principal supplier of REE there are other significant, but largely

---

<sup>44</sup> See Eckes, Alfred E., *The United States and the Global Struggle for Mineral*, University of Texas Press, Austin, 1979, p. 241.

<sup>45</sup> The United States Geological Survey (USGS) lists as rare earth elements lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, lutetium and yttrium See United States Geological Survey, ‘Rare Earth Elements—Critical resources for High Technology,’ *U.S. Department of the Interior*, 2002, [http://minerals.usgs.gov/minerals/pub/commodity/rare\\_earths/](http://minerals.usgs.gov/minerals/pub/commodity/rare_earths/) (26 May 2006).

The unique properties of rare earth elements make them essential for applications which include miniaturized electronics, computer disk drives, visual display screens, missile guidance, pollution control catalysts, high-resolution optics and advanced magnetism material. See Grigg, William Norman, ‘Beijing Cornering Strategic Minerals,’ *New American*, February 11, 2006, [http://www.thenewamerican.com/artman/publish/printer\\_3318.shtml](http://www.thenewamerican.com/artman/publish/printer_3318.shtml) (11 May 2006).

<sup>46</sup> See Haxel, Gordon B., James B. Hedrick and Greta J. Orris, ‘Rare Earth Elements—Critical Resources for High Technology’, *United States Geological Survey (USGS)*, 2002, [http://minerals.usgs.gov/minerals/commodity/rare\\_earths/](http://minerals.usgs.gov/minerals/commodity/rare_earths/) (26 May 2006).

<sup>47</sup> USGS, *Ibid.*

undeveloped reserves in Australia, India, and South America.<sup>48</sup> Interestingly, these three regions were once contiguous with Antarctica through their Gondwanaland antecedence. This ancient geographical linkage must beg-the-question as to whether REE reserves are also buried beneath Antarctica's icy landscape?

Uncertainty that surrounds the future supplies of non-fuel minerals is not restricted to rare earth elements alone, governments are only now beginning to appreciate that current high rates of consumption of many minerals is depleting reserves at a rate some experts consider injudicious.<sup>49</sup> Two factors drive the resource depletion paradigm, first global population increase and secondly the increase in living standards across the world. Most estimates of how many years of global reserves are left for key minerals is speculative for the calculations upon which they are based remain crude since they don't take into account any increase in demand due to new technologies, plus they assume that current production equals consumption.<sup>50</sup> Even given these assumptions the conclusions are alarming. Without more recycling, reserves of antimony, used to make fire-retardant material, will be exhausted in approximately twelve years, silver in around seven and indium in less than three years.<sup>51</sup> Under a more sophisticated analysis that does incorporate the effects of new technologies in determining the lifespan of a number of mineral the result is just as dramatic. Reserves of zinc could be extinguished by 2037, both indium and hafnium-increasingly used in the manufacture of computer chips-exhausted by 2017, terbium- used to make green phosphorous in fluorescent light bulbs could be depleted by 2012,<sup>52</sup> and platinum, used as a catalyst in automobiles and fuel-cells-will be exhausted by 2020.<sup>53</sup> As another sign of problems yet to come, should all of the world's peoples to employ zinc at the current wealthy country rate then existing reserves are insufficient to

---

<sup>48</sup> See Jensen, Mead L. and Alan M. Bateman, *Economic Mineral Deposits*, John Wiley & Sons, New York, 1979, pp. 456-457.

<sup>49</sup> See Cohen, David, 'Earth audit,' *New Scientist*, Vol. 194, No. 2605, 26 May 2007, p. 35.

<sup>50</sup> *Ibid.*, p. 41.

<sup>51</sup> *Ibid.*

<sup>52</sup> *Ibid.*

<sup>53</sup> See Gordon, R. B., M. Bertrum and T. E. Graedel, 'Metal stocks and sustainability,' *Proceedings of the National Academy of Sciences of the United States of America*, Vol. 103, No. 5, January 31, 2006, p. 1213.

cover that level of usage and recycling is unlikely to makeup the deficit.<sup>54</sup> Additional virgin reserves of many minerals need to be found!

In a world sharply divided into electricity haves and have-nots global energy poverty is set to become a defining issue in what is now being termed the “Energy-Climate Era.”<sup>55</sup> In a world that now perceives hydrocarbons as a ‘toxic’ fuel source tomorrow’s global citizens may be forced to accept nuclear energy as the single safe and proven energy source that has minimal global consequences.<sup>56</sup> However, the feedstock of nuclear energy – uranium – is not inexhaustible, although the period of time before known deposits are exhausted is subject to debate. David Cohen suggests that as a result of a foreseen growth in electricity demand uranium reserves will be effectively exhausted before mid-century,<sup>57</sup> whereas the United States National Intelligence Council considers available uranium reserves to be sufficient to support the expansion of nuclear energy without reprocessing well into the second half of the century.<sup>58</sup> The global availability of uranium deposits means nothing to those countries that are energy-poor and where disruptions to electricity supplies matters little. But in energy-rich countries where the aspirations of the populace have increase with every kilowatt, the sudden curtailment of electricity could become “politically explosive.”<sup>59</sup>

Uncertainties over the continuing availability of most minerals calls into doubt aspirations for a planet that in the future might provide all citizens with the sort of lifestyle currently enjoyed by people in the developed world. Denying the majority of global citizens their prosperity because it may jeopardize the living standards enjoyed by a minority presages communal violence and warfare. Although not all geologists would agree, many accept that the planet’s burgeoning population, in combination with rising living standards, is likely to place unprecedented demands on the minerals only Earth itself can provide. For instance, R. B. Gordon *et al.* maintain that should worldwide demand for minerals continue to increase then the “...virgin stocks of several metals appear inadequate

---

<sup>54</sup> *Ibid.*

<sup>55</sup> See Friedman, Thomas L., *Hot, Flat, and Crowded*, Penguin, London, 2009, p. 64.

<sup>56</sup> See Lovelock, James, *The Revenge of Gaia: Earth’s Climate in Crisis and the Fate of Humanity*, Basic Books, New York, 2006, p. 11.

<sup>57</sup> Cohen, *op. cit.*, p. 38.

<sup>58</sup> See National Intelligence Council, “Global Trends 2025: A Transformed World,” *United States Government Printing Office*, November 2008, p. 43,

[http://www.dni.govt/nic/NIC\\_2025\\_project.html](http://www.dni.govt/nic/NIC_2025_project.html) (23 November 2008).

<sup>59</sup> Freidman, *op. cit.*, p. 82.

to sustain the modern ‘developed world’ quality of life for all Earth’s peoples under contemporary technology.”<sup>60</sup> And when resources run short, conflict is often not far behind.<sup>61</sup> In order to forestall conflict countries tend to explore with the view to exploit resources in the less accessible reaches of the planet – the Arctic today,<sup>62</sup> Antarctica tomorrow?

### **Hydrocarbon minerals**

Obtaining reliable estimates of remaining worldwide oil reserves is notoriously difficult especially when oil companies such as Royal Dutch/Shell fraudulently overstate their oil reserves by some four billion barrels.<sup>63</sup> Estimates of petroleum reserves remaining are flexible depending upon which “authoritative” source is used and hence it remains notoriously difficult to garner a straight answer. In 2001, Michael Klare, using U.S. Department of Energy estimates, predicts that worldwide petroleum reserves amount to 1,005 billion barrels (Gb).<sup>64</sup> The oil industry itself, with characteristic optimism, estimates reserves at between 1,019 to 1,160 billion barrels.<sup>65</sup> A contrary estimate is provided by Petro-consultants Campbell and Laherrère who estimated that as of 1996 worldwide oil reserves amount to no more than 850 billion barrels.<sup>66</sup> Two more contemporary estimates place oil reserves at 2,628 Gb of ultimately recoverable reserve (URR), a figure provided by United States Geological Survey (USGS) after a year-long study completed in 2000,<sup>67</sup> or at 2,448 Gb of remaining recoverable resources (RRR) as determined by an International Energy Agency (IEA) 2008 study.<sup>68</sup> Although both estimates make allowances for ‘yet to be discovered’ oil reserves of 732 and 805 Gb respectively, some commentators maintain that the USGS study underestimates the reserves available in numerous geographical regions including the Arctic, Antarctica and sub-Saharan Africa by as much as one fifth of global oil RRRs, or

---

<sup>60</sup> Gordon *et al.*, *op. cit.*, p. 1214.

<sup>61</sup> Cohen, *op. cit.*, p. 41.

<sup>62</sup> See Graff, James, ‘Fight for the Top of the World,’ *Time*, No. 38, October 1, 2007, p. 23.

<sup>63</sup> See Big News, ‘U.K. joins U.S. in Royal Dutch/Shell probe’, 8<sup>th</sup> June 2004, <http://www.bignewsnetwork.com/?sid=7823769ff7659387> (8 June 2004).

<sup>64</sup> See Klare, Michael T. ‘The New Geography of Conflict’, *Foreign Affairs*, Vol. 80, No. 3, 2001, p. 56.

<sup>65</sup> See Campbell, Colin J. and Jean H. Laherrère, ‘The End of Cheap Oil,’ *Scientific America*, March 1998, <http://www.dieoff.com/page140.htm> (8 June 2004).

<sup>66</sup> *Ibid.*

<sup>67</sup> See Sorrel, Steve, Jamie Speirs, Roger Bentley, Adam Brandt and Richard Miller, ‘Global Oil Depletion,’ *UK Energy Research Centre*, August 2009, p. 127.

<sup>68</sup> *Ibid.*, p. 131.



approximately 460 Gb.<sup>69</sup> Professor Thomas Homer-Dixon questions the accuracy of the USGS estimates of remaining oil reserves given their prediction of 24 billion barrels per year of “new” oil for the period between 1995 and 2025 has yet to materialize. In fact for the first eight years of this period actual discoveries represent only 8.5 billion barrels a year, or slightly over a third of the predicted amount. Despite whose predictions one accepts it is difficult not to agree with a telling remark made by Homer-Dixon that “...estimating discovery trends, the size of existing reserves, and future reserve growth is less a science than a black art.”<sup>70</sup>

An equally contentious issue is the date that ‘peak oil’ will occur. If unrestricted oil extraction occurs the volume of oil extracted from any oil field tends to follow a bell-shaped curve – extraction starts slowly at first, builds to a peak, before declining at the same rate it climbed. Peak output – represented by the curve’s apogee – occurs when approximately half the oil in the reserve has been extracted.<sup>71</sup> As most governments and analysts have in the past exhibit little concern about physical depletion the general level of understanding of this topic remains fairly poor. The debate is nevertheless important because without sufficient investment in demand reduction and substitute sources of energy, a decline in the global production of conventional oil could have major economic impacts. If global export capacity declines more rapidly than global production, the economic impacts in importing countries would be magnified. Moreover, transition from conventional oil to substitute sources of energy is likely to hold major economic, environmental and security challenges.<sup>72</sup>

Some ‘peak oil’ proponents maintained oil production would peak in 2008<sup>73</sup> and then decline at a rate of about six per cent annually unless new reserves are discovered.<sup>74</sup> By 2015, according to Jon Thompson of ExxonMobil, the oil industry will need to find, develop and produce 60 million barrels per day or eighty per cent of daily world consumption from yet to be discovered oil fields.

---

<sup>69</sup> *Ibid.*, p. 132.

<sup>70</sup> See Homer-Dixon, Thomas, *The Upside of Down: catastrophe, Creativity, and the Renewal of Civilization*, Island Press, Washington, 2006, p. 88.

<sup>71</sup> *Ibid.*, p. 85.

<sup>72</sup> Sorrel, *op. cit.*, p. 2.

<sup>73</sup> See Association for the Study of Peak Oil & Gas, ‘Oil and Gas Liquid 2004 Scenario’, 2003, <http://www.peakoil.net/uhdsg/2004Scenario.jpg> (4 June 2004).

<sup>74</sup> See Swinney, Clare, ‘Putting Out The Fire With Gasoline,’ *Investigate*, February 2004, p. 43.

This is equivalent to the discovery of ten new North Sea oil fields.<sup>75</sup> Thompson's predictions were supported by British Petroleum (BP), which maintained that oil needed to flow from a yet to be discovered oil fields no later than 2005 to prevent consumers from experiencing interruptions to supply.<sup>76</sup> A recent prediction of the IEA suggests that unless significant new reserves are found 'peak oil' will occur in 2020, especially if oil demand grows on a business-as-usual basis.<sup>77</sup> An alternative, but strongly supported, prediction by the Agency suggests that if a further 64 million barrels per day or the equivalent to eight times the daily output of Saudi Arabia became available, then 'peak oil' would be delayed till after 2030.<sup>78</sup> However, Sorrel *et al* consider the assumption upon which this scenario is based is "at best optimistic and at worst implausible."<sup>79</sup> To date not a single significant 'yet to be discovered oil field' has been discovered.

Year by year, from 1860, the volume of newly discovered oil climbed steadily upwards until 1961, when it peaked, and since then, on average, oil companies have found less new oil than the world consumes. According to Wood Mackenzie Consultants, industry is finding less than forty per cent of the new oil needed to keep the base of known reserves from shrinking.<sup>80</sup> The most obvious question, to ask therefore is how much oil is yet to be discovered? Campbell and Laherrère suggest that based on data available to them in 1998 about 1,000 billion barrels of conventional oil remain to be discovered.<sup>81</sup> Nine years prior to the Campbell and Laherrère estimate of 'proven' but unexploited oil reserves, estimated reserves of yet to be discovered oil were as low as 700 billion barrels.<sup>82</sup> In a more recent statement (2002) on oil reserves, BP concluded that there was 1047.7 billion barrels of oil were yet to be discovered, however, like Campbell and Laherrère, BP made no mention of possible polar oil fields.<sup>83</sup> There is no

---

<sup>75</sup> See Thompson, Jon, 'The Lamp,' 2003, <http://www.peakoil.net/TheLamp/TheLamp.html> (8 June 2004).

<sup>76</sup> See British Petroleum, 'Proved oil reserves at end of 2002,' 2002, <http://www.bp.com> (4 June 2004).

<sup>77</sup> See The Economist, 'Peak oil: 2020's the year, says agency,' *The Business Herald*, Auckland, December 18, 2009, p. 16.

<sup>78</sup> Sorrel *et al.*, *op. cit.*, p. 1.

<sup>79</sup> *Ibid.*, p. 165.

<sup>80</sup> See Roberts, Paul, *The End of Oil*, London, Bloombury, 2005, p. 51.

<sup>81</sup> Campbell *et al.*, *op. cit.* Non-conventional oil production occurs at enormous cost in Venezuela's Orinoco belt and Canada's Athabasca tar sands and ultra-deep waters.

<sup>82</sup> Gleick, Peter H., 'The Implications of Global Climate Change for International Security,' *Climate Change*, Vol. 15, 1989, p. 317.

<sup>83</sup> BP, 2002, *op. cit.*

significant variation between the USGS and IEA as to the quantum of oil yet to be discovered. The former suggests that the amount is 732 Gb,<sup>84</sup> while the latter's estimate is 805 billion barrels.<sup>85</sup> The non-mention of either polar region in some estimates of yet to be discovered oil is interesting given that the former British Minister for the Environment, Michael Meacher, identified the Polar Regions as the only locations left where new conventional oil fields of significant size may yet be discovered.<sup>86</sup>

Compounding the problem of yet to be discovered oil is estimating the quantum of URR. The URR is the amount of oil that can realistically be expected to be extracted from the ground.<sup>87</sup> Extraction using the pressure that is naturally present in crude oil reservoirs is rarely sufficient to release more than thirty per cent of the oil in the reservoir. Secondary recovery techniques using water flooding or gas injection to increase the pressure within the reservoir may increase extraction by a further ten per cent. More costly tertiary techniques such as the use of steam or solvents which can reduce the oil's viscosity could boost recovery to as much as sixty per cent.<sup>88</sup> The steam injection technique used at the Saudi Arabian oil field of Ghawar: an oil field that has already peaked and is now declining at the rate of eight per cent a year.<sup>89</sup> Such a poor recovery rate automatically implies that total recovery is impossible.

There appears a reasonable correlation between the statistics issued by the various sources as to the quantum of available oil, although how long these oil reserves will last depends on worldwide consumption. In 1996, worldwide oil consumption was 71.5 million barrels per day.<sup>90</sup> By the year 2000 consumption was approximately 80 million barrels per day<sup>91</sup> and is projected to rise to 110 million barrels per day by 2020.<sup>92</sup> The IEA estimates that by 2030 oil demand will reach 120 million barrels per day, of which three-quarters of the increase in

---

<sup>84</sup> Sorrel, *op. cit.*, p. 127.

<sup>85</sup> *Ibid.*, p. 131.

<sup>86</sup> Swinney, *ibid.*

<sup>87</sup> Homer-Dixon, *op. cit.*, p. 86.

<sup>88</sup> See Smil, Vaclav, *Transforming the Twentieth Century*, Oxford University Press, New York, 2006, p. 169.

<sup>89</sup> Homer-Dixon, 2006, *ibid.*, p. 92.

<sup>90</sup> See Klare, Michael T. *Resource Wars*, Metropolitan Books, New York, 2001, p. 39.

<sup>91</sup> See Victor, David G. and Nadejda M. Victor, 'Axis of Oil?' *Foreign Affairs*, Vol. 82, No. 2, 2003, p. 53.

<sup>92</sup> Klare, *op. cit.*, p. 39.

demand will come from the transport sector.<sup>93</sup> In the past oil reserves were expected to at least last until 2040.<sup>94</sup> But by the same estimates, if oil consumption rose by two per cent per year — as also predicted by the U.S. Department of Energy — then the existing reserves will be depleted between 2025 and 2030.<sup>95</sup> Even this estimate could be overly optimistic since satiation of Asia's oil thirst<sup>96</sup> could easily exhaust existing reserves prior to the earliest of the above dates. What is evident today from the projections contained in a 2009 IEA report is that by 2030 output from both conventional and non-conventional petroleum sources will leave the world deficient of 23 million barrels of oil per day<sup>97</sup> unless either consumption is curbed or production expanded. Just as with predictions about 'peak oil' the IEA's production figures for the year 2030 are being questioned, on this occasion by European academics. Their independent analysis suggests that total oil production from both conventional and non-conventional sources will by 2030 aggregate to no more than 75 million barrels per day, some 26 million barrels per day lower than the IEA predictions.<sup>98</sup> Aleklett *et al.* findings have been supported by some staff of the IEA, who themselves suggest that "...US influence and fears of stock market "panic" were encouraging the IEA to downplay the potential for future oil scarcity."<sup>99</sup>

The International Energy Agency maintains that there is a link between future increases in global gross domestic product (GDP) and increases in oil production.<sup>100</sup> On this basis, the corollary should equally hold true that any decline in future oil production would cause a similar decline in GDP, as oil could no

---

<sup>93</sup> See Birol, Fatih, 'World Energy Outlook 2009,' *International Energy Agency*, Conference paper presented in Moscow, 7-8 December 2009.

<sup>94</sup> Klare, *op. cit.*, p. 39.

<sup>95</sup> *Ibid.*

<sup>96</sup> See Calder, Kent E. 'Asia's Empty Tank', *Foreign Affairs*, Vol. 75, No. 2, 1996, p. 58.

By 1996 China was importing 600,000 barrels of oil per day. By 2000 this figure had grown to one million barrels per day and is expected to reach three million by 2010. By 2015 China is expected to import more than seven million barrels per day which is close to the total current production of the Saudi oil field which has reached 8.8 million barrels per day (June 2004). Also since 1994 China's oil usage has risen by 109%, South Korea's by 78% and India's by 68%. (Swinney, *op. cit.*, p.39.)

<sup>97</sup> Birol, *op. cit.*

<sup>98</sup> See Aleklett, Kjell, Mikael Höök, Kristofer Jakobsson, Michael Lardelli, Simon Snowden and Bengt Söderbergh, 'The Peak of the Oil Age,' *Energy Policy*, Vol. 38, No. 3, March 2010, p. 1398.

<sup>99</sup> See Macalister, Terry, 'Oil: Future World Shortages are being Drastically Underplayed,' *The Guardian*, November 12, 2009, <http://www.globalpolicy.org/> (8 February 2010).

<sup>100</sup> See Birol, Fatih, 'Oil Market Outlook and Policy Implications,' Testimony presented to United States Senate Committee on Energy and Natural Resources on behalf of the International Energy Agency, 10 January 2007, p. 17. <http://www.iea.org/> (8 February 2010).

longer help drive future growth. A similar conclusion was reached by Robert Hirsch who concluded that in future world oil supplies and global GDP will decline in unison, i.e. a one per cent decrease in world oil supply could conceivably produce a one per cent decline in global GDP.<sup>101</sup> Inevitably, this situation will lead to higher global oil prices which will impact most severely on poor Third World Countries, curtailing development prospects with consequences ranging from state failure to large-scale migration.<sup>102</sup>

The United States has responded in a consistent fashion to all systemic challenges to stability of oil-producing regions which might adversely impact its economy: the employment of armed forces to guarantee the unhindered flow of petroleum. This approach was first adopted during the Truman and Eisenhower presidencies post-World War Two, when Soviet adventurism in Iran and pan-Arab upheavals in the Middle East appeared to threaten the security of Persian Gulf oil supplies. It found formal expression during the Carter administration, when, in response to the Soviet occupation of Afghanistan and the Islamic revolution in Iran, President Carter announced that the safety of Persian Gulf oil was in “the vital interest of the United States of America,” and that in protecting this interest America would use “any means necessary, including military force.”<sup>103</sup> The Carter doctrine of using force to protect the flow of oil was later cited by President George Bush senior to justify American intervention in the Gulf War of 1990-91, and it provided the underpinning strategic rationale for the 2003 American invasion of Iraq.<sup>104</sup> Not surprisingly, given the United States ever-growing requirement for imported petroleum, officials have begun to extend the Carter doctrine to other major oil producing regions, including the Caspian Sea basin, Africa and Latin America.<sup>105</sup> Hence the securitisation of oil holds the potential to unsettle many strategic relationships any one of which could result in another, but not the last, oil war.

---

<sup>101</sup> See Hirsch, Robert L., ‘Mitigation of maximum world oil production: Shortage scenarios,’ *Energy Policy*, Vol. 36, No. 2, February 2008, p. 888.

<sup>102</sup> See Burrows, Mathew and Gregory F. Treverton, ‘A Strategic View of Energy Futures,’ *Survival*, Vol. 49, No. 3, Autumn 2007, p. 83.

<sup>103</sup> See Klare, Michael T., ‘Oil Wars Transforming the American Military into a Global Oil-Protection Service,’ *Tomgram*, October 7, 2004, <http://www.tomdispatch.com/blog/1888/> (1 February 2010).

<sup>104</sup> *Ibid.*

<sup>105</sup> *Ibid.*

Numerous wars in the twentieth century were fought over oil. For example, the Chaco War of 1932-35, when Paraguay annexed a region of Bolivia in the mistaken belief that it contained oil deposits.<sup>106</sup> In Asia-Pacific during the 1930s a revisionist Japan was violently expanding its Asian empire much to the consternation of the United States. Ultimately curtailment of oil supplies to Japan by the United States in particular, placed Japan at a strategic disadvantage, for Japan needed an unimpeded source of oil in order to prosecute its war with China. As the prospects for a peaceful resolution to this oil crisis diminished Japan's leadership decided to go to war with the United States.<sup>107</sup> The outcome of this decision was the Pacific War (1941-1945) resulting in the defeat and occupation of Japan. In one of the bloodiest conflicts of the Cold War era the Nigerian government eventually defeated *Ibo* separatist for control over an oil rich region of Biafra in the Niger Delta.<sup>108</sup> Although four decades have elapsed since the end of this war, ethnic conflicts fueled by oil continue to dog the Niger Delta reigniting the specter of yet more irredentist wars.<sup>109</sup> In August 1990, Iraq invaded Kuwait in response to the alleged theft of Iraqi oil by the Kuwaitis. Iraq's invasion was greeted with worldwide condemnation and resulted in a United Nation sanctioned, United States lead War of Liberation; a war that lasted a mere three days.<sup>110</sup> In this century, opponents of the first significant interstate war, the 2003 invasion of Iraq by the United States and its coalition partners, argue that the real aim of the war was to enable the US to take control of Iraq's oil reserves (the second largest of any country after Saudi Arabia).<sup>111</sup>

### **Natural Gas Liquids**

The IEA expects the global output of natural gas liquids (NGL) – light hydrocarbons that exist in liquid form underground and are produced with natural gas and recovered in separation facilities or processing plants – to almost double, from 10.5 million barrels per day in 2007 to slightly less than 20 million barrels per day by 2030. This increase will be driven by a steady rise in natural gas output.

---

<sup>106</sup> Westing, *op. cit.*, p. 12.

<sup>107</sup> See Barber, Laurie and Ken Henshall, *The Last War of Empires: Japan and the Pacific War*, David Bateman, Auckland, 1999, pp. 86-87.

<sup>108</sup> See Stern, Andy, *Who won the Oil Wars*, Collins & Brown, London, 2005, pp.124-129.

<sup>109</sup> See Robinson, Simon, 'Nigeria's deadly Days', *Time*, May 22, 2006, pp. 38-43.

<sup>110</sup> Stern, *ibid.*, p. 150.

<sup>111</sup> Stern, *ibid.*, p. 168.

The majority of the increase will come from Organization of Petroleum Exporting (OPEC) countries, where natural gas production has the ability to expand the quickest.<sup>112</sup> Proven natural gas reserves (2004) stand at 180 trillion cubic metres which is sufficient to meet global demand at current (2004) consumption rates for sixty-six years.<sup>113</sup> No less than forty per cent of the global natural gas reserves are situated in the greater Middle East<sup>114</sup> where continued access by Western countries could become problematic. In the Central Asian republics where Russia is unable to prevent China from securing energy resources, it is using all of its political influence to deny the United States access to the region economic and military purposes.<sup>115</sup>

It should be acknowledged that the geopolitical implications of gas differ from oil. Although the nature of the gas industry is changing, the majority of natural gas is still sold on long-term contracts with prices indexed to oil: most liquefied natural gas (LNG) is sold on this basis, making LNG tankers nothing more than ‘floating pipelines.’ Thus, the key issues to be address at international forums revolve around location of and ownership of pipelines. In geopolitics of gas pipelines Russia remains central, placing Eurasia generally, but Europe especially at a distinct disadvantage.<sup>116</sup> Like other regions that have recently become heavily dependent on Russian natural gas, Europe, conscious of the regional geo-economic control energy provides Russia but, unable to find alternate gas supplies, has largely chosen to acquiesce to Russia’s dominance in the energy field and to encourage their national firms to eke out what profits they can make from cooperation with the Russians.<sup>117</sup> Just such an alliance has of January 2011 been agreed between Russian and British oil majors for the exploration of oil prospects in the Arctic region’s southern Kara Sea.<sup>118</sup> Despite this agreement Russia shows no inclination to relinquish its energy dominance since its resource abundance is

---

<sup>112</sup> Cited in Aleklett *et al.*, *op. cit.*, p. 23.

<sup>113</sup> See Kobasyashi, Kenji, ‘Forecasting Supply and Demand up to 2030,’ *International Energy Agency*, 2004, p. 17, <http://www.iea.org/> (17 February 2010).

<sup>114</sup> *Ibid.*

<sup>115</sup> See Kotkin, Stephen, ‘The Unbalanced Triangle,’ *Foreign Affairs*, Vol. 88, No. 5, September/October 2009, p. 132.

<sup>116</sup> Burrows *et al.*, *op. cit.*, p. 81.

<sup>117</sup> See Klare, Michael T., *Rising Powers, Shrinking Planet: The New Geopolitics of Energy*, Holt, New York, 2008, p. 111.

<sup>118</sup> See Nilsen, Thomas, ‘Rosneft and BP form strategic alliance for Kara Sea,’ *BarentsObserver.com*, 15 January 2011, <http://barentsobserver.com/rosneft-and-bp-form-strategic-alliance-for-kara-sea.4872391.html> (26 January 2011).

seen as a means of restoring its major world status, thereby commanding the respect of all other major powers. As demand for lower-carbon fossil fuels intensifies in a climate change conscious world geopolitical gamesmanship centered on natural gas supplies are likely to intensify. Russia's leverage is likely to grow until a global natural gas market develops and gas becomes fungible as oil.<sup>119</sup>

Over the next two decades demand natural gas is expected to rise from 3,000 billion cubic metres in 2010 to slightly less than 5,000 billion cubic metres by 2030 with the greatest increase in demand arising from Organization of Economic Cooperation and Development (OECD) Countries.<sup>120</sup> If access to natural gas supplies from the greater Middle East and Russia become uncertain then the developed world might be forced to consider less conventional sources of supply such as the Polar Regions. If an illustration is needed of the importance the Arctic has now assumed in the geopolitical lexicon of energy security there is no need to look beyond the planting of a Russian flag on the seabed at the North Pole in 2007.<sup>121</sup> Although no similar impudent acts have occurred in Antarctica such action cannot be entirely dismissed for according to William Westermeyer there are six seaborne locations that are potentially natural gas reservoirs of some significance.<sup>122</sup> However, if Klare is correct and conflict over hydrocarbons in the years ahead is all but a foregone conclusion,<sup>123</sup> then exploiting polar hydrocarbon reservoirs might serve humanity well by delaying the enactment of Klare's prognosis, although conversely it might precipitate it.

### **Alternative energy sources**

Alternative energy sources in 2001 were estimated at thirteen per cent of total primary energy supply globally, taking into account both commercial and non-commercial energy sources. Of this share, eighty per cent was supplied by biomass and waste and twenty per cent by hydro-power and other renewable energy sources. In the developed world most of renewable energy sources are

---

<sup>119</sup> Burrows *et al.*, *op. cit.*, p. 82.

<sup>120</sup> Kobayashi, *op. cit.*, p. 18.

<sup>121</sup> Klare, *op. cit.*, p. 113.

<sup>122</sup> See Westermeyer, William E., *The Politics of Mineral Resources Development in Antarctica*, Westview Press, Boulder, 1984, p. 38.

<sup>123</sup> See Klare, Michael T., *Resource Wars: The New Landscape of Global Conflict*, Metropolitan Books, New York, 2001, p. 29.



used to generate electricity, while in the remainder of the world renewable energy sources are used directly in the residential, commercial and services sector. Increasing the share of biomass production in total primary energy by source (TPES) from eleven per cent in 2000 to approximately sixteen per cent by 2050, as envisaged by some energy-supply scenarios, would require at least a three-fold increase in production, which is almost twice as high as that experience in the past ten years. Biomass plantings on this scale would require devoting increasing amount of land to this use, potentially leading to stronger competition with food production. Moreover, marginal land may not be suitable for such crop systems – particularly a problem in dry regions.<sup>124</sup>

Globally, an increase in biomass production of that magnitude at affordable costs requires significant progress in agricultural and soil improvement techniques; this would require a paradigmatic shift equivalent to "Green Revolution" that food production experienced during the twentieth century. It might necessitate the application of bioengineering techniques to improve plant yields. In addition, despite its futuristic connotations, biomass production in the oceans may have to be considered;<sup>125</sup> as does the commercialisation of synthetic fuel drawn from the brackish ponds of 'algal farms.'<sup>126</sup> However, a substantial reduction in costs and improvements in the energy transformation efficiency would be called for if biomass of any type were to replace oil and gas in the production of liquid and gaseous fuels.<sup>127</sup> This would make it implausible to expect that the world by 2035 will have entirely foregone fossil fuels for an alternative; hence hydrocarbon wars remain possible if not probable.

### **The food-water nexus**

Since the close of the Second World War, global agricultural output has increased at a rate never seen before in human history. Much of this productivity increase is attributable to the development of high-yielding crop varieties, intensive use of inorganic fertilizers and pesticides, irrigation expansion and capital-intensive farming practices. In the 1970s the euphoria surrounding this 'green revolution'

---

<sup>124</sup> See Viridia, Maria Rosa, *Energy to 2050: Scenarios for a Sustainable Future*, International Energy Agency, 2003, p. 139.

<sup>125</sup> *Ibid.*, p. 140.

<sup>126</sup> See 'Military drive puts fuel from algae within reach,' *New Zealand Herald*, Auckland, February 15, 2010, p. A7.

<sup>127</sup> Viridia, *op. cit.*, p. 140.

was questioned in the wake of the energy crisis and a growing awareness of long-term environmental consequences brought on by advanced farming management practices. Intensive agricultural practices were found to cause soil erosion, groundwater contamination, soil compaction and a decline in natural soil fertility. Since then agricultural research has expanded its scope to include sustainable and resource-efficient cropping system and production techniques.<sup>128</sup>

Since the early 1980s yet another threat to agriculture has emerged to garner global attention. Although there is still much debate over its cause many climatologists remain convinced that significant climate change will afflict itself on humanity over the coming century due to increasing atmospheric carbon dioxide and other trace gases. As a consequence major changes in hydrological regimes have been forecast. The severity and geographical distribution of such climate-induced changes may affect humanity's ability to expand food production to a level necessary to feed a world population approaching ten billion by mid-century.<sup>129</sup> Demand for water for agriculture could increase by thirty per cent by 2030 and could double by mid-century.<sup>130</sup> Although extending one's vision four decades into the future maybe rash, John Beddington, Great Britain's chief scientist, population pressures will within as little as two decades result in a "perfect storm" created by energy, food and water shortages.<sup>131</sup>

According to Westing, in order to produce staple food crops a country must satisfy a number of critical conditions, among them: (a) sufficient arable land and an appropriate climate; (b) receive sufficient rainfall or have access to other sources of fresh water (irrigation); (c) have access to fertilizers; and (d) produce or import enough oil and other fuels.<sup>132</sup> Depending upon the extent to which these and other prerequisites (vermin-proof storage) are not satisfied, the food deficit must be met by imports or international aid. However, both imports and aid may serve only to perpetuate the vicious cycle that created the original food deficit.

Cereals are the staple food crop across the world, in particular in Third World countries. In 2005, about 2.2 thousand million tonnes of grain—maize, wheat, rice,

---

<sup>128</sup> See Fischer, G., K. Froberg, M.L. Parry and C. Rosenzweig, 'Climate change and world food supply, demand and trade,' *Global Environmental Change*, Vol. 4, No. 1, 1994, p. 7.

<sup>129</sup> *Ibid.*

<sup>130</sup> Foresight, *op. cit.*, p. 58.

<sup>131</sup> See Barnett, Sarah, 'Morsel combat,' *New Zealand Listener*, Vol. 222, No. 3639, February 6-12, 2010, p. 17.

<sup>132</sup> Westing, *ibid.*, p.13.

barley, millet, oats—was produced globally.<sup>133</sup> This was sufficient to feed the world's population for it equates to approximately a third of a tonne per person. In addition to cereals a further 2.1 million tonnes of soybeans was also produced.<sup>134</sup> However, statistics hide the fact that production of staple foods occurs unevenly across the world, a situation that can only worsen as deserts encroach onto available arable land, chiefly in Africa and Asia. This natural occurring phenomenon has been aggravated by detrimental and unsustainable agricultural practices caused by the economic necessity to export primary produce into the global market economy.<sup>135</sup>

It is difficult to overstate the current importance of irrigation to cereal production for globally two-thirds of the world cereal crops are grown on irrigated land. Global groundwater extraction for irrigation purposes may exceed 600 to 800 km<sup>3</sup> per year.<sup>136</sup> In particular, developing countries rely heavily on irrigated land, because crop yields from such land are twice as heavy as harvests from solely rain-fed lands – 3.3 tons per hectare compared with 1.5 tons per hectare.<sup>137</sup>

The bulk of world's cereal production is committed to providing animal feed, indeed about two thirds of all maize and other coarse grains are dedicated to this purpose.<sup>138</sup> The consumption of animal protein is steadily rising in tandem with a rise in financial incomes, a point well illustrated by the climb in world beef production from 20 million tons in 1950 to nearly 60 million tons in 2003.<sup>139</sup> However, the change to a global society that prefers to feast on animal protein is of itself wasteful of water. Each kilogram of grain-fed beef consumes 15,500 litres of water compared to 3,900 litres per kilogram of chicken, 3,400 litres per kilogram of rice, 900 litres per kilogram of maize or 180 litres for a thousand grams of

---

<sup>133</sup> See United Nations Food and Agriculture Organisation, 'Faostat,' 24 April 2006, <http://faostat.fao.org/faostat/> (15 June 2006).

<sup>134</sup> *Ibid.*

<sup>135</sup> See Elmekki, Abdel-Galil, 'Food Crises: Their Roots in a Country's Political and development Crises', in Mohamed Suliman (ed.), *Ecology, Politics & Violent Conflict*, Zed Books, London, 1999, pp. 228-256.

<sup>136</sup> See Moench, Marcus, 'Groundwater: The Challenge of Monitoring and Management,' in Gleick, Peter H., *The World's Water 2004-2005*, Island Press, Washington, D.C., 2004, p. 88.

<sup>137</sup> See Cai, Ximing and Mark W. Rosegrant, 'Water Availability and the Future of Irrigated and Rainfed Cereal Production,' in Keith Wiebe (ed.), *Land Quality, Agricultural Productivity, and Food Security*, Edward Elgar, Cheltenham, 2003, p. 384.

<sup>138</sup> See Evans, L. T., *Feeding the Ten Billion: Plants and population growth*, Cambridge University Press, Cambridge, 1998, p. 189.

<sup>139</sup> See Brown, Lester R., *Outgrowing the Earth*, W. W. Norton, New York, 2004, p. 49.

tomatoes.<sup>140</sup> Each glass of milk (250 ml.) consumes 250 litres water in its production prior to being purchased by a retail customer.<sup>141</sup> Such is the looming shortage of water resulting from food production, communities and commodities are being critiqued against their “water footprint”<sup>142</sup> in a manner similar to that used to determine their overall ecological footprint.

As stated earlier in this chapter world population is expected to reach 9.2 billion by 2050. If, over this period, economic development proceeds as expected in low-income countries then the global demand for food will increase threefold.<sup>143</sup> Specialists at the International Food Policy Research Institute (IFPRI) estimate that by 2020 the world demand for cereals will equal 2497 million metric tonnes and of this total the developing world will consume 1675 million metric tonnes, which is approximately threefold increase on 1974. A similar pattern is predicted for meat consumption, whereby in 2020 worldwide demand will equal 327 million metric tonnes of which the developing countries will consume 213 million metric tonnes or nearly twice the consumption of developed countries. Of the global consumption of meat consumed in 2020 forty per cent will be chicken and twenty-four per cent beef.<sup>144</sup> Meeting such a demand is seen as a Herculean task. Based on current trends, by 2025, Africa will be able to feed only around forty per cent of its population, expected to be about one billion souls. The prospect for South Asia is similar. While, in the developed world, demand for meat and milk will likely plateau, or even decline, in the developing world, income growth and urbanisation will fuel a strong increase in their demand.<sup>145</sup> If humanity fails to implement a strategic transformation to both

---

<sup>140</sup> See Hoekstra, Arjan Y., ‘The water footprint of food,’ in Jonas Förrare (ed.), *Water for food*, The Swedish Research Council, Stockholm, 2008, p. 54.

<sup>141</sup> *Ibid.*

<sup>142</sup> The “water footprint” is an indicator of water use that takes into account both the direct and indirect water use of a consumer. The water footprint of an individual, community or business is defined as the total volume of freshwater that is consumed in the production of goods and services utilized by individuals, communities or businesses. There is yet another concept that explains the new role for water in food production –a concept known as “virtual water.” Virtual water occurs when food containing water is imported, particularly by countries that have diminishing water supplies. Water then becomes a tool to release the pressure on available domestic water resources and a viable alternative water source. *Ibid.*, p. 51.

<sup>143</sup> See Sapp, Amy, *Production and Consumption of Meat: Implications for the Global Environment and Human Health*, Harvard Medical School, 2001, p. 9.

<sup>144</sup> See Roseguant, Mark W., Michael S. Paisner, Siet Meijer and Julie Witcover, ‘2020 Global Food Outlook: Trends, Alternatives and Choices,’ *International Food Policy Research Institute*, Washington, D.C., August 2001.

<sup>145</sup> Sapp, *op. cit.*, p. 9.

production and consumption patterns, then by 2050 it is unlikely that all world's people can be fed sustainably and equitably.<sup>146</sup> Failure to change existing patterns will likely result in societal conflict and civil unrest.<sup>147</sup>

If the population and food consumption forecasts for 2020 and beyond are correct there will a dramatic impact on both global and regional “water footprints.” Should consumption patterns by 2050 not have changed radically from those of today then their impact on the global water footprint is likely to be nothing short of catastrophic, even without the exacerbating effects of climate change. In the future it will be water rather than food that turns the thoughts of states towards war.

In the past countries that have turned to war to alleviate perceived scarcity of land, fresh water, or oil have only resort to destruction of croplands and food supplies as means of subduing their opponent and the community that supports them.<sup>148</sup> Food can also be a potent weapon of war, especially when, as in Sudan, it is gifted directly to one protagonist (the rebels) in their fight against government forces.<sup>149</sup> However, future tightening of the relationship between water and food suggests that it will no longer be apposite for any state to merely concentrate their endeavours on gaining sovereignty over land capable of providing food, what will be even more important is securing ‘ownership’ to water sources capable of supporting food production from the ‘acquired’ land. In the future productive land and an attendant water source shall not necessarily share the same geographical location. This radical change in emphasis holds dire implications for Antarctica in particularly, given that the continent remains the largest repository of fresh water on Earth. Paradoxically, it will be restricted access to resources, especially food and water, which will ultimately curtail all human activities at a time when the majority humanity is enjoying or is on the cusp of enjoying an unprecedented standard of living.

---

<sup>146</sup> Foresight, *op. cit.*, p. 40.

<sup>147</sup> *Ibid.*, p. 70.

<sup>148</sup> See Westing Arthur H., ‘Crop destruction as a means of war’, *The Bulletin of the Atomic Scientists*, Vol. 37, No. 2, 1981, pp. 38-42.

<sup>149</sup> See Perlez, Jane, ‘U.S. weighs using food as support for Sudan rebels,’ *New York Times*, November 29, 1999, <http://members.tripod.com/plarforum/food.htm> (19 June 2006).

### **Expanding middle class**

Previous periods of extensive middle class expansion like those that occurred in the late ninetieth century in both Europe and the United States are now considered as periods of enormous economic progress, but also of political, social and environmental change. Despite its frequent use, the term ‘middle class’ has no generally accepted definition. Goldman Sachs have, in an arbitrary manner, defined the global ‘middle class’ as those with a 2007 equivalent income per person of US\$6,000-US\$30,000 per year in purchasing power parity terms.<sup>150</sup> With this definition global income distribution gets narrower, not wider.

Over the next two decades the expansion of the middle class will accelerate and its impact will be felt in two possible ways. The first is a shift in spending power, which will move towards rising Eastern middle-income economies and away from Western rich countries to a point where the Eastern economies could come to dominate global spending once the largest population countries enter the middle-income group. By 2050 this middle-income group will include Egypt, Indonesia, Iran, Philippines, Mexico and Vietnam, plus three of the four BRIC states Brazil, China and India. It is also forecast that this grouping of countries will be responsible for close to sixty percent of global gross domestic product.<sup>151</sup> Also by 2050 the economic expansion expected of South Africa and Thailand may place them within this grouping.<sup>152</sup> The second significant impact forecast to occur is a shift in spending power towards middle-income people, which will result in an explosion of the global middle-class on a scale never previously seen. As at the year 2008, the global middle class was estimated at 1.5 billion, or marginally above one billion if both China and India were excluded from the global total.<sup>153</sup> Over the last decade humanity has seen an unprecedented expansion of this group. However, the pace of this expansion over the next two decades is predicted to accelerate resulting in a further two billion people joining the global middle-class. At around thirty per cent of the world’s population this

---

<sup>150</sup> See Wilson, Dominic and Raluca Dragusanu, ‘The Expanding Middle: The Exploding World Middle Class and Falling Global Inequity,’ *Goldman Sachs*, Global Economic Paper No 170, July 7, 2008, p. 8.

<sup>151</sup> *Ibid.*, p. 3.

<sup>152</sup> *Ibid.*, p. 8.

<sup>153</sup> *Ibid.*, p. 6.

explosion will dwarf even the 19<sup>th</sup>-century middle-class surge in its global scale.<sup>154</sup>

The significance of this middle-class ‘bulge’ on resource consumption is best demonstrated through a scenario posed by David Douglas of Sun Microsystems. Douglas poses the question “What if once the next billion [middle class] people are all here, we gave each of them just one small gift – a sixty-watt incandescent light bulb?” This would equate to 60,000 megawatts. But in all likelihood this billion people will use their bulbs for just four hours per day, so at any one time the requirement to be met is only 15,000 megawatt. Thus, globally, thirty new 500 megawatt coal or gas-burning generation plants would be required.<sup>155</sup> If the middle-class expands by a further one or two billion people then the problem of resource consumption in the energy sector, where resource availability is anything but unlimited, will be greatly exaggerated.

While access to electric lighting by the rising middle-class will not be limited by the lack of coal for global reserves are estimated at one trillion tonnes, enough to last 200 years at present consumption rates.<sup>156</sup> However, the same is not true for the metal tungsten which forms the lighting element within an incandescent light bulb, for at present rate of consumption tungsten ore reserves could be depleted within fifty years.<sup>157</sup> Although substitute materials are capable of replacing tungsten in many applications, tungsten, along with many other minerals will face demand pressures exerted by the new expanding middle-class and this sort of change is likely to generate tensions within and between countries.

### **Signs of a problematic future**

Between 2010 and 2030 the demand for natural gas will grow the fastest in absolute terms while demand for non-hydro alternative energy source will grow fastest in percentage terms, but oil will remain the dominant fuel. Over the same time period dependence on oil imports will be approaching, if not exceeding, ninety per cent in many regions of the world including Europe, China, India and

---

<sup>154</sup> *Ibid.*, p. 5.

<sup>155</sup> This example was cited by Friedman, *op. cit.*, p. 68.

<sup>156</sup> See Coal Industry Advisory Board, ‘World Coal Demand and Supply Prospects,’ *International Energy Agency*, 10 December 2003, p. 3.

<sup>157</sup> Depletion period calculated from data contained in the United States Geological Survey, ‘Tungsten,’ *Mineral Commodity Summaries*, January 2010, p. 177.

the Pacific.<sup>158</sup> Over a slightly longer review period (2000 to 2030) coal demand will have increased by some 900 million tonnes of oil equivalents (Mtoe) to reach 3,629 Mtoe with seventy-four per cent being committed to electricity generation. Nearly sixty per cent of all coal consumed in 2030 will arise from the developing world.<sup>159</sup> This rise appears to be the result of annual incremental increases rather than an anticipated demand caused by an exploding middle-class.

There is no disguising the fact that energy related greenhouse gas emissions will continue to rise up to and beyond 2030. Global carbon dioxide emissions attributable to energy generation are expected to increase by 1.8 per cent per year to thirty-eight billion tonnes in 2030 – seventy per cent above the 2000 level. Beyond 2025, the developing world rather than OECD countries will be the greatest emitters of energy related greenhouse gases.<sup>160</sup>

J.R. McNeil in a critique of Jared Diamond's book, *Collapse: How Societies Choose to Fail or Succeed*, made a poignant observation when he asserted that even if humanity can agree that by 2050 it will have restricted world population to nine billion and have globalize a new energy regime, it is the next 40 to 50 years that are likely to be the most dangerous.<sup>161</sup> Given current population and energy use projections McNeil has cause to worry. As the global middle-class continues to grow the economic convergence between wealthy and poor states narrows; a narrowing the West too readily assumes will only come about as the incomes in the developing world lift – otherwise it will not occur at all. But there exists a third scenario: that income in the West declines, an outcome that appears to be

---

<sup>158</sup> See Birol, Fatih, 'World Oil Outlook to 2030,' *International Energy Agency*, 1 February 2010, <http://www.iea.org/speech/2001-2002/birol.pfd> (24 February 2010).

<sup>159</sup> Coal Industry advisory Board, *op. cit.*, p. 2. While there is no denying the demand for coal is rising rapidly some analysts consider that there exists within the industry an over confidence that production can meet demand. The Energy Watch Group (EWG), in undertaking an investigation into coal reserves found that the quality of available data was poor, both on global and national levels. Vietnam, for instance had not updated it proven reserves for forty years, while the data for China was last updated in 1992. By using data for proven and recoverable reserves rather than for resource availability, which is highly speculative in character, EWG has concluded that global coal production will peak around 2025 at thirty per cent above present production it will then plateau and thereafter decline. Unlike the IEA which expects both demand and production to increase beyond 2025, but based on their analysis the EWG considers growth in production as unrealistic. See Zittel, Werner and Jörg Schindler, 'Coal: Resources and Future Production,' *Energy Watch Group*, EWG-Paper No. 1/07, 10 July 2007, pp. 4-7.

<sup>160</sup> Birol, *World Oil Outlook to 2030*.

<sup>161</sup> See McNeil, J.R., 'Diamond in the Rough: Is there a Genuine Environmental Threat to Security?' *International Security*, Vol. 30, No. 1, Summer 2005, p. 195.



beyond the imagination of many Westerners, most of whom have caught America's affluenza.<sup>162</sup>

With the average American consuming thirty-two times as many resources as the average Kenyan and ten times as many as the average Chinese, it is difficult to see how the 5.5 billion people who reside in the developing world could match the standard of living experienced by the 1.1 billion people of the developed world. For peaceful global economic equilibrium to exist the developing world must be permitted a 'rightful' rise in their standard of living while the developed world accepts the inevitable decline in theirs.<sup>163</sup> In each "Americum" living standards depend on unfettered access to natural resources, in particular increasing supplies of fossil fuels. Should access to these be curtailed or worse still denied, who can predict what any country's reaction will be?

According to Klare an adverse reaction could precipitate any one of the three types of conflict. First are the resource wars driven by scarcity of vital industrial materials, such as oil and minerals. The second are those resource wars that will occur as rainfall patterns shift to the detriment of food-growing regions; and the third, a possible consequence of the second, is the "migratory war," where people are forced to move from uninhabitable regions. Of the third type, people don't discuss its origins in terms of climate change, but rather in terms of economic deprivation. Despite which term is preferred it is likely to cause conflict.<sup>164</sup>

A sense that disputes over resources may not be resolved peaceably has some of the world's militaries rethinking their doctrines and force structures, the most striking example of which is the creation by the United States Armed Forces of a unified military command for Africa (AFRICOM). While the United States military along with some military analysts argue that Africa's growing strategic importance necessitated the establishment of a dedicated regional command, other

---

<sup>162</sup> Friedman, *op. cit.*, p. 88. "Americum," is a collective term covering economic advantage conveyed by American affluenza, one coined by Tom Burke of Third Generation Environmentalism, a non-profit green consultancy. Where at present Burke identifies two Americums – North America and Europe, by 2030 "Americums" will exist in China and India and collectively in a region comprising Singapore, Malaysia, Vietnam, Thailand, Indonesia, Hong Kong, Korea and Japan. Russia and Central Europe represent a nascent Americum as does South America and the Middle East. Burke maintains that "...by 2030 we will have gone from a world of two Americums to a world of eight or nine." Each a carbon copy of America.

<sup>163</sup> See Morgan, Gareth, 'What to watch out for in 2010,' *New Zealand Listener*, Vol. 222, No. 3638, January 30-February 5, 2010, p. 21.

<sup>164</sup> See Moss, Trefor, 'Climate of war,' *Janes Defence Weekly*, Vol. 46, No. 16, 22 April 2009, p. 25.

experts suggest the command's creation was motivated by more specific concerns: China and oil.<sup>165</sup> This latter opinion appears to be endorsed by the United States Department of Defense through a statement that "Securing adequate supplies of resources and materials has become a major driver of Chinese foreign policy. Beijing has pursued stronger relations with Angola...Sudan...and Zimbabwe to secure long-term resource supply agreement."<sup>166</sup> Since publication of this report in 2006, China pursued long-term oil supply contracts with other African countries including Chad, Egypt and Nigeria.<sup>167</sup> China's Nigerian flirtation will be of particular concern to the United States since even as far back as 2003 it was importing 900,000 barrels per day of sweet Nigerian crude. The United States Department of Energy expects that oil imports from Africa will top 770 million barrels per year by 2020.<sup>168</sup>

China's growing economic presence and influence in Africa is not the only reality Europe and the United States have to face, for India like China also wants access to Africa's natural resources. India already imports eleven per cent of its oil from Nigeria and is seeking to secure access to supplies from Angola against stiff political opposition from the Chinese. However, the Indians and Chinese can cooperate in Africa's energy development as demonstrated controversial tie-up in the Greater Nile Oil Project in the Sudan, which enabled the Sudanese government to ignore Western attempts to mediate in the conflict in Darfur. In order to secure the resources it needs, India appears willing to follow the Chinese rather than the Western model. Like China, India displays few scruples when it comes to trading with corrupt authoritarian regimes.<sup>169</sup>

Displaying a lack of scruples when access to natural resources is at stake is not just the prerogative of either the Chinese or Indians. Nuclear power industry is also stricken with the problem of future fuel supply. Global uranium supplies are currently considered adequate to meet civilian reactor needs, largely because of

---

<sup>165</sup> See Hanson, Stephanie, 'U.S. Africa Command (AFRICOM),' *Council on Foreign Relations*, May 3, 2007, <http://www.cfr.org/publications/13255/> (24 February 2010).

<sup>166</sup> See Office of the Secretary of Defense, *Military Power of the People's Republic of China 2006*, United States Department of Defense, Washington, D.C., 2006, p. 1.

<sup>167</sup> See Office of the Secretary of Defense, *Military Power of the People's Republic of China 2009*, United States Department of Defense, Washington, D.C., 2009, p. 4.

<sup>168</sup> See Schultz, Barry and Paul Michael Wihbey, 'African Oil: A Priority for U.S. National Security and African Development,' *African Oil Policy Initiative Group*, Washington, D.C., 2003, p. 4.

<sup>169</sup> See Worcester, Maxim, 'China and India: The new African Colonial Masters?' *Institut für Strategie- Politik- Sicherheits- und Wirtschaftsberatung*, Berlin, 7 July 2008, p. 6.

the uranium stockpiles left over from the Cold War era weapons industry. Once this stockpile is expended uranium supplies will become increasingly scarce and prohibitively expensive: if demand grows as is predicted then virgin uranium reserves could be exhausted in less than sixty years.<sup>170</sup> It has therefore become imperative for those countries that rely currently on nuclear power, or those countries that foresee their future tied to nuclear power to secure access to the diminishing sources of uranium as the highly prolific mines have become exhausted, and only the less productive mines remain in operation today.<sup>171</sup>

Wittingly or unwittingly, Western states – Canada, France, Japan and the United States – have displayed a hypocritical disregard for their professed values by permitted national organisations to invest billions of dollars in authoritarian Kazakhstan, the location of one of a few remaining underexploited large uranium deposits.<sup>172</sup> Their involvement comes despite allegation by human-rights groups that the government of Kazakhstan persists with arbitrary arrests, detention and even torture.<sup>173</sup> Clearly, where a countries prosperity is derived from the exploitation or consumption of natural resources, Western ideals, environmental protection and human rights can sink beneath a tide of self-interest and likely to be replaced by a new set of values.<sup>174</sup> Natural resources are often consider a “curse” inflicted upon any country that has them in abundance, especially if governance from the centre is corrupt, weak or diffused among competing actors.

---

<sup>170</sup> Cohen, *op. cit.*, p. 38. Since 1945, 2.3 million tonnes of uranium ore has been produced exhausting the reserves of eleven countries, principally in Africa and Europe. The remaining resources with commercial potential are situated in Australia, Canada and Kazakhstan; however only Canada has “high-grade” ore deposits with 1% uranium content. The majority of Australian reserves have a uranium content of less than 0.06%, while those reserves found in Kazakhstan are far below 0.1 per cent. Mining for uranium where the ore concentrate is below 0.01-0.02% is marginal, since the energy required over the whole fuel cycle to obtain a kilogram of uranium ore can make extraction uneconomic except under special circumstances. The projected life of those reserves that are economic, especially those with an extraction cost less than \$40.00 per kilogram will be exhausted within the next thirty years at current demand levels. Likewise, possible resources – which contain all estimated discovered resources with extraction costs of up to \$130.00, will be exhausted within sixty-five years. See Zittel, Werner and Jörg Schindler, ‘Uranium Resources and Nuclear Energy,’ *Energy Watch Group*, EWG-Paper No 1/06, December 2006, pp. 4-13.

<sup>171</sup> Klare, *Rising Powers, Shrinking Planet*, *op. cit.*, p. 53.

<sup>172</sup> See Pan, Peter P., ‘Battle is underway for access to Kazakhstan’s uranium deposits,’ *Washington Post*, February 24, 2010,

<http://www.washingtonpost.com/wp-dyn/content/article/2010/02/24/AR2010022403242.html> (25 February 2010).

<sup>173</sup> See Kurlantzick, Joshua, ‘The Downfall of Human Rights,’ *Newsweek*, March 1, 2010, p. 30.

<sup>174</sup> See Foroohar, Rana, ‘The Coming Energy Wars,’ *Newsweek*, June 9, 2008, p. 18.

Both the Arctic and Antarctica could be “cursed” in the same manner given their geological location belies a treasure-house of natural resources and they still remain devoid of a universally recognized governance structure. Thus, both Polar Regions in the future will be susceptible to the imposition of a new governing regime especially one formulated by a disparate collection of resource-deprived states who have no wish to uphold existing international institutions, for their sole concern is to effect an alleviation of their own resource insecurity through the exploitation of these twin global commons.

## Chapter Ten

### Scenario Driver - Climate Change

#### Climate confusion

Mount Kilimanjaro is an iconic symbol to the people of Tanzania, for its snow-covered peak provides a dramatic contrast to the dry equatorial savannah. Kilimanjaro is also an icon for the world's glaciologists for its retreating glaciers stand as a bold testament to the ravages of climate change.<sup>1</sup>

Before proceeding to discuss the nexus between climate change and security, wisdom would suggest that the technical difference between “weather” and “climate” be explained. Weather is the current state of the atmosphere as discussed daily by meteorologists. Climate describes the general characteristics of the weather experienced in any region: it is variations in temperature, humidity, wind direction and strength, and precipitation. Climate also takes account of the rare, more extreme events which cannot always be predicted with accuracy but can, based on past experience, be accorded a probability of happening once every so many years.<sup>2</sup>

That climate can change is beyond dispute, for historical evidence shows that the world has been both warmer and cooler than it is today, although neither climatic state necessarily encompassed the entire globe during the same time period. In the Northern Hemisphere a period of warming started around 8,100 years ago and lasted for approximately four thousand years. It was unusually warm in Greenland and, over the same time period, there occurred the greatest summer melting of ice over the last ten thousand years. During this period the Arctic was up to three degrees Celsius warmer than it is today.<sup>3</sup> By contrast, it was exceptionally cold in Antarctica suggesting that a polar seesaw – an Antarctic climate anomaly – had occurred with warmth flipping between hemispheres.<sup>4</sup>

---

<sup>1</sup> See Revkin, Andrew, ‘Icon of the climate debate’. *New Zealand Herald*, March 27-28, 2004, p. B16.

<sup>2</sup> See Boyle, Stewart and John Ardill, *The Greenhouse Effect*, New English Library, London, 1989, p. 7.

<sup>3</sup> See Plimer, Ian, *heaven+earth - Global Warming: The Missing Science*, Howling At The Moon Publishing, Kaukapakapa, New Zealand, 2009, p. 49.

<sup>4</sup> Shackleton, Nicholas, ‘Climate Change Across the Hemispheres,’ *Science*, Vol. 291, No. 5501, 5 January 2001, p. 58.

There is also strong evidence for asynchronous temperature changes in Greenland and Antarctica during the last ice age.<sup>5</sup>

That such natural changes are capable of occurring rapidly is evidenced by the advent of an intense cold period 12,900 years ago that lasted for some thirteen hundred years. At the start of this period known as the *Younger Dryas*, global temperatures are assessed to have dropped by seven degrees Celsius in as little as a decade.<sup>6</sup> At the end of this period temperatures returned to their previous level in just a few years, with possibly half of the warming taking place in little more than a fifteen year period.<sup>7</sup> Although climatic changes can occur abruptly, their onset or ending is not certain and is difficult to predict. During the 1930s the popular press carried news items that the world “at least for the time being was growing warmer;” a contention readily supported by meteorologists.<sup>8</sup> However, this decade long period of balmy weather proved to be a false-promise, for by November 1941 “General Winter” forced Hitler’s panzers to stall at the gates of Moscow through a combination of unusually early heavy snowfalls and exceptionally severe temperatures, which in at least one instance dropped to as low as minus fifty-three degrees Celsius.<sup>9</sup>

Indeed, this climatic false-promise did end in 1940. From that year onwards some meteorologists maintain that the world had entered a cooling phase that did not release its icy grip for fifty years. Periodically, but especially during the mid-1970s, the prospect of another “ice age” featured in the popular media with messages such as “[t]he telltale signs are everywhere – from the unexpected persistence and thickness of pack ice in the waters around Iceland to the southward migration of a warmth-loving creature like the armadillo from the Midwest”<sup>10</sup> of America. To the meteorologists these empirical observations, along with other unspecified pieces of “convincing” evidence lead them to conclude that the global mean temperature since 1940 had dropped by no less than 2.7°

---

<sup>5</sup> *Ibid.*, p. 59.

<sup>6</sup> Plimer, *op. cit.*, p. 43.

<sup>7</sup> *Ibid.*, p. 46.

<sup>8</sup> ‘Warmer World,’ *Time*, 2 January 1939, p. 27.

<sup>9</sup> See Chew, Allen F., ‘Russia at War 1941-1945,’ *Great Victory Society*, Fort Leavenworth, 2006, <http://www.russian-victory.ru/> (11 March 2010).

<sup>10</sup> See ‘Another Ice Age?’ *Time*, June 24, 1974, <http://www.time.com/time/printout/0,8816,944914,00.htm> (28 August 2008).

Fahrenheit.<sup>11</sup> A more cataclysmic picture was portrayed in the weekly magazine *Newsweek* one year later when it reported that:

*There are ominous signs that the Earth's weather patterns have begun to change dramatically and that these changes may portend a drastic decline in food production – with serious political implications for just about every nation on Earth. The drop in food output could begin quite soon, perhaps only 10 years from now.*<sup>12</sup>

While the cause behind the climatic change was unclear, what was obvious to the meteorologists was that lower temperatures would herald reduced agricultural productivity for the remainder of the twentieth century.<sup>13</sup> Today, a similar cataclysmic event is being attributed to a change in global temperatures, the result of a warming not cooling planet.<sup>14</sup>

Similarly, the American National Academy of Sciences warned that “major climatic changes would force economic and social adjustments on a worldwide scale because the global patterns of food production and population that have evolved are implicitly dependent on the climate of the present century.”<sup>15</sup> Given that the average global temperature during the great Ice Ages was approximately seven degrees lower than the balmy nineteen-thirties, it is little wonder that meteorologists were predicting a reversion to the “little ice age” conditions that brought bitter winters to much of Europe and northern America between 1600 and 1900.<sup>16</sup>

As with global warming, global cooling also has its fervent adherents. According to Professor Bob Carter of James Cook University, there is no substantive evidence to show that the modern rates of environmental change lie outside historical natural bounds. This should come as no surprise since changes to global climate follow historic cyclical patterns. Global temperature warmed slightly in the late twentieth century and has been cooling since 2002, with neither

---

<sup>11</sup> *Ibid.*

<sup>12</sup> See Dutton, Denis, ‘The Cooling World,’ *Newsweek*, April 28, 1975, [http://denisdutton.com/cooling\\_world.htm](http://denisdutton.com/cooling_world.htm) (28 April 2008).

<sup>13</sup> *Ibid.*

<sup>14</sup> See Smith, Dan and Janani Vivekananda, *A Climate of Conflict: The links between climate change, peace and war*, International Alert, London, 2007, p. 13.

<sup>15</sup> Dutton, *op. cit.*

<sup>16</sup> *Ibid.*

warming nor cooling being unusual in rate or magnitude.<sup>17</sup> This could represent the onset of another “Little Ice Age” for long cold snaps are historically nothing exceptional<sup>18</sup> as global climate patterns flip-flop every few thousand years, sometimes cooling by as much as ten degrees Celsius in just a few years.<sup>19</sup>

While history cannot be rewritten there exists a body of climatologists that believe that “[H]istorical weather patterns are no longer a reliable predictor of the future”<sup>20</sup> and that “[H]uman-induced climate change is happening now, and impacts are already apparent” with “[G]reater impacts...projected, particularly if heat-trapping gas emissions continue unabated.”<sup>21</sup> Their contention was reported to be supported by a consistent finding of the U.S. Global Change Research Program that the “rate and magnitude of future climate change and resulting impacts depend critically on the level of global atmospheric heat-trapping gas concentrations as well as the types and concentrations of atmospheric particles (aerosols)” and “unless the rate of emissions is substantially reduced, impacts are expected to become increasingly severe for more people and places.”<sup>22</sup>

While there is almost universal acceptance that the world’s climate is currently warming, there are differing opinions within the scientific community as to the origins of this change. Some climatologists maintain that climate change is a natural phenomenon that has a cyclical pattern of occurrence which is quite independent of human activity.<sup>23</sup> Others climatologists accept climate change as natural phenomenon but stridently maintain that present-day changes are anthropogenic in origin. Irrespective of its origins, climate change is predicted to outpace the ability of both human society and ecosystems to adjust to any “new” norm.<sup>24</sup> This is especially true for the two Polar Regions where much of the world’s weather is born.

---

<sup>17</sup> See Carter, Bob, ‘New Zealand Speculative Global Warming Policy: A Failure of Duty to Care,’ James Cook University, unpublished meeting notes, 2008.

<sup>18</sup> See Kerr, Richard A., ‘The Little Ice Age – Only the Latest Big Chill,’ *Science*, Vol. 284, No. 5423, June 25, 1999, p. 2069.

<sup>19</sup> See Kerr, Richard A., ‘Warming’s Unpleasant Surprise: Shivering in the Greenhouse?’ *Science*, Vol. 281, No. 5374, July 10, 1998, p. 156.

<sup>20</sup> See Karl, Thomas R., Jerry M. Melillo and Thomas C. Peterson (eds.), *Global climate Change Impacts in the United States*, Cambridge University Press, New York, 2009, p. 61.

<sup>21</sup> *Ibid.*, p. 157.

<sup>22</sup> *Ibid.*

<sup>23</sup> See Weart, Spencer R., *The discovery of global warming*, Cambridge, Harvard University Press, 2003, pp.17-18.

<sup>24</sup> Karl *et al.*, *op. cit.*, p. 10.



Contemporary climate change is considered to be a post-Industrial Revolution phenomenon caused or exacerbated by a build-up of “green-house” gases such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and water vapour that trap the sun’s heat in the lower atmosphere. Deforestation, along with the burning of fossil fuels is responsible for the majority of greenhouse gas emissions. Projections published by the United Nations Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (IPCC AR4) show that by the year 2100 the Earth’s average surface temperature will have risen by between 2.0 and 4.5 degrees Celsius with the most likely rise being about three degrees Celsius.<sup>25</sup> However, some commentators speculate that by the turn of the century the average temperature will be nearly six degrees higher than it is today.<sup>26</sup> Even a temperature change of just 0.1°Celsius per decade is of concern because the climate will be changing faster than the adaptive capacity of many animals and plants.<sup>27</sup>

If anthropogenic forcing is the cause of climate change then the ability to control the speed and extent of that change requires the stabilization of atmospheric carbon dioxide concentrations. This can only be achieved by a drastic reduction in global CO<sub>2</sub> emissions. Yet, despite the need for restraint, fossil fuel emissions increased by twenty-nine per cent over the period 2000 to 2008. In conjunction with the increase in emissions from emerging economies, the principal cause behind this increase was a rise in the international trade of goods and services and an increase of coal as a fuel source. By contrast, emissions from land-use changes were nearly constant over the same period. Over the past fifty years there has been a gradual annual increase in the fraction of CO<sub>2</sub> emissions that remain in the atmosphere and models suggest that this trend was caused by a decrease in the uptake of carbon dioxide by both land and ocean carbon sinks; a response to climate change and climatic variability.<sup>28</sup> If carbon sinks fail and

---

<sup>25</sup> See Intergovernmental Panel on Climate Change, *Fourth Assessment Report: Working Group I: The Physical Science Basis, Mean Temperature*, 2007, [http://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch10s10-1-mean-temperature.html](http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-1-mean-temperature.html) (16 March 2010).

<sup>26</sup> See Zimmer, Carl, ‘Zeroing in on Climate Change’, *Newsweek*, December 1, 2003, p. 41.

<sup>27</sup> See Buckley, Richard (ed.), 1997, *Climate Change: What’s happening to the Weather?* Buxton Press, Cheltenham, p. i.

<sup>28</sup> See Le Quéré, Corinne, R. Raupach, Josep S. Canadell, Gregg Marland *et al.*, ‘Trends in the sources and sinks of carbon dioxide,’ *Nature Geoscience*, 17 November 2009, p. 1, <http://www.nature.com/naturegeoscience> (16 March 2010).

emissions are not curtailed then Professor Le Quéré suggests that “...it is not 2.5°C or 3°C we will get: it’s 5°C or 6°C – that is the path we’re on.”<sup>29</sup>

The 2009 Copenhagen Accord sponsored by the United Nations Framework Convention on Climate change (UNFCCC) endorsed the need for “deep cuts in global emissions” documented by the IPCC Fourth Assessment Report if the increase in global temperature is to be held below two degrees Celsius. While this goal is clearly enunciated, the path for its achievement is less definitive given that “...social and economic development and poverty eradication are the first and overriding priorities of developing countries.”<sup>30</sup> Although members to the Accord may “...underline that climate change is one of the greatest challenges of our time”<sup>31</sup> the vagueness of its wording might induce international commitment over the next decade to wane, just as many of the emission-reduction targets contained in the Kyoto Treaty are likely to remain unachieved. If the promise of the Copenhagen Accord remains unfulfilled then the rise in average global temperature is unlikely stabilize at or even near two degrees Celsius.

The Copenhagen Accord holds salience if, and only if, there is statistical validation that the climate is warming and that the origins of such warming are anthropogenic. Upon reviewing a wealth of attribution studies Peter Stott *et al.* concluded that there was an increasingly remote possibility that climate change was dominated by natural rather than anthropogenic factors.<sup>32</sup> Stott *et al.* also maintain that progress made since AR4 has shown that discernible human influence extends to reductions in Arctic sea ice and changes in the hydrological cycle associated with increasing atmospheric moisture content, regional and worldwide patterns of precipitation changes.<sup>33</sup> In addition, changes in Antarctic temperatures have been attributed to human influence<sup>34</sup> and there is increasing

---

<sup>29</sup> See McCarthy, Michael, ‘Catastrophic rise in temperature tipped by study,’ *New Zealand Herald*, Auckland, November 19, 2009, p. A11.

<sup>30</sup> See United Nations Framework Convention on Climate Change, *Copenhagen Accord*, FCCC/CP/2009/L.7, 18 December 2009, p. 2.

<sup>31</sup> *Ibid.*, p. 1.

<sup>32</sup> See Stott, Peter A., Nathan P. Gillett, Gabriele C. Hegerl, David J. Karoly *et al.*, ‘Detection and attribution of climate change: a regional perspective,’ *Wiley Interdisciplinary Reviews of Climate Change*, 2010, p. 15. Statistical tests conducted by Stott *et al.* shows that the 50-year global warming trend observed from 1959 to 2008 is detected at the five per cent significance level, as there is less than a five per cent likelihood of such a large trend being due to internal climate variability alone. *Ibid.*, p. 2.

<sup>33</sup> *Ibid.*, p. 15.

<sup>34</sup> See Gillett, Nathan P., Daithi A. Stone, Peter A. Stott, Toru Nozawa *et al.*, ‘Attribution of polar warming to human influence,’ *Nature Geoscience*, Vol. 1, November 2008, p. 750.

evidence that anthropogenic influence on temperature is becoming significant below continental scale.<sup>35</sup> Thus, Stott and his researchers like those authors who compiled the AR4 report observed “fingerprints” of human activity on many different aspects of climate change.

Despite a wealth of observational evidence that the climate is unequivocally warming, the arrival of intemperate weather in 2008 was put forward by some climate sceptics as evidence that “the hell that the radicals [climate change alarmists] have promised is freezing over.”<sup>36</sup> Such media articles encouraged David Easterling and Michael Wehner to establish whether the climate was warming or cooling. Their research showed that periods of no trend or even cooling of the global average surface temperature were found in the last thirty-four years of the observed records, as well as in the simulation models for the twentieth and twenty-first century that included greenhouse gas forcing. Their analysis indicates that the climate over the twenty-first century will follow this past pattern by producing periods of a decade or two where the global mean surface air temperature will show no discernible trend or even a slight cooling in the presence of long-term anthropogenic forced warming. The conclusion reached by these two researchers was that “claims that global warming is not occurring that are derived from a cooling observed over such short time periods ignore this natural variability and are misleading.”<sup>37</sup> So as not to be ‘mislead’ this thesis accepts that in the absence of conclusive scientific evidence to the contrary, the IPCC AR4 report represents the unequivocal authority on climate change and its future impact on both human and physical systems.

### **Adapt or die**

While the AR4 report should have provided a universally accepted scientific platform from which to launch a discussion on the role society has to play in climate mitigation, adaptation or both, regrettably it has been found wanting. The ambiguity surrounding the science that underpins this report has created a

---

<sup>35</sup> Stott, *op. cit.*, p. 15.

<sup>36</sup> See Investor’s Business Daily, ‘Alarmists Heated Even As World Cools,’ November 5, 2008, <http://www.realclearmarkets.com/printpage/?url=http://www.realclearmarkets.com/article> (17 March 2010).

<sup>37</sup> See Easterling, David R. and Micael F. Wehner, ‘Is the climate warming or cooling?’ *Geophysical Research Letters*, Vol. 36, No. L08706, DOI:10.1029/2009GI037810, 2009.

seemingly unbridgeable schism between the climate change ‘alarmists’ – those who consider climate change is solely the outcome of anthropogenic forcing, and ‘deniers’ – those who consider a changing climate results from natural forces beyond human control. Recent inaccuracies included within the AR4 report and acknowledged by the IPCC give the deniers cause for healthy scepticism as to where the truth about climate change might lie, but given that uncertainties riven climate science, these minor scientific infractions are no excuse for inaction.<sup>38</sup> Finally, there is a third group, which accepts that anthropogenic forcing has probably given rise to an acceleration of natural processes through positive ‘feedback’ looping and that both human-induced and natural forces are now working in concert to change the global climate to humanity’s ultimate disadvantage.

From an alarmists perspective humanity has already emitted enough additional greenhouses gases into the atmosphere to cause some degree of climate change and the disruptions that will come with it are an inevitable part of humanity’s future.<sup>39</sup> However, humanity can mitigate the severity of this future by curtailing the emissions of carbon dioxide and thus stabilizing the global temperature below the level at which it becomes seriously detrimental to contemporary civilization. Often the perception of what is required for successful mitigation is nothing more than the application of a simple ‘technological fix’ derived from either the space programme or from another form of high technology. The means by which mitigation could be achieved can verge on the fanciful, with one suggestion being to place a sunlight-deflecting disc approximately seven miles in diameter at the Lagrange point<sup>40</sup> between the earth and the sun that could disperse a few percent of the incoming sunlight and hence cool the planet.<sup>41</sup>

Despite the alarmist’s good intentions the “window of opportunity” to effect the stabilization of global greenhouse gas emissions may have physically past or now be too expensive to achieve. Recent research shows that along the shallow

---

<sup>38</sup> See ‘The clouds of unknowing’ *The Economist*, Vol. 394, No. 8674, March 20, 2010, pp. 69-72.

<sup>39</sup> See Friedman, Thomas L., *Hot, Flat, and Crowded*, Penguin Books, London, 2009, p. 240.

<sup>40</sup> The Lagrange point is where the gravitational pull of the Earth and the sun are equal and opposite and where little effort would be required to keep the giant disc in place. See Lovelock, James, *The Revenge of Gaia: Earth’s Climate Crisis and the Fate of Humanity*, Basic Books, New York, 2006, p. 129.

<sup>41</sup> *Ibid.*, p.128.

East Arctic Shelf the Arctic Ocean is “on the boil” as methane gas from deep within the ocean floor bubbles to the surface. What remains uncertain is whether this is a recent phenomenon or an indicator of a positive feedback loop.<sup>42</sup> Such a phenomenon will be impossible to mitigate hence adaptation measures may deliver greater benefits than either the Kyoto Protocol or other more ambitious mitigation schemes.<sup>43</sup> Thus, humanity must adapt or die.

If the increase in global temperature is to be kept below two degree Celsius then immediate mitigation action must ensue by imposing deep emission cuts, particularly on developed countries. Emission cuts will find little favour if they herald a drastic reduction in quality of life for the citizens of the developed world or the termination of a dream held by a substantial number of people in the Third World. Furthermore, whether the citizens of the developed world will provide the necessary ongoing financial resources, technology and capacity-building support to Third World states remains uncertain.<sup>44</sup> But if such actions were to severely jeopardize the lifestyle choices of those in the “West” then self-interest could see mitigation support for the Third World wane then vanish. Ultimately, all climate accords, in common with other societal responses to climate change, might collapse because they cannot fulfill an unrealistically high level of optimism over the potential for international co-operation.<sup>45</sup> The overwhelming difficulty society faces in addressing climate change is the one highlighted by Professor Bruce Bueno de Mesquita of New York University. Using computer assisted games theory de Mesquita predicts that the emerging economic powers of Brazil, China and India will, despite the protests from the United States and the European Union, force the abandonment of any replacement treaty for the Kyoto protocol because they will foresee that such a treaty will not be in their best interests.<sup>46</sup> This example reinforces de Mesquita’s other contention that despite the dire

---

<sup>42</sup> See Leahy, Stephen, ‘Climate Change: Arctic shelf leaking potent greenhouse gas,’ *Inter Press Service News Agency*, March 5, 2010, p. 1. <http://www.ipsnews.net/print.asp?idnews=50565> (22 March 2010).

<sup>43</sup> See Goklany, Indur M., ‘Climate change: the 21<sup>st</sup> century’s most urgent environmental problem or proverbial last straw?’ in Kendra Okonski (ed.), *Adapt or Die: The science, politics and economics of climate change*, Profile Books, London, 2003, p. 72.

<sup>44</sup> United Nations Framework Convention on Climate Change, *op. cit.*, p. 2.

<sup>45</sup> See Mabey, Nick, *Delivering Climate Security: International Security Responses to a Climate Changed World*, Routledge, Abingdon, 2008, p. 41.

<sup>46</sup> See O’Connell, Sanjida, ‘The man who sees the future,’ *NewScientist*, Vol.205, No. 2752, 20 March 2010, p. 43. Bueno de Mesquita claims that over the past thirty years he has made thousands of predictions about hundreds of different issues with an overall accuracy success rate of about ninety per cent. *Ibid.*, p. 42.

predicament humanity might well find itself in through climate change, people will be "... looking out for numero uno."<sup>47</sup>

### **Which future?**

Over the second half of the twentieth century the growth in material consumption exceeded the growth in population. While world population doubled, food production almost tripled, energy use more than quadrupled and the overall level of economic activity quintupled. As a result of these unbridled developments there came to exist five tectonic stresses that have become so intermeshed that it has become impossible to construct a scenario that depicts a plausible future arising from the impact of any one stress without having to accommodate the not insignificant impact of the other four. These stresses have all been mentioned previously, but never drawn together into a single list

- population stress arising from differences in population growth rates between developed and less developed countries and the burgeoning growth of mega-cities in the latter group of countries;
- energy stress, arising mainly from the increasing scarcity of conventional oil;
- environmental stress arising from worsening damage to global land, water, forest and fishery resources;
- climate stress arising from changes to the global atmosphere, and;
- economic stress resulting from inequities in the global economic system and the ever-widening income gap between rich and poor people.<sup>48</sup>

---

<sup>47</sup> See de Mesquita, Bruce, Bueno, 'Recipe for Failure,' *Foreign Policy*, November/December 2009, [http://www.foreignpolicy.com/articles/2009/10/16/recipe\\_for\\_failure?print](http://www.foreignpolicy.com/articles/2009/10/16/recipe_for_failure?print) (25 March 2009).

<sup>48</sup> See Homer-Dixon, Thomas, *The Upside of Down: Catastrophe, Creativity, and the Renewal of Civilization*, Island Press Washington, p. 11. A similar breakdown of stresses is to be found in Robert Kates and Thomas Parris, 'Long-term Trends and a Sustainability Transition,' *Proceedings of the National Academy of Sciences*, Vol. 100, No. 14, July 8, 2003, pp. 8062-8067.

State security agencies in several countries have compiled and published trend lists that identify key drivers and developments that will shape future world events in decades to come. In November 2008, the United States National Intelligence Council (NIC) published a compendium of key trends along with the causal factors that drive them. The similarity between this list and that compiled by Homer-Dixon is striking and, like Homer-Dixon, the NIC does specifically highlight resources scarcity as an impending transnational security issue; one that will be amplified by climate change.<sup>49</sup> Many of the key trends identified by Homer-Dixon have also been listed as emerging security challenges in an address given to the Center for Strategic and International Studies (CSIS) in April 2009 by Michèle Flournoy, the U.S. Department of Defense Under Secretary for Policy, titled “Rebalancing the Force: Major Issues for QDR 2010.”<sup>50</sup> When discussing climate change, Flournoy considers that it would over time hasten state failures, accelerate mass migration, spread disease and create an environment where insurgency could flourish, especially in regions where weak governments display an inability to cope with the effects of climate change.<sup>51</sup>

A more recent security futurecast was published in March 2010 by the Development, Concepts and Doctrine Centre (DCDC) of the United Kingdom’s Ministry for Defence, entitled *Global Strategic Trends – Out to 2040*.<sup>52</sup> In this report climate change is seen as a key driver of global transformation and as such was labeled a *Ring Road* issue – an issue “that will affect the lives of everyone on the planet over the next thirty years.”<sup>53</sup> It is assumed in the report that the global temperature will continue to rise over the next century and as a consequence “climate change *will* affect the land, the atmosphere and the oceans, and *may* <sup>54</sup> be

---

<sup>49</sup> See National Intelligence Council, “Global Trends 2025: A Transformed World,” *United States Government Printing Office*, November 2008, p. viii, [http://www.dni.govt/nic/NIC\\_2025\\_project.html](http://www.dni.govt/nic/NIC_2025_project.html) (23 November 2008). The five key trends identified are - globalizations, demography, the rise of new powers, decay of international institutions, climate change and, the geopolitics of energy.

<sup>50</sup> See Flournoy, Michèle, ‘Rebalancing the Force: Major Issues for QDR 2010,’ an address given to *Center for Strategic and International Studies*, Washington, D.C., April 27, 2009. Note “QDR” signifies Quadrennial Defense Review.

<sup>51</sup> Flournoy’s remaining four emerging security challenges besides climate change are - global economic downturn, demographic changes, natural resource scarcity and the spread of destabilizing new technologies. *Ibid.*

<sup>52</sup> See Ministry of Defence, ‘Global Strategic Trends – Out to 2040,’ Fourth Edition, *Development, Concepts and Doctrine Centre* (DCDC), 12 January 2010.

<sup>53</sup> *Ibid.*, p. 20. The other ‘Ring Road’ issues are globalisation, global inequality and innovation.

<sup>54</sup> In the report’s nomenclature *will* has a probability range greater than 90 per cent. The probability of *may* falls within the range of 10 to 60 per cent. *Ibid.*, p. 8.

an unstable and unpredictable process, involving both progressive evolution and sudden instabilities.”<sup>55</sup> As a consequence of this and other ‘ring road’ issues, each further aggravating discernible trends such as declining resource availability, the era out to 2040 *will* be a period of transition *likely*<sup>56</sup> to be characterized by instability in relations both between states and between groups within states.

In acknowledging that considerable similarity exists between these projections, it is also important to appreciate that there also exists disparities between them which make each unique. This is understandable for it is the consequence of where each organization places emphasis, but it is also the product of unpredictability – what does the future hold for humanity? The uncertainty that surrounds the ultimate impact of climate change has created a situation where humanity will have to respond to both “known unknowns” and “unknown unknowns”<sup>57</sup> and under such conditions the future is commonly explored using scenario analysis.

The global impact associated with incremental increases in global average surface temperature is contained in the IPCC’s Special Report on Emission Scenarios (SRES) appended to each Assessment Report. The SRES provides a climate change impact snapshot from which plausible scenarios depicting societal and security consequences can be derived. The choice of scenario format varies greatly amongst scenario creators. Journalist, Gwynne Dyer prefers to explore the societal and security impacts through a chronology of possible political events attributable to climate change, but without assigning each event a specific occurrence date.<sup>58</sup> A similar format was adopted by the NIC to portray a fictionalized account of how global inattention to climate change might lead to major unexpected consequences that could conceivably thrust the world into a new level of vulnerability. The specific point made in the NIC scenario is that at the current level of scientific knowledge the world may have unknowingly already exceeded a climate tipping point which will have already placed the worst effects of climate change beyond civilization’s ability to mitigation.<sup>59</sup> Mark Lynas, a

---

<sup>55</sup> *Ibid.*, p. 21.

<sup>56</sup> In the report’s nomenclature *likely* has a probability range between 60 to 90 per cent. *Ibid.*, p. 8.

<sup>57</sup> See BezanDarrow, ‘Donald Rumsfield Unknown Unknowns,’ Video of an address delivered by Donald Rumsfield, Secretary for Defense during the Bush junior presidency, posted August 7, 2009, <http://www.youtube.com/watch?v=RpSv3HjpEW> (29 March 2010).

<sup>58</sup> See Dyer, Gwynne, *Climate Wars*, Scribe, Melbourne, 2008.

<sup>59</sup> National Intelligence Council, *op. cit.*, p. 57.



journalist who frequently writes about the looming perils of climate change, takes a different approach by describing the adverse effects for each degree rise in average global temperature up to a maximum of six degrees.<sup>60</sup> This scenario format replicates that adopted by SRES reports.

Instead of creating a scenario depicting the future global impact of climate change some scenario builders restrict themselves to describing a specific geographical region or a particular storyline event. The Canadian academic Michael Byers used scenario analysis to explore what political and security ramifications might arise out of the illegal passage of a foreign merchant ship through Canada's 'ice-free' Northwest Passage. His analysis concluded that under circumstances stipulated within his scenario, the application of military force is the only option able to demonstrate Canada's determination to defend its sovereignty and deter further territorial transgressions by foreign ships. Byers maintain that such a military show of force will be required irrespective of the international consequences.<sup>61</sup>

While the storyline of these scenarios is, until the future proves otherwise, quite plausible they lack a certain authority that comes from being cited in other published works. In this thesis the question of authority can be allayed through the use of abridged thumbnail sketches of three plausible scenarios drawn from a publication authored by the American CSIS.<sup>62</sup> These scenarios form the principal secondary source for at least two recently published books.<sup>63</sup> The most telling observation to be drawn from each scenario, which has as their basis the IPCC AR4 report, is the exponential rise in global impact and damage as each scenario becomes more extreme. The year 2040, which features as the end date in the first two scenarios, is but three decades hence. Although Scenario 3 is the most extreme, it could ultimately prove to be conservative since it does not include all

---

<sup>60</sup> See Mark Lynas, *Six Degrees: Our Future On A Hotter Planet*, National Geographic, Washington, D.C., 2008.

<sup>61</sup> See Byers, Michael, *Who Owns the Arctic?: Understanding Sovereignty Disputes in The North*, Douglas & McIntyre, Vancouver, 2009, pp. 131-141.

<sup>62</sup> See Campbell, Kurt M., Alexander T. J. Lennon and Julianne Smith, *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change*, Centre for Strategic and International Studies, Washington, D.C., November 2007.

<sup>63</sup> The two published books are – Campbell, Kurt M. (ed.), *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change*, The Brookings Institution, Washington, D.C., 2008 and Nick, Mabey, *Delivering Climate Security: International Security Response to a Climate Changed world*, The Royal United Services Institute, Whitehall Paper 69, Routledge, Abingdon, 2008.

climate feedback mechanisms, notably an increase in greenhouse gas emissions from thawing permafrost. All three storylines reflect a northern hemisphere bias and one should not assume that the southern hemisphere will follow the same pathway portrayed for the northern hemisphere. However, climate change's uncertain path does not lessen the unwavering message that global greenhouse gas emissions need to have peaked in the next ten to fifteen years if the damaging effects highlighted in these scenarios is to be avoided.

Given the security emphasis of this thesis it would appear appropriate to include for each of the three climate scenarios a summary of their plausible security implications. These implications were developed by a group of both academic and non-academic security specialists charged with visualizing the security repercussion for each climate scenario. Each summary, except for the first, builds upon the impacts of the scenarios that precede it, plus its own unique contribution. Not surprisingly these authors envision humanity tumbling towards chaos in lockstep with a warming world.

#### **Climate Scenario 1: Expected Climate Change**

By 2040 average global temperature rise is 1.3° Celsius above the 1990 average. Warming is greatest over land masses and increases from low to high latitudes. Generally, the most damaging local impacts occur at low latitudes due to ecosystem sensitivity to an altered climate and high human vulnerability in the developing world. The damage to the Arctic is significant because of particularly large temperature variability at high northern latitudes. Global mean sea level rise is 0.23 metres, causing damage to the most vulnerable coastal wetlands with associate negative impact on local fisheries, seawater intrusion into groundwater supplies in low-lying coastal areas and elevated storm surge damage to unprotected coastlines. Many of the affected areas have large, vulnerable populations that will require international assistance to cope with or escape the effects of sea level rise. Marine fishing grounds and agricultural zones will shift towards the poles in response to warmer temperatures, in some instances moving across international boundaries.

Regionally, the most significant impact to climate change occurs in the southwestern United States, Central America, sub-Saharan Africa, the Mediterranean region, river deltas of South and East Asia, the topical mountain ranges of South America and small islands of the Pacific and Indian Oceans. The most prevalent and widespread impact relates to reductions in water availability and increases in the frequency and

intensity of extreme weather events. The Mediterranean region, sub-Saharan Africa, northern Mexico and southwestern United States will experience more frequent and longer-lasting droughts and extreme heat events such as wildfires.

Overall, northern mid-latitudes will experience both benefits and harm. The benefits include reduced winter heating costs, decreased mortality and injury from exposure to cold and an increase in agricultural and forestry productivity in wetter regions due to longer growing seasons, carbon dioxide fertilization and fewer periods freezing weather. These benefits will be offset by more heavy rainfall events, an increase in heat-related deaths and illnesses, more intense storms with associated flooding, and wind damage resulting in loss of life, property and infrastructure.<sup>64</sup>

### **Summary of National Security Implications**

- Conflict over access to resources due to and driving human migration;
- Threat of the spread of pandemic diseases curbs freedom of inter-country travel with consequential loss of national income;
- Dissatisfaction with state governments could radicalize internal politics leading to the establishment of new ‘safe havens’ in weak or failed states;
- A new geopolitical system that favours energy exporting countries, while simultaneously weakening, both strategically and economically, energy importing countries;
- Where available, both social and welfare services are likely to become a burden on central government and;
- Countries capable of controlling river system water flows will become regionally more influential as the water crisis deepens.<sup>65</sup>

### **Climate Scenario 2: Severe Climate Change**

Average global surface temperature rises at an unexpectedly rapid rate to 2.6° Celsius above 1990 levels by 2040. As with the previous scenario the largest warming is over land masses and at high latitudes. Dynamic changes in polar ice sheets (i.e. changes in the rate of ice flow into the sea) accelerate rapidly, resulting in a global mean sea level rise of 0.52 metres. There exists a high level of confidence that the Greenland and West Antarctic ice sheets have become unstable and that four to six metres of sea level rise are now inevitable over the next few centuries. Water availability declines in most affected regions at lower latitudes – dry tropics and subtropics – affecting approximately two

<sup>64</sup> CSIS, *op. cit.*, p. 43.

<sup>65</sup> See Campbell, Kurt M. and Richard Weitz, ‘Conclusion: The Clear implications of Global Climate Change,’ in Campbell, Kurt E. (ed.), *Climate Cataclysm: The Foreign Policy and National Security Implications of Climate Change*, Brooking Institution, Washington, D.C., 2008, pp. 215-216.

billion people worldwide. Crop yields decline significantly in the fertile river deltas due to sea level rise and damage from increased storm surges. Agriculture becomes nonviable in the dry subtropics where irrigation becomes exceptionally difficult because of low water availability and increased soil salinity. Arid regions at low latitudes expand, removing previously marginal cropland from production. North Atlantic fisheries are affected by a significant slowing of the North Atlantic meridional overturning circulation (MOC). Globally, there is widespread coral bleaching, ocean acidification, substantial loss of coastal nursery wetlands and warming and drying of tributaries that serve as breeding grounds for anadromous fish like salmon. Because of a dramatic decrease in the extent of Arctic sea ice, the Arctic marine ecosystem is dramatically altered and the Arctic Ocean is navigable for a significant period of the year. Those developing states in the lower latitudes are affected most severely because of their sensitivity to climate change and low adaptive capacity. The wealthy developed states experience clear net harm and consequently must divert a greater proportion of their wealth to adapting to climate change at home.<sup>66</sup>

### **Summary of National Security Implications**

- Wealthiest members of society separate themselves from the rest of the population thereby undermining morale and viability of democratic governance;
- Possibility that global fish stocks crash, enmeshing maritime states in confrontations over dwindling supplies;
- Likely privatization of water supplies: past experience of privatization in poor societies suggests the likelihood of violent protest and political upheaval;
- Globalization might end and rapid economic decline could begin, owing to the collapse of financial and production systems that depend on integrated global merchandizing systems;
- Transnational corporations may become increasingly powerful relative to nation-states as the wealthy moneyed class seek out financial and physical security from private providers. This may engender a new form of globalization in which transnational business becomes increasingly more powerful and;
- Alliance systems and multilateral institutions might collapse – among them the United Nations, the result of the Security Council becoming irreconcilably polarized.<sup>67</sup>

---

<sup>66</sup> CSIS, *op. cit.*, p. 43.

<sup>67</sup> Campbell, *Climate Cataclysm, op. cit.*, pp. 215-216.

**Climate Scenario 3: Catastrophic Climate Change**

Between 2040 and the twenty-second century, the impact associated with previously described climate change become progressively more severe and large-scale singular events of abrupt climate change occur. The average global temperature rises to 5.6° Celsius above 1990 levels with greater warming over land masses and higher latitudes. Dynamic changes to the polar ice sheets accelerate resulting in a mean sea level rise of two metres relative to 1990, rendering low-lying coastal regions uninhabitable, including many large coastal cities. The large fertile deltas of the world become largely uncultivable due to saltwater inundation and more frequent and higher storm surges that reach farther inland. The North Atlantic MOC stops mid-century, generating large-scale collapse of the North Atlantic ecosystem and associated fisheries. Northwestern Europe experiences colder winters, shorter growing seasons and reduced crop yields relative to the twentieth century. Beyond the North Atlantic borderlands the collapse of the MOC increases average temperatures in most regions and reorganizes precipitation patterns in unpredictable ways, hampering water resource planning across the world and drying out existing grain-exporting regions.

Southern Europe and the Mediterranean region remain warmer than the twentieth century average and continue to experience hotter dryer summers. Agriculture in the traditional food-growing regions is severely compromised by alternating drought and extreme storm events that bring irregular severe flooding. Crops are physiologically stressed by temperatures and grow more slowly even when environmental conditions are otherwise favourable. In many regions experiencing increased precipitation summertime soil moisture is reduced by increased evaporation. Conditions favourable to food production shift northwards into formerly sub-Arctic regions with traditionally small human populations and little infrastructure, but extreme year-by-year climate variability in these regions makes sustainable agricultural production difficult on the scale needed to feed the world population.

Mountain glaciers have virtually disappeared and the annual snow pack is dramatically reduced in regions where large human populations traditionally relied on glaciers and snowfall for water supply and storage including Central Asia, Europe, mountain spine of South America and western North America. Arid

regions expand rapidly overtaking regions that previously received sufficient rainfall to support high population numbers. The dry subtropics, including the Mediterranean region, much of Central Asia, northern Mexico, much of South America and the southwestern United States are no longer habitable. Not only do these regions require remote water sources for habitability, but such water sources are much fewer in number because mountain glaciers and snowlines have dramatically retreated as well. Half of the world's human population experiences persistent water scarcity. Locally devastating weather events have become the norm for coastal and middle latitude continental locations, where tropical and mid-latitude storm activity and associated wind and flood damage becomes much more intense and occurs annually, leading increased loss of life, property and infrastructure in many countries every year. Whereas water availability and loss of food security disproportionately affect poor developing states at lower latitudes, extreme weather events are more or less evenly distributed, with perhaps greater frequency at mid-latitudes because of extra tropical storm systems, including severe winter storms.<sup>68</sup>

### **Summary of National Security Implications**

- Lack of access to food and freshwater drives millions of 'climate change' refugees towards those countries where both resources still exist. This march of refugees will likely dominate security and humanitarian concerns of recipient states;
- A shrinking Russian population might have considerable difficulty preventing China from asserting control over much of Siberia and the Russian Far East, increasing the likelihood of conflict between two destabilized nuclear powers;
- A rise in public anger at governments' inability to deal with abrupt and unpredictable crises;
- A rise in religious fervor and 'doomsday' cults;
- Growth in public hostility towards migrants and minority groups;
- Altruism and generosity likely to be severely curtailed;
- Curtailment of United States military's worldwide role so it can concentrate on the demands of near neighbourhood missions and;
- Electricity generation and distribution systems are highly vulnerable to attack by disenfranchised groups, terrorists and rogue states.<sup>69</sup>

<sup>68</sup> CSIS, *op. cit.*, p. 43.

<sup>69</sup> *Climate Cataclysm: The Foreign Policy and National Security Implications of Climate Change*, pp. 215-216.

The “storyline” conveyed through these scenarios is of a world in the future racked by abrupt and sudden climate change which will challenge the ability of every society to adapt. Two countervailing trends could mitigate the more dire effects of climate change in the long-term: innovation in science and technology and the social changes brought on by them. New technologies may dramatically reduce society’s reliance on fossil fuels as the principal source of energy and provide the tools to mitigate those climatic effects that cannot be prevented. Conversely, for some commentators, reliance on future technologies to solve today’s problems is ludicrous since many of the assumed ‘techno-fixes’ rely on crucial, non-renewable materials that are already in short supply.<sup>70</sup>

Secondly, the human capacity for hope and determination should never be discounted even under the most extreme circumstances. Once the effects of climate change become undeniable, people could elect to work collaboratively to find solutions which may ultimately provide the much-needed catalyst for global change. Regrettably, as the failure of the United Nations climate change conferences held in both Copenhagen and Cancun demonstrated, that time has not yet arrived.

### **Future implications of climate change**

As a ‘ring-road’ issue, climate change will cause a measure of security disadvantage for every state, but what remains indeterminable is the exact character and severity of that disadvantage. In that sense the CSIS has identified a number of systemic events caused by the likely non-linear character of climate change that humanity will need to grapple with and will hopefully resolve before the future alone determines their outcome.

- *Increase in Centre-Periphery Tensions*

In the context of this chapter section casting countries either as the ‘North’ and ‘South’ is obsolete and unhelpful. Equally, the often used term ‘Third World’ has lost of its import once the ‘Second World’ vanished with the demise of the Soviet

---

<sup>70</sup> See Heinberg, Richard, *Peak Everything: Waking Up to the Century Of Declines*, New Society Publishers, Gabriola Island, BC., Canada, 2007, p. 175. An illustrative example is the generation of electricity through the use of photovoltaic panels whose manufacture requires gallium and indium; two minerals that are scarce and thus quickly depleted.

empire.<sup>71</sup> Moreover, what does the ‘West’ mean when it includes Japan and New Zealand; the ‘East’ when it includes Brazil or ‘South’ when it includes Korea and excludes Australia? An alternate approach that retains the notion of hierarchy within the international system, but without necessitating recourse to geographical images, is that of ‘Centre-Periphery.’ Barry Buzan’s adaptation of this 1970s approach appears to encapsulate not only the existing hierarchical relationship between states, but also allows for the probable transiently nature of interstate relationships over the course of the twenty-first century. ‘Centre’ implies a globally dominant core of capitalist or market-orientated economies, while ‘Periphery’ denotes a set of industrially, financially and politically weaker states operating within a set of relationships largely constructed by the ‘Centre.’ The more robust and developed states in the periphery comprise a ‘semi-periphery’, whose aspiration is membership of the existing ‘Centre’<sup>72</sup> or membership of an alternate ‘Centre’ in a new international order.<sup>73</sup>

Centre-Periphery tensions are likely to increase as problems of equity and cause and effect permeate the climate change debate. States within the ‘Periphery’ with limited response capabilities will suffer disproportionately from the adverse impacts of climate change. Their ability to overcome several such events simultaneously or in succession is doubtful. A failure by the ‘Centre’ to assist the ‘Periphery’ to manage the climate change challenges will almost certainly cause a heightening of Centre-Periphery tensions. Additionally, citizens of wealthier countries of the ‘Centre’ appear better positioned to cope with early consequences of modest climate change. Nonetheless, social and economic disparities within every society will conceivably result in its wealthy citizens pulling away from the rest of the population creating internal friction or even class warfare that could plausibly undermine morale and the viability of democratic governance, worldwide.<sup>74</sup>

A dysfunctional security relationship between the states of the ‘Centre’ and those of the ‘Periphery’ could easily be mirrored within the ‘Periphery’ especially

---

<sup>71</sup> See Ravenhill, John, ‘The North-South balance of power,’ *International Affairs*, Vol. 66, No. 4, October 1990, p. 745.

<sup>72</sup> See Buzan, Barry, ‘New Patterns of Global Security in the Twenty-First Century,’ *International Affairs*, Vol. 67, No. 3, July 1991, p. 432.

<sup>73</sup> See Barma, Naazneen, Ely Ratner and Steven Weber, ‘A World Without the West,’ *National Interest*, July/August 2007, p. 23.

<sup>74</sup> CSIS, *op. cit.*, p. 77.



in the locally rooted dynamics of regional security, whose patterns of amity; enmity, and rivalry do not depend on input from the ‘Centre.’<sup>75</sup> A number of ‘Periphery’ countries are vulnerable to virtual obliteration by sustained drought and desertification or by rising sea levels. Given that their ability to cope with such changes is severely limited, the mass migration that would be triggered could quickly develop into a schismatic antagonism between societies leading to further political instability, poverty, population growth and environmental degradation.<sup>76</sup> Even less dramatic changes that do not threaten obliteration might put such stress on weak state structures as to cause political breakdown, adding pressure on boundary maintenance.<sup>77</sup>

- *Increased Migration*

People rarely migrate for environmental factors alone. Other contributory factors include economic opportunity, food scarcity and other resource limits, health impacts or even the cultural effects of globalisation. To say that on occasions an influx of migrants into a new area can be a significant factor in violent conflict is no longer challenged, although by no means do all large scale migrations end in conflict. In cases where conflict does arise, the causal factor is not usually the migration *per se*, but a consequential clash of national identities. Moreover, identity conflicts are not an inevitable outcome of inter-group mixing, rather they are a product of political forces seeking to gain power or defend themselves against perceived threats to power. It is therefore less the movement of people and more the political and institutional responses to that movement that matter most in conflicts in which immigration is a factor.<sup>78</sup>

Displaced people, no matter the cause of their displacement, have in the past been more likely to move locally rather than regionally, with a relatively small proportion of them moving internationally. However, the flow of migrants towards the countries of the ‘Centre’ already shows a significant increase. For example, in 1960, fifty-seven percent of migrants lived in ‘Periphery’ states, but

---

<sup>75</sup> Buzan, *op. cit.*, p. 439.

<sup>76</sup> See Widgren, Jonas, ‘International Migration and Regional Stability,’ *International Affairs*, Vol. 66, No. 4, October 1990, p. 756.

<sup>77</sup> Buzan, *op. cit.*, p. 448.

<sup>78</sup> See Barnett, Jon, ‘Security and climate change,’ *Global Environmental Change*, No. 13, 2003, p. 12.

by 2005 only thirty-seven percent did so.<sup>79</sup> Irrespective of which region of the world climate-forced migration occurs in it will be uncontrolled and will generate significant social disruption,<sup>80</sup> along with unfavourable economic impacts, which are likely to necessitate international humanitarian assistance of an unprecedented scale and duration.<sup>81</sup>

Taken globally, climate forced migration is likely to be on a very large scale. Although, the average global temperature has currently risen by less than one degree Celsius, climate-induced sudden-onset natural disasters have been credited with displacing no fewer than twenty million people in 2008 alone.<sup>82</sup> Naturally, when faced with sudden shocks and long-term challenges brought about by or exacerbated by climate change, people will move. Thus it is entirely conceivable that the scale of climate forced migration will reach between 200 million<sup>83</sup> and 250 million by 2050.<sup>84</sup> Ultimately, migration could reach a level predicted in a World Development report of 2007, which suggested that should the average global temperature rise by 3-4° Celsius then 330 million people could be displaced through flooding alone.<sup>85</sup> In the face of significant change, the pressure to accept large numbers of refugees from “donor” countries could become intense and will certainly divert resources of the “host” countries away from long-term development budgets into humanitarian aid and disaster preparedness or, more plausibly, border security.

Without doubt climate change will alter the frequency and intensity of extreme weather events, it will threaten densely populated littoral, urban and farming regions with changing growing seasons, flooding and storm damage. However, this ominous future is not restricted to any one state or specific geographical region, for humanity’s vulnerability to climate change links the fate of each state to that of every other state. Historically, society’s reaction to a government’s

---

<sup>79</sup> DCDC, *op. cit.*, p. 95.

<sup>80</sup> See Ansley, Greg, ‘Fears on population, refugees haunt Rudd,’ *New Zealand Herald*, Auckland, April 14, 2010, p. A14. An issues of public concern that have gained prominence during the period leading up to Australia’s 2010 Federal Parliamentary Elections are that of population increase – from 22 million in 2010 to 36 million by 2050 – and a resurgence of refugees and asylum seekers from Asia and Indian Ocean littoral states.

<sup>81</sup> *Ibid.*, p. 26.

<sup>82</sup> See Guterres, Antonio, ‘Climate change, natural disasters and human displacement: a UNHCR perspective,’ *United Nations High Commissioner for Refugees*, October 2008, <http://www.uhcr.org/climate> (13 April 2010).

<sup>83</sup> National Intelligence Council, *op. cit.*, p. 53.

<sup>84</sup> Smith and Vivekananda, *op. cit.*, p. 15.

<sup>85</sup> Mabey, *op. cit.*, p. 85.

inability to mitigate the worst effects of abrupt and unpredictable crises is increased religious fervor, radicalisation and hostility and violence towards migrant and minority groups.<sup>86</sup> Massive movements of refugees, climate-inspired or not, within a relatively short period of time is likely to be deeply problematic for “host” countries and the refugees themselves. As in the past, any future profound increase in the unsanctioned movement of people will likely result in violent conflict within and between countries.

- *Global Health Consequences*

Climate change will have profoundly negative consequences for the population’s health, especially in, but not exclusively to, ‘Periphery’ countries. Not only will some geographical regions become more hospitable for vector-borne disease, but climate-induced shortages of food and water supplies will increase the population’s susceptibility to diseases and chronic illnesses. Any mass movement of refugees can be expected to expose themselves to diseases to which they have little resistance, and the diseases with which they become infected are likely move with them to their new place of refuge, thereby inflecting the people living in that area.<sup>87</sup> Equally, a warming climate in temperate countries could exacerbate insect-borne diseases like malaria and dengue fever given that their vector-host mosquito will find northern latitudes climatically hospitable.<sup>88</sup>

The emergence of novel, highly transmissible and virulent illnesses, such as highly pathogenic avian influenza strains, for which there currently exist no adequate counter measures, could initiate a global pandemic. If a pandemic does emerge then internal and cross-border tensions and conflict becomes more likely as states struggle, possibly with degraded capabilities, to control the movement of people seeking to avoid infection or gain access to medical services. While pandemic diseases are considered a “push” factor behind the displacement of people,<sup>89</sup> such contagious diseases also hold dire consequences for more stable societies. The NIC maintains that no country’s social fabric can be maintained if

---

<sup>86</sup> CSIS, *op. cit.*, p. 106.

<sup>87</sup> See Collier, Paul, *The Bottom Billion: why the Poorest Countries Are Failing and What Can Be Done About It*, Oxford University Press, Oxford, 2007, p. 28.

<sup>88</sup> DCDC, *op. cit.*, p. 35.

<sup>89</sup> See Myers, Norman, ‘Environmental Refugees: An Emergent Security Issue,’ Conference paper delivered to the 13<sup>th</sup> Economic Forum, Prague, May 2005, [http://www.osce.org/documents/eea/2005/05/14488\\_en.pdf](http://www.osce.org/documents/eea/2005/05/14488_en.pdf) (26 November 2009).

the population's infection rate is above ten per cent.<sup>90</sup> Thus, a significant aspect of the pandemic/security nexus relates to the maintenance of social coherence and economic wellbeing within an "afflicted" state and between that state and its regional neighbours and ultimately with the global community.

- *Resource Scarcity*

There is no common view as to whether natural resources will over the next thirty years continue to be abundant or become critically scarce. The United Kingdom's Ministry of Defence considers that over this period there will be sufficient energy, food and freshwater resources available to sustain the growing global population and the global economy. However, their distribution and access will be uneven, and both local and regional shortages will occur thereby increasing the likelihood of societal instability within states and jealousies between states. Both conditions could ignite conflict. States on the 'Periphery' will be unable to access resources necessary to allow their population to prosper and their economies grow.<sup>91</sup> This situation could exacerbate the flow of migrants from the 'Periphery' to the 'Centre.'

The United States Centre for Strategic and International Studies suggests that over the next three decades climate change exacerbated water scarcity will contribute to instability in many regions of the world. A shortage of potable water is a significant problem in itself, but the lack of fresh water for irrigation will accentuate climate changes other detrimental effect on agriculture – drought. Friction could arise within and between states that experience dwindling water supplies, with countries husbanding an abundance of freshwater seeking to exploit their good fortune for economic, political and diplomatic advantage.<sup>92</sup> Conflicts over food and water resources may be both bloody and protracted since combatants may be view these conflicts as wars of survival. Even the presence of a water sharing treaty, such as that which apportions the waters of the Indus River between India and Pakistan, cannot overcome the fear that one country will gain water security at the cost of the other's survival. In Pakistan, for example, as the gap between water availability and requirements widens so will the desire to

---

<sup>90</sup> See Prins, Gwyn, 'AIDS and global security,' *International Affairs*, Vol. 80, No. 5, 2004, p. 949.

<sup>91</sup> DCDC, *op. cit.*, p. 11.

<sup>92</sup> CSIS, *op. cit.*, p. 106.

intensify jihadi operations grow.<sup>93</sup> Even more disturbing is a comment attributed to a Pakistani official in 2001, “that any conflict [with India] over water would lead to Pakistan using nuclear weapons on a first strike basis against India.”<sup>94</sup> In the future this may not turn out to be an empty threat for rapid glacial melt in the Himalayas is likely to exacerbate water access problems throughout Asia.<sup>95</sup>

Population growth, access to fresh water, food shortages and crop decline are not discrete issues, but an aggregation, with two or more issues layered over each other to form ‘multiple stress zones.’ According to the United Kingdom’s Ministry of Defence, by 2040 climate change will be responsible for extending existing multiple stress zones now covering Africa and South Asia eastward to Asia’s Pacific littoral and southwards into Oceania. This *will* increase the challenges for these states and *may* increase the likelihood of interstate conflict.<sup>96</sup> Competition for resources *will* increase the geostrategic importance of certain regions such as the Asian meridian, the wider Middle East and both Polar Regions.<sup>97</sup>

---

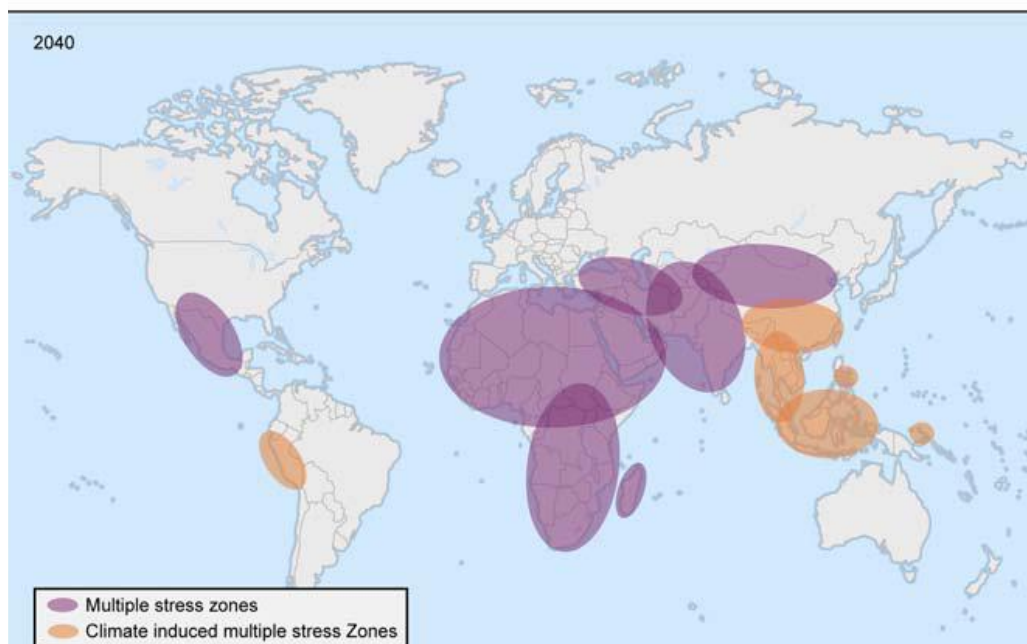
<sup>93</sup> See Wirsing, Robert G. and Christopher Jaspardo, ‘Spotlight on Indus River Diplomacy: India, Pakistan, and the Baglihar Dam Dispute,’ *Asia-Pacific Centre for Security Studies*, Washington, D.C., May 2006, <http://www.apcss.org> (14 April 2010).

<sup>94</sup> Dyer, *op. cit.*, p. 113.

<sup>95</sup> DCDC, *op.cit.*, p. 11.

<sup>96</sup> *Ibid.*, p. 69.

<sup>97</sup> *Ibid.*, p. 16. The Asian Meridian is a region that extends from Hong Kong in the north, through Southeast Asia into Australia. Thus this potentially economically successful region will sit at the intersection of the Chinese and Indian spheres of influence and is likely to be a region of geostrategic competition. The region sits astride a global trade route that includes the ‘choke-points’ of the Malacca and Lombok Straits through which twenty per cent of global oil production is transported, including eighty per cent of both China’s and Japan’s oil imports. The importance of these choke-points is *likely* to grow out to 2040 placing the region at the intersection of *probable* Indian, United States and Chinese spheres of influence. *Ibid.*, p. 64. The search for alternative sources of energy, minerals, food and water *will* become more urgent consequently the exploration of extreme environments such as space, the Polar Regions, the deep oceans and deep underground regions is *likely* to increase. *Ibid.*, p. 115.



**Map 12.** Regions of multiple stresses as at 2040. The processes that give these regions substance are already occurring and their severity and geographical extent will be observable by 2030. Source: Ministry of Defence, United Kingdom, *Global Strategic Trends – Out to 2040*, p. 64.

Wild fish represent a special category within the living resource grouping for species are often temperature sensitive and capable of migrating to an environment that best suits their needs. Climate change itself is unlikely to alter the total levels of fish stock to a great degree, but it will have a large impact on the location and composition of fish stock. For states of the ‘Periphery’ this will have a serious impact on traditional, subsistence fishers who cannot follow fish stocks as they move and might not be able to survive off any replacement species. Shifting fish populations will drive conflict between commercial and subsistence fisher people and could cause the collapse of existing fish management agreements between countries.<sup>98</sup> Climate change will simply exacerbate existing tensions between fishers of each hemisphere given that the northern hemisphere industry’s future depends on its ability to exploit new species from the southern hemisphere.<sup>99</sup> In the absence of a new global agreement governing the fishing industry, piracy will appear an increasingly attractive option for those fishers heavily in debt and with no access to a legitimate fish quota.<sup>100</sup>

<sup>98</sup> Mabey, *op. cit.*, p. 78.

<sup>99</sup> See Knecht, G. Bruce, *Hooked*, Allen&Unwin, Crows Nest, Australia, 2006, p. 154.

<sup>100</sup> *Ibid.*, p. 56.

The security threat for maritime states implicit in the desperate plight of northern hemisphere fishers should not be dismissed lightly, since it is common for fishing vessels sailing out of Asian ports to carry heavy machineguns and rocket-propelled grenade launchers.<sup>101</sup> It is also quite common for fishing fleets to be accompanied by a naval flotilla especially in the highly contested waters of Pacific Asia.<sup>102</sup> Within three decades the New Zealand Defence Force anticipates that foreign fishing fleets will be accompanied by naval forces as they illegally exploit fish stock in or near New Zealand's Exclusive Economic Zone.<sup>103</sup>

Climate change could plausibly affect the international politics of energy production and consumption. Any oil or natural gas importing country with high energy intensity could suffer disproportionately due to the difficulties associated with a switch to alternative fuel supplies. The availability of hydroelectric power might be adversely affected by a decline in glacial runoff, or by upstream states diverting river water flows, or husbanding water in reservoirs within their state borders. Electricity generated from nuclear power plants might also be curtailed due to the limited availability of water necessary to cool generators. An increase in the number and intensity of storms could interfere with long-distance electricity transmission, further stressing infrastructure assets that in many countries are already prone to failure. Addressing the current vulnerability of energy infrastructure would address two conceivable problems of the future: the heightened risks of resource-related terrorism, state initiated or not, and the need to find alternative energy sources that mitigate further climate change impacts.<sup>104</sup> Rectifying either vulnerability increases the likelihood of actor-to-actor conflict.

- *Social and Political Change*

Severe or sudden climate change will present a profound challenge to existing social and political organisations in countries of both the 'Centre' and 'Periphery.' There exists the possibility that international cooperation might increase as globally people rally to save human civilisation, but equally likely is that

---

<sup>101</sup> See Dupont, Alan, *The Environment and Security in Pacific Asia*, Adelphi Paper 319, Oxford University Press, Oxford, 1998, p. 53.

<sup>102</sup> See Scott, Richard, 'Tenix to fashion New Zealand vessels,' *Jane's Defence Weekly*, 15 September 2004, p. 30.

<sup>103</sup> Ministry of Defence, *Defence White Paper 2010*, Ministry of Defence, Wellington, November 2010, p. 26.

<sup>104</sup> CSIS, *op. cit.*, p. 106.



individuals and groups become solely preoccupied in their own survival.<sup>105</sup> In the presence of climate change, the future of international institutions appears uncertain. The United States government foresees the authority of multilateral institutions being severely weakened by 2025. Moreover, as the type and kinds of actors proliferate in the future so does the prospect that the international system will fragment and in so doing highlight the inability of international institutions to address new transnational challenges. According to the NIC, current trends suggest that global governance will become a patchwork of overlapping, often *ad hoc* and fragmented efforts, comprised of a shifting coalition of member states, international organisations, social movements, non-governmental organisations and transnational companies.<sup>106</sup> Additionally, this situation will be further complicated by a shift in economic and political power away from the existing centres of power in the United States and Europe to Asia. Such a shift in power could, when couple with the global challenges of climate change, resource scarcity and population growth, result in a period of instability and intense competition between major powers.<sup>107</sup> Hence, international institutions such as the United Nations will experience great difficulty in managing the full range of adverse consequences.<sup>108</sup> Implications arising out of new international alignments are always uncertain, but the complex and inherently divisive nature of climate change is likely to impede a collective response.<sup>109</sup>

- *Challenge to Existing Governments*

Climate change could hold deep implications for the effectiveness and viability of existing governments. The political elite along with established institutions may be unable to effectively manage climate-induced challenges thereby losing their legitimacy once public support wanes. National leaders professing authoritarian ideologies could become attractive to constituents if liberal democratic systems fail to marshal sufficient political determination to manage the climate challenge. Under climate-induced stress the citizenry might resort to violence – especially when the opportunities to change leaders through elections are circumscribed – to

---

<sup>105</sup> Campbell, *op. cit.*, p. 220.

<sup>106</sup> National Intelligence Council, *op. cit.*, p. 81.

<sup>107</sup> DCDC, *op. cit.*, p. 38.

<sup>108</sup> CSIS, *op. cit.*, p. 107.

<sup>109</sup> See Ferguson, Niall, 'When Empires Crumble,' *The Australian Financial Review*, Sydney, 16 April 2010, p. 10.



remove existing governments. It is conceivable that citizens might turn to non-state actors including religious movements or terrorist groups for comfort or to achieve dramatic change.<sup>110</sup> Furthermore, under conditions of severe climate change, environmental factors might well push already failed states or a region within a weak state, deeper into the realm of being ungovernable.

- *World Political Disequilibrium*

Climate change holds the potential to affect world politics, given that the challenges ensuing from a changing climate will likely affect states very differently, with some states able to respond more effectively than others. Climate change also has the potential to affect relations among states. In the future certain states could require increased public health assistance to face new to them vector-borne diseases such as malaria, while other states could experience limits on their exports resulting from unanticipated changes in the global trading regime due to climate-related effects.<sup>111</sup> Some states could even become vulnerable to foreign predation by militarily stronger states that covert their resources or by a stronger neighbouring state that desires their land upon which to settle its own burgeoning population.<sup>112</sup>

Disequilibrium within the international system would likely usher in an era of increased global instability. Over the long term, the very divergent regional effects of a changing climate could affect the evolving global distribution of power with unpredictable consequences for international security.

- *Increase in Nuclear Activity will Increase Attendant Risks*

Climate change could lead to a renaissance in nuclear energy, driven partly by the expectation that an increase in production will reduce the use of carbon-emitting fossil fuels, while also reducing penalty costs imposed under a global carbon trading mechanism. However, such a renaissance could worsen problems of nuclear safety and proliferation. As of December 2009, there existed 435 nuclear reactors operating in thirty countries, 53 reactors under construction, with a further 136 either on order or being planned. An additional 299 reactors are

---

<sup>110</sup> Campbell, *op. cit.*, p. 220.

<sup>111</sup> *Ibid.*

<sup>112</sup> CSIS, *op. cit.*, p. 108.

proposed to be built by 2030. New reactors brought into service during the period 1996-2008 were balanced by old plants retired from service. However, there is no firm indication of the number of reactors to be retired by 2030.<sup>113</sup> Thus, over the next two decades there will be an increase in the total number of nuclear reactors around the world, including some under the control of states that may lack the experience to safely manage such operations.

The threat of global climate change could also provide states interested in acquiring nuclear weapons with yet another justification to pursue nuclear-related research and technologies. As an example, oil-rich Persian Gulf states are among the largest emitters of greenhouse gases per capita and it would be reasonable for these states to claim a need for nuclear energy to power water desalination plants or cut greenhouse gas emissions.<sup>114</sup> This argument becomes even more compelling for countries such as Saudi Arabia, which by 2040 could well face a nuclear-armed Iran without a strong guarantee from the United States as to its security against attack.<sup>115</sup>

The above list represents a daunting catalogue of challenges for the future. More ominously, if climate change is not dealt with proactively then it will come to dominate both foreign and national security policies. For some commentators climate change will shape the current and subsequent generations view of the world and their place within it, just as the Cold War was responsible for shaping the world view of the last three generations.<sup>116</sup> To meet these challenges in the future states might elect to exploit the more extreme geological regions of the globe, including both Polar Regions, in order to avert the need to embark upon a military campaign to obtain those resources necessary to stabilize their society. Eventually, even the respite such action provides will be exhausted heightening the possibility of interstate conflict.

Whilst Cold War ideologies fashioned the world into a number of classical regional security complexes, in the future it could be the ideologies arising from the politics of climate change that will shape the world into a new series of

---

<sup>113</sup> See World Nuclear Association, 'World Nuclear Power Reactors & Uranium Requirements,' 1 December 2009, <http://www.world-nuclear.org/info/default.aspx%3fid%3d11520> (27 April 2010).

<sup>114</sup> CSIS, *op. cit.*, p. 107.

<sup>115</sup> DCDC., *op. cit.*, p. 82.

<sup>116</sup> Campbell, *op. cit.*, p. 222.

security complexes. These are likely to be a response to the pressures climate change imposes upon societies – mass migration or pandemic disease – rather than climate change *per se*. Hence, the origin of any security complex formed more correctly lies within the societal rather than the environmental sector of the sector securitisation typology.<sup>117</sup> Such cross-overs will serve only to make more difficult the identification of facilitating conditions that precipitated the formation of a sector-specific security complex. There is little doubt that climate change will increasingly complicate both foreign policy and national security issues in the years ahead.

---

<sup>117</sup> See Buzan, Barry, Ole Wæver and Jaap de Wilde, *Security: A New Framework for Analysis*, Lynne Rienner, Boulder, 1998, p. 138.

## Chapter Eleven

### Conclusion: A Lack of Will

Natural resource scarcity and abundance have always been intertwined with poverty and insecurity. Demographic and environmental stresses can exacerbate demands further weakening societies, while unresolved grievances can ferment instability from below. The recent unrest amongst the peoples of certain Middle-Eastern and North African states has been attributed, at least in part, to the scarcity of affordable resources, particularly food. Furthermore, climate change is one environmental stress that appears certain to aggravate any weakness in societal cohesion at the global, regional or state levels. At the global level this lack of cohesion is exemplified by the continuing failure of states to make the necessary accommodations in order to agree a procedure that would replace the Kyoto Accord. Given the global impact of just these two adversities it would be reasonable to expect humankind to respond through cooperation but, as discussed further in this chapter, the will to cooperate is diminishing as humankind puts self-interest ahead of the common good. Unless attitudes change self-interest will drive humanity to exploit the Polar Regions in order to satisfy lifestyle choices.

Speaking at the Dimpleby Memorial Lecture in London just three months after the terrorist attack on New York in 2001, former American president, Bill Clinton, called for “a truly global consciousness” to spread the benefits of the twenty-first century around the world.<sup>1</sup> Clinton went on to say that “...we have the means to make the 21<sup>st</sup> century the most peaceful and prosperous in human history. The question is whether we have the will.”<sup>2</sup> The will of the developed world in 2009 and again in 2010 was definitely lacking, for even a foreseeable global climate crisis failed to prevent vested interests from extinguishing any immediate hope that humanity could arrive at a common position on reducing carbon dioxide emissions prior to the onset of an irreversible human-initiated calamity.

---

<sup>1</sup> See Clinton, Bill, ‘The Struggle for the Soul of the 21<sup>st</sup> Century,’ December 14, 2001, <http://www.australianpolitics.com/news/2001/01-12-14.shtml> (4 January 2010).

<sup>2</sup> *Ibid.*

Every serious study of commitments made to reduce carbon dioxide emissions by states at the Copenhagen climate conference show that they will be insufficient to ward off a two degree Celsius rise in global temperature. The United Nations Environment Programme found that countries had locked in less than half the greenhouse gas reductions necessary to provide a fifty per cent chance of preventing a two degree temperature increase by 2050. Another study conducted by the Massachusetts Institute of Technology and the United States based Sustainability Institute suggests that the emission reductions agreed at Copenhagen will result in the world warming by 3.9 degrees Celsius by 2100. A third report, this one by Germany's Potsdam Institute, found that even if every proposal agreed to by those states that attended the Copenhagen conference was fully funded the average global temperature will be 3.2 degrees Celsius higher by century's end. A recent assessment by the Intergovernmental Panel on Climate Change suggests that a business-as-usual approach could result in global temperatures in excess of six degrees Celsius by 2100.<sup>3</sup> If the United Nations sponsored climate change conferences achieved anything then that was to demonstrate that self-interest remains a cardinal human motive.

Professor Mirko Bagaric maintains that human beings appear incapable of making meaningful sacrifices for the betterment of others (other than family), especially foreigners and future generations.<sup>4</sup> This observation was also made by Al Gore who maintains that when climate change takes centre stage, humanity will show itself as predisposed to both short-term thinking and restricting emotional connections to "those who are closest to us."<sup>5</sup> Gore does claim, however, that humanity can with considerable effort extend emotional connections to future generations.<sup>6</sup> The lack of intergenerational concern possibly explains the results of recent social surveys that suggest people, especially those in the developed world, are unlikely to support climate change mitigation if they are expected to shoulder "significant costs."<sup>7</sup> Such self-interest on the part of the developed world was, according to Bagaric, the reason why the Copenhagen

---

<sup>3</sup> Simons, Graig, 'Climate Summit's Big Failure,' *Newsweek*, Vol. CLV, No. 3, January 18, 2010, p. 8.

<sup>4</sup> See Bagaric, Mirko, 'Only self-interest will drive us to act on climate,' *The New Zealand Herald*, Auckland, December 24, 2009, p. A13.

<sup>5</sup> See Barnett, Sarah, 'Man of the moment,' *New Zealand Listener*, Vol. 221, No. 3633, December 26, 2009-January 1, 2010, p. 20.

<sup>6</sup> *Ibid.*

<sup>7</sup> See 'Who cares?' *The Economist*, Vol. 393, No. 8660, December 5, 2009, p. 16.

conference turned into a failure, despite universal acceptance that the world is lurching towards an environmental disaster.<sup>8</sup>

Regarding the Copenhagen Conference, it is easy to accept Bagaric's observation that the First World was ultimately too greedy and short-sighted for a meaningful, effective and binding climate accord to be reached.<sup>9</sup> By this action the people of the developed world have proved themselves to be the ultimate climate sceptics. Yet, despite today's inaction, action will occur, but only when the developed world is "hit with widespread life-taking environmental disasters, which are unequivocally linked to global warming."<sup>10</sup> Absent that, the leaders of the developed world "will continue to be green only at the conversational level."<sup>11</sup>

Even at the sub-state governmental level climate change induced self-interest drives policy. In Australia, the degradation of the Murray River Basin has been the cause of much interstate friction especially between New South Wales and South Australia. The basin is in deep crisis with its waters afflicted by salinity and pollution, its flow dehydrated by overuse and drought, and the wetlands at its mouth facing extinction. The Australian Constitution allows for each state to store whatever quantity of river water it deems appropriate, which has historically meant that South Australia receives less water than it requires. The self-interest of New South Wales became obvious in the aftermath of the 2009/2010 summer floods that spilt approximately 500 gigalitres of water into the basin. In a display of beggar-thy-neighbour attitude, the New South Wales government immediately withheld this 'windfall' precipitation. Only after a flurry of complaints from two states through which the Murray River also flows – Victoria and South Australia – did the government of New South Wales relent and release additional water into the river system.<sup>12</sup> While the action of New South Wales might have been deplored by the governments of the two other affected states it may equally be indicative of self-interested behaviour that will become increasingly common as water resources become regionally scarce and degraded.

Bagaric's view on the power of self-interest echoes the result of a mathematical simulation of a community's voluntary vaccination uptake in a

---

<sup>8</sup> Bagaric, *op. cit.*, p. A13.

<sup>9</sup> *Ibid.*

<sup>10</sup> *Ibid.*

<sup>11</sup> *Ibid.*

<sup>12</sup> Ansley, Greg, 'Abbott shows green credentials as he puts pressure on Rudd,' *Weekend Herald*, Auckland, January 16, 2010, p. A25.

response to a bioterrorism threat.<sup>13</sup> Modelling this threat suggests that voluntary vaccination levels may be difficult to maintain because an individual has little to gain from being vaccinated if the rest of the community is already immune. This situation is similar to the classical “prisoner dilemma” in which cooperative behaviour does not produce a stable strategy because it cannot overcome the pervasive power of self-interest. Historical examples, together with game-theoretical modelling, suggest that self-interested behaviour is both inevitable and universal and that its pursuit should be seen as normatively appropriate, rational, and enlightened.<sup>14</sup>

Self-interest as a social norm can be defined as a shared perception of appropriate behaviour that possesses the power to induce people to act in a manner that deviates from their private inclination.<sup>15</sup> This same behavioural trait is regularly displayed by states, though in those situations the term “national interest” is frequently used.<sup>16</sup> Although interdependence among states, plus the emergence of increasing numbers of supranational actors has diminished reliance on national interest as an analytical concept, national interest continues to be the motivation behind many political actions taken by states. For some European countries nothing other than “self-interest and idiosyncratic” reasons can account for the rekindling of their involvement in sub-Saharan Africa.<sup>17</sup> More recently, the United States in pursuit of its own self-interest has found itself in a geopolitical struggle with China over access to West Africa’s oil wealth.<sup>18</sup> Equally driven by self-interest, China cut export quotas of rare earth minerals by 72 per cent during 2010, which not only forced price increases upon competitor states, but also

---

<sup>13</sup> See Bauch, Chris T., Alison P. Galvani and David J. D. Earn, ‘Group interest versus self-interest in smallpox vaccination policy,’ *Proceedings of the National Academy of Science of the United States of America*, Vol. 100, No. 18, September 2, 2003, p. 10564.

<sup>14</sup> See Miller, Dale T., ‘The Norm of Self-Interest,’ *American Psychologist*, Vol. 54, No. 12, December 1999, <http://faculty-gsb.stanford.edu/millerd/does/docs/1999amerpsyc.html> (27 December 2009).

<sup>15</sup> Miller, *op. cit.*

<sup>16</sup> See Brown, Chris, *Understanding International Relations*, MacMillan, Basingstoke, 1997, p. 33. That states like people do have interests can be problematic and is not universally accepted. However, the realist position is that states are like ‘persons,’ capable of possessing interests and that these ‘national interests’ are not simply the interests of whatever group controls the administrative structure of the state. States behave in accordance with these interests and not in response to some abstract principle or a desire to be altruistic. *Ibid.*, p. 34.

<sup>17</sup> See Stevenson, Jonathan, ‘Africa’s Growing Strategic Resonance,’ *Survival*, Vol. 45, No. 4, Winter 2003-04, p. 162.

<sup>18</sup> See Mortished, Carl, ‘New decade brings changing of the guard,’ *Waikato Times*, Hamilton, January 2, 2010, p. C2.

exacerbated tensions with the United States.<sup>19</sup> In pursuit of its national interests China has found itself in conflict with a resurgent West, particularly Europe, which considers Africa to lie within its commercial sphere of influence. In this clash of self-interest China envisages itself the victor.<sup>20</sup> Irrespective of whether self-interest pertains to the individual or the state, humanity should not forget that it inhabits a social world where selfishness on any level can often have unforeseen consequences.

One such consequence, and one that would no doubt shock societies that preceded today's, is how attitudes and behaviours are now highly influenced by whether people conceive that they will obtain a material benefit from the implementation of a particular social policy.<sup>21</sup> Thus, people who would likely benefit from the implementation of a social policy can be expected to hold a more favourable attitude towards that policy than those people who will not benefit. Equally, it is now expected that people who are offered financial compensation for undertaking a socially beneficial act e.g. the giving of blood, are expected to be more willing to participate in such acts than those who receive no financial gratuity.<sup>22</sup> Such self-interest and selfishness continues to perpetuate what Friedman would call the "Santa Claus" syndrome,<sup>23</sup> where politically difficult, but statesman like decisions are forsaken for the continuance of a phenomenon described by Thérèse Delpech as the *pleasure principle*: the desire for perpetual peace so that the existing order of Western societies can continue untroubled into the future.<sup>24</sup> What should not be overlooked is that by 2030 an additional two billion middle-class people in the developing world<sup>25</sup> could equally be ensnared by the *pleasure principle*, exacerbating further the strain humanity already imposes on the climate and natural resources.

---

<sup>19</sup> See MacKinnon, Ian, 'Mineral deal shows level of panic,' *New Zealand Herald*, Auckland, December 30, 2010, p. A15.

<sup>20</sup> See Lee, John, 'China's Africa Gambit,' *Time*, Vol. 174, No. 19, November 16, 2009, p. 48.

<sup>21</sup> See Friedman, Thomas L., *Hot, Flat, and Crowded*, Penguin, London, 2009, pp. 28-29.

<sup>22</sup> Miller, *op. cit.*

<sup>23</sup> Friedman, *op. cit.*, p. 48.

<sup>24</sup> See Delpech, Thérèse, *Savage Century: Back to Barbarism*, Carnegie Endowment for International Peace, Washington, D.C., 2007, p. 22.

<sup>25</sup> See Goldstone, Jack A., 'The New Population Bomb,' *Foreign Affairs*, Vol. 89, No. 1, January/February 2010, p. 34.



## PART III

### Chapter Twelve

#### Introduction: The Thawing of Frozen Wealth

The primacy accorded to material self-interest has rapidly turned a custom into a natural law that people believe should not be violated, even though in the past such ready acquiescence to self-interest would have been derided as contrary to society's social values.<sup>1</sup> However, according to Thérèse Delpech, today's Western societies no longer believe strongly enough in social values to teach them, much less to defend them against existential threats.<sup>2</sup> The demise of values is seen by people from other cultures, Confucians, for example, as the predominant cause for the rise of egoism, utilitarianism and hedonism, as well as a lack of spirituality, that has enveloped the developed world.<sup>3</sup> Coincidentally, the waning influence of values on policies at the national level has seen a rise of beggar-thy-neighbour nationalism, national egoism and local chauvinism: all behaviours that are said to pose a threat to world peace and prosperity.<sup>4</sup>

However, in the absence of the kind of threats typified by the United States-Soviet confrontation of the Cold War era, domestic political agendas have had a large impact on the foreign policy choices of all states, especially those of current and nascent great powers. In reinforcing the *pleasure principle* great powers continue to seek means to prevent rival great powers from dominating the wealth-generating regions of the world. Today those regions are usually populated by the leading industrialized states, although increasingly they encompass less-developed states that possess critically important raw materials. Great powers sometimes

---

<sup>1</sup> See Miller, Dale T., 'The Norm of Self-Interest,' *American Psychologist*, Vol. 54, No. 12, December 1999, <http://faculty-gsb.stanford.edu/millerd/does/docs/1999amerpsyc.html> (27 December 2009).

<sup>2</sup> See Delpech, Thérèse, *Savage Century: Back to Barbarism*, Carnegie Endowment for International Peace, Washington, D.C., 2007, p. 86.

<sup>3</sup> See Youzhi, Yao and Liu Hongsong, 'Future Security Trends in the Asia-Pacific Region,' in Michael Pillsbury (ed.), *Chinese Views of Future Warfare*, University Press of the Pacific, Honolulu, 2002, p. 99.

<sup>4</sup> *Ibid.*, p. 98.

attempt to dominate these regions themselves, but at the very least they try to ensure that none fall under the control of a rival great power.<sup>5</sup> Regions that contain little intrinsic wealth are less likely to interest great powers,<sup>6</sup> unless they harbour states that possess or seek to possess a nuclear arsenal, weapons of mass destruction or provide a sanctuary for terrorists.<sup>7</sup>

Energy is one category of resource that continues to direct great power interest towards certain geopolitical regions, principally the Persian Gulf and Central Asia and more recently Africa. After a long era of excess capacity, the prices for oil have risen sharply and become more volatile. Yet, resource concerns go far beyond oil. European governments worry about the security of natural gas supplies, particularly when their principal supplier, Russia, is given to capricious behaviour that benefits neither itself nor its consumers.<sup>8</sup> Similar worries beset India and other states which are destined to depend heavily on coal imports in the coming decades. The governments of nearly every large consumer country are besieged with doubts about energy security, not dissimilar to concerns experienced during the oil crisis of the 1970s.

Energy insecurity for Western industrialized state comes from the knowledge that they will have to compete with the emerging-market countries notably China and India for energy. Moreover, the International Energy Agency (IEA) maintains that by 2030, China will depend on imports for no less than two-thirds of its oil, and India for even more.<sup>9</sup> Both countries, but especially China, are choosing to secure access to energy resources by relying less on multinational commercial interests and more on state-to-state negotiations with producer countries. Through their actions they are making it harder for the energy markets to function smoothly, thus endangering the energy security of all states.<sup>10</sup> In face of this reality, states will seek energy security by diversifying the regions from which they draw their supplies, even if such locations require the exploitation of

---

<sup>5</sup> See Mearsheimer, John J., *The Tragedy of Great Power Politics*, Norton, New York, 2001, p. 144.

<sup>6</sup> *Ibid.*

<sup>7</sup> See David, Steven R., 'Why the Third world Matters,' *International Security*, Vol. 14, No. 1, Summer 1989, pp. 50-85 and Steven R. David, 'Why the Third World Still Matters,' *International Security*, Vol. 17, No. 3, Winter 1992-93, pp. 127-159.

<sup>8</sup> See Matthews, Owen, 'Pipeline politics may backfire,' *Weekend Herald*, Auckland, January 20, 2007, p. B12.

<sup>9</sup> See Victor, David G. and Linda Yueb, 'The New Energy Order: Managing Insecurities in the Twenty-first Century,' *Foreign Affairs*, Vol. 89, No. 1, January/February 2010, p. 62.

<sup>10</sup> *Ibid.*

ecologically vulnerable and politically sensitive regions; plausibly, these will include the Arctic and Antarctica.

It is easy to treat the political and security environment of the two polar regions as distinctly different since they are geographically and geologically ‘worlds apart.’ However, the political and security differences that separate them today will likely lessen over the course of the twenty-first century as both climate change and resource scarcity forces society to consider the unconscionable; the intensive development and exploitation of first the Arctic and then Antarctica. Both governmental and non-governmental organisations predictive scenarios signal that serious consideration of this prospect has commenced by those charged with assessing the national security implications of a climatically warmer, resource constrained world.

The United States National Intelligence Council (NIC) is charged with identifying key drivers and developments likely to shape world events a decade or more in the future. While the NIC has made no predictions in its 2008 report with regard to what future awaits Antarctica, its predictions for the Arctic point to a radically changed physical and security environment for the region by 2025. The Council suggests that potential climate change winners out of the Arctic-rim countries are likely to be Canada and Russia.<sup>11</sup> A warming climate along with a cornucopia of resources should result in economic prosperity and enhanced geopolitical status. However, these advantages could be sullied by renewed interstate tensions and small-scale confrontations over contested territorial claims.<sup>12</sup> Also, while future developments in novel drilling techniques will create new opportunities to find and exploit previously unexplored ultra-deep oilfields, the application of such techniques in the Arctic could expose hydrocarbon reserves that lie within currently contested territory and thereby represent a high potential for interstate conflict.<sup>13</sup>

In 2009, the United States Department of Defense (DoD) when undertaking its quadrennial defense review concurred with a NIC assertion that “The 21<sup>st</sup> century will see momentous change in the international system” the result of

---

<sup>11</sup> National Intelligence Council, ‘Global Trends 2025: A Transformed World,’ *United States Government Printing Office*, Washington, D.C., November 2008, p. 52, [http://www.dni.govt/nic/NIC\\_2025\\_project.html](http://www.dni.govt/nic/NIC_2025_project.html) (23 November 2008).

<sup>12</sup> *Ibid.*, p. 55.

<sup>13</sup> *Ibid.*, p. 63.

globalisation and the emergence of new powers.<sup>14</sup> Among the challenges to the international system identified by the review is the rise in interstate tension within the global commons – sea, space, air and cyberspace.<sup>15</sup> The importance of these commons in security terms is underscored by Barry Posen, who maintains that “if grand strategists [in the United States or any other aspirant great power] wish to pursue an activist global foreign policy, then they must preserve command of the commons”<sup>16</sup> Flournoy and Brimley contend that as states grapple with problems ranging from economic crises to climate change and globalisation the ability to command or deny access to global commons will become a strategic necessity. Challenge to America’s self-assumed command of all global commons is becoming increasingly evident. For example, Flournoy *et al* suggest that America’s current command over the Arctic Ocean is under serious challenge by Russia,<sup>17</sup> while a similar allegation has been levelled at the Chinese by Hillary Clinton over China’s perceived desire to dominate outer space.<sup>18</sup>

One of the future strategic trends identified through the quadrennial review process that poses a significant challenge to the United States, and thus to its allies, is the possibility that rising powers will not be content to simply acquiesce to America’s role as uncontested guarantor of the global commons. Flournoy *et al* worry that countries such as China, India and Russia will demand a role in maintaining the international system commensurate with their actual or perceived power and national interests. As a consequence of this devolution in power, regions within the global commons that were once seen as secure, such as the Indian and Arctic Oceans, will become “new global centres of gravity.”<sup>19</sup> This is an acknowledgement that the strategic importance of the Polar Regions will likely grow during the twenty-first century.

---

<sup>14</sup> See Flournoy, Michéle and Shawn Brimley, ‘The Contested Commons,’ *Quadrennial Defense Review 2010*, The United States Department of Defense, 2009, [http://www.defense.gov/home/feature/2009/0509\\_qdr/flournoy-article.html](http://www.defense.gov/home/feature/2009/0509_qdr/flournoy-article.html) (4 August 2010). Michéle Flournoy is currently the Undersecretary for Defense (Policy) with responsibility for managing the Quadrennial Defense Review 2010, for the United States Department of Defense.

<sup>15</sup> *Ibid.*

<sup>16</sup> See Posen, Barry, ‘Command of the Commons: The Military Foundation of U.S. Hegemony,’ *International Security*, Vol. 28, No. 1, Summer 2003, p. 19.

<sup>17</sup> Flournoy *et al.*, *op. cit.*

<sup>18</sup> See Ross, Tim, Holly Watt and Christopher Hope, ‘China and US shoot satellites in standoff,’ *New Zealand Herald*, Auckland, February 4, 2011, p. A18.

<sup>19</sup> Flournoy *et al.*, *op. cit.*

Like the United States military, the United Kingdom Ministry of Defence has recently published a comprehensive review of future global strategic trends for a period extending out to 2040.<sup>20</sup> While this is a wide-ranging review of global strategic trends, it makes a specific comment about the Polar Regions by asserting that “...competition for resources **will** [emphasis in the original] increase the geostrategic importance of certain regions such as...the Polar Regions.”<sup>21</sup>

The Ministry of Defence foresees as a defining feature of the next three decades the constant tension between greater interdependence and intensifying competition between all levels of society, including the interstate level. This feature is likely to stimulate competing strategies among states in an environment where meeting resource demands will be difficult and as a consequence states are likely to pursue individual rather than multilateral solutions. In this quest for resources, specific regions, those most likely to hold deposits of resources, will eventually possess a geopolitical importance far in excess of their contemporary standing; these are the ‘pivotal regions’ of the future:

*Pivotal regions are those whose future paths are **likely** [emphasis in the original] to have an effect on global stability disproportionate to their geopolitical status. They represent significant strategic chokepoints, where trends have the potential to converge to give them importance out of proportion to their economic, political or demographic standing. These regions include...the Polar Regions....*<sup>22</sup>

The on-going search for alternative sources of energy, food and water is becoming more urgent. Consequently the commercial pressure to explore and eventually exploit extreme environments, such as the Polar Regions, is likely to significantly increase. This is even more probable given that the United States Geological Survey estimates that approximately fourteen per cent of the world’s yet to be

---

<sup>20</sup> See Ministry of Defence, ‘Global Strategic Trends – Out to 2040,’ Strategic Trends Programme, Fourth Edition, *Development, Concept and Doctrine Centre*, February 2010, pp. 1-168.

<sup>21</sup> *Ibid.*, p. 16.

<sup>22</sup> *Ibid.*, p. 59. That an event is *likely* to occur has a probability range of 60% to 90%.

discovered oil and natural gas reserves are likely to be located in the Arctic.<sup>23</sup> It is equally likely that similar pressure will be applied to Antarctica where littoral oil and gas reserves are known to exist.<sup>24</sup> While environmental restrictions and technological difficulties currently inhibit both polar exploration and exploitation, in the future resource shortages and climate change will be the decisive factors that persuade the global community to pursue commercial goals despite environmental limitations and societal constraints and concerns.

Exploitation of all extreme environments will not ultimately satisfy the ever increasing demand for natural resources. Supply disruptions caused by scarcity, hoarding or withholding of vital resources may cause conflict both between states and within states as groups vie for sovereignty and access. States that are unable to access the necessary materials to allow their population to survive and prosper, either through participation in international markets or bilateral arrangements, might resort to the use of force. Such risks will be considerably heightened once states are forced to adapt to the worst effects of climate change.

The insecurities created by interstate relations during the Cold War inspired Sam Hall to portray how the simple need to secure resources and protect citizens of the Arctic could readily cascade from a purely defensive endeavour to a world war. As climate change and resource scarcity drive states to consider the exploitation of the Polar Regions Hall's Cold War portrayal holds a message too poignant to be overlooked:

*Suddenly, [a]rctic wealth has become a military liability. In political terms, oil, gas, uranium and other valuable minerals, in addition to the growing number of Arctic residents, must be defended. Oil installations and pipelines are tempting targets for terrorists and saboteurs. Tankers and liquefied natural gas carriers operating in northern seas are vulnerable in times of war. Communications and supply lines to isolated cities must be protected. Yet this preparation of defences leads inevitably to the formulation of plans for attack and counter-attack, an unwritten law*

---

<sup>23</sup> See US Geological Survey, 'Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas Deposits North of the Arctic Circle,' *Factsheet 0349*, 2008.

<sup>24</sup> Westmeyer, *op. cit.*, p. 38.

*which has impelled defence chiefs in the United States, Canada, Scandinavia and the Soviet Union to develop the Arctic as the decisive battleground in the event of a future world war.*<sup>25</sup>

Although war has not erupted above the Arctic Circle in the three decades since Hall's caution, Arctic states still have no policies rooted in irenic ideals. Therefore, the political geography of the Arctic has changed little since the days of MacKinder. As a consequence, the Russian military still view the Arctic through a geostrategic lens, as confirmed by Rear Admiral V. Aleksin, who stated in the summer of 1995 "...he who controls the Arctic controls the world."<sup>26</sup> In the twenty-first century these words could ring equally true of Antarctica.

Although a war for territorial possessions or resources at either pole is not inevitable, conflict becomes more likely as polar warming renders previously undesirable regions susceptible commercial exploration and exploitation,<sup>27</sup> especially for those mineral that are becoming physically, politically or commercial unattractive to exploit elsewhere in the world. The melting of the Arctic sea ice, for example, has brought about an era of mounting competition over territory and resources both between Arctic-rim states and between these states and non-Arctic rim states. While to date, the majority of these disputes have been resolved peaceably or held in abeyance, this may not be so in the future.<sup>28</sup> The severity of any conflict in the Arctic, or indeed in Antarctica, will be a function of the degree to which the interests of the actors concerned are incompatible and the importance each actor attributes to the issue that divides them.<sup>29</sup> It is difficult to conceive anything that is more important than securing access to the resources that allow one's citizens to survive and prosper. In securing these resources states create a level of security interdependence amongst states with the same polar ambitions as themselves. It is these ambitions that will

---

<sup>25</sup> See Hall, Sam, *The Fourth World: The Heritage of the Arctic and its Destruction*, Bodley Head, London, 1987, p. 203.

<sup>26</sup> Brubaker, R. Douglas and Willy Østreng, 'The Northern Sea Route Regime: Exquisite Superpower Subterfuge?' *Ocean Development and International Law*, No. 30, 1999, p. 304.

<sup>27</sup> Ministry for Defence, *op. cit.*, p 115.

<sup>28</sup> See Harrington, Caitlin, 'Eyeing up the new Arctic,' *Janes Defence Weekly*, Vol. 45, No. 3, 16 January 2008, p. 24. Also see James Graff, 'Fight for the Top of the World' *Time*, No. 38, October 1, 2007, pp. 20- 27.

<sup>29</sup> See Osherenko, Gail and Oran R. Young, *The Age of the Arctic: Hot Conflicts and Cold Realities*, Cambridge University Press, Cambridge, 1989, p. 169.

ultimately compel states to coalesce into either a single polar regional security complex or a number of complexes depending upon the relevant importance of the issues under contest. Such is the growing importance of energy and non-energy resource security that a resource-inspired security complex could evolve into a shatterbelt, especially if antagonistic great powers seek to turn a minor regional imbroglio into a theatre of conflict.

While this chapter has highlighted a number of issues that may shape the future of the Polar Regions, these issues are but influences to be tested against the *essential elements*. Those six elements are recalled below:

1. *boundary, which differentiates the SC from its neighbours;*
2. *anarchic structure, which means that the SC must be composed of two or more autonomous units, but geographical contiguity is not mandatory;*
3. *polarity, which covers the distribution of power among the units;*
4. *social construction, which covers the patterns of amity and enmity among the units;*
5. *the intensity of security externalities on both regional and non-regional units; and*
6. *competition for control over a geographic region by strategically important states is indicative of a 'shatterbelt region' that can overlay security complexes, unstructured security regions or a grouping of the two.*

Part III consists of three chapters. The first, Chapter Thirteen pertains to the Arctic, concentrating quite narrowly on the current political setting, its rising import created by natural resources and its increasing geostrategic importance. Since Antarctica shares many of the Arctic's geostrategic and geopolitical characteristics it is conceivable that both polar regions could share the same fate. Thus, Chapter Fourteen explores a compendium of topics, ranging from Antarctica's political architecture to the impact of climate change, and from the governance exerted by the Antarctic Treaty to the availability of natural resources. The third chapter, Chapter Fifteen, draws upon all that has been raised and discussed in preceding chapters to either affirm or deny a hypothesis that by 2035 states with polar interests will have been forced by mutual security concerns to coalesce into a new regional security structure, the manifestation of which could be as a collage of security complexes or in the worst-case as a shatterbelt.



## Chapter Thirteen

### The Arctic: The High North

#### Militarisation of the Arctic wilderness

During the early decades of the twenty-first century, the Arctic could act as a window through which one could observe the probable changes awaiting Antarctica further into the future. This would be a role reversal for, during the first half of the twentieth century Antarctica was deemed more strategically important than the High North. Prior to the Second World War the Arctic region was, from a military view point, one of the few remaining unexploited regions of the world. Militarily, the region was considered benign because Nature single-handedly took care of the security for all Arctic Ocean littoral states.<sup>1</sup>

Unlike Antarctica, where latitude 60° South determines the northern geopolitical boundary of the southern polar region, there is no natural geographical delineator for the Arctic region. The Arctic Circle – at latitude 66 degrees 33 minutes North<sup>2</sup> is a datum line above which there is at least one 24-hour day of darkness and one 24-hour day of daylight each year – is popularly accepted as the boundary between the Arctic and sub-Arctic regions.<sup>3</sup> By this parameter the Arctic region encompasses about six per cent of the Earth's surface.<sup>4</sup> It is a region with an area in excess of twenty-one million kilometres squared, of which almost eight million kilometres squared is onshore and seven

---

<sup>1</sup> See Brubaker, R. Douglas and Willy Óstreg, 'The Northern Sea Route Regime: Exquisite Superpower Subterfuge,' *Ocean Development and International Law*, No. 30, 1999, p. 301.

<sup>2</sup> See Arctic Marine Shipping Assessment, 'Arctic Marine Geography, Climate and Sea Ice,' 29 April 2009, p. 19, [http://www.arctic.gov/publication/AMSA/arctic\\_marine\\_geography.pdf](http://www.arctic.gov/publication/AMSA/arctic_marine_geography.pdf) (17 August 2010).

<sup>3</sup> See Dunlap, William V., 'The Sector Principle of Arctic Jurisdiction: A Notion Apart,' in Clive Schofield, David Newman, Alasdair Drysdale and Janet Allison Brown (eds.), *The Razor's Edge: International Boundaries and Political Geography*, Kluwer Law International, The Hague, 2002, p. 240. This is simply an arbitrary method of defining the southern limits of the Arctic region. Other proposed means of defining the region are – the permafrost boundary, the tree line, a warmest month isotherm, a coldest month isotherm, or maximum or minimum extent of sea ice – but none seems to have any more relevance to jurisdictional issues than does the Arctic Circle. *Ibid.*, p. 241.

<sup>4</sup> See Gautier, Donald L., 'Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas North of the Arctic Circle,' *U.S. Geological Survey*, 2008, <http://pubs.usgs.gov/fs/2008/3049/> (31 August 2010).

million kilometres squared is on continental shelves under less than 500 metres of water.<sup>5</sup>

This problem of delimitation is compounded by the fact that unlike Antarctica, which is a continent surrounded by an ocean, the Arctic is an ocean surrounded by continents. Thus, the Arctic *per se* is not a landmass but a shallow ocean, which has a maximum depth of 4,665 metres.<sup>6</sup> This ocean is known for its broad continental shelf that extend 100 to 200 kilometres from the United States (Alaska) and Canada, and more than one thousand kilometres north from the Russian Federation. With an area of 14.056 million kilometres squared, the Arctic Ocean is the smallest of the world's five oceans. It is primarily an enclosed ocean with a limited exchange of deep water with other contiguous Oceans.<sup>7</sup>

A threshold often used to define the Arctic environment is that set by the ten degrees Celsius July isotherm – see Map 13. This isotherm marks the southern Arctic boundary where the monthly mean temperature in July is below ten degrees Celsius. Above this threshold the climate is described as being persistently cold with a relatively narrow annual temperature range varying, for example, in Greenland, from a summer high of 5.5° Celsius to a winter low of minus 35° Celsius.<sup>8</sup> Winters are cold, but with clear skies, while summers are characterized by damp and foggy weather interspersed with weak cyclones that bring rain and snow.<sup>9</sup> The terrain of the Arctic Ocean is characterized by drifting pack ice about three metres thick which is moving in a clockwise direction propelled by the Beaufort Gyral Stream. During the summer months the pack ice is surrounded by open seas, whilst during winter the area of pack ice doubles in size and encircles the adjacent land mass.<sup>10</sup> However, as of 2009, the Arctic sea ice cover is undergoing an extraordinary transformation that has significant implications for marine access and shipping throughout the Arctic basin.<sup>11</sup>

Politically, the Arctic Ocean does not define the Arctic region *per se*. If the Arctic Circle represents the political perimeter of the Arctic region then only six

---

<sup>5</sup> *Ibid.*

<sup>6</sup> See Feldman, Gene Carl, 'Arctic Ocean Geography,' *Smithsonian Institute*, 1994, [http://seawifs.gsfc.nasa.gov/OCEANPLANET/HTML/oceanography\\_geography\\_Arctic.html](http://seawifs.gsfc.nasa.gov/OCEANPLANET/HTML/oceanography_geography_Arctic.html) (17 August 2010).

<sup>7</sup> Arctic Marine Shipping Assessment, *op. cit.*, p. 16.

<sup>8</sup> *Ibid.*, p. 24.

<sup>9</sup> Feldman, *op. cit.*

<sup>10</sup> *Ibid.*

<sup>11</sup> Arctic Marine Shipping Assessment, *op. cit.*, p. 25.

countries – the United States, Canada, Greenland (Denmark), Iceland, Norway and Russia are Arctic states.<sup>12</sup> However, if less precise markers were used to delineate the region's southern margin, for example the northern extremity of taiga biome or the natural southern maxima of the indigenous peoples, then two additional countries would qualify as Arctic states – Finland and Sweden.<sup>13</sup> However, these two countries are not usually considered to be Arctic-rim states.

The loosening of Nature's grip on Arctic security was observed by the British journalist H. P. Smolka during a visit to the Soviet Arctic in 1937. Smolka was convinced that the Soviet Union was systematically undertaking the militarisation of the Arctic Ocean. Based on these observations, Smolka correctly predicted that the Soviet Union would make Murmansk their principal naval base in Europe, the Northern Sea Route (NSR) an artery for naval vessel transfers between the Atlantic and Pacific Oceans and the ocean column beneath the Arctic sea ice an area for submarine operations.<sup>14</sup> The usefulness of the NSR as a means of providing a safe passage for shipping in the time of war was aptly illustrated by the voyage of the German commerce raider *Komet*. In the summer of 1940, the *Komet* travelled without official Soviet permission, and undetected by the allies, from the Barents Sea to the Bering Strait in order to gain access to the Pacific Ocean where it successfully conducted a merchant raider's war.<sup>15</sup>

Early in the twentieth century, a British geographer, Halford MacKinder identified a vast sweep of Eurasia including all of the Soviet Union south of the Arctic Ocean, but minus the territory east of the Yenisei River, as the pivotal heartland from which world domination could spring.<sup>16</sup> While the geopolitics of the 1920s and early 1930s was not embraced by either British or American strategic thinkers, MacKinder's views did attract the attention of German

---

<sup>12</sup> See Bloomfield, Lincoln P., 'The Arctic: Last Unmanaged Frontier,' *Foreign Affairs*, Vol.60, No.1, 1981, p. 89.

<sup>13</sup> See Chaturvedi, Sanjay, *The Polar Regions: A Political Geography*, John Wiley, Chichester, 1996, p.15.

<sup>14</sup> See Smolka, H. P., 'Soviet Strategy in the Arctic,' *Foreign Affairs*, Vol. 16, No. 2, 1938, pp. 272-278.

<sup>15</sup> See Armstrong, Terence, 'The Voyage of the *Komet* along the Northern Sea Route,' *Polar Record*, Vol. 35, 1949, pp. 291-295.

<sup>16</sup> See 'Democratic Ideals and Reality,' 2004, <http://geography.about.com/library/misc/mackinder.htm?terms=political+theory> (10 February 2004).

geopoliticians, notably Karl Haushofer.<sup>17</sup> It still remains unclear whether MacKinder's "Heartland" theory influenced Hitler's global strategy,<sup>18</sup> suffice to note that in June 1941 the German army, the Wehrmacht, attacked the Russian heartland in a campaign known as *Operation Barbarossa*.



**Map 13.** The Arctic Region.  
Source: CIA Atlas, 1999.

<sup>17</sup> See Sempa, Francis P., 'MacKinder's World,' [http://www.geocities.com/eurasia\\_uk/macworld.html](http://www.geocities.com/eurasia_uk/macworld.html) (10 February 2004).

<sup>18</sup> *Ibid.*



The strategic importance of Arctic Scandinavia was recognized by both the Allies and Axis powers at the outset of the Second World War. For the Allies, occupation of northern Norway presented an opportunity to deny Germany seaports from which it could export Swedish iron ore back to Germany. For Axis powers, the invasion of Norway provided access to the Gällivare iron ore deposits of northern Sweden, which the Allies were intent on denying them.<sup>19</sup> Hence, the Norwegian Campaign can be viewed, at least in part, as a resource war. Once the Soviet Union joined the Allied powers in 1941, Norway's Atlantic seaports provided Germany with sheltered bases from which its navy could interdict allied convoys that shuttled military supplies between Great Britain and the Soviet military complexes on the Kola Peninsula. Just the mere presence of two German capital ships – *Tirpitz* and *Scharnhorst* – in Norwegian waters caused Great Britain in the early years of the war to overreach its ability to prosecute naval warfare worldwide.<sup>20</sup> As the Cold War emerged from the fading ghost of the Second World War, two superpowers – the United States and the Soviet Union – began to view the Arctic through a new geopolitical lens: a lens created by two nuclear explosions half a world away in Japan.

### **A Cold War in a cold place**

The impact of the Cold War on the Arctic needs to be examined in light of the prevailing regional and global context of one of the greatest power struggles of the twentieth century. While the Cold War meant many things to many people, geopolitically, it meant that the United States along with its Western allies, were in a crusade against an 'evil' communist empire intent on territorial and ideological expansion into Eurasia, including all of the Arctic-rim lands.<sup>21</sup> Given Western rhetoric, the Soviet Union naturally sought additional territory to buffer itself against American militarized capitalism. Under such tension, the Cold War became a zero-sum game marked by fear and suspicion with both superpowers gripped by a totalitarian image of the other.<sup>22</sup> National interest on both sides of this ideological schism was intertwined with security, where security was defined

---

<sup>19</sup> See Churchill, Winston S., *The Second World War: The Gathering Storm*, The Reprint Society, London, 1948, p. 487.

<sup>20</sup> See Woodward, David, *The Tirpitz*, William Kimber, London, 1953, pp. 133-180.

<sup>21</sup> Chaturvedi, *op. cit.*, p. 84.

<sup>22</sup> *Ibid.*, p. 86.

as the ability to keep the potential adversary from making either territorial gains or ideological converts at the expense of one's own interests. For the United States this schism became synonymous with the foreign policy advocated by George Kennan, which centered on the "long term, patient but firm and vigilant containment of Russian expansionist tendencies."<sup>23</sup>

The era of Soviet containment coincided with the beginning of a period when political interest in the Arctic underwent a dramatic transformation, ultimately foreclosing all options for cooperation in both the military and non-military realms. As if to defy the past when most strategists considered the Polar Regions to be the wrong place for large military operations,<sup>24</sup> the policy of containment forced both superpowers to consider the Arctic the key geostrategic deployment area in any future global contest. Ultimately, geography determined the strategic importance of the Arctic. Lying at the top-of-the-world, the Arctic provides the shortest route between three continents – Asia, Europe and North America. With core industrial regions in Europe, Russia, the United States and Japan lying within seven thousand kilometres of the North Pole, the strategic importance of the Arctic throughout the Cold War era remained undiminished.<sup>25</sup> It is also difficult to overlook the fact that the United States and Russia are immediate neighbours in the Arctic, being just a mere ninety-one kilometres distant at the Bering Strait.

The dramatic transformation of the Arctic from Nature's kingdom to the military frontline gained impetus following the 1962 Cuban missile crisis when the Soviet Union launched an ambitious development programme to strengthen its navy. The goal of this programme was to enable to Soviet navy to the match the naval capability of the United States wherever and whenever necessary. The Soviet Northern Fleet, based well within the Arctic Circle along the Kola Peninsula, benefitted enormously from this naval construction programme, which continued with undiminished haste throughout the 1970s and 1980s. By the mid-1980s no ocean in the world had a higher concentration of naval vessels than the Barents Sea, where the Northern Fleet located 203 submarines and 220 surface

---

<sup>23</sup> See Evans, Graham, *The Penguin Dictionary of International Relations*, Penguin Books, London, 1998, p. 96.

<sup>24</sup> Chaturvedi, *op. cit.*, p. 88.

<sup>25</sup> *Ibid.*

combatants.<sup>26</sup> Although vessel numbers have decline dramatically since the late 1980s, the Northern Fleet still remains a potent naval force.<sup>27</sup>

As the enmity between the two Cold War superpowers deepened, new means of launching nuclear weapons were developed with missile launching submarines quickly replacing aircraft as the preferred weapons platform. Initially, the Soviet Union could not match the technological sophistication and range of the American submarine-launched ballistic missiles (SLBM) and was forced to dispatch, at great risk, its own nuclear-powered ballistic missile submarines (SSBN) into the mid-Atlantic through the ‘choke-point’ formed at the Greenland-Iceland-United Kingdom (GIUK) gap. However, with improvements in missile technology the Soviet Union gained a strategic advantage *vis-à-vis* its Western adversaries by being able to retain their highly valued SSBNs within a heavily defended bastion in the Barents Sea under the Arctic pack ice.<sup>28</sup> By the mid-1970s, the Soviet navy was able to operate its principal SLBMs – *Typhoon* and *Delta* class submarines – throughout the majority of the Arctic Ocean<sup>29</sup> while the United States was forced to commit its nuclear-powered attack submarines (SSNs) to missions deep within a secure Soviet submarine bastion.

Nuclear deterrence during the Cold War<sup>30</sup> required the establishment of numerous surveillance systems, a number of which were located in the Arctic. Each superpower needed the other to know that any attack on their homeland would be detected in time for a counterattack to be launched. In order to provide credibility to this belief both adversaries needed to have dependable surveillance

---

<sup>26</sup> Brubaker *et al.*, *op. cit.*, p. 302.

<sup>27</sup> The steady decline in Russian naval power after the collapse of the Soviet Union resulted in a marked reduction in combatant units. As of 2008 the Russian navy comprised 230 combatants with an average age of twenty-one years. Evidence available in 2009 would indicate that a concerted effort is being made by the Russians to reverse this decline. This is further evidenced by comments made by President Dmitry Medvedev in January 2009, that despite the financial downturn, plans to expand and modernize the navy would proceed. Therefore, Milan Vego maintains that the Russian navy’s “future role will increase, if for no other reason than Moscow’s firm determination to restore Russia as a great power.” See Vego, Milan, ‘The Russian Navy Revitalized: Moscow will use sea power in its quest for greater world influence,’ *Armed Forces Journal*, April 2009, <http://www.armedforcesjournal.com/2009/04/3989255> (13 August 2010).

<sup>28</sup> See Nilssen, Lawrence R., ‘Nordic NATO in transition: Towards turbulence in the 1990s?’ *Airpower Journal*, Summer 1988. <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj88/sum88/nilssen.html> (16 August 2010).

<sup>29</sup> See Ries, Tomas, ‘Soviet Military Strategy and Northern Waters,’ in Clive Archer (ed.), *The Soviet Union and Northern Waters*, Routledge, London, 1988, p. 98.

<sup>30</sup> See Waltz, Kenneth N., ‘Nuclear Myths and Political Realities,’ *The American Political Science Review*, Vol. 84, No. 3, September 1990, pp. 731-745.

systems as far north as possible. With regard to the siting of radar stations, the Soviet Union held an advantage for it could position its early-warning *Hen House* and large phased-array missile-tracking radars around the country's north-west periphery. The United States, rather than confining its early-warning radar systems to within central forty-eight states, was required to deploy its phase-array surveillance radar assets in Alaska, Greenland and the United Kingdom.<sup>31</sup> Therefore, the Arctic was the critical strategic location for both fighting an intercontinental nuclear war and avoiding it.

### **The post-Cold War Arctic**

The collapse of the Soviet Union brought to an end the Cold War and both superpowers allowed their military forces to dissipate. Among the NATO northern allies, Canada, Denmark and Norway took immediate action to garner the economic advantage any "peace dividend" offered.<sup>32</sup> The United States, of all Arctic states, retained the largest and most capable Arctic navy and air force. The former Soviet Union's navy rapidly dwindled to a fraction of its former capability as it dealt with its newly diminished powers.<sup>33</sup>

The reduction in naval capabilities did not bring to an end the practice of aggressive surveillance operations undertaken by submarines operated by either the United States navy or that of the navy of the newly formed Russian Federation.<sup>34</sup> Nor did the assumed reduction in capabilities greatly reduce the number of ex-Soviet bomber aircraft available to the Russian Federation. Thus, the United States, in particular, felt the need to retain aircraft detection facilities and hence to maintain the North America Aerospace Defense Command (NORAD) until the commissioning of the highly automated Northern Warning System.<sup>35</sup>

During the decade and a half following the end of the Cold War, attention shifted from military security to environmental security among the circumpolar

---

<sup>31</sup> See Lindsey, George, *Strategic Stability in the Arctic*, Adelphi Papers 241, The International Institute for Strategic Studies, London, 1989, p. 9.

<sup>32</sup> See Young, Oran R., 'Governing the Arctic: From Cold War Theatre to Mosaic of Cooperation,' *Global Governance*, No. 11, 2005, p. 9.

<sup>33</sup> See Huebert, Rob, 'Canadian Arctic Security Issues: Transformation in the post-Cold War era,' *International Journal*, No. 54, Spring 1999, p. 203.

<sup>34</sup> *Ibid.*, p. 217.

<sup>35</sup> *Ibid.*, p. 212.



states as their focus became directed towards protecting the Arctic environment. This change in emphasis created the Arctic Environmental Protection Strategy (AEPS), a Finnish initiative that has become subsumed within the responsibilities allotted to the Arctic Council.<sup>36</sup> This redirection of attention enabled most of the Arctic states to shift their focus from matters military to concerns associated with constabulary duties, such as environmental protection and fishery patrols.<sup>37</sup> Concern for the environment also led to one of the more significant international security actions undertaken by the Arctic states the safe decommissioning of the Russian government's nuclear-powered submarine force. With the collapse of the Russian economy following the disintegration of the Soviet Union, the Russian armed forces fell into disarray and submarines were allowed to decay within the confines of their naval base. International concern over this situation grew once Western nations realized that the nuclear reactors left on board these submarines could suffer a meltdown thereby posing a serious environmental threat. It was left to the United States, Norway and Russia to properly decommission these submarines and to safely store the radioactive materials.<sup>38</sup>

Furthermore, during this period Arctic states reduced the military forces they had previously deployed in the region, curtailed or eliminated Arctic military exercises; and gave the appearance of having stopped developing policies that were directed towards operations in the Arctic. For example, Canada, not only cancelled plans to purchase a significant number of nuclear-powered submarines and heavy-duty ice breakers, but also ended, or significantly curtailed its military forces' Arctic operation.<sup>39</sup> The military confrontation in the Arctic, which began in the Second World War, was now conveniently confined to history.

---

<sup>36</sup> *Ibid.*, p. 207.

<sup>37</sup> See Mychajlyszyn, Natalie, *The Arctic: Canadian Security and Defence*, PRB 08-13E, Ottawa: Parliamentary Information and Research Service, October 24, 2008, <http://www2.parl.gc.ca/content/LOP/ResearchPublication/prb0813-e.htm> (16 August 2010).

<sup>38</sup> See Huebert, Rob, 'The Newly Emerging Arctic Security Environment,' *The Canadian Defence & Foreign Affairs Institute*, Calgary, March 2010, p. 3.

<sup>39</sup> See Carnaghan, Matthew and Allison Goody, *Canada Arctic Sovereignty*, PRB 05-61E, Ottawa: Parliamentary Information and Research Service, January 26, 2006, <http://www2.parl.gc.ca/content/LOP/ResearchPublication/prb0561-e.htm> (17 August 2010). The Canadian Defence White Paper of 1987 contained a provision to purchase 10-12 nuclear-powered submarines and "polar class 8" icebreakers that could operate in the Arctic year-round. These costly programmes were reversed at the end of the Cold War. Underwater surveillance capabilities have been subject to continuing debate, considering potential incursions into Canadian territorial waters by British, French, Russian, United States and presumably Chinese nuclear submarines.

### **Geopolitics of a resource-rich wilderness**

The origins of geopolitics in the Arctic extend back nearly five centuries to the pressing need for resources (whale oil) and the discovery of the Spitsbergen Archipelago by the Dutch mariner W. Barents in 1556.<sup>40</sup> The Spitsbergen Archipelago, or as it is now known the Svalbard Archipelago, is collection of islands lying approximately midway between northern Norway and the North Pole. Spitsbergen (previously known as West Spitsbergen) is the largest island in the archipelago and contains abundant reserves of coal and other minerals, including potentially significant offshore reserves of oil and natural gas. A noteworthy feature of the archipelago is that it is devoid of an indigenous population.

Following the discovery of larger schools of whales within the boundary of the archipelago, there were sharp clashes between English and Dutch whalers. As a result the English whalers persuaded the King of England to annex the islands so they could carry out whaling undisturbed by nationals of other countries. However, such annexation was contested by the Dutch, who being at the height of their seafaring primacy, effectively challenged English supremacy in Svalbard whaling. The Dutch challenge effectively ended the English presence in these northern waters and their claims to sovereignty over the archipelago. As stocks of whales became depleted in the waters around Spitsbergen, the Dutch were forced to find other areas of operation, thus leaving only Denmark-Norway to maintain an interest in the archipelago, and a claim to its sovereignty. Once the whalers sought their prey elsewhere, Arctic sealing became the industry of choice and thus of considerable importance to the population of northern Norway. However, sealing like whaling was an unsustainable industry and eventually Norwegian commercial interests focused their attention on the coprolite deposits on West Spitsbergen.<sup>41</sup>

Historical disputes over sovereignty diminished with the demise of whaling and a proposal to colonize the archipelago by Sweden-Norway was favourably received by other European states, except Russia. By the third-quarter of the

---

<sup>40</sup> *Chaturvedi*, op. cit., p. 55.

<sup>41</sup> *Ibid.*, p. 56. Coprolite is fossilized animal droppings which are high in phosphates making them valuable as a fertilizer. Worldwide, coprolite mining went into decline during the 1880s, only to be revived during the early years of the First World War as a source of phosphate for explosive and munitions manufacture.

nineteenth century an understanding was reached between Sweden-Norway and Russia to treat the archipelago as *terra nullius*, or no man's land, which up to that time had been the de facto situation. In 1906, the newly independent state of Norway reaffirmed its commitment to *terra nullius* for Svalbard. Almost immediately there was keen competition for space and resources on the archipelago and the very notion of no man's land came under stress. What was needed was a system of laws and administration for a large, resource-rich Arctic region with no indigenous population, while at the same time preserving the archipelago as 'open territory.'<sup>42</sup> Unfortunately no model existed.<sup>43</sup>

In 1909, Norway took the initiative of organizing a conference of all the powers interested in Spitsbergen. However, Russia, supported by Sweden, insisted on preliminary negotiations or *pourparlers* between the three powers in order to prevent any involvement by the United States, whose nationals had commercial interests on Spitsbergen. What eventually emerged from the *pourparlers*, was an agreement in principle that the archipelago was to remain *terra nullius* and the sovereign territory of no state, while remaining open to citizens of all states. Land was to remain public property, with rights of occupation exclusively restricted to those people exploiting natural resources.<sup>44</sup> However, "other interested" powers – those states whose citizens historically frequented the archipelago for the purpose of resource exploitation – failed to endorse this proposal, effectively scuttling any international agreement covering the administration of the archipelago.<sup>45</sup>

In early 1919, at the Paris Peace Conference following the First World War, Norway requested that the Spitsbergen question be considered and that the archipelago be allocated to Norway. A special commission duly drafted a treaty by which contracting powers recognize Norwegian sovereignty over the archipelago, subject to certain limitations, including equal rights of access to resources by nationals of signatory powers and provided for the demilitarisation of the islands.<sup>46</sup> Only the Soviet Union of all the First World War allies expressly sought to void the treaty, but ultimately it too signed away its sovereignty rights

---

<sup>42</sup> *Ibid.*, p. 57.

<sup>43</sup> See Singh, Elen C. and Artemy A. Saguirian, 'The Svalbard Archipelago: The Role of Surrogate Negotiators,' in Oran R. Young and Gail Osherenko (eds.), *Polar Politics: Creating International Environmental Regimes*, Cornell University Press, Ithaca, 1993, p. 58.

<sup>44</sup> *Ibid.*, p. 59.

<sup>45</sup> Chaturvedi, *op. cit.*, p. 58.

<sup>46</sup> Singh *et al.*, *op. cit.*, p. 66.

over the archipelago. Although the strategic location of the islands was not of major importance in 1919, subsequent actions, especially by the Soviet Union, have become increasingly strategic, for the archipelago has since the 1970s abutted the principal launch area for Soviet and then Russian nuclear-powered ballistic missile submarines.<sup>47</sup> Furthermore, serious stresses are likely to be placed on the treaty arrangement if offshore oil and gas reserves are found beneath the continental shelf upon which the archipelago is located.<sup>48</sup>

While there is no doubt that Norway, with sovereignty over the archipelago, would have regulatory jurisdiction over resources within the maritime zone, questions arise about the operating conditions other states might be required to comply with. Should provisions of the Svalbard Treaty apply, then nationals from other countries are entitled to equal access and rights of exploitation on favourable conditions. If Treaty limitations do not apply beyond Norwegian maritime territorial limits, then the general principle of exclusive coastal state rights will apply. Given the potential economic value involved, any disagreement over which state holds rights to those resources beneath the continental shelf could readily spark interstate conflict.<sup>49</sup>

The Norwegian position is that treaty provisions cannot be interpreted to extend beyond the shoreline and out into the maritime area. The Norwegians argue that the continental shelf surrounding the archipelago is nothing more than an extension of Norway's own continental shelf. If this argument is accepted, then Norway has exclusive sovereignty over seabed resources within the two-hundred nautical miles Exclusive Economic Zone (EEZ) surrounding the archipelago.<sup>50</sup> At present, no other signatory party to the Svalbard Treaty openly supports Norway's claim, while some, Russia for example, strongly contest it.<sup>51</sup> On several occasions, dating back to 1986, the British Foreign Office has supported Russia through its claim that Svalbard had its own continental shelf, the extent of which had not

---

<sup>47</sup> Archer, *op. cit.*, p. 98.

<sup>48</sup> Singh *et al.*, *op. cit.*, p. 70.

<sup>49</sup> See Sollie, Finn, 'The Soviet Union in Northern Waters-Implications for Resources and Security,' in Clive Archer (ed.), *The Soviet 36. Union and Northern Waters*, Routledge, London, 1988,

<sup>50</sup> See Anderson, Alun, *After the Ice: Life, Death and Geopolitics in the New Arctic*, HarperCollins, New York, 2009, p. 120.

<sup>51</sup> See Claes, Dag Harald, Øyvind Østerud and Øistein Harsem, 'The New Geopolitics of the High North,' *Paper presented at the 51<sup>st</sup> ISA Convention in New Orleans*, February, 18, 2010, p. 4.

been determined.<sup>52</sup> At its heart this dispute revolves around the desire by certain states to have the same access rights as Norway to Svalbard's waters in the event that the region becomes available for hydrocarbon exploration and exploitation.

Svalbard is not the only area under contest. Some disputes have been resolved amicably, usually through international arbitration, in the same way that, in 1931, Norway formally acknowledged Canadian sovereignty over the Sverdrup Islands in the Arctic.<sup>53</sup> However, others remain unresolved and thus a potential source of conflict.

One of the ongoing controversies in the Southern Arctic is where does the maritime border between Canada and the United States lie in the Beaufort Sea. For the United States the border should lie at the perpendicular angle to the coastline, about thirty degrees to the east. Canada insists that the border should replicate that agreed by treaty in 1825 between Russia and Great Britain, which defines the eastern border of Alaska as the meridian line of the 141<sup>st</sup> degree. On Map 14, the disputed area appears as an insignificant wedge, but physically represents an area in excess of 18,000 kilometres squared, which could be incredibly important to either country given that geologists suspect it harbours considerable reserves of natural resources.<sup>54</sup>

Canada is also involved in another dispute over territory, this time with Denmark. Han Island is a tiny uninhabited island barely measuring two kilometres across and is at the centre of an international dispute over whether Greenland (Denmark) or Canada holds sovereignty. This international boundary dispute takes on great significance for two reasons. First, these waters abound with fish stock, including turbot and shrimp and the boundary will affect the division of these resources. Secondly, since the impact of climate change is expected to cause substantial warming of the polar region this geophysical change could open up the island and waters immediately surrounding it to petroleum exploration. This territorial disagreement has sometimes escalated into bitter squabbling that on occasions has resulted in military posturing and brinksmanship.<sup>55</sup>

---

<sup>52</sup> See Howard, Roger, *The Arctic Gold Rush: The New Race for Tomorrow's Natural Resources*, Continuum, London, 2009, p. 57.

<sup>53</sup> *Ibid.*, p. 55.

<sup>54</sup> *Ibid.*, p. 54.

<sup>55</sup> See Huebert, Rob, 'The Return of the "Vikings",' in Fikret Berkes, Rob Huebert, Helen Fast, Micheline Manseau, and Alan Diduck (eds.), *Breaking Ice: Renewable Resource and Ocean Management in the Canadian North*, University of Calgary Press, Calgary, 2005, pp. 319-336.

South of the Svalbard Archipelago is the 'Grey Zone,' which is the location of yet another simmering border dispute. It revolves around the same issue as the Beaufort Sea controversy: the delineation of the border between maritime Russia and Norway. The Norwegians claim that drawing a 'median line' equidistant to the nearest point on each state's mainland would give the fairest outcome. The Russian claim, based largely on a Soviet order of 1926, maintain that the border should follow a more westerly line that would extend the existing Russian-Norwegian border straight up to the North Pole, bypassing the Svalbard Archipelago. An agreement between these two states over shared fishing rights within this area has failed to reduce tension over sovereignty of this disputed region.<sup>56</sup>

In several regions of the Barents and Norwegian Seas, various coastal states are making overlapping claims as to the size and limits of their continental shelves. These conflicting claims will ultimately need to be resolved to each state's satisfaction through the processes instituted by the United Nations Convention on the Law of the Sea if peace and cooperation is to be maintained. The same is equally true of areas of the far north into which the Arctic-rim states could claim, or have already claimed, that their continental shelves extend. There are some areas close to the North Pole where the claims made by Russia, Canada and Denmark could overlap.<sup>57</sup> However, what is now evident is that some non-Arctic states, for instance China, are questioning whether the Arctic-rim countries can legitimately take unto themselves the sole right to determine sovereignty issues in the Arctic, given the region's changing geopolitical environment arising "from the melting of the ice."<sup>58</sup>

Despite the current tension between states over sovereignty, peace and cooperation rather than conflict prevails in the region. However, this situation could readily change for, if as the United Kingdom Ministry of Defence claims, in the future the greatest likelihood of confrontation between great or major powers lies in contested regions, especially those in geo-strategic locations with significant resource potential or where spheres of influence overlap or touch. The

---

<sup>56</sup> Howard, *op. cit.*, p. 57.

<sup>57</sup> See Graff, James, 'Fight for the Top of the World,' *Time*, No. 38, October 1, 2007, p. 26.

<sup>58</sup> See Jakobson, Linda, 'Preparing for an ice-free Arctic (3),' *Chinadialogue*, April 21, 2010, <http://www.chinadialogue.net/article/show/single/en/3584-Preparing-for-an-ice-free-Arctic> (28 April 2010).

Arctic is identified as one such region, for its resource potential is beyond doubt and, as Map 14 illustrates, Arctic states jostle each other for legitimacy over sought-after maritime territory and the resources such territory may hold.<sup>59</sup> There is also another aspect to sovereignty in the Arctic that cannot be overlooked now that the world is entering an Energy-Climate Era: the right of free passage for shipping throughout an increasingly ice-free Arctic Ocean.

The centuries-long quest to find the fabled Northwest Passage, which could link the Atlantic and Pacific Oceans across northern Canada and has proved quixotic for generations of explorers, will likely become ice-free during the twenty-first century. If navigable, the Northwest Passage would cut eleven-thousand kilometres off the Europe-to-Asia route through the Panama Canal and nineteen-thousand kilometres off the trip around Cape Horn for those supertankers too large to transit the canal.<sup>60</sup> International interest in this 'new' shipping route has heightened Canadian concern over which, if any, single state has sovereignty over the Passage. For Canada this question is an issue of national security.

Norwegian explorer Roald Amundsen made the first complete transit of the Northwest Passage from 1903 to 1906. Forty years passed before the next ship, the Royal Canadian Mounted Police Schooner *St. Roch* completed the transit in 1942. Prior to the *Manhattan* Crisis of 1969, only eight surface ships and two nuclear submarines had successfully transited the Passage and the ship, the *Manhattan*, would be the first merchant ship to do so.<sup>61</sup> Several oil companies sponsored the experimental voyage of the oil-tanker *Manhattan* as a demonstration of the economic benefits that would accrue if Alaskan oil could be shipped directly from Prudhoe Bay to the North-eastern United States rather than via the trans-Alaskan oil pipeline and tanker to the United States. Initially, Canada endorsed this experiment for the success of the venture would also prove that commercial access to the mineral wealth of Canada's Arctic Archipelago and tanker transport from the Mackenzie Delta oil fields was possible.<sup>62</sup>

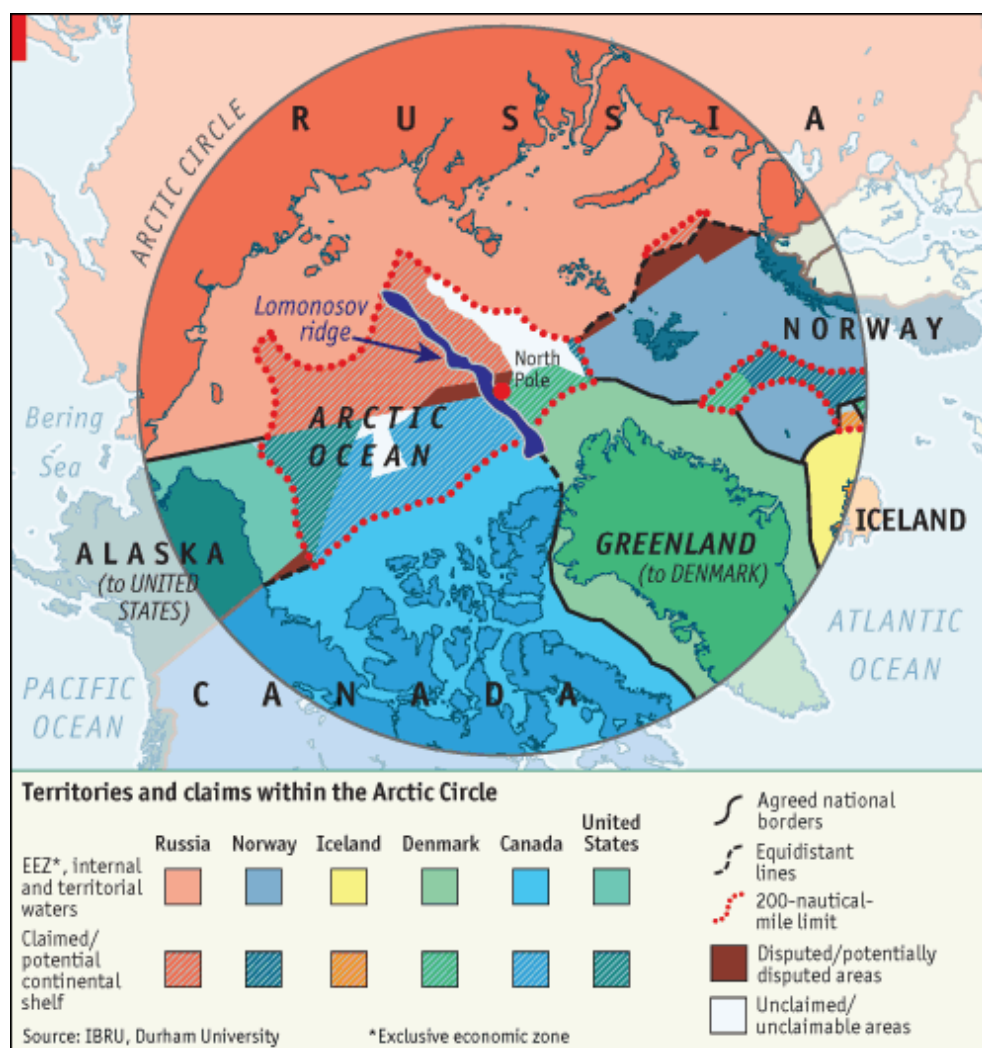
---

<sup>59</sup> See Ministry of Defence, 'Global Strategic Trends – Out to 2040,' Strategic Trends Programme, Fourth Edition, *Development, Concept and Doctrine Centre*, February 2010, p. 44.

<sup>60</sup> See Kerr, Richard A., 'A Warmer Arctic Means Change for All,' *Science*, Vol. 297, 30 August 2002, p. 1490.

<sup>61</sup> See Caldwell, Nathaniel French, *Arctic Leverage: Canadian Sovereignty and Security*, Praeger, New York, 1990, p. 45.

<sup>62</sup> *Ibid.*, p. 47.



**Map 14.** Map of the Arctic region showing boundaries of claimed & disputed territories. Source: United Kingdom Ministry of Defence, 2010, p. 63.

However, the question of sovereignty over the Northwest Passage placed the venture in jeopardy when the United States refused to accede to a Canadian request that the United States seeks permission for the *Manhattan's* transit. The United States did not wish to make an official request. Such a request might have given tacit acknowledgement of Canada's sovereignty over Arctic straits, thereby weakening the notion of freedom of passage through strategic straits around the world.<sup>63</sup> The accompaniment of a United States Coast Guard icebreaker tended to give the impression that the voyage had official United States sanction, which in itself contributed to public outrage in Canada.<sup>64</sup>

<sup>63</sup> See Joyner, Christopher C. 'United States Legislation and the Polar Oceans', *Ocean Development & International Law*, Vol. 29, 1998, p. 268.

<sup>64</sup> Caldwell, *op. cit.*, p. 47.



In an action prompted by the unwelcome voyage of the *Manhattan*, Canada, one year later, extended the outer limit of its territorial sea from three to twelve nautical miles. With this extension, Canada made it impossible for foreign shipping to use the Northwest Passage without entering Canadian territorial waters at some point during their transit.<sup>65</sup> In the mid-1980s, the United States once again challenged Canada's sovereignty over the Northwest Passage. The challenge came when the United States government ordered the Coastguard ship *Polar Sea* to transit the passage, having intentionally failed to give Canadian authorities prior notice of the voyage. As a consequence Canada redefined the boundaries of its territorial seas, but this time used the internationally recognised straight baseline system – as specified in the 1958 Geneva Convention on Territorial Sea.<sup>66</sup> An immediate effect of this change was that the entire sea area enclosed within the Canadian Arctic Archipelago became an integral part of Canadian territory. While the United States finally accepted, albeit with reservations, Canada's sovereignty over the sea area within the Arctic Archipelago, Canada's authority over this maritime area remains disputed by some member states of the European Community.<sup>67</sup> The Russian Federation has also adopted the straight baseline system to delimit its territorial seas. By so doing Russia has effectively prevented free passage along the Northern Sea Route, for it is impossible to travel this sea-lane without intruding into Russian territorial waters.<sup>68</sup>

Just as its Arctic policy prevents the United States from accepting Canada's sovereignty claim over the Northwest Passage, the same policy equally prevents America from accepting a similar claim made by the Russian Federation over the Northern Sea Route.<sup>69</sup> Reconciling these policies would appear impossible, especially given that Russian Federation Arctic Policy proclaims “the use of the Northern Sea Route as a *national* unified transport link of the Russian Federation

---

<sup>65</sup> See Churchill, Robin R. ‘Claims to Maritime Zones in the Arctic – Law of the Sea Normality or Polar Peculiarity?’ in Alex G. Oude Elferink, and Donald R. Rothwell, *The Law of the Sea and Polar Maritime Delimitation and Jurisdiction*, Martinus Nijhoff, The Hague, 2001, p. 109.

<sup>66</sup> See Scovazzi, Tullio, ‘The Baseline of the Territorial Sea: The Practice of the Arctic States’, in Alex G. Oude Elferink, and Donald R. Rothwell (eds.), *The Law of the Sea and Polar Maritime Delimitation and Jurisdiction*, Martinus Nijhoff, The Hague, 2001, p. 69.

<sup>67</sup> *Ibid.*, p. 78.

<sup>68</sup> *Ibid.*, p. 83.

<sup>69</sup> See Cohen, Ariel, ‘From Russian Competition to Natural Resource Access: Recasting U.S. Arctic Policy,’ *Background*, The Heritage Foundation, No. 2421, June 15, 2010, p. 9.

in the Arctic” to be in the national interest of Russia.<sup>70</sup> This divergence in policy mattered little when sea ice prevented all but small cargo ships from navigating the iceberg strewn Northern Sea Route during the brief Arctic summer. However, the geopolitics of the Northern Sea Route changed in the late summer of 2010 when a Russian liquid petroleum gas supertanker successfully navigated the Northern Sea Route carrying gas from Murmansk in Russia to Ningbo in China. Taking this route effectively reduced by one-third the distance the supertanker would have travelled if its passage was through the Suez Canal.<sup>71</sup>

This reduction in distance could make travel through the Northern Sea Route four times cheaper in terms of fuel and charter time than the conventional route from Europe to China and the rest of Asia via the Suez Canal and the pirate plagued African coast.<sup>72</sup> Commercial transport through the Arctic will become economically more attractive with the ready availability of a new class of double-acting ice-strengthen container ship able to traverse the region even during the winter months without the need for attendant icebreakers.<sup>73</sup>

When the ice recedes sufficiently, which could be within a decade or two, a marine highway over the North Pole could materialize.<sup>74</sup> This route would most likely run between Iceland and Alaska’s Dutch Harbour, connecting the shipping megaports of the North Atlantic with those in the North Pacific.<sup>75</sup> Already some states are foreseeing that the opening of this route will result in Iceland becoming a major maritime hub and in anticipation of this event, China, has significantly increased the size of its embassy staff to become the largest embassy in Reykjavik.<sup>76</sup> Other states consider a more direct shipping route would be one that links the Arctic port of Murmansk in Russia with the Hudson Bay port of Churchill in Canada, for the latter port is connected to the North American rail network.<sup>77</sup> The first of these alternate shipping routes would make both the

---

<sup>70</sup> *Ibid.* Emphasis in the original.

<sup>71</sup> See Mason, Rowena, ‘Tanker’s voyage opens way for shipping shortcut,’ *New Zealand Herald*, Auckland, September 2, 2010, p. A18.

<sup>72</sup> *Ibid.*

<sup>73</sup> See Arctic Marine Shipping Assessment, ‘Scenarios, Futures and Regional Futures to 2020,’ 29 April 2009, p. 102, [http://www.arctic.gov/publication/AMSA/arctic\\_marine\\_geography.pdf](http://www.arctic.gov/publication/AMSA/arctic_marine_geography.pdf) (28 August 2010).

<sup>74</sup> See Borgerson, Scott G., ‘Arctic Meltdown: The Economic and Security Implications of Global Warming,’ *Foreign Affairs*, Vol. 87, No. 2, March/April 2008, p. 70.

<sup>75</sup> *Ibid.*

<sup>76</sup> Jakobson (3), *op. cit.*

<sup>77</sup> Borgerson, *op. cit.*, p. 70.

Northern Sea Route and Northwest Passage redundant as a prospective transcontinental shipping lane. Conversely, both shipping routes would make more pressing the need to resolve the issues of territorial sovereignty beyond existing exclusive economic zones, for with sovereignty comes a responsibility for the safety of mariners and the ships they sail.

### **Geopolitics of climate change**

Cold War geopolitics in the Arctic lost its salience with the collapse of the Berlin Wall. As a result high politics within Arctic-rim countries was redirected away from the Arctic to more pressing global security issues, culminating in the War on Terrorism. But the Arctic's strategic location, immense resource wealth and disappearing icecap has now reasserted its prominence as a region of heightened national interest to both Arctic and non-Arctic states alike. Although a melting Arctic holds great promise, it also poses grave dangers. The combination of new shipping routes, the promise of considerable wealth from oil and gas reserves and a poorly defined picture of state ownership make for a "toxic brew."<sup>78</sup>

The situation is especially precarious because there are currently no overarching political or legal structures that can provide for the orderly development of the region or mediate political disagreements. The Arctic Council only addresses environmental issues because the United States purposefully emasculated it at conception by prohibiting it from addressing security concerns. It is argued that the United Nations Convention on the Law of the Sea provides mechanisms for states to settle boundary disputes and submit claims to resources beyond their Exclusive Economic Zones. However, according to Borgenson, the Convention cannot be seamlessly applied to the Arctic, for the region's unique geographic circumstances do not allow for a neat application of its legal framework.<sup>79</sup> The Arctic is home to a number of vexing problems, some of which have been discussed previously, which, when taken in their entirety, make the region a special case. While the Antarctic Treaty might provide some valuable lessons, this treaty is pertinent to a continent not an ocean, and the negotiations that gave birth to it unfolded in an entirely different era.<sup>80</sup> Few of today's Arctic

---

<sup>78</sup> *Ibid.*, p. 71.

<sup>79</sup> *Ibid.*, p. 72.

<sup>80</sup> *Ibid.*, p. 73.

challenges that so vex the international community would have arisen but for climate change.

Warming in the Arctic is causing change to nearly every part of the physical climate system. Manifestation of these changes is becoming increasingly apparent and will likely have a considerable geopolitical impact as climate change becomes increasingly more severe. Although climatologists have long appreciated that changes in the Arctic would be faster and more intense than elsewhere on Earth, the degree and speed of those changes has been underestimated.<sup>81</sup>

The most obvious change has been the rise in atmospheric temperature. Annual average temperatures have increased at almost twice the rate as that of the rest of the world over the past few decades. The rise is especially evident in winter and particularly in Alaska and western Canada where temperature has risen by three to four degrees Celsius over the past fifty years. Paralleling the rise in temperature is an increase in precipitation. Precipitation has increased by about eight per cent over the past century with much of this increase falling as rain, especially during autumn and winter months. A stark consequence of increased rainfall has been a rise in river flows and a decline in snow cover. Indeed, snow cover has declined by approximately ten per cent over the past thirty years.<sup>82</sup>

The severity of climate change on the Arctic terrestrial environment is fittingly demonstrated by the early break-up of lake and river ice, the rapid melting of glaciers, especially in Alaska, and the thawing of permafrost throughout the polar region. Over recent decades permafrost has warmed by up to two degrees Celsius, with the depth of the layer that thaws increasing year by year. Possibly, the most serious impact of Arctic warming in a global context is the area of the Greenland Ice Sheet subjected to summer melting. In volume, the Greenland ice sheet equals ten per cent of the world's freshwater and should it melt entirely global sea levels would rise by about seven meters.<sup>83</sup> The area that experiences some melting increased by approximately sixteen per cent between

---

<sup>81</sup> See Boslough, Mark, Mark Ivey, Mark Taylor, Bernard Zak and George Backus, 'The Arctic as a Test Case for an Assessment of Climate Impacts on National Security,' Sandia Report, Sand2008-7006, Sandia National Laboratory, Albuquerque, November 2008, p. 3.

<sup>82</sup> See Arctic Council, *Impacts of a Warming Arctic*, Arctic Climate Impact Assessment (ACIA), Cambridge University Press, Cambridge, 2004, p. 12.

<sup>83</sup> Boslough *et al.*, *op. cit.*, p. 17.

the years 1979 and 2002,<sup>84</sup> but the rate of melting is accelerating. In 2007, the extent of the melt affected at least forty per cent of the total ice sheet.<sup>85</sup>

Yet another significant impact of climate change is the depletion of Arctic Ocean sea ice which has long been identified as one of the strongest signals of climate change. Ice cover is now disappearing at an alarming and unprecedented rate, well beyond the most pessimistic predictions. A cautious Arctic Climate Impact Assessment (ACIA) projects a “near-total loss of Arctic sea ice in the summer...for late this century.”<sup>86</sup> But when recent trends are taken into account, some commentators suggest that a seasonally ice-free Arctic could happen as early as 2013.<sup>87</sup> Over the thirty years up to the turn of this century the annual average sea ice extent had decreased by about eight per cent or nearly one million kilometres squared and this rate of melting is accelerating.<sup>88</sup> In the summer of 2008 – for the second year in a row – the sea ice extent had dropped below five million kilometres squared, but most alarmingly, this occurred one month earlier than normal, at the end of August.<sup>89</sup> The volume of sea ice is also shrinking very rapidly. While there is some uncertainty over the precise thickness of Arctic ice, there is nevertheless evidence that ice volume is shrinking at an ever faster rate because thicker, older ice is being replaced by younger, thinner ice. This makes the sheet more vulnerable as young ice is less resistant to melting. According to a United States Office of Naval Research report, sea ice has now almost thinned to less than half its pre-warming volume.<sup>90</sup> Another, equally alarming observation is that the sea ice is on average thirty per cent thinner than in the year 2000.<sup>91</sup>

While the Arctic climate is warming rapidly, much larger changes are forecast to occur. Based upon a better than worst-case emissions scenario, by the latter part of this century, the annual average temperature is expected to rise across the entire Arctic region by around three to five degrees Celsius over the land area and up to seven degrees Celsius over the ocean. Winter temperatures are

---

<sup>84</sup> *Ibid.*, p. 13.

<sup>85</sup> See Jenkins, Mark, ‘True Colors: The Changing Face of Greenland,’ *National Geographic*, Vol. 217, No. 6, June 2010, p. 47.

<sup>86</sup> Arctic Council, *op. cit.*, p.13.

<sup>87</sup> Boslough *et al.*, *op. cit.*, p. 13.

<sup>88</sup> Arctic Council, *op. cit.*, p. 25.

<sup>89</sup> Boslough *et al.*, *op. cit.*, p. 13.

<sup>90</sup> *Ibid.*, p. 14.

<sup>91</sup> See Sale, Richard and Eugene Potapov, *The Scramble for the Arctic: Ownership, Exploitation and Conflict in the Far North*, Frances Lincoln, London, 2010, p. 182.

projected to be significantly higher, with increases of four to seven degrees Celsius over land and seven to ten degrees Celsius over the Arctic Ocean. Some of the strongest warming over land is expected to occur along the coastal regions of northern Russia due to a projected sharp decline in sea ice.<sup>92</sup> Global warming will lead to increased evaporation, which will result in increased precipitation. Over the Arctic as a whole, annual total precipitation is expected to increase by approximately twenty per cent by century end, with most of the increase falling as rain. While rainfall patterns will be uneven, coastal regions can expect an increase in excess of thirty per cent during the autumn and winter months.<sup>93</sup>

Furthermore, as the climate warms, acceleration in the contraction of sea ice is expected. An additional decline of around ten to fifty per cent in annual sea ice extent is projected by the end of the century. Loss of sea ice during the summer months is expected to be significantly greater than the annual average decrease, with some climate models projecting near complete disappearance of summer sea ice. The projected reduction in sea ice will increase regional and global warming by reducing the reflectivity of the ocean surface.<sup>94</sup> As in the marine environment, a warmer climate is expected to significantly affect snow cover over the Arctic landmass. By century end, snow cover is expected to have decreased by an additional ten to twenty per cent, with the decline being greatest during the spring months. This suggests a further shortening of the snow season and an earlier pulse of river runoff to the Arctic Ocean and coastal seas.<sup>95</sup>

While the majority of climate impact assessments focus on scenarios in which the climate gradually warms, there exists the possibility that this gradual warming could, as it has done in the past, trigger an abrupt change in the climate.<sup>96</sup> Abrupt changes could result from non-linear processes forcing the climate to switch from one state to another. This situation is consistent with climate simulation models that show external forcing increases the probability of a threshold crossover. Thus, if human activities are driving the climate system towards one of these thresholds, it will increase the likelihood of an abrupt climate

---

<sup>92</sup> Arctic Council, *op. cit.*, p. 28.

<sup>93</sup> Boslough *et al.*, *op. cit.*, p. 29.

<sup>94</sup> *Ibid.*, p. 30.

<sup>95</sup> *Ibid.*, p. 31.

<sup>96</sup> See Alley, R. B., J. Marotzke, W. D. Nordhaus, J. T. Overpeck, D. M. Peteet, R. A. Pielke, R. T. Pierrehumbert, P. B. Rhines, T. F. Stocker, L. D. Talley and J. M. Wallace, 'Abrupt Climate Change,' *Science*, Vol. 299, 28 March 2003, p. 2005.

change occurring, possibly within the next hundred years.<sup>97</sup> Should this occur when humanity is struggling to produce enough food to feed itself, the consequences would be devastating<sup>98</sup> and result in the re-emergence of age-old patterns of conflict.<sup>99</sup>

Ice core records indicate that temperatures over Greenland dropped by as much as five degrees Celsius within a few years 8,500 years ago following the last ice age, before abruptly warming again. This relatively sudden and persistent change in weather across Greenland led to a sharp curtailment in the ocean circulation that brings warmth to Europe and the Arctic. In the future a similar change could be initiated by increases in Arctic precipitation and river runoff and the melting of Arctic snow and ice – all of which are currently occurring and predicted to become more severe in the future.<sup>100</sup> The outcome of such a catastrophic event is the subject of a pessimistic Pentagon report authored by Peter Schwartz and Doug Randall.<sup>101</sup> These authors portray a future world of warring states, frequently racked by famine, disease and weather-related disasters. They suggest that in a sense of desperation arising from an inability to provide for their human population, states will impose their unwanted citizens upon an unreceptive foreign country through a programme of aggressively enforced *lebensraum*.<sup>102</sup> Although Professor Alan Dupont considers many of Schwartz and Randall's projections to be highly speculative and possibly misleading, he also concedes that they warrant credit for thinking the unthinkable by identifying how abrupt climate change might impact on international security. Dupont accepts that while the probability of such a scenario is low, it is far from zero, and given that its impact is very high policy makers ought to factor its occurrence into their security calculations and alternative-futures planning.<sup>103</sup>

Climate change is a double-edged sword. While many Arctic residents, especially among the indigenous peoples lament the changes climate change has

---

<sup>97</sup> *Ibid.*, p. 2008.

<sup>98</sup> See Broecker, Wallace S., 'Thermohaline Circulation, the Achilles Heel of Our Climate System: Will Man-Made CO<sub>2</sub> Upset the Current Balance?' *Science*, Vol. 278, 28 November 1997, p. 1582

<sup>99</sup> See Dupont, Alan, 'The Strategic Implications of Climate Change,' *Survival*, Vol. 50, No. 3, June-July 2008, p. 43.

<sup>100</sup> Arctic Council, *op. cit.*, p. 32.

<sup>101</sup> See Schwartz, Peter and Doug Randall, *An Abrupt Climate Change Scenario and Its Implication for United States National Security*, October 2003, pp. 1-22, <http://bloodbanker.typepad.com/submerging-markets/Pentagon.pdf> (30 May 2005).

<sup>102</sup> *Ibid.*, p. 18.

<sup>103</sup> Dupont, *op. cit.*, p. 44.

wrought upon their lives,<sup>104</sup> other, for example, Sergey Lavrov, the Russian Foreign Minister, sagely note that “global warming not only creates additional problems for us but opens new possibilities as well.”<sup>105</sup> Furthermore, Lavrov conceded, that these new possibilities arose from Arctic “oil and gas production, nuclear energy, the transportation and processing of hydrocarbons and other raw materials.”<sup>106</sup> Thus climate change in tandem with the exploitation of non-living resources are two new forces driving the contemporary resurrection of geopolitics in the High North.

### **Geopolitics of natural resources**

According to the U.S. Geological Survey most of the Arctic, especially beyond its shoreline, is essentially unexplored with respect to petroleum. This is especially true of the region’s extensive continental shelves which may constitute the geographically largest unexplored prospective area for petroleum remaining on Earth.<sup>107</sup> Onshore, numerous areas in Alaska, Canada and Russia have been explored for petroleum resulting in the discovery of nearly four hundred oil and gas fields north of the Arctic Circle. These fields alone account for approximately 240 billion barrels of oil and oil-equivalent natural gas, which is almost ten per cent of the world’s known conventional petroleum resources – these resources comprise both production and proven reserves.<sup>108</sup>

It is the petroleum potential hidden beneath the Arctic Ocean, especially beneath the continental shelves, which is responsible for the contemporary geopolitical interest in the region. In 2008, the U.S. Geological Survey estimated that the Arctic could hold as much as ninety billion barrels of oil, which is equivalent to thirteen per cent of the world’s undiscovered oil reserves. The Survey also suggests that the region could hold 47.3 trillion cubic metres or thirty per cent of the world’s undiscovered natural gas, in conjunction with forty-four billion barrels of natural gas liquids.<sup>109</sup> At prevailing 2008 consumption rates and assuming a fifty per cent utilization rate of reserves, this quantity of oil would

---

<sup>104</sup> See Byers, Michael, *Who Owns the Arctic*, Douglas & McIntyre, Vancouver, 2009, p. 125.

<sup>105</sup> See Beary, Brian, ‘Race for the Arctic: Who owns the region’s undiscovered oil and gas?’ *CQ Global Researcher*, Vol. 2, No. 8, August 2008, p. 230.

<sup>106</sup> *Ibid.*

<sup>107</sup> U.S. Geological Survey, *op. cit.*

<sup>108</sup> *Ibid.*

<sup>109</sup> *Ibid.*



satisfy global demand for nearly two years or United States demand for six years. Arctic natural gas reserves may equal Russia's proven reserves, the world's largest.<sup>110</sup>

The Russian Ministry of Natural Resources estimates the maritime Arctic region claimed by Russia could hold as much as 586 billion barrels of unproven oil reserves. Also, according to the Ministry, proven oil deposits "in the Russian area of water proper" in the Barents, Pechora, Kara, East Siberian, Chukchi and Laptev Seas might reach three billion barrels, while proven gas reserves may be as high as 7.7 trillion cubic metres. Unexplored reserves in the same region could amount to 67.7 billion barrels of oil and 88.3 trillion cubic metres of natural gas.<sup>111</sup> Russian officials have also concluded that the continental shelf beyond the country's Exclusive Economic Zone could hold hydrocarbon deposits equivalent to seventy-three trillion barrels of oil.<sup>112</sup>

Although the release of large quantities of methane gas and methane-hydrates from thawing permafrost concerns climatologists, methane gas hydrates harvested from beneath the oceans could be a potential source of energy in the future. Under certain temperature and pressure conditions methane, when combined with water solidifies. As the temperature rises this unstable state can be shifted and methane gas released.<sup>113</sup> As a future energy source, gas hydrates are difficult to overlook given that one cubic metre of gas hydrate will release 164 cubic metres of natural gas.<sup>114</sup> As global usage of natural gas continues to rise, conventional and unconventional natural gas production are not expected to match demand and hence gas hydrates are anticipated to play a significant role in moderating price increases and ensuring adequate future supplies. While no technology currently exists to extract gas hydrates at an industrial level, small scale field experiments in hydrate extraction have been successful.<sup>115</sup>

---

<sup>110</sup> See Cohen, Ariel, Lajos F. Szaszdi, and Jim Dolbow, 'The New Cold War: Reviving the U.S. Presence in the Arctic,' *Backgrounder*, The Heritage Foundation, No. 2202, October 30, 2008, p. 3. [www.heritage.org/Research/EnergyandEnvironment/bg2202.cfm](http://www.heritage.org/Research/EnergyandEnvironment/bg2202.cfm) (31 August 2010).

<sup>111</sup> See Cohen, *op. cit.*, p.11.

<sup>112</sup> See Lovett, Richard A., 'Russia's Arctic Claim Backed by Rocks, Officials say,' *National Geographic News*, September 21, 2007, <http://news.nationalgeographic.com/news/pf/47871933.html> (31 August 2010).

<sup>113</sup> See Zellen, Barry Scott, *Arctic Doom, Arctic Boom: The Geopolitics of Climate Change in the Arctic*, Praeger, Santa Barbara, 2009, p. 149.

<sup>114</sup> See United States Department of Energy, 'Methane Hydrates: The Gas Reserves of the Future,' 2008, <http://www.fossilenergy.gov/program/oilgas/hydrates.index.html> (1 September 2010).

<sup>115</sup> *Ibid.*

Known offshore Arctic oil and gas reserves are likely to be supplemented by gas hydrated deposits, although the extent of these deposits remains speculative. One report suggests that gas extracted from gas hydrates reserves along Alaska's North Slope region would be sufficient to heat 100 million homes for more than a decade.<sup>116</sup> A hypothesis contained within a Canadian government report presumes that hydrate fields extend from Canada to the North Pole.<sup>117</sup>

In the future, the liquid resource most treasured by humanity and one which the Arctic has in abundance, will be fresh water. Although, fresh water resources are rarely the sole source of violent conflict or war, the relationship between fresh water and security is often belittled or ignored.<sup>118</sup> However, this relationship cannot be ignored in a world affected by climate change. Clean fresh water has become a valuable commodity due to its chronic shortage in many regions of the world. This shortage represents a commercial opportunity especially for Arctic-rim states to export fresh water harvested from either icebergs or pristine northern lakes. While no state has to date availed itself of this opportunity the Arctic Research Council envisages that by the year 2040 specialized tankers will be transporting water from ports in Greenland and Canada to the Middle East, Japan and the Mediterranean.<sup>119</sup>

What the Arctic Research Council appears to have failed to consider is that non-Arctic states could themselves harvest fresh water directly from icebergs adrift in the Arctic Ocean beyond the Exclusive Economic Zone of Arctic-rim states. The opportunity for Arctic-rim states to prevent such an activity is severely limited, for as Christopher Joyner states:

*... the international law concerning ice remains  
incomplete and unclear. No international legal regime*

---

<sup>116</sup> See American Chemical Society, 'Ice That Burns May Yield Clean Sustainable Bridge to Global Energy Future,' *ScienceDaily*, March 24, 2009, <http://www.sciencedaily.com/release/2009/03/090323143858.htm> (1 September 2010).

<sup>117</sup> See Krajick, Kevin, 'Race to Plumb the Frigid Depths,' *Science*, Vol. 315, 16 March 2007, p. 1525.

<sup>118</sup> See Gleick, Peter H., 'Environment & Security: Water Conflict Chronology Version 2004-2005,' in Peter Gleick (ed.), *The World's Water 2004-2005*, Island Press, Washington, D.C., 2004, p. 234.

<sup>119</sup> See Brigham, Lawson W., 'Thinking about the Arctic's Future: Scenarios for 2040,' *The Futurist*, September-October 2007, p. 34.

*is yet in place which comprehensively sets out the legal status of ice in its various forms.*<sup>120</sup>

Terrestrial hard mineral mining already exists beyond the Arctic Circle. The world's largest zinc mine (Red Dog mine) is located in the Alaskan Arctic and the largest nickel mine (Norilsk) in Siberia, while the Mary River iron ore deposits on Baffin Island, in the Canadian Arctic is renowned for high-grade ore.<sup>121</sup> Recently, the owners of the Raglan Mine in northern Québec commenced extracting nickel ore from one of the largest deposits in the world. Although mining only began in 1997 this deposit is expected to be exhausted by 2030.<sup>122</sup> The discovery of volcanoes and thermal vents along the Gakkel Ridge offers a potential source of commonly precipitated metals including copper, silver and gold.<sup>123</sup> Although, such deposits might not be tapped anytime soon, other maritime resources are available. The Arctic seabed is known to contain significant deposits of various hard minerals and precious stones, such as gold, silver, copper, iron, lead, manganese, nickel, platinum, tin, zinc and diamonds.<sup>124</sup> Just the prospect of access to such mineral wealth has rekindled numerous interstate rivalries and attracted resource-hungry non-Arctic states, such as China and India to the region.<sup>125</sup>

### **A geopolitical futurecast**

The Arctic, being located between the United States and the Soviet Union, was a conflict front line during the Cold War. Nuclear ballistic missile submarines prowled the Arctic Ocean while nuclear bomb carrying aircraft from both superpowers circled on standby overhead. Runways and radar stations were constructed throughout the High North, as were underwater acoustic sensors. Even as the Cold War was coming to an end demilitarisation of the Arctic was considered neither practical nor conducive to strategic stability.<sup>126</sup>

---

<sup>120</sup> See Cripps, Emily, 'The Legal Status of Ice in the Antarctic Region,' *Australian Law Students Association*, 30 April 1999, <http://www.alsa.asn.au/files/acj/1996/cripps.html> (2 September 2010).

<sup>121</sup> Arctic Marine Shipping Assessment, *Scenarios, Futures and Regional Futures*, *op. cit.*, p. 98.

<sup>122</sup> Sale *et al.*, *op. cit.*, p. 166.

<sup>123</sup> Krajick, *op. cit.*, p. 1525.

<sup>124</sup> Cohen *et al.*, *op. cit.*, p. 4.

<sup>125</sup> Borgerson, *op. cit.*, p. 71.

<sup>126</sup> Lindsey, *op. cit.*, p. 75.

A more cooperative approach emerged in 1990, allowing the United States and the Russian Federation to agree upon the location of their maritime border in the Bering Strait and Chukchi Sea – although this has not been ratified by the Russian Duma. This warming of relations permitted both states to easily discuss common non-military issues under the auspice of the Arctic Council. Since the turn of the century this cooperation intensified further in response to the impact imposed by climate change. The melting of sea ice, opening of shipping routes and more ready access to oil and gas meant that maritime boundary disputes gained new salience. In May 2008, the five Arctic-rim countries adopted the Ilulissat Declaration in which they reaffirmed their commitment to work within the existing framework of international law to delimit their respective areas of seabed jurisdiction.<sup>127</sup> Despite this apparent warming of relations, the Cold War schism has not been easy to bridge on matters of security.

Notwithstanding forty-five years of Cold War history, the most significant security threats in the Arctic still remain those found along its southern fringes, in the Northwest Passage and Northern Sea Route. These involve non-state actors such as terrorists who could take advantage of ice-free Arctic waters to move contraband and people between oceans and continents. These non-traditional threats continue to attract the attention of Arctic states although not all states are equipped to address this challenge.<sup>128</sup> With the exception of Russia, the other Arctic countries have not maintained a sufficient number of capable maritime assets (icebreakers) necessary to conduct policing or military operations in the harsh Arctic environment.<sup>129</sup>

In this harsh environment it will be the larger countries which will set the frame work within which the smaller Arctic states will form their security policies.<sup>130</sup> Features of this arena of contest are already visible. The United States and Russia continue to deploy nuclear powered and armed submarines in Arctic waters. Likewise, both countries continue to deploy military aircraft over the Arctic, often to the consternation of the other Arctic-rim states. The Russian

---

<sup>127</sup> See Byers, Michael, 'Conflict or Cooperation: What future for the Arctic?' *The bulletin of the Program in Arms Control, Disarmament, and International Security*, Vol. XVII, No. 3, Fall 2009, p. 18.

<sup>128</sup> *Ibid.*, p. 19.

<sup>129</sup> Beary, *op. cit.*, p. 233.

<sup>130</sup> See International Institute of Strategic Studies, *Strategic Survey 2008*, Vol. 08, No. 1, September 2008, p. 70.

navy's decline has been reversed and its strength is bound to increase in the years ahead. Moscow is determined to increase its prestige and influence not only in its immediate neighbourhood, but worldwide. The Russian navy is potentially the most effective instrument to support Russia's foreign policy. Professor Milan Vego maintains that while Russia's power projection capabilities are modest compared with the United States navy, they should not be underestimated or, even worse, ignored.<sup>131</sup>

Despite conciliatory rhetoric emanating from Arctic-rim countries, Professor Rob Huebert, maintains that resource scarcity has heightened both political tension and the prospect of conflict throughout the Arctic region.<sup>132</sup> His view has gained salience with the recent call by the Russian president Dmitry Medvedev for Russia to drill its Arctic territory for the resources it contains. In a speech laced with belligerent overtones to the Russian Security Council Medvedev is reported to have said:

*Regrettably, we have seen attempts to limit Russia's access to the exploration and development of the Arctic mineral resources...That's absolutely inadmissible from the legal viewpoint and unfair given our nation's geographical location and history.*<sup>133</sup>

Although this might have been a direct attempt by President Medvedev to exert pressure on the UNCLOS process, it elicited, perhaps unintentionally, a confrontational response from Canada.<sup>134</sup>

As mentioned previously, the United States is not bound by the strictures of UNCLOS, but is pursuing its claim to sovereignty over Alaskan continental shelves by relying on President Truman's Presidential Proclamation of 1945, which uncompromisingly declared:

---

<sup>131</sup> Vego, *op. cit.*

<sup>132</sup> See Boswell, Randy, 'Russian report suggests conflict over Arctic possible,' *CanWest News Service*, May 13, 2009, <http://www.canada.com/news/Russia+report+suggusts+conflict+over+Arctic+possible/1593393.htm> (2 September 2010).

<sup>133</sup> See Bennett, Mia, 'Russia reaffirms desire to exploit Arctic resources; Canada reacts,' *The Arctic*, March 24, 2010, <http://arctic.foreignpolicyblogs.com/2010/03/24/russia-reaffirms-desire-to-exploit-arctic-resources> (6 September 2010).

<sup>134</sup> *Ibid.*

*Having concern for the urgency of conserving and prudently utilizing its natural resources, the Government of the United States regards the natural resources of the subsoil and sea bed of the continental shelf beneath the high seas but contiguous to the coasts of the United States as appertaining to the United States, subject to its jurisdiction and control.*<sup>135</sup>

For the United States, the Arctic remains important for the defence of its territorial integrity and for the resources, especially energy resources, it could provide. For these reasons the region will likely increase in importance as an arena for military operations and intelligence gathering, especially on Russian operational capabilities.<sup>136</sup> In a further sign of the transformation currently underway in the Arctic, the United States is assessing the need for a new strategic deep-water naval base in Alaska adjacent to the western entrance to the disputed Northwest Passage.<sup>137</sup> In a definitive gesture the Canadian government plans to construct a deep-water port near the waterway's eastern gate, at Nanisivik on northern Baffin Island.<sup>138</sup>

China is a large non-Arctic state with an increasing interest in the region. It has started to assess the commercial, political and security implications of a seasonally ice-free Arctic region.<sup>139</sup> For a country with no Arctic strategy<sup>140</sup> China holds very definite views on how the Arctic States should consider the interests of non-Arctic States. Hu Zhengyue, China's Assistant Minister of Foreign Affairs, issued a caution to Arctic-rim states by saying:

*When determining the delimitation of outer-continental shelves, the Arctic states not only need to handle relationships between themselves properly, but must also consider the*

<sup>135</sup> See Woolley, John T. and Gerhard Peters, *The American Presidency Project* [online]. Santa Barbara, CA., <http://www.presidency.ucsb.edu/ws/?pid=12332> (31 August 2010).

<sup>136</sup> *Strategic Survey 2008, op. cit.*, p. 69.

<sup>137</sup> See Boswell, Randy, 'Arctic is source of conflict, international competition,' CanWest News Service, February 23, 2010, <http://www.globalmaritimes.com/sitemap/Arctic+source+conflict+international+competition> (28 April 2010)

<sup>138</sup> *Ibid.*

<sup>139</sup> See Jakobson, Linda, 'Preparing for an ice-free Arctic (1),' *Chinadialogue*, April 21, 2010, <http://www.chinadialogue.net/article/show/single/en/3584-Preparing-for-an-ice-free-Arctic> (28 April 2010).

<sup>140</sup> Jakobson (3), *op. cit.*

*relationship between the outer-continental shelf and the international submarine area that is the common human heritage, to ensure a balance of coastal countries' interest and the common interest of the international community.*<sup>141</sup>

Hu's comments were reinforced by those attributed to Admiral Yin Zhou of the People's Liberation Army Navy who asserted, "Under the provisions of the UN Convention of the Law of the Sea (UNCLOS), the Arctic does not belong to any particular nation and is rather the property of all the world's people" and that "China must play an indispensable role in Arctic exploration as it has one-fifth of the world's population."<sup>142</sup> In particular, China appears cautious of Russian intentions in the Arctic. In a rare open-source article about the Arctic, an officer of the People's Liberation Army warns that the use of military force cannot be ruled out in the Arctic due to complex sovereignty disputes.<sup>143</sup>

Therefore, a peaceful and cooperative future for the Arctic region is far from assured, for as Professor Rob Huebert asserts:

*All of the Arctic states have begun rebuilding their military forces and capabilities in order to operate in the region. Personnel are undertaking Arctic training exercises; submarines that can operate in ice are being developed or enhanced; icebreakers are being built; and so forth. The catalyst for the Arctic states' efforts appears to be a recognition that the Arctic is critically vital to their interests and they will take the steps necessary to defend these interests. The consequence of these efforts is that notwithstanding the public statements of peace and cooperation in the Arctic issued by the Arctic states, the strategic value of the Arctic is growing. As this value grows, each state will attach a greater value to their own national interests in the region. The Arctic*

---

<sup>141</sup> *Ibid.*

<sup>142</sup> *Ibid.*

<sup>143</sup> See Jakobson, Linda, 'Preparing for an ice-free Arctic (2),' *Chinadialogue*, April 21, 2010, <http://www.chinadialogue.net/article/show/single/en/3584-Preparing-for-an-ice-free-Arctic> (28 April 2010).

*states may be talking cooperation, but they are preparing for conflict.*<sup>144</sup>

Although they have arisen in two different geopolitical epochs there is a striking similarity between the predictions proffered by Hall and Huebert

If, in the future, contemporary interstate cooperation is replaced by tension or even conflict as Huebert contends, and if this potential centres upon access to resources, particularly liquid resources (petroleum or water), then Arctic-rim states are likely to coalesce into a resource based security complex. The structure of this complex is discussed in Chapter Fifteen. More problematic for states within and beyond the Arctic region is the probability that adverse external interstate relationships will create political intransigence and an inability to resolve contentious issues, which will then transform this security complex into a shatterbelt.

---

<sup>144</sup> See Huebert, Rob, *The Newly Emerging Arctic Security Environment*, Canadian Defence and Foreign Affairs Institute, Executive Summary, March 2010.



## Chapter Fourteen

### Antarctica: The Deep South

#### A continent like no other

The ancient Greeks presumed the existence of Antarctica for, having noted the probable existence of the Arctic, they assumed that there must be a countervailing twin landmass to the south. The first recorded venture south to the Antarctic Circle was by the British ships *Adventure* and *Resolution*, during an expedition led by Captain James Cook in 1772-75. Although Cook circumnavigated Antarctica, his expedition was denied a glimpse of its landmass as pack ice prevented him from sailing within one hundred nautical miles of the continent.<sup>1</sup> Nevertheless, the bitter cold in combination with floating icebergs indicated the presence of a continent or at least a large tract of land near the South Pole. During the years 1819-21, Antarctica was 'discovered' by both the Briton Edward Bransfield and the Russian explorer Thaddus von Bellingshausen. A dispute over priority of discovery was resolved in 1955 when the International Court of Justice ruled that Bransfield discovered Antarctica on 30 January 1820.<sup>2</sup>

Sealing and whaling provided the incentive for most nineteenth century voyages to Antarctic waters and as a consequence interest in Antarctica began to flourish. As interest grew in the science of geography the International Geographic Congress proclaimed 1901 as the "Year of the Antarctic." This was followed some eleven years later by two notable Antarctic expeditions, one led by the Englishman Robert Falcon Scott and the other by the Norwegian Roald Amundsen. The laurel for being the first person to reach the South Pole went to Amundsen. Scott, having lost the race to the Pole, lost his life in tragic circumstances on the return journey to the Ross Sea.

Science was not the only impulse that propelled countries to renew their interest in Antarctica: the doctrine of economic imperialism also played a part. The seemingly unlimited bounty of living resources led to a flurry of territorial

---

<sup>1</sup> See Fogg, G. E., *A History of Antarctic Science*, Cambridge University Press, Cambridge, 1992, p. 23.

<sup>2</sup> See Buckley, Richard (ed.), *Antarctica: Protecting the last wilderness*, European Schoolbook Publishing, Cheltenham, 1995, p. 1.

claims during the first half of the twentieth century, with Great Britain asserting the first sovereignty claim in 1908. Sovereignty claims were also made on behalf of the peoples of New Zealand (1923), France (1925), Australia (1933), Norway (1939), Chile (1940) and Argentina (1943). Two other countries with a long history of involvement in Antarctica, Russia and the United States, have claimed no Antarctic territory and nor do they recognise the claims of other countries.

In terms of the geophysical features that identify it, the Antarctic region stretches north of the Antarctic Circle (66° 30' South) to include an area bounded by the Antarctic Convergence. The Antarctic Convergence at around 60° South delineates a belt of sea where the waters of the southern and northern oceans mix.<sup>3</sup> The continental landmass of Antarctica is approximately 14 million kilometres squared, an area exceeding the combined area of China and India or the United States and Mexico.<sup>4</sup> Ice shelves amount to an additional 1.6 million kilometres squared.<sup>5</sup> During the winter the newly formed pack ice around Antarctica's perimeter may extend the continent to twice its summer size. In total, Antarctic ice sheets holds approximately seventy per cent of all the freshwater on Earth and produce about one thousand cubic kilometres of icebergs per year.<sup>6</sup>

The continent is commonly divided into two regions: West Antarctica, essentially a chain of islands bonded together by ice, and East Antarctica, a great ice-covered plateau. These two regions are divided from each other by the Transantarctic mountain range that runs for more than nine-thousand kilometres from the Filchner Ice Shelf to the eastern side of the Ross Sea.

The South Pole lies at an elevation of 2,800 metres. With an average height of 2,300 metres Antarctica is three times as high as any other continent. Moreover, its continental shelves are exceptionally deep, with water depths averaging between five-hundred metres and one kilometre, compared to a mean depth of one hundred and thirty metres for the world's other continental shelves.<sup>7</sup> Ice up to 4.5

---

<sup>3</sup> *Ibid.*, p. 17. The Antarctic Convergence is a band of sea where the cold dense nutrient-rich waters of the Polar Region meet the warmer and more saline waters of the Atlantic, Pacific and Indian Oceans. This natural zone provides a convenient boundary, although its actual position varies marginally from ocean to ocean and from year to year.

<sup>4</sup> See Beck, Peter J., 'Antarctica enters the 1990s: an overview,' *Applied Geography*, Vol. 10, 1990, p. 248.

<sup>5</sup> Buckley, *op. cit.*, p. 2.

<sup>6</sup> See Hill, John, *New Zealand and Antarctica*, Government Printer, Wellington, 1983, p. 49.

<sup>7</sup> Buckley, *op. cit.*, p. 2.

kilometres thick covers ninety-eight per cent of the continent and has an estimated volume of twenty-nine million cubic kilometres.<sup>8</sup>

The Antarctic plateau is effectively a desert which under normal conditions receives an annual precipitation of less than 0.05 metre of snow - although coastal regions can receive ten times as much. Antarctica also holds ninety per cent of all the Earth's glacial ice<sup>9</sup> while along its littoral margin gigantic ice shelves rise and fall with the tide. The Ross Ice Shelf, being the largest, measures 540,000 kilometres squared - about the size of France.<sup>10</sup> There exists an acceptance that climate change may cause the collapse of ice shelves and that the disintegration of the Larsen B Ice Shelf in 2002 was one such casualty.<sup>11</sup> Once ice shelves collapse, glaciers that feed them are then capable of moving faster. In the wake of Larsen B collapse surrounding glaciers accelerated by up to six times their original flow rate.<sup>12</sup> A more recent ice shelf collapse occurred on the western base of the Antarctic Peninsula in late February 2008, when the Wilkins Ice Shelf disintegrated. This is considered as affirmation of warming temperatures in the region.<sup>13</sup>

The strong westerly winds that rage unhindered around Antarctica are fed by the steep temperature and atmospheric pressure gradients of the southern latitudes. Gales blow for approximately 300 days a year.<sup>14</sup> On land, 'katabatic' winds can reach velocities in excess of three-hundred kilometres per hour, making Antarctica the stormiest continent on earth.<sup>15</sup> Wind drives the mean annual air temperature to a low of minus 22° Celsius at the coast and minus 56° Celsius in the interior, with an extremely low temperature of minus 89.2° Celsius being recorded at the Russian Vostock Station. In summer the mean temperature approaches zero

---

<sup>8</sup> *Ibid.*, p. 3.

<sup>9</sup> See Keys, J. R., 'Ice,' in G. P. Glasby (ed.), *Antarctic Sector of the Pacific*, Elsevier, Amsterdam, 1990, p. 97.

<sup>10</sup> Buckley, *op.cit.*, p. 3.

<sup>11</sup> See Reuters, 'Giant ice shelf shatters,' *New Zealand Herald*, Auckland, March 21, 2002, p. A10.

<sup>12</sup> See Scott, Michon, 'Disintegration: Antarctic warming claims another ice shelf,' *NASA Earth Observatory*, September 6, 2010, <http://earthobservatory.nasa.gov/Features/WilkinsIceSheet/> (7 September 2010).

<sup>13</sup> *Ibid.*

<sup>14</sup> See Suter, Keith, *Antarctica: Private Property or Public Heritage?*, Zed Books, London, 1991, p. 15.

<sup>15</sup> Buckley, *op. cit.*, p. 17. Complex patterns of air circulation and temperature gradients create katabatic winds that gush down the mountain ranges and the coastal escarpments of Antarctica.



Despite its frigid climate, observable evidence shows that climate change is causing changes to the Antarctic environment. It is the current and potential change in climate that enables this thesis to contend that Antarctica can be divided into three distinct regions – the Antarctic Peninsula, the remainder of West Antarctic and East Antarctica.<sup>17</sup>

The Antarctic Peninsula has been warming at the rate of half a degree Celsius per decade<sup>18</sup> or by 2.8° Celsius over the past fifty years.<sup>19</sup> The Peninsula is considered to be one of the fastest warming locations on Earth:<sup>20</sup> comparable to the rapidly warming regions of the Arctic.<sup>21</sup> This rise in temperature has facilitated the establishment of flowering plants and mosses along the promontory and colonizing invertebrates have also advanced down the Peninsula in tandem with this progression.<sup>22</sup> In another sign of warming along the Peninsula, a recent study found that since 1940 no fewer than 210 glaciers were in retreat and that the average rate of retreat was accelerating. Retreat of some individual glaciers has been extensive, for example, the Sjogren Glacier had move back by thirteen kilometres since 1993. Not all glaciers on the Peninsula were in retreat, but those that were advancing have gained on average only three-hundred metres over the past fifty years.<sup>23</sup>

Antarctica, west of the Transantarctic mountain range, is warming at a rate of 0.17° Celsius per decade which is a significant advance on the average surface temperature for the continent as a whole, which for the past five decades has warmed by only 0.12° Celsius.<sup>24</sup> Studies of ice around the Amundsen Sea have shown that West Antarctica's two principal glaciers, Thwaites and Pine Island, are shedding more than 110 cubic kilometres of ice each year. This rate of discharge

---

<sup>17</sup> See Intergovernmental Panel on Climate Change (IPCC), *2007: Impacts, Adaption and Vulnerability*, Fourth Assessment Report (AR4), 2007, p. 655. The IPCC maintains that climate change will present profoundly different characteristic both within and between the Polar Regions.

<sup>18</sup> Scott, *op. cit.*

<sup>19</sup> See Vaughan, David G., 'Antarctic Peninsula: rapid warming,' *British Antarctic Survey*, 2007, [http://www.antarctica.csc.uk/bas\\_research/science/climate/antarctica\\_peninsula.php](http://www.antarctica.csc.uk/bas_research/science/climate/antarctica_peninsula.php) (8 September 2010).

<sup>20</sup> Scott., *op. cit.*

<sup>21</sup> Vaughan, *op. cit.*

<sup>22</sup> See Goklany, Indur M., 'Climate Change: the 21<sup>st</sup> century's most urgent environmental problem or proverbial last straw?' in Kendra Okonski (ed.), *Adapt or Die*, Profile Books, London, 2003, p. 61.

<sup>23</sup> See Fry, Carolyn, *The Impact of Climate Change: The World's Greatest Challenge in the Twenty-First Century*, New Holland, London, 2008, p. 74.

<sup>24</sup> Vaughan, *op. cit.*

is triple that of a decade ago. Together these two glaciers have the ability to raise sea levels world-wide by more than a metre.<sup>25</sup>

While some areas of East Antarctica have cooled in recent decades the longer fifty-year trend indicates that, on average, temperatures are rising across the entire continent.<sup>26</sup> There appears to be little disagreement that Antarctica is warming – see Map 16, but it is not melting as rapidly as scientists would have expected. The main factor determining the extent of continental warming is the strength of the winds that circle Antarctica. These winds have become stronger over the past four decades effectively sealing off most of the continent each summer from the effects of global warming. The cause behind the strengthening circumpolar winds is the thinning of the stratospheric ozone layer. As the ozone hole heals over the coming decades, however, the winds should weaken, and as Antarctica warms during the summer months ice melting will increase.<sup>27</sup>

Regional warming is not restricted to the continent alone, for there is an accumulation of evidence to show that the sea surface temperature in the Southern Ocean has also warmed substantially during the second half of the twentieth century.<sup>28</sup> According to Sarah Gille, the Southern Ocean is warming twice as fast as other world oceans.<sup>29</sup> Associated with this warming, there has been an enhanced atmospheric hydrological cycle in the Southern Ocean that has resulted in an increase of Antarctic sea ice over the past three decades created through a reduction in the upward movement of warm ocean water and an increase in snowfall.

Simulation models suggest that the warming over the past fifty years was associated with the Antarctic Oscillation rather than anthropogenic forced climate change. Nevertheless, with the expected increased loading of greenhouse gases in the atmosphere over the twenty-first century, the same models predict accelerated warming throughout the Southern Ocean, and indicate that anthropogenic forcing will exceed natural internal variability. As both the atmosphere and ocean warm

---

<sup>25</sup> Fry, *op. cit.*, p. 74.

<sup>26</sup> *Ibid.*

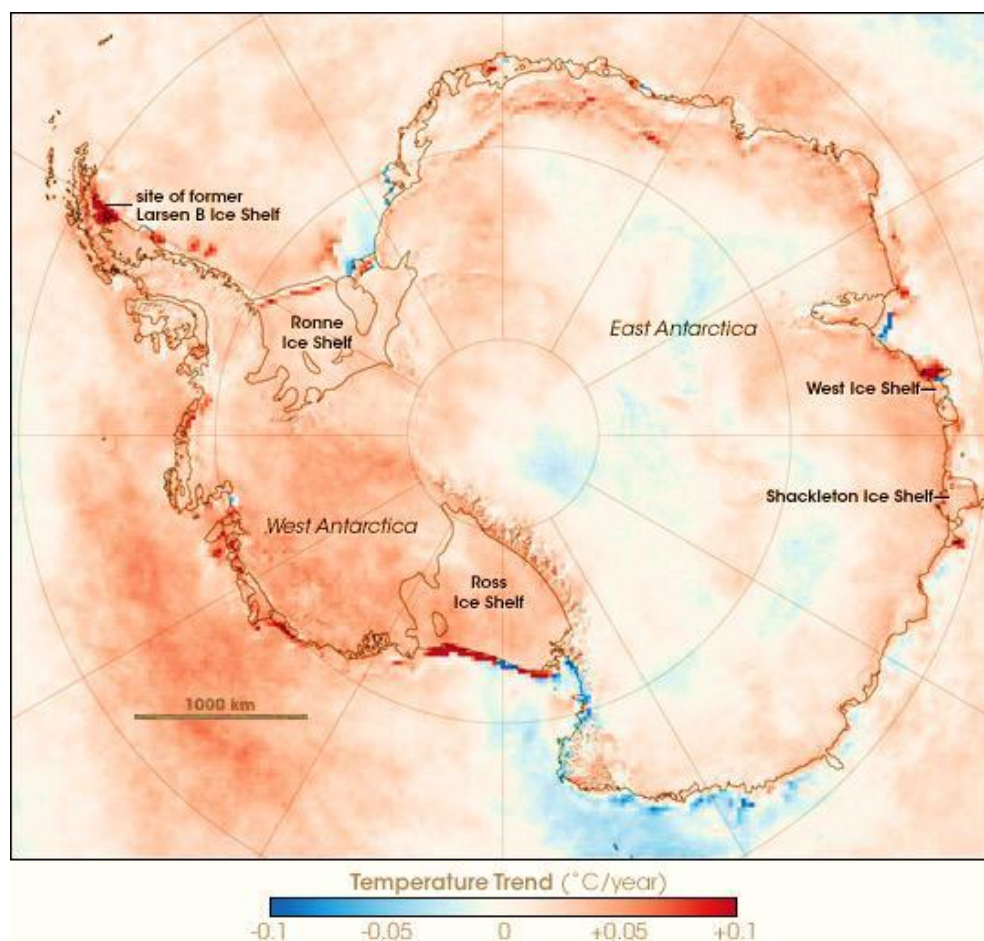
<sup>27</sup> *Ibid.*

<sup>28</sup> See Liu, Pijing and Judith A. Curry, 'Accelerated warming of the Southern Ocean and its impact on the hydrological cycle and sea ice, *PNAS Online*, August 16, 2010, <http://www.pnas.org/lookup/suppl/doi:10.1073/pnas.1003336107/> (8 September 2010).

<sup>29</sup> See Gille, Sarah, Scripps Institute of Oceanography, 14 February 2002, <http://www.eces.org/archive/ec/globalwarming/Antarctica.shtml> (5 March 2004).



and rainfall associated with the enhanced hydrological cycle increase leading to a decline in Antarctic sea ice.<sup>30</sup>



**Map 16.** Antarctica: showing warming for a fifteen year period ending 2007.  
Source: <http://antarcticasun.usap.gov/features/image/antarctica> (7 September 2010).

Ice thickness, its spatial extent, and the fraction of open water within the ice pack can vary rapidly and profoundly in response to weather and climate. Sea ice typically covers approximately seventeen-to-twenty million kilometres squared of the Southern Ocean nestling Antarctica. On average, the seasonal decrease is much larger in Antarctic than in the Arctic, with only about three to four million kilometres squared remaining at summer's end, compared to approximately seven million kilometres squared in the Arctic.<sup>31</sup> As a consequence of global warming, sea ice in the future will retreats earlier and further and so present a diminished physical barrier to the exploitation of both Polar Regions.

<sup>30</sup> Liu *et al.*, *op. cit.*

<sup>31</sup> See National Snow and Ice Data Centre, *State of the Gyrosphere*, University of Colorado, 4 August 2010, [http://nsidc.org/sotc/sea\\_ice.html](http://nsidc.org/sotc/sea_ice.html) (9 September 2010).

Over the next hundred years the impact of climate change in the Polar Regions is expected to exceed the impact forecast for many other regions and will most likely produce reinforcing feedbacks of globally significance. However, according to the IPCC, the uncertain nature of climate change means that any future impact on biological and human systems remains very difficult to predict.<sup>32</sup>

Aligned with the proposal for dividing Antarctica into three distinct climatic zones, this thesis will give priority to describing suggested future climatic changes to the Antarctic Peninsula. The Peninsula is a rugged mountain chain that differs from most of Antarctica by having a summer melt season that produces many isolated snow free areas. The Peninsula has experienced dramatic warming rates several times the global mean. Over the past fifty years average temperatures have risen by greater than 2.5° Celsius, which is sufficient to raise the number of positive-degree days by seventy-four per cent. This has resulted in approximately 14,000 kilometres squared of ice being lost from floating ice shelves, causing eighty-seven per cent of glacier termini to retreat and seasonal snow cover to decrease. If summer warming continues, the IPCC expects these effects to grow.<sup>33</sup>

Ice sheet cores show that ice shelves have not retreated so far landward for at least 10,000 years. This suggests that the retreat is not a natural phenomenon, but created by anthropogenic influences. Winter warming along the Peninsula's west coast appears to be caused by similar influences, but these have found manifestation in the persistent retreat of sea ice and the warming of the Bellingshausen Sea. If warming continues (especially in the summer) there will be significant regional impacts for the retreat of coastal ice and loss of snow cover would result in the exposure of additional rock and permafrost, thus providing new habitats for colonisation not only by expanding and invading flora and fauna,<sup>34</sup> but also by human beings.

The IPCC maintains that in its entirety the global significance of the Antarctic Peninsula warming is difficult to encapsulate, but their main concern centres on the loss of a unique landscape and biota. Furthermore, the Peninsula is a dramatic illustration of how subtle climate-dynamic processes can drive regional

---

<sup>32</sup> IPCC, *op. cit.*, p. 655.

<sup>33</sup> *Ibid.*, p. 674.

<sup>34</sup> *Ibid.*, p. 675.



climate change and the complexity of its impacts in an environment where human influence has been at a minimum.<sup>35</sup>

On the Antarctic Peninsula, anecdotal evidence of a climatically changed region track that of climate science and the personal observations of Meredith Hooper have poignancy too strong not to repeat:

*The Antarctic Peninsula is unstitching. Ice slides off, crumbling, tumbling. Glaciers shrink and thin, discharge rates accelerating. Ice shelves are at risk, melt water penetrating consistently, deeply, into ancient structure. Along the western coast the sea's annual coating of ice performs fitfully.*

*The stitches were held together by cold. Warmth denies their performance, removes their ability to function. The Antarctic Peninsula was cold. Now it is warming. Temperature, and the seasons are everything.*<sup>36</sup>

If climate change is going to facilitate the development of Antarctica over the next twenty-five years, then exploitation will most likely to occur on either the Antarctic Peninsula or along the coastal margin of West Antarctica. The ice sheet on the Antarctic Peninsula is not alone in showing a clear response to contemporary climate change, for the larger West Antarctic and East Antarctic ice sheets are also showing changes attributed to climate change. In West Antarctica, there is a suggestion that the dramatic recent thinning of the ice sheet throughout the Amundsen Sea sector appears to be the result of recent ocean change. Indeed, there is evidence of deglaciation in some parts of West Antarctica, although there is no universal acceptance that climate change is responsible. However, the retreat of glaciers has reinvigorated debate over the timescale one would expect such deglaciation to occur. Satellite observations fail to provide unequivocal evidence of whether the mass balance of the East Antarctic ice sheet has marginally thickened or experienced no change.<sup>37</sup>

---

<sup>35</sup> *Ibid.*

<sup>36</sup> See Hooper, Meredith, *The Ferocious Summer: Palmer's penguins and the warming of Antarctica*, Profile Books, London, 2007, p. 273.

<sup>37</sup> IPCC, *op. cit.*, p. 663.

### The illusion of ownership

Antarctica is fashionably described as the only terrestrial global commons. Without an indigenous human population of its own, Antarctica is considered by many to be the property of all humankind. While this is an admirable notion, it is complicated by conceptual difficulties and political realities. There appears to be little agreement amongst political actors as to a common understanding of the global commons concept. The fundamental problem associated with the global commons is often expressed, as noted in a previous chapter, as the “tragedy of the commons.”<sup>38</sup>

In broad terms, global commons have been described as those portions of the planet that lie beyond the limits of national jurisdiction and the legal prerogatives of individual states. If global commons are to remain economically productive, they must remain environmentally healthy. To that end, regimes must be devised and effectively implemented that provide for the sustainable management of such areas. While the Antarctic Treaty System (ATS) has been successful in some areas, i.e. preservation of the Antarctica terrestrial wilderness, it has been less than successful in preventing the pirating of Southern Ocean fish stocks.<sup>39</sup> The latter is considered a classic illustration of Hardin’s “tragedy of the commons.”

Political realities in Antarctica continue to be shaped by the lack of clarity as to legal ownership of the continent. What still remains unclear is whether Antarctica is owned by any state or by every state. Four principal approaches in modern international law pertain to the status and “ownership” of international spaces such as Antarctica.<sup>40</sup> The first is the concept of *res nullius*, “the property of nobody.” In the absence of an owner, sovereignty accrues to the first lawful taker able to demonstrate sufficient legal authority and control over that territory. This is the basis of all existing claims to Antarctica. For the international community, other than the seven claimant countries, the consequence of applying *res nullius* to Antarctica is to admit that the current seven claims might merit legal credibility. To date, that admission has not been forthcoming.

---

<sup>38</sup> See Joyner, Christopher C., *Governing the Frozen Commons*, University of South Carolina Press, Columbia, 1998, p. 25.

<sup>39</sup> See Knecht, G. Bruce, *Hooked*, Allen&Unwin, Crows Nest, Australia, 2006, pp. 1-244.

<sup>40</sup> Joyner, *op. cit.*, p. 30.

The second concept is that of *res communis*, the property is available for use by everyone. Generally this classification is applied to common areas that do not have definitive boundaries, i.e. oceans or the atmosphere. While sovereignty claims do not legally occur under *res communis*, the clear implication is that of an open access regime. Hence, any country with the technology and economic wherewithal may exploit a common area, provided that any specified obligations of resource conservation and environmental protection are observed.

Common heritage of mankind (CHM), while often confused with *res communis*, is more far-reaching in its intended scope. First, no person, group, or sovereign owns the commons. Secondly, access to the commons is not restricted. Most importantly, however, the distribution of benefits shifts from state(s) to humankind as a whole. In 1982, the Malaysian Prime Minister Mahathir Mohamad proposed that Antarctica be declared the common heritage of mankind. In advocating this proposal before the United Nations General Assembly, Mahathir, with characteristic directness said: “The days when rich nations can grab whatever territory and resources that they have access to, are over. Henceforth, all the unclaimed wealth of this earth must be regarded as the common heritage of all nations.”<sup>41</sup> While the Malaysian initiative remains a thorny issue for the Antarctic Treaty Parties (ATP), it has not changed the management regime for Antarctica nor given the Third World access to the continent’s mineral wealth.

*Res publica*, or “public heritage of humankind” is yet another concept that could be applied to Antarctica, as it would give free access to the continent while at the same time preventing abuses through enforcement action of a state. This begs the question as to which state? As no single country has a sovereign right to Antarctica, administration under *res publica* would in all probability devolve to the United Nations. This alone would make *res publica* unacceptable to the Antarctic Treaty Party states.

As none of the above concepts have found universal acceptance, the legal status of Antarctica remains unresolved. Even if a legal framework were to be agreed there is no guarantee that territorial claims by any of the seven claimant states would stand.

---

<sup>41</sup> See Clad, James, ‘Breaking the ice,’ *Far Eastern Economic Review*, December 1, 1983, p. 25.

Today, it is the doctrine of *occupatio*<sup>42</sup> that determines the legitimacy of acquired territory. This doctrine is comprised of two elements: possession and administration.<sup>43</sup> To meet the test of possession, the territory must be taken into possession by the occupying state. As for administration, this test is met only once the occupying state, having taken possession, establishes some kind of institutional administration that shows that the territory is being effectively governed by the occupying state. If, however, within a reasonable time after the act of taking possession, the occupying state does not establish some institutional authority to exercise governing functions, then there is no effective occupation.<sup>44</sup> It is doubtful that the claimant state could use the doctrine of *occupatio* to legally prosecute a claim for a segment of Antarctica.

### **Geopolitics of Antarctic imperialism**

At the turn of the twentieth century, Great Britain began to appreciate the strategic significance of Antarctica in the domination of the southern maritime trade routes via the Cape of Good Hope and Cape Horn. Such sea lines of communication (SLOC) would become vital to Britain's commercial well-being should shipping routes through either the Suez or Panama canals be severed by political or military interference.<sup>45</sup> However, it was not only the threat of political instability in both North Africa and Latin America that brought Antarctica to the fore in British strategic thinking. In the early stages of both World Wars the British fought major naval engagements in the region<sup>46</sup> and was forced to commit considerable sea

---

<sup>42</sup> See Bernhardt, J. Peter A., 'Sovereignty in Antarctica,' *California Western International Law Journal*, Vol. 5, 1975, p. 325.

<sup>43</sup> See Wain, Barry, 'More Claims,' *Far Eastern Economic Review*, April 15, 2004, p. 20. The World Court in 2002 ruled that claims to territorial sovereignty require claimant state to demonstrate to the satisfaction of the international community that it has had continuous occupation, administration and control over the territory being claimed.

<sup>44</sup> *Ibid.*

<sup>45</sup> See Johnson, J. V., 'An Examination of the Military Implications of Australia's Continued Claims to a Large Part of Antarctica,' *Australian Defence Force Journal*, No. 99, 1993, p. 19.

<sup>46</sup> See Bennett, Geoffrey, *Coronel and the Falklands*, Batsford, London, 1962 and Churchill, *op. cit.*, pp.410- 426. On the December 8 1914, a British naval force under command of Vice-Admiral Sir Doveton Sturdee successfully and without the loss of a single man-of-war, defended the Falkland Islands against attack by the German East Asiatic Naval Squadron under the command of Vice-Admiral Maximilian Graf von Spee. By dint of good fortune, Sturdee turned what should have been a repeat of the British defeat at the Battle of Coronel into a stunning victory. Twenty-five years later, at the dawn of the Second World War (1939-1945), the German Admiralty dispatched two 10,000-ton displacement pocket-battleships into the Atlantic Ocean to serve as commerce raiders. The *Deutschland* was to interdict shipping on the North Atlantic trade route while the *Admiral Graf Spee* sailed into the South Atlantic in search of allied merchant shipping. The *Admiral Graf Spee* was eventually trapped off the coast of South America by a naval flotilla

power to search out German armed commerce raiders (disguised as harmless merchantman) as they hid amongst the icebergs of the Southern Ocean.<sup>47</sup>

The strategic position of the Falkland Islands, lying at the eastern entrance to Drakes Passage, was not lost on the British Admiralty. With France and Spain showing interest in colonising these islands, Britain was forced to react promptly, and first occupied the Falkland Islands in 1764. Thus, any ambiguity about the status of the Falkland Islands was settled once and for all.<sup>48</sup> However, early sovereignty claims to Antarctica were more difficult to prosecute for, as recorded in the British parliamentary Hansard, the “continent was constantly under snow and ice, is only partly explored, and it is difficult to say with any exactitude where the land finishes and the ice begins.”<sup>49</sup> These doubts did not completely inhibit British political interest in the control of Antarctica for a sector (20°W-80°W) was claimed in 1908 and in 1917 amalgamated into the Falkland Islands Dependency (FID). In 1919-20 with the memory of the Falkland War acting as a driver, the British government decided to acquire control over the entire continent through the pursuit of a gradualist strategy.<sup>50</sup> To this end, a secret committee was convened, comprising mainly civil servants, but with representatives from Australia and New Zealand. By 1923 this committee had galvanized the British parliament to pass by Order in Council a claim for sovereignty over another sector of West Antarctica. This new claim henceforth called the ‘Ross Dependency’ lay below latitude 60° South and between longitudes 160° East and 150° West. An

---

comprised of British and New Zealand-manned cruisers. Despite a lack of serious damage, the *Admiral Graf Spee* fled the engagement for the sanctuary of the Uruguayan City of Montevideo, located on the River Plate. After 72 hours at anchor and with no desire to face the gathering British naval force, the Germans scuttled the *Admiral Graf Spee* on the evening of December 17, 1939.

<sup>47</sup> See Brennkecke, H. J., *Ghost Cruiser H.K. 33*, William Kimber, London, 1954, p. 175, ‘German Raiders in the Antarctic during the War’, *Polar Record*, Vol. 4, No. 32, July 1946, p. 403 and Churchill, Winston S., *The Grand Alliance*, Reprint Society, London, 1952, p. 409. On the January 19, 1941, the German commerce raider, “H.K. 33” entered the Weddell Sea, and there affected the surprise capture of three Norwegian whaling factory ships and eleven whale chasers. The capture of the three factory ships represented a war prize of some 35,000 gross registered tons of shipping space and some twenty-two thousand tons of whale oil. Three German commerce raiders are known to have used Gazelle Basin in the Sub-Antarctic Kerguelen Islands for crew rest and recreation. There also existed a German proposal to establish a meteorological and radio station on the Kerguelen Islands. In total, German commerce raiders sank in total, 134 ships equalling 837,278 gross tons.

<sup>48</sup> See Chaturvedi, Sanjay, *The Polar Regions: A Political Geography*, John Wiley, Chichester, 1996, p. 60.

<sup>49</sup> See Beck, Peter, *The International Politics of Antarctica*, Croom Helm, London, 1986, p. 28.

<sup>50</sup> Fogg, *op. cit.*, p. 158.

enthusiastic New Zealand government accepted sovereignty over this latest addition to the British Empire.<sup>51</sup>

Anticipating that Britain's imperialist desires would not be satiated with sovereignty over the Ross Dependency, France formally annexed, by Presidential decree, in November 1925, the islands of Saint Paul and Amsterdam, the Kerguelen and Crozet archipelagos, along with Adélie Land on the continent proper.<sup>52</sup> Although the French Antarctic enclave comprised a relatively small wedge sandwiched between the two large slices of territory ultimately claimed by Australia, the French presence caused consternation amongst British Empire claimants although no counter-claim was made.

By the late 1920s, international interest in Antarctica had reached a new height with the continent presenting a unique challenge to adventurers. In 1928, an American, Commander Richard Evelyn Byrd, with the support of commercial sponsors<sup>53</sup> established a base called *Little America* at the Bay of Whales on the Ross Ice Shelf. The following summer Byrd became the first person to successfully fly to the South Pole and back, thus ensuring that his name became synonymous with Antarctica in the minds of most Americans.<sup>54</sup>

The British acknowledged American involvement in Antarctica with little warmth. As a result of such 'interloper' activity, the British became even more focused on implementing a policy 'to paint the whole of Antarctica red' and add a further five and a half million square miles to its Empire.<sup>55</sup> This policy provided the impetus for the 1929-31 British-Australian-New Zealand Antarctic Research Expedition (BANZARE) led by Sir Douglas Mawson. While this expedition carried out some excellent science its principal purpose was political,<sup>56</sup> paving the way for Australia to claim forty-two per cent of Antarctica. In 1933, the British Parliament passed another Order in Council affirming British sovereignty over a sector south of latitude 60° and between longitude 45° and 160° East. Sovereignty was transferred to a reluctant Australian government in 1933, but a further three

---

<sup>51</sup> *Ibid.*

<sup>52</sup> Chaturvedi, *op. cit.*, p. 68.

<sup>53</sup> Fogg, *op. cit.*, p. 158. The private sponsorship came from the American industrialists J. D. Rockefeller Jr. and Edsel Ford.

<sup>54</sup> *Ibid.*, p. 159.

<sup>55</sup> See Beck, Peter J., 'A Cold War: Britain, Argentina and Antarctica,' *History Today*, June 1987, p. 18.

<sup>56</sup> Fogg, *op. cit.*, p. 164.

years lapsed before any formal Australian proclamation was publicised.<sup>57</sup> By 1933, the British Empire laid claim to two-thirds of Antarctica, but it had also reached the zenith of its territorial ambitions.

Norway was next to stake an Antarctic claim. On 14 January 1939, Norway claimed all of the territory that stretches from the FID boundary to the Australian Antarctic Territory (AAT) in the east. The territory became a Norwegian dependency in 1937 and was called Dronning Maud Land.<sup>58</sup> Norway's claim was initiated by the need to protect its whaling industry from British interference, especially once Britain recognized that exploitation of southern whale stocks by American and European whalers was seriously jeopardizing its own whaling industry.<sup>59</sup>

The advent of the Second World War once again sharpened perceptions of strategic and political possibilities in the Antarctic. Even before hostilities began, a possible German claim to territory resulting from a 1938 *Deutsche Antarktische Expedition* raised concerns in both London and Washington. Such was the strength of those concerns that further American Antarctic expeditions were approved for the summer seasons of 1939 through to 1941. For the first time these expeditions were sponsored by the United States Antarctic Service organised under the auspices of the Departments of State, Treasury, Navy and Interior. By now a Rear Admiral, Byrd, with two ships and four aircraft, was dispatched to set up an East Base on Stonington Island off the west coast of the Antarctic Peninsula and a West Base called, *Little America III*, on the Ross Ice Shelf.<sup>60</sup> While this expedition was purported to be scientific in orientation, President Franklin D. Roosevelt advised Byrd that permanent bases on Antarctica were necessary "...because of their growing value for four purposes – national defense of the Western Hemisphere, radio-wave promulgation, meteorology and minerals."<sup>61</sup> As for the German territorial claim, nothing eventuated, although it was rumoured, somewhat improbably, that Hitler and his mistress Eva Braun had landed by U-boat at a 'New Berchtesgarden' built in Antarctica by the 1938 expedition.<sup>62</sup>

---

<sup>57</sup> *Ibid.*, p. 161.

<sup>58</sup> Chaturvedi, *op. cit.*, p. 68.

<sup>59</sup> Beck, *International Politics of Antarctica*, *op. cit.*, p. 27.

<sup>60</sup> Fogg, *op. cit.*, p. 159.

<sup>61</sup> *Ibid.*, p. 162.

<sup>62</sup> Chaturvedi, *op. cit.*, p. 70.

Argentina and Chile began to assert their rights in the Antarctic during the Second World War. Once again such interest only served to heighten British disquiet. This time, however, anxiety reached fever pitch and a secret British naval expedition titled *Operation Tabarin*<sup>63</sup> was dispatched in 1943 to establish a permanent presence on the Antarctic Peninsula. The British also dispatched a warship, *HMS Carnarvon Castle* to the Falkland Islands in response to numerous acts of perceived trespass committed by the Argentinians as they tested Britain's resolve to defend its strategic South Atlantic possessions.<sup>64</sup> At the conclusion of the war, *Operation Tabarin* was terminated and the facilities constructed on the Antarctic Peninsula were transferred to a nascent civilian organisation known as the British Antarctic Survey (BAS).

Chile was the first South American country to stake a claim to territory in Antarctica. On the 6 November 1940, Chile sought sovereignty over all lands and territorial waters of the "Southern Territories", a sector that lies between longitudes 53° and 90° West. This claim had an immediate international impact. The British government protested on the grounds that the sector defined incorporated a part of its FID, while the reaction of the United States was in keeping with its previous stance of recognising no territorial claims. Even the Argentinians held reservations about the validity of the decree since it cut across a sector of the continent that Argentina would soon claim as its own.<sup>65</sup> In February 1943, Argentina laid claim to a section of Antarctica south of latitude 60° and between the meridians 25° and 68° West.<sup>66</sup>

The Anglo-Argentine imbroglio of the war years continued to dog the relationship between the two states after war's end. On several occasions this acrimony almost resulted in naval conflict, the most serious of which occurred in 1948 when a large Argentine naval flotilla was encountered off the South Shetland

---

<sup>63</sup> See Dodds, Klaus, *Pink Ice*, Tauris, London, 2002, p. 14.

<sup>64</sup> Beck, *International Politics of Antarctica*, *op. cit.*, p. 32. These acts of trespass by Argentina only served to propel the oft-neglected Antarctica onto the agenda of the British War Cabinet as a region of significance worthy of a fresh policy initiative covering a range of political, strategic, legal and economic issues. In January 1943 the War Cabinet decided that "all possible steps should be taken to strengthen our title to the Antarctic Dependencies of the Falkland Islands, against which the Argentines were encroaching." *Ibid.*

<sup>65</sup> Chaturvedi, *op. cit.*, p. 78. In 1907, Argentina and Chile attempted to conclude a treaty that would divide 'American Antarctica' between the two states in an endeavour to forestall British claims in the region and deprive London its hegemonic ambitions.

<sup>66</sup> Dodd, *op. cit.*, p. 18.



Islands by a British cruiser and frigate.<sup>67</sup> This incident encouraged these two protagonists, along with Chile, to formally agree that none of their warships would henceforth venture beyond of 60° south. The nebulous nature of its claim<sup>68</sup> convinced the British government that the best course of action to resolve the simmering dispute in the South Atlantic was to refer the whole issue to the International Court. This Britain attempted to do on two occasions. However, neither South American country saw any value in this approach, since in all likelihood the Court would confirm Britain's hegemony over Antarctica. Instead, they set their differences aside in a vain attempt to expedite Britain's removal from a slice of Antarctica they both claim.<sup>69</sup>

Argentine and Chilean ambitions in the Antarctic were both reinforced and challenged by other South American states. Support from Brazil, Ecuador, Peru and Uruguay was conditional upon both Argentina and Chile accepting an alternate legal approach – the Brazilian conceived 'frontage' concept that divided 'Latin American Antarctica' amongst the six states according to the length of each Latin-American country's own maritime boundary.<sup>70</sup> Therezinha de Castro, a Brazilian political commentator, has suggested that the 'frontage' theory arose from an acknowledgement that "Antarctica is fated to be constituted as a cornerstone of our [Brazil's] destiny, thanks to its importance as a base of warning, interception and departure in whatever emergency might occur to affect the defence of the South Atlantic."<sup>71</sup> The frequent and unqualified reference to "defence" and "security" of the South Atlantic has continued to provide Brazil with the pretext for an involvement in Antarctic affairs.<sup>72</sup> Obviously, the 'frontage' concept does not favour either Argentina or Chile, for neither country

<sup>67</sup> Beck, *International Politics of Antarctica*, *op. cit.*, p. 34.

<sup>68</sup> *Ibid.*, p. 30. The territorial claim of Britain, as well as those of Australia and New Zealand, rest on the legal arguments related to prior discovery, the taking of possession and the exercise of a vague form of British 'administration' represented by the issuing of whaling licences and the occasional visit of explorers. According to the British government, such activities constituted a form of 'effective occupation' for polar conditions, which render permanent settlement impossible. Nevertheless the situation remains cloudy, especially since the United States maintains that the absence of a permanent settlement ruled out the acquisition of sovereignty in Polar Regions.

<sup>69</sup> *Ibid.*, p. 35. On several occasions conflict did erupt between Britain and Argentina over the siting of bases on the Antarctic Peninsula. The most serious occurred in 1952 when British marines were landed at Hope Bay to protect FID workers from on-going Argentine military interference as they set about reconstructing a base destroyed by fire in 1948.

<sup>70</sup> See Beck, Peter J., 'International Relations in Antarctica: Argentina, Chile and the Great Powers,' in Michael A. Morris (ed.), *Great Power Relations in Argentina, Chile and Antarctica*, MacMillan, London, 1990, p. 103.

<sup>71</sup> Chaturvedi, *op. cit.*, p. 81.

<sup>72</sup> *Ibid.*

would retain in totality their respective Antarctic claim. However, ratification of the frontage concept would completely exclude Great Britain from Antarctica.

The Cold War brought about a change in American attitudes towards Antarctica. The United States needed to resolve the Argentine-British-Chilean imbroglio as the continuing impasse was diverting British military interest away from the more important European theatre. At the same time the impasse brought an ‘expansionist’ European power (Great Britain) into the Western Hemisphere, which was contrary to America’s own Monroe Doctrine. To assert its hegemony over Antarctic affairs, America mounted the largest individual expedition ever sent to the region, *Operation Highjump* (1946-47), to which America committed some 4,700 personnel plus thirteen naval ships including an aircraft carrier, two seaplane tenders and a submarine. It left no room for doubt about America’s capability to transport a sizeable military force to Antarctica.<sup>73</sup> The objectives of *Operation Highjump* were more military than scientific, for it was used to prepare men and equipment for possible deployment to the Arctic – the Arctic being too sensitive to allow training activities.<sup>74</sup> *Operation Highjump* was followed a year later by *Operation Windmill*, which again had a military objective, this time of testing equipment developed out of the experiences gained during the previous expedition.<sup>75</sup>

### **The road to a treaty**

American activity was viewed with misgivings by other nations with interests in Antarctica. These concerns persisted until the dawn of the International Geophysical Year (IGY).<sup>76</sup> The IGY did highlight the value of Antarctica as an open-air laboratory for the natural sciences and gave the politicisation of the continent a totally new direction. The political need to preserve a pristine Antarctica away from the tensions of Cold War politics became clearly apparent to the two superpowers. This was especially so since a parallel effort in the Arctic had failed. It was against this backdrop that the United States, in May 1958,

---

<sup>73</sup> *Ibid.*, p. 108.

<sup>74</sup> Beck, *International Politics of Antarctica*, *op. cit.*, p. 37.

<sup>75</sup> Fogg, *op. cit.*, p. 167.

<sup>76</sup> The details of just how tortuous this road became prior to the arrival of the International Geophysical Year are discussed in Chapter Fifteen.

invited eleven other countries –including the Soviet Union – to a conference on Antarctica.<sup>77</sup>

American interest in the continued protection of the Antarctic environment was not strictly altruistic, for any treaty negotiated would allow America to protect any potential territorial claim from deterioration while providing sufficient time to formulate strategies to protect its national interest. Moreover, a treaty would help avoid further conflict between the Latin-American claimants and Great Britain, while at the same time preventing a confrontation with the Soviet Union. In the prevailing Cold War climate the Soviet Union, for economic, technological and military reasons, was content to endorse the American initiative provided that any treaty negotiated recognised its interest in Antarctica.<sup>78</sup> Obviously the interests of the United States and the Soviet Union had converged forestalling any immediate confrontation between these hemispheric powers over the continent.

The Antarctic Treaty with a preamble and fourteen articles was signed in Washington on December 1, 1959 by the representatives of the twelve countries that had participated in the IGY.<sup>79</sup> The Treaty took effect on 23 June 1961.

In terms of geopolitics there are four clauses salient to the continued success of the Treaty. Article I of the Treaty declares that “Antarctica shall be used for peaceful purposes only.” All activities with a military orientation, such as the establishment of military bases and fortifications, the pursuance of military manoeuvres, as well as the testing of any weapons, are strictly prohibited. This Article won strong support at the treaty conference from the superpowers for both were keen to keep Antarctic away from the influence of Cold War politics. However, the use of military personnel and equipment was permitted (in recognition of the inhospitable environment of the region) so long as military endeavours are in support of scientific research or other peaceful purposes.<sup>80</sup> The geographical realities have forced the militaries of many nations to co-operate with each other for the sake of science.

---

<sup>77</sup> Chaturvedi, *op. cit.*, p. 110.

<sup>78</sup> *Ibid.*

<sup>79</sup> The twelve signatory states were: Argentina, Australia, Belgium, Chile, the French Republic, Japan, New Zealand, Norway, The Union of South Africa, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, and the United States of America.

<sup>80</sup> Chaturvedi, *op. cit.*, p. 111.

Article I is complemented by Article V, which prohibits any country from conducting nuclear tests in Antarctica and the disposal there of radioactive waste material. This initiative came principally from the Southern Hemisphere countries for the nuclear powers of the late 1950s, being located distant from the continent, were less than enthusiastic about incorporating such a provision.<sup>81</sup>

Article VII provides for wide rights of inspection of all areas of Antarctica by the Antarctic Treaty Consultative Parties (ATCP); these being the countries that are signatories to the Treaty and actively undertake research activities on the ice. The right of inspection was included primarily to monitor non-militarisation and to engender mutual trust amongst participant states. Great Britain proposed the inclusion of this article as means of reducing suspicion that states are not complying with the intent of the Treaty. The United States also insisted upon its inclusion and made it clear that without the unfettered right of inspection there would be no treaty.<sup>82</sup>

Under Article III, the contracting parties agreed that, to the greatest extent practicable there should be an exchange of information about scientific programmes, an exchange of scientific personnel between expeditions and bases, and a free exchange of scientific observations and results between nations.<sup>83</sup>

The remaining articles concern the ways and means of making the treaty system function in the desired manner. In operation, the Treaty is administered on behalf of the international community by the ATCP. There are periodic Antarctic Treaty Consultative Meetings (ATCM) held among the ATCP to recommend measures that would further the objectives of the Treaty. Since 1984, Non-consultative Parties (NCP), countries that do not undertake Antarctic research, but are signatories to the Treaty, along with environment-orientated NGOs, have been invited to attend all meetings of the ATCP.

For the seven claimant countries the Treaty neither endorsed nor extinguished their territorial claims. These were simply “frozen” with the possibility of being resurrected at some future date. As for the Soviet Union (now Russia) and the United States, neither sought to obtain or extinguish their

---

<sup>81</sup> *Ibid.*

<sup>82</sup> *Ibid.*, p. 112.

<sup>83</sup> *Ibid.*

individual right to claim a sector of Antarctica, preferring instead unfettered access to the whole continent.

### **Conventions and protocols**

Since the Treaty was principally a device to keep Cold War adversaries apart, scant attention was paid to the protection of the Continent's fauna and flora, a deficiency made obvious when several European states renewed their interest in harvesting Antarctica's burgeoning populations of fur and elephant seals.<sup>84</sup> International dismay at this prospect was such that precautionary measures were negotiated before any large-scale commercial harvesting could commence. In 1972, the Consultative Parties (CP) formally adopted a Convention for the Conservation of Antarctic Seals (CCAS). Although feared at the time negotiations took place, commercial sealing has not resumed in Antarctica.<sup>85</sup> This was in large part because of the seemingly stringent requirements imposed by the Scientific Committee on Antarctic Research of the International Council of Scientific Unions (SCAR).

Following the reduction in Antarctic whaling, commercial fishing emerged as an important new activity in Antarctic waters. By the early 1970s there were fears that over fishing, particularly of krill, might herald the collapse of the entire marine ecosystem if it was not properly regulated. In addition, both the United Nations Food and Agriculture Organisation (FAO) and the United Nations Development Program had proposed a food development programme for Third World countries based upon the utilisation of Antarctic marine resources. Although not specifically mentioned in the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) agreed in 1980, regulation of the krill fishery was central to the development and adoption of an ecosystem approach to resource management. However, the ATCP had a political motive for seeking an agreement on Antarctic living resources. Such an agreement would avoid sovereignty claims driven by a state's desire to gain exclusive control of marine living resources, while at the same time, allowing consultative countries to

---

<sup>84</sup> See Hansom, James D. and John E. Gordon, *Antarctic Environments and Resources*, Longman, Harlow, 1998, p. 278.

<sup>85</sup> See Templeton, Malcolm, *Protecting Antarctica*, New Zealand Institute of International Affairs, Wellington, 2002, p. 14.

retain control over Antarctica in the face of threats from Third World countries or the FAO.<sup>86</sup>

Just as with the management of living resources, the Antarctic Treaty failed to address the question of mineral resources and their possible exploitation. As the economic potential of Antarctica became subject to increasing speculation during the 1970s, the ATCP appeared less willing to address the mineral rights issue than protecting marine living resources. Although commercial mining activities were not imminent the ATCP eventually decided to adopt a precautionary approach in preference to trying to negotiate a mineral regime once exploitable deposits had been discovered. This was made necessary once American oil companies began exploratory drilling off the Ross Ice Shelf in 1973.<sup>87</sup> Any mineral discovery would have raised legal and sovereignty issues and carried the risk of destabilising the treaty system: for example, the Dufek Intrusion, also referred to as the Dufek Massif, which may contain significant deposits of strategic ores, lies within territory claimed by Argentina, Britain and Chile.<sup>88</sup> In addition, non-treaty parties and developing states perceived that Antarctica held vast mineral riches and were keen to acquire common heritage access by drawing a parallel to the Law of the Sea Convention. These political concerns underscored the urgent need to develop a mineral regime.<sup>89</sup>

The Convention on the Regulation of Antarctic Mineral Activities (CRAMRA) was signed in 1988, but in 1989 both Australia and France backtracked on ratifying the convention. Instead, both countries advocated that no mining should take place in Antarctica and that the continent should be a 'natural reserve land of science.'<sup>90</sup> Although environmental concerns were cited as the basis of both Australian and French rejection of CRAMRA, other factors came to dominate their attitudes. In Australia it was a fear about loss of sovereignty, public opposition to mining on environmental grounds, pressure from NGOs, and a rise in popularity of the Green Party in the crucial Tasmanian State electorate.<sup>91</sup> For the French, the pivotal political issue was the rise in the 'green' vote. As a

---

<sup>86</sup> Hansom *et al.*, *op. cit.*, p. 280.

<sup>87</sup> See Wallace, Catherine, *The Antarctic Mineral Convention: Negotiating the rules of the game for future development*, Victoria University, Wellington, 1988, p. 6.

<sup>88</sup> See Wells, John, *Antarctic Resources: A dichotomy of interest*, Australian National University, Canberra, 1991, p. 11.

<sup>89</sup> Hansom *et al.*, *op. cit.*, p. 283.

<sup>90</sup> *Ibid.*, p. 184.

<sup>91</sup> *Ibid.*

consequence of joint Australian-French lobbying consultative parties became divided over the suitability of CRAMRA. Countries including Belgium, Italy and New Zealand eventually supported the Australian-French initiative while America, Britain and Japan argued against any permanent ban on mining. Although New Zealand had assiduously sponsored the CRAMRA in the past, its announcement in 1990 that it would not ratify the convention effectively shelved CRAMRA.

Having scuttled CRAMRA, Australia and France submitted an alternative environmental protection regime for Antarctica. However, this initiative was universally dismissed, as was an initiative developed by Chile. The quest for an acceptable replacement instrument for CRAMRA was concluded at Madrid in 1990, with the approval of the Protocol on Environmental Protection to the Antarctic Treaty (PEPAT) which embraces many of the features of CRAMRA but, unlike CRAMRA, applied them to most human activities in Antarctica rather than only to mineral resource activities. Also, unlike CRAMRA, one of the central elements of PEPAT was that it unconditionally prohibited any mining-related activity in Antarctica, but only for a fifty-year period.<sup>92</sup> After this period has expired countries may request a revision of this prohibition. The lack of a permanent ban on mineral activities angered numerous ATCP along with many environmental NGOs, but an 'implied' moratorium on mining was all that the United States would agree to. When signing the Protocol in 1991, President George Bush senior was given to comment that the Protocol "addresses our concerns and provides effective protection for Antarctica without foreclosing the options for future generations".<sup>93</sup> Other states, however, considered the Protocol an irresponsible document and only agreed to it after the United States had used bully-boy tactics.<sup>94</sup>

In comparison with CRAMRA, the Protocol leaves one vital question unanswered - it does not address who is responsible for planning human activities in Antarctica. It does place an obligation upon each state that is a signatory to the Protocol to ensure that agreed environmental assessment procedures are applied during any planning process leading to decisions about an activity contemplated in

---

<sup>92</sup> See Wolfrum, Rüdiger, *The Convention on the Regulation of Antarctic Mineral Resource Activities*, Springer-Verlag, Berlin, 1991, p. 88.

<sup>93</sup> Templeton, *op. cit.*, p. 47.

<sup>94</sup> *Ibid.*

Antarctica.<sup>95</sup> After two decades of indecision the lack of agreement on how to manage human activity in Antarctica is tearing at the very fabric of the Antarctic Treaty system. While countries such as Russia have a history of subverting processes regulating fishing in the Southern Ocean, regulation of new activities on the continent itself, initially tourism, but more latterly bio-prospecting, are still defying resolution via the consensus process.

If these twentieth century issues continue to remain unresolved simply because they are too contentious or run counter to the national interest of one or more of the ATCP, then how are the disputatious issues of the twenty-first century to be resolved? Once states seek access, especially to non-living resources of Antarctica (as inevitably they must),<sup>96</sup> the lack of consensus amongst a few privileged countries on how best to deal with such requests will likely breed frustration that could easily turn to unilateral action or even conflict.

## **Gondwanaland's minerals**

### **Hard minerals**

The presence of non-living resources was first recorded by Frank Wild, who discovered coal deposits close to the Beardmore Glacier during Ernest Shackleton's early twentieth-century expedition.<sup>97</sup> These tentative observations belie the fact that Antarctica probably contains the world's biggest coalfields.<sup>98</sup> Given the Energy Watch Group caution about diminishing coal reserves, their exploitation may prove too enticing for some states to resist. In the world of the 1970s and 1980s when global interest became focused on world mineral reserves, especially on oil and natural gas, attention naturally turned to the potential mineral wealth of Antarctica. However, apart from large coal resources along the Trans-Antarctic Mountains and iron-ore deposits in East Antarctica, the presence of significant mineral deposits has yet to be conclusively proved or if they exist, made public. This paucity of information can be directly attributed to the

---

<sup>95</sup> Wolfrum, *op. cit.*, p. 91.

<sup>96</sup> See Darby, Andrew, 'China flags its Antarctic intent,' January 12, 2010, <http://www.nationaltimes.com.au/politics/china-flags-its-antarctic-intent-20100111-m287.html> (9 June 2010)

<sup>97</sup> Hansom *et al.*, p. 221.

<sup>98</sup> See Mitchell, Barbara and Jon Tinker, *Antarctica and its resources*, Earthscan, London, 1980, p. 26.



enactment of PEPAT which prohibits, at least overtly, any exploration for minerals.<sup>99</sup>

The International Geophysical Year was especially fruitful for establishing that many valuable minerals were to be found in the exposed rocks of the mountain ranges. Besides immense seams of coal, traces were found of manganese, molybdenum, uranium, copper and lead.<sup>100</sup> Other reports note that substantial quantities of unspecified minerals have been discovered during the course of scientific investigation in ice-free areas.<sup>101</sup> As a consequence of commercial efforts to locate new reserves of oil and natural gas during the 1970s and 1980s, the occurrence of many non-fuel minerals was established as shown on Map 17. Not all deposits may turn out to be commercially viable for in geological terms “an occurrence is defined as a small quantity of a mineral, often of interest only to geologists.”<sup>102</sup>

Given the past difficulties in exploring for minerals under an ice-sheet with a thickness that can be in excess of four kilometres, any review of Antarctica’s prospective mineral wealth is best based on circumstantial geologic evidence. Nevertheless, according to Maarten de Wit, there is a sound scientific basis for believing that there exist a number of well-defined areas in Antarctica that have a high probability of ore-grade mineral concentrations.<sup>103</sup> In this regard, the most frequently referred to area is the Antarctic Peninsula. Rock from the Peninsula’s mountain belt are so comparable in type and association to those of the Andes of South America that speculation about similar ore deposits in these two mountain belts appears reasonable.<sup>104</sup> The central Andes of Chile and Peru comprise zones of copper and molybdenum deposits, which may or may not occur in association with gold and a host of other minerals. Still other deposits in the central Andes of Peru, Bolivia and Argentina are rich in tin and tungsten, often in association with

---

<sup>99</sup> Hemmings, Alan, ‘Commercial Penetration of Antarctica,’ *ECOLink*, October 2004, p. 8.

<sup>100</sup> See Roucek, Joseph S., ‘The Geopolitics of the Antarctic: The Land is Free for Scientific Work But its Wealth of Minerals has Excited Imperialist Claims,’ *American Journal of Economics and Sociology*, Vol. 45, No. 1, January 1986, p. 71.

<sup>101</sup> See Dugger, John A., ‘Exploiting Antarctic Mineral Resources-Technology, Economics, and the Environment,’ *University of Miami Law Review*, Vol. 33, December 1978, p. 318.

<sup>102</sup> See Westermeyer, William E., *The Politics of Mineral Resource Development in Antarctica: Alternative Regimes for the Future*, Westview Press, Boulder, 1984, p. 54.

<sup>103</sup> See de Wit, Maarten J., *Minerals and Mining in Antarctica: Science and Technology, Economics and Politics*, Clarendon Press, Oxford, 1985, p. 15.

<sup>104</sup> *Ibid.*



this range of mountain might also contain reserves of copper, lead, zinc, silver, tin and gold.<sup>109</sup>

Yet another area of potential mineralisation straddles the Transantarctic mountain range. This geologic anomaly is the previously mentioned the Dufek Massif. This geological intrusion was discovered during the IGY as a consequence of a geographic and geophysical exploration of the region behind of the Filcher and Ronnie Ice Shelves.<sup>110</sup> The Dufek Massif is of particular interest because it is an igneous stratiform complex similar to others around the world where chromium, platinum, copper and nickel are mined in commercial quantities.<sup>111</sup> Similar intrusions containing platinum mineralisation are found in Montana, USA, and more significantly, in a mineral-rich Bushveld layered complex in South Africa.<sup>112</sup>

The geological relationship that exists between South America and the Antarctic Peninsula similarly exists between the other locations in Antarctica and countries that once comprised Gondwanaland. Along the margins of East Antarctica lies a possible mineral-rich belt which connects it to the lead–zinc–silver–rich belts of Australia and Southern Africa.<sup>113</sup> East Antarctica also displays strong similarities with India most significantly with regard to hydrocarbon and coal potential.<sup>114</sup>

### **Hydrocarbons**

There is more than anecdotal evidence to suggest that Antarctica is rich in petroleum. In 1973, the American drillship *Glomar Challenger* drilled four exploratory wells in the Ross Sea bed, in three of which traces of hydrocarbons were found.<sup>115</sup> The same vessel revisited Antarctica in the mid-1980s<sup>116</sup> and as a part of the American managed Ocean Drilling Program (ODP) another drillship,

---

<sup>109</sup> See Zumberge, James H., 'Mineral Resources and Geopolitics in Antarctica,' *American Scientist*, Vol. 67, January/February 1979, p. 72.

<sup>110</sup> *Ibid.*, p. 19.

<sup>111</sup> Westermeyer, *op. cit.*, p. 39.

<sup>112</sup> De Wit, *op. cit.*, p. 19.

<sup>113</sup> *Ibid.*, p. 17.

<sup>114</sup> See Quilty, Patrick, 'Mineral resources of the Australian Antarctic Territory,' in Stuart Harris (ed.), *Australia's Antarctic Policy Options*, Australian National University, Canberra, 1984, p. 196.

<sup>115</sup> Wallace, *op. cit.*, p. 27.

<sup>116</sup> See Fox, Robert, *Antarctica and the South Atlantic*, British Broadcasting Corporation, London, 1985, p.176.

*Joides Resolution*, drilled a series of holes in the Weddell Sea in 1987 and Prydz Bay in 1988. Although pressure still exists for the drilling programme to continue in Antarctic waters, overt drilling for oil is currently not acceptable. Notwithstanding treaty provisions, seismic mapping of potential oil reservoirs and covert drilling continue under the auspices of science.<sup>117</sup> Also, there are reoccurring reports of Russia prospecting for oil in Antarctica's Cosmonaut Sea.<sup>118</sup>

While there are no proven commercial petroleum reserves in Antarctica, it has long been speculated that extensive hydrocarbon deposits exist in the sedimentary basins in and around the continent. Such speculation is based on the relationships of hydrocarbon occurrence in sedimentary basins and undisturbed tectonic plate edges elsewhere in the world.<sup>119</sup> Although geophysical data is sparse, sedimentary basins with hydrocarbon potential exist beneath the Ross Sea continental shelf, the Weddell Sea, the Bellinghausen Basin, along the Wilkes Land coast, and in the Prydz Bay-Amery Basin.<sup>120</sup> An additional potential site has been identified in the Amundsen Sea close to Mary Byrd Land, offshore from the Russian base of *Russkaya*.<sup>121</sup>

In Antarctica the prospects of commercial exploration for offshore hydrocarbons are better than for onshore. Of twenty-one onshore and offshore sedimentary basins ten have been identified as suitable for further exploration. There is conjecture that these basins hold in total some 203 billion barrels of oil equivalent,<sup>122</sup> which would be sufficient to turn the gaze of an oil-starved world south despite the Antarctic Treaty. One estimate of the hydrocarbon reserve beneath the Ross Sea suggests it will hold at least a billion cubic metres of oil equivalents,<sup>123</sup> while another estimate posits that this location holds at least 15 times the hydrocarbons potential of New Zealand's Maui field.<sup>124</sup>

---

<sup>117</sup> Wells, *op. cit.*, p. 9.

<sup>118</sup> Hemmings, *op. cit.*, p. 8.

<sup>119</sup> Hansom *et al.*, *op. cit.*, p. 32.

<sup>120</sup> *Ibid.*

<sup>121</sup> See Freedman, Lawrence, *Atlas of Global Strategy*, MacMillan, London, 1985, p. 179. The sites mentioned are also highlighted on Map 15.

<sup>122</sup> Hansom *et al.*, *op. cit.*, p. 222.

<sup>123</sup> See Cook, R.A. and F.J. Davey, 'Hydrocarbon Exploration and Potential', in G.P. Glasby (ed.), *Antarctic Sector of the Pacific*, Elsevier, Amsterdam, 1990, pp. 173-177.

<sup>124</sup> See Barrett, Peter, 'The Search for Wealth,' *New Zealand International Review*, Vol. VI, No. 6, 1979, p. 7.

Outside the Antarctic Treaty area, the sedimentary basins around the Falkland Islands are generating active exploration interest. Almost 30 years after the victory in the Falklands conflict against Argentina a United Kingdom petroleum exploration company has discovered an oil reserve north of the Falkland Island.<sup>125</sup> The ‘Sea Lion’ field is expected to hold at least 240 million barrels of oil, although more than one expert suggests that the field could hold some 700 million barrels of oil.<sup>126</sup> Irrespective as to which estimate is eventually judged correct it is but a small portion of the sixty billion barrels of oil that the South Atlantic fields are presumed to contain.<sup>127</sup>

Illustrative of how far Anglo-Argentine relations have deteriorated, Argentina took the unprecedented step of securing the support of thirty-two Latin American and Caribbean countries in demanding that Britain stops its oil exploration in the South Atlantic.<sup>128</sup> A substantial oil find is likely to intensify Argentine rhetoric over sovereignty of the Falkland or Las Malvinas Islands. Moreover, the relationship between these two ‘Antarctic’ states is likely to deteriorate further given that Great Britain intends to extend its exploration rights to cover the vast tract of seabed between South America and the coast of Antarctica.<sup>129</sup>

### **Frozen water**

The volume of Antarctic ice is estimated at around thirty million cubic kilometres representing approximately ninety per cent of all the earth’s glacial ice and about

---

<sup>125</sup> See Webb, Tim, ‘UK firm’s Falklands oil find sparks mix of hopes and fears,’ *Guardian*, 6 May 2010, <http://www.guardian.uk/uk/2010/may/06/falklands-oil-discovery-rockhopper> (21 September 2010).

<sup>126</sup> See Hawkes, Steve, ‘£3 billion Falkland oil boost,’ *The Sun*, 21 September 2010, <http://www.thesun.co.uk/sol/homepage/news/money/city/3145751/3billion-Falkland-Island-oil-boost.html> (21 September 2010).

<sup>127</sup> *Guardian*, *op.cit.*

<sup>128</sup> See Austin, Mark, ‘If the Falklands oil saga comes to war, Britain is on her own,’ *The Mirror*, 28 February 2010, <http://www.mirror.co.uk/news/top-story/2010/02/28/if-the-falklands-oil-saga-comes-to-war-Britain-is-on-her-own-115875-22076343/> (21 September 2010).

<sup>129</sup> See Strange, Hannah, Frank Pope and Deborah Haynes, ‘British drilling for Falkland oil threatens Argentine relations,’ *The Times*, February 13, 2010, <http://business.timesonline.co.uk/business/industrysector/naturalresources/article7025799.ece> (21 September 2010).

two-thirds of the world's theoretical fresh water.<sup>130</sup> Captain James Cook, as far back as 1773, testified to the quality of the water, for he exclaimed even sea ice, once drained of its salt-water covering, yielded fresh water that was perfectly sweet and well tasted.<sup>131</sup>

Although commercial harvesting of Antarctic freshwater ice has not yet begun, it could become a reality because it is not prohibited by PEPAT. The commercial harvesting of icebergs has been discussed for many years as a potential source of fresh water for an increasingly parched world. Yearly production of icebergs in Antarctica represents an estimated 1000 billion tons of water and a "small" iceberg may yield as much as 10 billion litres of fresh water.<sup>132</sup> Mining the continent itself or its larger ice shelves for water cannot be discounted as a future method of satiating a thirsty world.

Countries that are confronting a fresh water shortage have not discounted the potential of Antarctica as a source of fresh water. With water draw-off rendering Australia's great Murray River no more than a trickle as it nears the sea, extraction of fresh water from icebergs transported to the South Australian coast has been seriously debated in the past.<sup>133</sup> A changing climate when coupled with exponential population growth and unfettered economic prosperity has resulted in both China<sup>134</sup> and India<sup>135</sup> being blighted with an acute shortage of potable fresh water. Since both countries have identified that Antarctic ice holds the potential to quench their water requirement, it is only a matter of time before either or both turn their attention and technical resources towards harvesting the continent's ice.

In Antarctica, icebergs are calved from the grumbling sea edges of the numerous glacier-fed ice shelves. According to Professor Pat Quilty<sup>136</sup> the notion of towing melted icebergs from Antarctica was seriously considered by the Germans in the 1980s and since then the technology of wrapping icebergs in a

---

<sup>130</sup> See Buckley, Richard, *Antarctica: Protecting the last wilderness*, European Schoolhouse Publishing, Cheltenham, 1995, p. 3.

<sup>131</sup> See Sellick, R.G. (ed.), *Antarctica: First Impressions 1773-1930*, Fremantle Art Centre Press, Fremantle, 2001, p.19.

<sup>132</sup> See Joyner, Christopher C. 'Antarctica and the Indian Ocean States: The Interplay of Law, Interests, and Geopolitics', *Ocean Development and International Law*, Vol. 21, 1990, p. 47.

<sup>133</sup> See "Erebus", 'A Limited Antarctic Warfare Capability for Australia – Part 1,' *Pacific Defence Reporter*, February 1979, p.47.

<sup>134</sup> See Keyuan, Zou, 'China's Antarctic policy and the Antarctic Treaty System', *Ocean Development & International Law*, Vol. 24, 1993, p. 249.

<sup>135</sup> Joyner, Antarctica and the Indian Ocean States,' *op. cit.*, p. 47.

<sup>136</sup> See Australian Broadcasting Corporation, 'South of no North,' 2000, [http://www.abc.net.au/southnorth/film\\_talent\\_profiles.htm](http://www.abc.net.au/southnorth/film_talent_profiles.htm) (2 June 2004).

plastic coat has been patented by a North American company. When using this technology the optimum sized iceberg is around one million tonnes. However, as there is little economic merit in traveling to Antarctica to harvest a single iceberg, each voyage would result in a number of icebergs being wrapped and left to drift north away from the continent prior to being towed to their ultimate destination.<sup>137</sup>

In what might ultimately turn out to be a conservative forecast the United Nations predicts that by 2025 global fresh water requirements will exceed by five per cent all accessible fresh water sources unless deep underground aquifers and polar icebergs are utilised.<sup>138</sup> Therefore, icebergs calved from Antarctic ice shelves could come to represent a valuable resource coveted by many water stressed countries.

Antarctica is a unique continent. Its geophysical uniqueness comes from being the highest, coldest, driest and windiest continent on Earth. No other land displays such extremes in climate and nor has climate been such a primordial determinant in shaping its terrestrial and marine environments. Geopolitically, Antarctica also is unique for it is without an indigenous people it is the only continent that can truly be called *terra nullius*. As a consequence, the legal status of Antarctica still remains undetermined and not beyond dispute. Also not beyond dispute, is the validity of the seven sovereignty claims to Antarctic territory. Had it not been for the Antarctic Treaty preventing the international community from assertively challenging the validity of these claims, Antarctica, in all probability would have been raked by continual dissention and conflict. The national interest of states has in the past determined Antarctica's future and will likely to do so again, especially when the need to access its natural resources displaces any lingering veneration towards the continent.

It was the drawing together of states under the auspice of the International Geophysical Year that sparked global determination to protect the continent from geophysical devastation spawned by a geopolitical malison – a nuclear conflict that could have turned Antarctica into a decimated battlefield pockmarked by weapons fielded by ideologically-driven combatants. Having survived this nascent

---

<sup>137</sup> See Johnston, Nicole, 'North American company patents ice berg towing,' 22 November 2001, <http://www.abc.net.au/worldtoday/s423378.htm> (1 June 2004).

<sup>138</sup> See United Nations, 'UN Assessment of Freshwater Resources,' June 1997, <http://www.un.org/ecosocdev/geninfo/sustdev/waterrep.htm> (1 June 2004).

threat, Antarctica could now be entering a new uncertain geopolitical era created by a previously unknown geophysical malison – climate change. Paradoxically, it is this latter curse that could render impotent the very geopolitical regime installed to protect Antarctica’s geophysical environment from anthropogenic initiated destruction.

The treaty system has not lessened the desire among states to commence mining Antarctica for strategic hard minerals or to explore its continental shelf to determine the exact extent of the continent’s oil reserves. Indeed, despite protestations to the contrary, evidence suggests some countries could be surreptitiously exploring Antarctica to determine what minerals lay beneath its icy mantle.<sup>139</sup> In a rush to satiate their national interests, states, particularly those that foresee commercial opportunities in a less regulated Antarctica, are already displaying declining respect for the treaty system.<sup>140</sup> This cavalier attitude towards the spirit of the Treaty may represent a precursory signal indicating that the long standing reverence shown the continent is now on the wane. If that is so then PEPAT may have a truncated lifespan. Renewed interest in Antarctica’s mineral wealth would bode ill for the preservation of the *status quo ante*.

An unstable Antarctica racked by resource-fuelled imbroglios would pose a serious threat to all six Southern Oceanic Rim Countries. How this threat would manifest itself will depend upon the political single-mindedness with which extra-regional states pursue their quest for resources. Assuming a weakening of the *status quo ante*, and a rise in resource competition between belligerent states, then one security option available to the Southern Oceanic Rim Countries is to coalesce into a security complex centered on Antarctica. However, as previously mentioned, an academic exploration of such an event is beyond the scope of this thesis. A less desirable outcome would be for these same countries to find themselves unwitting members of an “Austral” shatterbelt. These options are only briefly touched upon in Chapter Fifteen for the emphasis of that chapter is directed towards exploring the nature of the security architecture that might envelop the continent *per se*.

---

<sup>139</sup> See Brady, Anne-Marie, ‘China’s Rise in Antarctica?’ *Asian Survey*, Vol. 50, No. 4, 2010, p.775.

<sup>140</sup> Hemmings, *op. cit.*





## Chapter Fifteen

### Discussion - The Precarious Poles

#### Introduction

The below quotation attributed to the English historian and parliamentarian Edward Gibbon (1737-1794) is an essential truism even in the contemporary world, for the past inevitably exerts a deep shadow over the future.

*I have but one lamp by which my feet are guided and that lamp is experience. I know no way of judging the future but by the past.*<sup>1</sup>

If historical evidence is required that there is an unquestionable linkage between resource scarcity and war, then Adolf Hitler's 'Hossbach Memorandum' of November 1937 will prove more than adequate, for it is illustrative of one state's quest to achieve resource autarky in a time of rising uncertainty. This 'testament' was centred on Hitler's conviction that Germany's needed additional *lebensraum* – living space – to accommodate her expanding population if there was to be any chance of maintaining the people's **living standards**<sup>2</sup> (emphasis added). Hitler concluded that if Germany could not make itself self-sufficient in the resources needed, especially food, by 1945 then "we can expect a change for the worse."<sup>3</sup> In keeping with the 'Hossbach Memorandum,' Germany's thrust onto the steppes of Russia appears a rational solution to a foreseen problem.<sup>4</sup>

Contemporary – as of October 2010 – talk is of the polarizing effect of 'currency wars'<sup>5</sup> which would be engendered globally if states adopted self-serving economic methods to revitalize their economies; even at the risk of triggering a repeat of the trade wars that contributed to the Great Depression of the 1930s. In part this is in recognition that the 'free market' has proved incapable

---

<sup>1</sup> See Wisdomquotes, [www.wisdomquotes.com/topic/future/index3.html](http://www.wisdomquotes.com/topic/future/index3.html) (6 October 2010).

<sup>2</sup> See Hart, B. H. Liddell, *History of the Second World War*, Pan Macmillan, London, 1992, p. 7.

<sup>3</sup> *Ibid.*, p. 8.

<sup>4</sup> *Ibid.*, p. 7.

<sup>5</sup> For a discussion of the likely economic and political implications of the contemporary 'currency wars' see The Economist, 'How to stop a currency war,' *The Economist*, Vol. 397, No. 8704, October 10, 2010, p. 11 and p. 72.

of resolving all systemic economic failures. When market forces fail, states revert to political means to secure a position that favours them, even if that position disadvantages other states.<sup>6</sup> The same was true in the early 1980s when the market lost its force as a means of allocating supplies of natural resources. Access to raw materials was considered too important to leave to the market alone, especially under conditions of political instability resulting from the Soviet Union's flirtations with resource-rich Third World countries.<sup>7</sup> Such flirtations recognized that in spite of which side of the Cold War ideological schism a state positioned itself on, every country had to grow its economy to insure its security and tranquillity. Citizens then, as now, expected and demanded both a continual rise in income and the standard of living, neither of which could be achieved without assured access to resources.<sup>8</sup>

Materially satisfying these twin expectations divided the world into great power spheres of influence.<sup>9</sup> Moreover, then as now, the probability existed that critical raw materials would lie within another great power's sphere of influence and hence misgivings over continued access were rife. In an anarchic world suspicions over the motives of other great powers can prove to be corrosive. Ongoing mistrust between ideologically divided states in combination with the availability of technically superior weapon systems lead countries over the course of the Second Cold War to develop and improve their military capabilities.<sup>10</sup> In such circumstances the acquisition of arms can be seen as a normal or regular pattern of state behaviour. However, under periods of intense military competition 'normal' behaviour can turn 'abnormal,' causing states to embark upon an arms race.<sup>11</sup>

According to Colin Gray, definitions of the term "arms race" are rare and often unconvincing hence he penned his own which will suffice as a descriptor of

---

<sup>6</sup> See Dunphy, Harry and Martin Crutsinger, 'Currency wars loom as finance talks fail,' *New Zealand Herald*, Auckland, October 11, 2010, p. B20. The term "currency wars" was coined by the Brazilian Finance Minister Guido Mantega to explain why a state tries to keep its own economy viable by managing the exchange rate and intervening in financial markets to the detriment of other states. See Fraga, Arminio, 'Brace Yourself: Currency War is the Next Crisis,' *Newsweek*, November 2010-February 2011, 40.

<sup>7</sup> See Russett, Bruce, 'Security and the Resource Scramble: Will 1984 be like 1914?' *International Affairs*, Vol. 58, 1981-1982, p. 42.

<sup>8</sup> *Ibid.*, p. 43.

<sup>9</sup> See Alden, Chris, *China in Africa*, Zed Books, London, 2007, p. 135.

<sup>10</sup> Russett, *op. cit.*, p. 51.

<sup>11</sup> See Rolls, Mark G., *The 'Arms Dynamic' in South-East Asia During the Second Cold War*, Ashgate, Aldershot, 2002, p. 2.

this politico-military phenomenon that is now reported to be occurring among Arctic rim states.

*...there should be two or more parties perceiving themselves to be in an adversary relationship, who are increasing or improving their armaments at a **rapid** rate and structuring their respective military postures with a **general** attention to the past, current, and anticipated military and political behaviour of the other parties.*<sup>12</sup> (Emphases in the original)

Gray maintains that in order to create an arms race dynamic there must be a measure of action-reaction or there would be no arms race at all. Those states embroiled within this phenomenon are forced to maintain an awareness of military activities undertaken by rival participant states because their action serves as a trigger for a corresponding reaction.<sup>13</sup> Additionally, Gray maintains that war or the fear of war is the most likely initiator behind any arms racing, although, other analysts, for example Coral Bell, believe that there is an obvious correlation between a “crisis slide” and arms racing, which was evident during the periods 1906-14 and 1936-39.<sup>14</sup> A contemporary “crisis slide” along with a resultant arms race occurred in the southern Sudan ahead of the January 2011 referendum over independence for Sudan’s southern province.<sup>15</sup> In this oil-rich region both the Sudanese government and Sudan People’s Liberation Army were in a race to rearm ahead of what analysts foresee as a conflagration over hydrocarbons.<sup>16</sup>

Without doubt, the fiercest arms race occurred during the perilous years of the Cold War (1945-91) when military competition pivoted on the number of thermo-nuclear warheads and intercontinental delivery systems each superpower could field. While the collapse of the Soviet empire heralded a slow reduction of warheads and delivery systems held by each superpower, it failed to relegate the concept of cold wars to the draws of history. Since the dawn of the twenty-first

---

<sup>12</sup> See Gray, Colin S., ‘The Urge To Compete: Rationales for Arms Racing,’ *World Politic*, Vol. 26, No. 2, January 1974, p. 208.

<sup>13</sup> See Gray, Colin S., ‘The Arms Race Phenomenon,’ *World Politics*, Vol. 24, No. 1, October 1971, p. 28.

<sup>14</sup> Gray, ‘Urge to Compete,’ *op. cit.*, p. 212.

<sup>15</sup> See BBC News, ‘Hillary Clinton: South Sudan referendum is a ‘time bomb,’’ 9 September 2010, <http://www.bbc.co.uk/news/world-africa-11241359> (7 October 2010).

<sup>16</sup> See Ghosh, Bobby, ‘Birth Pains,’ *Time*, Vol. 176, No. 15, October 11, 2010, p. 30.

century the concept has once again found favour with political commentators,<sup>17</sup> principally in the guise of a resource-initiated cold war.<sup>18</sup>

Media reports inevitably, but not exclusively, link the fossil fuel/minerals-new cold war nexus to the current competition between states for sovereignty over the Arctic.<sup>19</sup> A similar linkage has also made with regard to the Antarctic.<sup>20</sup> Hence, the Polar Regions appear as the most likely loci where the new global resource-initiated cold war will be contested first. In an increasingly interdependent world, the forthcoming scramble for polar resources will serve as proof that neither the Arctic nor Antarctica can be shielded from social, economic, environmental or military milieus originating from within the non-polar world. Equally, both complementary and competing interests stemming from climate change will serve to bind the polar and non-polar worlds more firmly together, irrespective of whether either world is united through cooperation or cleaved by conflict.<sup>21</sup>

---

<sup>17</sup> A frequently cited reference on this topic see Edward Lucas, *The New Cold War: How the Kremlin Menaces both Russia and the West*, Bloomsbury, London, 2008. If seeking a non-traditional origin of a new Cold War see Larry Diamond, 'Winning the New Cold War on Terrorism,' <http://www.stanford.edu/~ldiamond/papers/ColdwarOnTerrorism.pdf> (12 October 2010).

<sup>18</sup> A. M. Martin Ferguson, the Minister for Resources and Energy for Australia in 2008, delivered a conference address in which he raised the possibility that a new "Cold War" had emerged in the competition over access to energy resources. See A. M. Martin Ferguson, 'Energy Security: the new Cold War,' *International of Global Energy Issues*, Vol. 29, No. 4, 2008, pp. 366-367. In 2007, at least two other assertions that a Cold War is again a political phenomenon have been published. In the first, Liam Fox, the then British shadow Defence Secretary, argued that a rising strategic challenge for all countries would be maintenance of energy security in an environment where the supply of fossil fuels had become a political weapon and energy security had become synonymous with national and economic security. See Fox, Liam, 'Energy: the new cold war,' *The Sunday Times*, London, July 15, 2007, [http://www.tmesonline.co.uk/tot/comment/columnist/guest\\_contributors/article207667.ece](http://www.tmesonline.co.uk/tot/comment/columnist/guest_contributors/article207667.ece) (13 October 2010). Such comments having been made by a Minister of the Crown could be seen as an initial step towards the securitisation of energy resources. The second article was published in the journal *Economist*, which highlighted that a scramble had begun among Arctic States to garner proof that their portion of the Arctic continental shelf incorporated a sector of the 'oil-rich' Lomonosov Ridge. A successful proof of claim would be detrimental to other Arctic-rim states. See *Economist*, 'Drawing lines in Melting Ice,' August 16, 2007, pp. 51-52, <http://iilj.org/documents/DrawingLinesinMeltingIce.TheEconomist.pdf> (14 October 2010).

<sup>19</sup> Lucas, *op. cit.*, pp. 242-243. Also see P. Whitney Lackenbauer, 'An Integrated Approach to Canada's Arctic,' *Behind the Headlines*, Vol. 65, No. 4, 2008, p. 21 and Cohen, Ariel, Lajos F. Szaszdi, and Jim Dolbow, 'The New Cold War: Reviving the U.S. Presence in the Arctic,' *Background*, The Heritage Foundation, No. 2202, 2008, [www.heritage.org/Research/EnergyandEnvironment/bg2202.cfm](http://www.heritage.org/Research/EnergyandEnvironment/bg2202.cfm) (31 August 2010).

<sup>20</sup> See Rozoff, Rick, 'Scramble for World Resources: Battle for Antarctica,' *Global Research*, May 16, 2009, <http://www.globalresearch.ca/PrintArticle.php?articleId=13639>. (14 October 2010).

<sup>21</sup> See Macalister, Terry, 'Climate change could lead to Arctic conflict, warns senior Nato commander,' *Guardian*, 11 October 2010, <http://www.guardian.co.uk/environment/2010/oct/11/nato-conflict-arctic-resources/print> (13 October 2010).

Many similarities appear to exist between the contemporary era and that described by Bruce Russett in 1981. Perhaps with prophetic insight, Russett argued that there will be a rising risk of great power confrontations stemming from economic causes in the twenty-first century. The reason behind many perceived forthcoming confrontations was clear; no industrialized state can tolerate sustained interruption in the supply of critical commodities, be they living or non-living resources. Russett wisely suggested that “neither exaggeration of the ‘resource war’ nor ignoring the likelihood of [resource] shortage can be done safely.”<sup>22</sup> Russett’s comments were proffered before climate change made more complex an already obfuscated situation. It is within these parameters that this chapter postulates upon the likely future configuration of security architecture for each polar region.

The “hybrid” theory approach developed in Chapters Three through to Six can be applied to evaluate the security architecture within any defined geographical region. Its strength is derived from an ability to synthesize from seven essential elements a theoretical structure capable of guiding the analytical enquiry at the heart of this chapter. The six essential elements it will be remembered are:

1. *boundary, which differentiates the regional security complex from its neighbours;*
2. *anarchic structure, which means that the regional security complex must be composed of two or more autonomous units, but geographical contiguity is not mandatory;*
3. *polarity, which covers the distribution of power among the units;*
4. *social construction, which covers the patterns of amity and enmity among the units;*
5. *the intensity of security externalities on both regional and non-regional units; and*
6. *competition for control over a geographic region by strategically important states is indicative of a ‘shatterbelt region’ that can overlay regional security complexes, unstructured security regions or a grouping of the two.*

---

<sup>22</sup> Russett, *op. cit.*, p. 57.

### **A security complex's evolutionary path**

At this juncture in the thesis it is appropriate to revisit those characteristics that make geopolitical theories an applicable analytical tool to examine the future regional security for both Polar Regions. The main advantage of the regionalist approach inherent in regional security complex theory is that it differentiates global from regional security dynamics and different regional security dynamics from each other. In so doing it reflects upon the territoriality innate in many security dynamics. Regionalism emphasizes local security dynamics and forces an evaluation of how the global and local security dynamics interplay with each other. According to Buzan and Wæver, acknowledging the regional level as an independent and frequently powerful factor in the security equation is essential to both sound theory and sensible policy.<sup>23</sup> While regions are not necessarily formed by geography, culture, patterns of current events or local discourses about regionalism, regional security complexes are essentially socially constructed by members through processes of securitisation or desecuritisation. Security complexes, therefore, can be transformed by changes to these processes.

One characteristic that will define both the global and region security discourse in the future is the issue of polarity within the international power structure in which all states must operate.<sup>24</sup> During the first two decades of the post-Cold War period, the global power structure has remained 1+ 4, with the United States as the sole superpower and China, the European Union, Japan and Russia as great powers.<sup>25</sup> While in the short-term this polarity is likely to remain unaltered, the structure might evolve into 1 + x or possibly 0 + x, where 'x' will only be quantified through hindsight. If America's superpower status is to be challenged, then that challenge will almost certainly come from Asia and most probably from China. If the United States accommodates this challenger then global polarity will revert to that which characterized the Cold War period of 2 + x.<sup>26</sup>

If America fails to maintain a 1 + x system, either by abdication or by misplaying its role, the shift to 0 + x would have several clear consequences for

---

<sup>23</sup> See Buzan, Barry and Ole Wæver, *Regions and Powers: The Structure of International Security*, Cambridge University Press, Cambridge, 2003, p. 480.

<sup>24</sup> See Buzan, Barry, *The United States and the Great Powers: World Politics in the Twenty-First Century*, Polity Press, Cambridge, 2004, p. 31.

<sup>25</sup> Buzan and Wæver, *op. cit.*, p. 446.

<sup>26</sup> *Ibid.*, p. 458.

the relationship between the regional and global levels. This possibility cannot be dismissed lightly for such an eventuality has been recognized by the United States National Intelligence Council through its “‘first” among equal [great] powers’ statement.<sup>27</sup> Irrespective of whether global polarity is 1 + x, 2 + x or neither, in the future the ‘x’ in the polarity equation will determine the number and geographic composition of regional security complexes. Almost certainly a future list of great powers will differ quite markedly from that identified by Buzan and Wæver: with the most notable absence from many lists of future great powers being the European Union. Condoleezza Rice, a former United States Secretary of State, identified six countries – Brazil, China, India, Indonesia, South Africa and Russia – along with the United States as the world’s future great powers.<sup>28</sup> The American consulting firm Goldman Sachs suggests that the seven great economic powers of the mid twenty-first century will be China, the United States, India, Brazil, Russia, Indonesia and Mexico.<sup>29</sup> In conceptualizing regionalism from a different perspective than the above authors, George Friedman envisages a future world fractured by political fault lines into regions centred on the United States, Mexico, Poland, Russia, Turkey and a condominium of China and Japan.<sup>30</sup> All of the above are illustrations of a probable hemispheric shift in power polarity which has implications for international security, the number and geographic composition of security complexes and the creation of shatterbelts.

There are two further evolutionary trends that have the potential to impact upon the theoretical precepts underlying this thesis. First, unstructured regions are in retreat. In its pure form this condition no longer exists, although in parts of Africa and central Asia, where the condition previously existed, structural transformation has not resulted in the creation of regional security complexes, but rather in pre- or proto-complexes. Thus Buzan and Wæver consider the world is now close to being made up entirely of classical regional security complexes.<sup>31</sup> Under this

---

<sup>27</sup> See National Intelligence Council, ‘Global Trends 2025: A Transformed World,’ *United States Printing Office*, 2008, p. 93, [http://www.dni.gov/NIC\\_2025\\_project.html](http://www.dni.gov/NIC_2025_project.html) (23 November 2008).

<sup>28</sup> See Rice, Condoleezza, ‘Rethinking the National Interest: American Realism for a New World,’ *Foreign Affairs*, Vol. 87, No. 4, July/August 2008, pp. 2-6.

<sup>29</sup> See Wilson, Dominic and Raluca Dragusanu, ‘The Expanding Middle: The exploding World Middle Class and Falling Global Inequality,’ *Goldman Sachs*, Global Economic Paper 170, 2008, p. 10.

<sup>30</sup> See Friedman, George, *The Next 100 Years: A Forecast for the 21st Century*, Black Inc., Melbourne, 2010, pp. 65-88.

<sup>31</sup> Buzan and Wæver, *op. cit.*, p. 472.



scenario the status of Antarctica and the Southern Ocean is not clarified, hence the region can reasonably be considered as unstructured.

The second evolutionary trend affects the concept of *insulator states* which is central to regional security complex theory. All states, with the exception of global powers, are located in only one regional security complex or they are insulator states that belong either to no region or several regions. In this latter category one or more states can occupy an insulating position “where they define and occupy the boundaries of indifference between the self-contained dynamics of [regional security complexes] on either side of them.”<sup>32</sup> However, limiting the role of ‘insulator’ to a single state (Burma) or a group of states (Caucasus) is seen as too narrow given that Sahel states of Africa perform this function by isolating the Southern African and Middle Eastern regional security complexes from each other.<sup>33</sup> In recognition of this evolutionary development, regional security complex theory now accepts that insulators can assume the structure of a mini-complex.<sup>34</sup> Just as with an insulator state, a mini-complex can isolate two regional security complexes from each other because neighbouring states may get involved in that part of the mini-complex that borders them, without that engagement ‘coming out on the other side,’ thus amalgamating two regional security complexes into one.<sup>35</sup>

Insulator states are by definition candidates for external transformation. They have links into several security complexes and their continued status depends on their miniscule level of security interdependence being maintained. If one regional security complex becomes more intense, while the other loses its relative importance, then the insulator could be absorbed into the strongest neighbouring security complex. While such a happening is neither frequent nor easy,<sup>36</sup> it is not an impossible event as will be demonstrated in the Arctic.

### **The Arctic: today a proto-complex, tomorrow a shatterbelt**

As discussed in Chapter Thirteen, the Arctic is undergoing physical and political change at an alarming pace that has astonished both the Arctic-rim states and the

---

<sup>32</sup> *Ibid.*, p. 484.

<sup>33</sup> *Ibid.*, p. xxvi.

<sup>34</sup> *Ibid.*, p. 484.

<sup>35</sup> *Ibid.*

<sup>36</sup> *Ibid.*, p. 487.

world as a whole. Global media usually concentrate their attention on the linkage between the impacts of climate change and the threat to Arctic states sovereignty. Never before has the very nature of the Arctic been challenged by such a disparate set of issues. The worldwide realisation that the Arctic is melting and hence more accessible than ever before, has forced upon the coastal states an awareness that they must prepare for the outside world's entry into their polar domain. With international challenges to Arctic states control of the region now emerging, no Arctic-rim state can afford to ignore its high north.

At the centre of the emerging challenges lies the issue of sovereignty. There are three main elements of sovereignty: an existing governance system, a defined territory, and people within that defined territory. In the Arctic, each of these variables is difficult to achieve and may not be achieved in their entirety.<sup>37</sup> For all Arctic-rim states there is no question that the first and third variables are met, but to meet the second variable defined boundaries are required. For a boundary to have validity, the agreement of the international community is required, although the number of states that must agree to a boundary before it is considered internationally acceptable remains unclear.<sup>38</sup>

The complexity surrounding the determination of ocean boundaries is extremely pertinent to state sovereignty in the Arctic. The United Nations Convention on the Law of the Sea codified existing customary international law and created several new maritime zones. As a general rule, the further removed a zone is from terrestrial territory the less control a state has over the activities within the zone. Sovereignty over the two zones nearest land – the territorial sea and the Exclusive Economic Zone – is universally accepted and gives coastal states control over all living and non-living resources in these zones. Beyond the Exclusive Economic Zone a state can exert control over the ocean soil and subsurface if it is able to show that the deep-ocean continental shelf is an extension of its own continental shelf. If this can be satisfactorily proved then a state can claim control of the seabed and resources for an additional 150 nautical miles. A state with such a zone has control of all activities that occur on or

---

<sup>37</sup> See Huebert, Rob, 'Canadian Arctic Sovereignty and Security in a Transforming Circumpolar World,' Foreign Policy for Canada's Tomorrow No 4, *Canadian International Council*, July 2009, p. 1, <http://www.canadianinternationalcouncil.org> (19 October 2009).

<sup>38</sup> *Ibid.*

beneath the seabed, but not within the water column. This is currently understood to mean control over such activities as oil and gas development.<sup>39</sup>

If, in the future, there is a challenge to the Arctic-rim states' sovereignty over the Arctic region, principally over the Arctic Ocean, then that challenge will centre on the recognition or non-recognition of each state's maritime boundaries. The question of legitimizing maritime boundaries and sovereignty over territory within those boundaries has been discussed previously in this thesis, as have the three unique and powerful forces leading to the Arctic region's transformation: climate change, resource development and a geopolitical transmutation.

It is these three forces working in concert that are likely to reshape the current strategic environment, although precisely how is not yet fully appreciated.<sup>40</sup> Most Arctic states have embarked upon reshaping their security requirements in the Arctic, though their actions have often been taken in the absence of a clear understanding of the future strategic environment. Consequentially, most Arctic states are currently rebuilding their military capabilities, particularly the capabilities likely to be needed in the Arctic, in order to be able to respond to every imaginable contingency.

Of particular concern among a number of Arctic states is the redeployment of Russian armed forces to the Arctic. While this concern has yet to translate into an actual threat, their concern is that should Russian actions become more bellicose then they must have the ability to respond. An equally nebulous concern is the indiscernible impact of climate change. Most Arctic states have publically announced that an increasingly accessible Arctic is expected to give rise to new, but as yet unspecified economic activities. The desire to be prepared for such an eventuality has focused their attention on enhancing surveillance and enforcement capabilities: the need to know what is happening is a significant driver for creating an indigenous ability capable of responding to any ominous exogenous event.<sup>41</sup>

Arctic-rim states previously accepted that with the cessation of the Cold War the strategic significance of the Arctic ended, as did the need to be concerned about traditional security threats. So total was the collapse of the Soviet Union

---

<sup>39</sup> *Ibid.*, p. 3.

<sup>40</sup> *Ibid.*, p. 19.

<sup>41</sup> *Ibid.*, p. 28.

that the threat posed by its Northern Fleet's impressive array of nuclear-powered attack and missile carrying submarines was quickly discounted. Simultaneously, almost all other Arctic states reduced the northern element of their own forces so that by 2002 the northern military capabilities of all Arctic states had been substantially curtailed.<sup>42</sup> This reduction in capabilities, in combination with a lack of interstate tension, apparently lead Buzan and Wæver to overlook the Arctic region when constructing their three post-Cold War classical regional security complexes centred on the continental great powers – the United States, the European Union and the Russian Federation.

Security complexes are considered to be durable, but not permanent structures. Structural transformations are possible, although they are likely to be limited in number. To date transformations in the post-Cold War era have occurred in Asia, the former Soviet Union and the Middle East, as well as in Africa all of which have been driven by changes in polarity, boundaries and/or shifts in the amity/enmity quotient.<sup>43</sup> Given that the processes driving transformation will continue, it is desirable to establish a datum point from which to view possible future changes to the three security complexes that border the Arctic. In the years immediately following the terrorist attacks of September 11 2001, Buzan and Wæver foresaw only limited change to these security complexes.

Accordingly, states comprising the North American regional security complex have accepted a deepening in centrality based on the United States as demonstrated by an increasingly regionalist attitude exemplified by the ratification of the North American Free Trade Agreement (NAFTA). Buzan and Wæver express concern about the future role the United States might play as patterns of international relations develop and change during the twenty-first century. These authors accept Dominique Moïsi's view that: "In world history, the US is the first empire that has ever combined so much comparative power and so little interest in the affairs of a world it *de facto* controls."<sup>44</sup> With a decreasing sense of a direct military threat to the American state, policies are shaped more by immediate interests than by long-term strategies for the international order. Such disinterest has lead Buzan and Wæver ask the "crucial question" as to whether the

---

<sup>42</sup> *Ibid.*

<sup>43</sup> Buzan and Wæver, *op. cit.*, p. 478.

<sup>44</sup> *Ibid.*, p. 302.

United States will continue to be a superpower and hence maintain the global power structure of 1 + x, or will it opt to change the polarity to 0 + x.<sup>45</sup> Any diminution in its superpower status will severely curtail America's ability to influence political events in the Arctic.

The EU-Europe has few security problems. Most European states remain relatively strong and prior to what is now termed the "Great Recession (2007-2009) era"<sup>46</sup> domestic politics had not readily turned violent. These underlying pacifistic tendencies are a characteristic of a security community built on desecuritisation.<sup>47</sup> For Europe, this security architecture works only by mixing the twin fears of resecuritisation with Europe's politically turbulent past.<sup>48</sup> Although the theories of democratic peace, interdependence and trading states insist that war among states of Western Europe is no longer credible, the region's history makes the notion of future European wars difficult to erase. Buzan and Wæver conclude that as long as war within Europe is possible, it will not happen, but if war becomes impossible, it might happen.<sup>49</sup> George Friedman posits that the portends of a twenty-first century European war already exist, for as the economic and political power of Europe ebbs, European states will seek to secure a line of buffer states between themselves and future tumultuous changes in Russia.<sup>50</sup> Any deterioration in interstate relations on the broader Eurasian continent will colour relationships between contesting states that share interests in the Arctic.

In the post-Soviet era, Buzan and Wæver foresee the possibility of numerous transformations involving Russia. Transformations range from the post-Soviet regional security complex becoming balanced rather than centred on Russia as states within the Commonwealth of Independent States (CIS) garner influence, to an external transformation of its border with Europe. Out of this ambit of possibilities the most likely are that Russia will adopt attitudes reminiscent of a superpower rather than those of a mere regional power.<sup>51</sup> It is this

---

<sup>45</sup> *Ibid.*, p. 303.

<sup>46</sup> See Baumeister, Christiane and Luca Benati, 'Unconventional Monetary Policies and the Great Recession,' *European Central Bank*, Working Paper Series No. 1258, October 2010, p. 6, <http://www.ecb.int/pub/pdf/scpwps/ecbwp1258.pdf> (11 November 2010).

<sup>47</sup> See Adler, Emanuel and Michael Barnett, 'Security communities in theoretical perspective,' in Emanuel Adler and Michael Barnett (eds.), *Security Communities*, Cambridge University Press, Cambridge, 1998, pp. 3-4.

<sup>48</sup> Buzan and Wæver, *op. cit.*, p. 375.

<sup>49</sup> *Ibid.*, p. 376.

<sup>50</sup> Friedman, *op. cit.*, pp. 160-165.

<sup>51</sup> Buzan and Wæver, *op. cit.*, p. 435.

aspiration that continues to define its relations with ex-Soviet Central Asian states – its ‘near abroad’ – its global role as an energy superpower<sup>52</sup> and its direct relations with countries that share a mutual interest in the Arctic.

The Eurasian continent comprises two centred regional security complexes, one centred on the EU and the other on Russia. Both are centred on great powers. Together, these two regional security complexes form a weak supercomplex. Any future strengthening of the European supercomplex would be an acknowledgement that the European Union was in the process of becoming a great power of increasing global relevance. Such an assertion is not assured given that the possibility remains, albeit unlikely, that the EU will fragment and individual states embark upon renationalisation.<sup>53</sup> In the Russian-centred complex the question of legitimacy over the post-Soviet space remains pivotal for without control over peripheral states the Russian centred classical regional security complex would collapse. According to Buzan and Wæver, the merger between these two complexes can be imagined either through increasing tension created by insecurity interdependence, or, by bolstering European security institutions and cooperation. A conflictual scenario is difficult to imagine in the near-term, but cannot be discounted over the longer-term.<sup>54</sup> Despite the torturous economic and security cooperation that exists between states within these two complexes, the cooperative scenario continues to hold, although, as with the conflictual scenario, it is unlikely to spark an external transformation leading to a complete merger.<sup>55</sup>

Compared to Buzan and Wæver’s rather conservative view of the world in 2003, there is need to quantify the “new” non-traditional security threats that are likely to become increasingly pronounced over the course of the twenty-first century. Although these threats have been catalogued in a previous chapter, their importance to the future politico-military sector has not long been recognized by security organisations. This change is exemplified in a recent publication authored by the United States Department of Defense (DoD) titled ‘Quadrennial Defence

---

<sup>52</sup> See Hill, Fiona, ‘Russia: The 21<sup>st</sup> Century’s Energy Superpower?’ *The Brookings Institution*, Spring 2002, [http://www.brookings.edu/artices/2002/spring\\_russia\\_hill.aspx](http://www.brookings.edu/artices/2002/spring_russia_hill.aspx) (12 November 2010).

<sup>53</sup> Buzan and Wæver, *op. cit.*, p. 437. This is also a central tenet of George Friedman’s futuristic exposé “The Next 100 Years: A Forecast for the 21<sup>st</sup> Century.”

<sup>54</sup> *Ibid.*, p. 438.

<sup>55</sup> *Ibid.*, p. 439.

Review Report,' from which a paragraph is worth quoting as it places these "new" threats to the Polar Regions in their security context.

*...powerful trends are likely to add complexity to the security environment. Rising demand for resources...the effects of climate change...are just some of the trends whose complex interplay may spark or exacerbate future conflicts.*<sup>56</sup>

The confluence of these two powerful trends in the Arctic domain is seen by the Department of Defense as posing a threat likely to require a military response.<sup>57</sup> More importantly, it is recognition that these threats could create an entirely new security complex – a petropolitical security complex – that would overlay the three existing Arctic regional security complexes.<sup>58</sup> The identification of hydrocarbons as a specific causal factor does not preclude access to other natural resources, especially frozen water, as the impetus behind a number of additional environmental security complexes come into being.

Unexploited hydrocarbon reserves in combination with disputed maritime borders can create fiction between sovereign states as evidenced by the political fury East Timor displayed towards Australia over the latter's initial unwillingness to share the hydrocarbon reserves beneath the Timor Strait.<sup>59</sup> In the Arctic the first oil wells began to operate at full production in 1911,<sup>60</sup> the single most important discovery was that made in 1967 when oil reserves were discovered at Prudhoe Bay on the Alaskan Arctic coast.<sup>61</sup> There are also various locations in northern Siberia, north of the Arctic Circle, where the oil industry is firmly established. The first Soviet field was discovered in 1930 and since that date in excess of 230 fields have been identified and more than 5,400 wells drilled.<sup>62</sup> Onshore reserves in Canada, Russia and Alaska north of the Arctic Circle support more than four-hundred oil and natural gas fields. Despite extensive oil exploration most of the

---

<sup>56</sup> See Secretary of Defense, *Quadrennial Defense Review Report*, United States Department of Defense, Washington, D.C., February 2010, p. iv.

<sup>57</sup> *Ibid.*, p. 86.

<sup>58</sup> The advent of petropolitical security complexes were discussed in detail in pages 92-94.

<sup>59</sup> See Dusevic, Tom, 'Hands Off My Petroleum', *Time Magazine*, May 10, 2004, pp. 36-41.

<sup>60</sup> See Howard, Roger, *The Arctic Gold Rush: The New Race for Tomorrow's Natural Resources*, Continuum, London, 2009, p. 67.

<sup>61</sup> *Ibid.*, p. 68.

<sup>62</sup> *Ibid.*

Arctic, especially offshore, is essentially unexplored with respect to hydrocarbon resources.<sup>63</sup>

Of the potential billions of barrels of undiscovered oil identified by the United States Geological Survey (USGS) as lying beneath the Arctic Ocean, approximately two-thirds of the oil deposits located by the USGS lie beneath the inner continental shelves of Alaska, Greenland, Siberia, in the East Barents Sea and the Beaufort Sea where the question of territorial sovereignty either does not arise or only exists between close allies.<sup>64</sup> Although, the USGS did find evidence of oil reserves beneath the disputed waters around the Svalbard Archipelago where Russia and Norway are rivals over sovereignty. The Lomonosov Ridge, or that portion that lies beyond existing Exclusive Economic Zones is predicted to harbour at least 2.5 billion barrels of oil equivalents,<sup>65</sup> which is not an insignificant economic windfall for any state that can extract such a prize.

The USGS survey is not without its critics for it is speculative and not based upon a systematic programme of exploratory drilling. Despite the publication of the survey report there still remains a paucity of reliable information on the Arctic's hydrocarbon reserves. This is especially true of the offshore Russian oil fields east of the Kara Sea, which had not been surveyed using modern methods of exploration and surveillance.<sup>66</sup> This could equally be true for offshore Greenland, given that the director of the Island's Bureau of Minerals and Petroleum has received "some very impressive estimates for northwest and northeast Greenland [amounting to] 50 billion barrels of oil and gas."<sup>67</sup> Hence, the Arctic is likely to prove Thomas Homer-Dixon correct in that predictions about its hydrocarbon resource rely more on black art than science. Only the future will show whether actual exploitable reserves match the USGS's 'best guess.' Irrespective of the ultimate size of Arctic hydrocarbon reserve their importance to the world community should not be understated, especially when the International Energy Agency predicts the world will face an energy crunch by 2015-2020.<sup>68</sup>

---

<sup>63</sup> See United States Geological Survey, 'Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas Deposits North of the Arctic Circle,' *Factsheet 0349*, 2008.

<sup>64</sup> Howard, *op. cit.*, p. 71.

<sup>65</sup> USGS, *op. cit.*

<sup>66</sup> Howard, *op. cit.*, p. 76.

<sup>67</sup> See Folger, Tim, 'Viking Weather,' *National Geographic*, Vol. 217, No. 6, June 2010, p. 63.

<sup>68</sup> See De Backer, Willy, 'Developing Europe's Energy Security: Is the Arctic the Future Frontier?' *Friends of Europe-Statoilhydro*, Café Crossfire Debate, Brussels, 19 September 2008,



Acknowledging that maritime boundary disputes still exist in the Arctic implies that in the presence of an energy crunch such disputes could readily transmute into interstate conflict over hydrocarbon reserves. Equally, but less likely, given the governing ideologies of the states involved, this transmutation could lead to deeper more expansive cooperation between Arctic states. The ultimately hypothetical expression of either of these alternatives is as a petro-security complex that will ‘overlay’<sup>69</sup> the Arctic Ocean portion of the Russian Heartland, European and North American classical regional security complexes – see Map 1. To be valid, this hypothesis must fulfil the specific requirements of the essential elements that undergird the hybrid theory – that test is as follows:

*[A] boundary, which differentiates the security complex from its neighbours.* Defined boundaries confine the geographical extent of this petro-security complex in both a latitudinal and longitudinal direction. In the latitudinal direction the complex will encompass the entire globe north of the Arctic Circle, with the northern longitudinal perimeter being defined by the outer limit of the existing Exclusive Economic Zone. Within this encompassment lie not only the five Arctic-rim states, but also Sweden and Finland. However, the traditional political-military influence created by the formation of this petro-security complex would extend well beyond constituent states, for example, Norwegian Arctic operations would impact on NATO operations. With the discovery of oil in Greenland’s maritime zone comes the prospect that Greenlanders will expect Denmark to cede its sovereignty over the island to them.<sup>70</sup> Should this transformation occur it would significantly weaken Europe’s claim to being an Arctic great power. Being

---

[http://www.friedsofeurope.org/portals/6/download/CC/CC\\_statoil\\_19-09-08\\_09\\_19\\_CC.Energy\\_Security\\_and\\_the\\_Arctic\\_SoD.pdf](http://www.friedsofeurope.org/portals/6/download/CC/CC_statoil_19-09-08_09_19_CC.Energy_Security_and_the_Arctic_SoD.pdf) (16 November 2010).

<sup>69</sup> The sense in which the term ‘overlay’ is used is the same as that described on page 89. However, the notion of an overlay does not preclude the possibility that a sector specific security complex could become established in the absence of a classical regional security complex.

<sup>70</sup> Folger, *op. cit.*, p. 52.

transcontinental in geographical extent would suggest that the complex might be more correctly termed a *petro-supercomplex*<sup>71</sup> to differentiate it from the hypothetical Asian petro-security complex and existing Middle East hydro-security complex, all of which are much smaller in geographical extent.

*[An] anarchic structure, which means that the security complex must be composed of two or more autonomous units, but geographical contiguity is not mandatory.* The composition of this petro-supercomplex encompasses the five Arctic-rim states in three different regional security complexes. Two of these complexes – European and Russian Heartland – are contiguous, while the third – North American – is separated from the other two by the Atlantic Ocean and Bering Strait respectively.

*[P]olarity, which covers the distribution of power among the units.*

The existing polarity within the Arctic petro-supercomplex is 1 + 2: the United States being the sole superpower and the European Union and Russia being great powers. However, by 2025 this polarity structure may have significantly changed with the United States, the “first among equals,” as a great power,<sup>72</sup> while the European Union may have lost its status as a great power.<sup>73</sup> The resurgence of Russia as a great power is accepted while its access to energy resources continues.<sup>74</sup> Should this polarity structure be evident prior to 2035, then the polarity within

---

<sup>71</sup> The characteristics required to be present for the formation of a supercomplex are discussed on page 38.

<sup>72</sup> See National Intelligence Council, ‘Global Trends 2025: A Transformed World,’ *United States Government Printing Office*, 2008, p. 93, [http://www.dni.govt/NIC\\_2025\\_project.html](http://www.dni.govt/NIC_2025_project.html) (23 November 2008).

<sup>73</sup> *Ibid.*, p.94.

<sup>74</sup> *Ibid.*

the Arctic petro-supercomplex would become 0 + 2 – the United States and Russia: a polarity that would exist into the foreseeable future.

*[S]ocial construction, which covers the patterns of amity and enmity among the units.* The current (2010) social patterns favour amity within the suggested Arctic petro-supercomplex as demonstrated by the amicable resolution of a long-standing maritime border dispute between Norway and Russia; although the claim by Russia to the Norwegian Svalbard Archipelago has not been withdrawn. However, questions have surfaced over whether Russia's current benignity towards other states, particularly Arctic-rim states, will continue three decades into the future when the United States has possibly lost its global hegemony<sup>75</sup> and Russia actively seeks to dominate the Arctic in order to secure resources to guarantee its prosperity and security.<sup>76</sup> A more authoritarian Russia is foreseen to be the primary security challenge in the Arctic for Europe, and by implication for the United States.<sup>77</sup> Thus it is probable that by 2035 the social construction within the Arctic petro-supercomplex will have turned from amity to enmity.

*[T]he intensity of security externalities on both regional and non-regional units.* It can be argued that some states, even non-Arctic-rim states, might be tempted to use military force to seize potentially oil-bearing regions from less military capable states on the premise that in the future technology and expertise will enable them to develop and exploit such regions. Will Denmark in the future permit 'defenceless' Greenland to cede from their union when at

---

<sup>75</sup> See Ministry of Defence (UK), 'Global Strategic Trends – Out to 2040,' Fourth Edition, *Development, Concept and Doctrine Centre*, 2010, p. 45.

<sup>76</sup> *Ibid.*, p. 49.

<sup>77</sup> *Ibid.*, p. 48.

the current (November 2010) price of US\$80.00 a barrel Greenland's potential oil reserves have a value in excess of four trillion dollars.<sup>78</sup> This enquiry will assume greater poignancy in the future given that the International Energy Agency expects demand to drive up the cost of a barrel of oil to US\$200.00 by 2035.<sup>79</sup> Greenland's oil reserve would then be worth ten trillion dollars. As access to hydrocarbon reserves becomes increasingly fraught throughout the non-Arctic world, tensions between states over access to remaining reserves will create security externalities for all five Arctic-rim states.

Security externalities that could give rise to the establishment of a non-traditional security complex are not sufficiently strong enough to supplant the causal factors responsible for the creation of the classical regional security complex. Nor is there the opportunity for extra-regional states to impose themselves upon the established pattern of regional security and create an entirely new regional security structure.

The sixth element does not apply since the transformation of this petro-supercomplex into a shatterbelt by 2035 appears unlikely; although it cannot be entirely precluded. However, this worst-case scenario, when viewed from a 2010 perspective, looks highly speculative providing the Arctic petro-supercomplex does not geographically extend beyond the Exclusive Economic Zone of each Arctic-rim state.

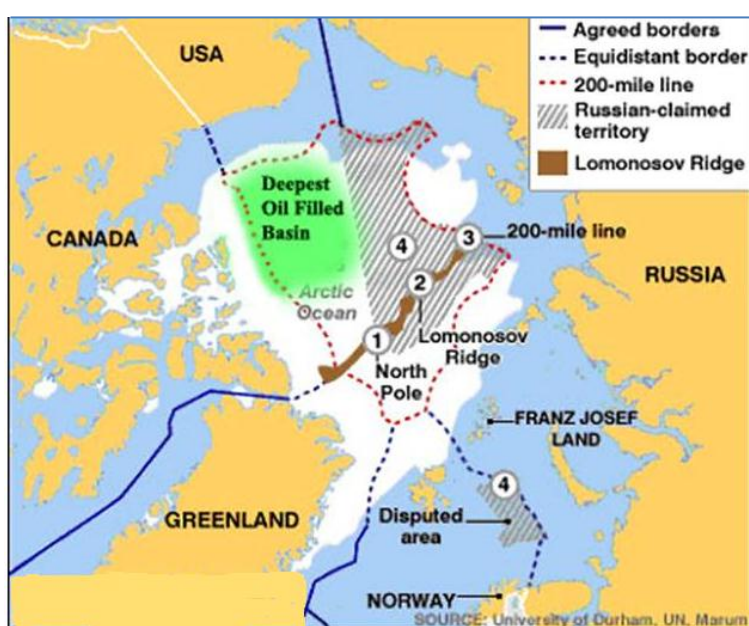
The region beyond the Arctic Exclusive Economic Zones, colloquially known as the "Area," or more correctly the "outer-continental shelves," which to date is the last unclaimed area of the Arctic Ocean. The "Area's" extent and location is shown on Map 18. It is possible to draw an analogy between the "Area" and the "focal ground" as proposed by Sun Tzu. Both are considered to be outside

---

<sup>78</sup> Folger, *op. cit.*, p. 63.

<sup>79</sup> See Kumar, Nikhil, 'Demand will drive cost to US\$200 by 2035, says agency,' *The Business Herald*, Auckland, November 12, 2010, p. 7.

of one's own territory, but to be of considerable strategic importance. The future is likely to confirm what history has aptly demonstrated, the state that first occupies the "Area" will ultimately find itself in a most advantageous position. Under one interpretation of Sun Tzu's writings the "[f]ocal ground is a junction which extends in all directions. ...it gives security to get but is dangerous to lose."<sup>80</sup> The first foray to secure a significant portion of the "Area" occurred on the 2 August 2007, when two Russian miniature submarines descended over four thousand metres to the Lomonosov Ridge enabling a politician plant the Russian flag on the seabed adjacent to the North Pole.<sup>81</sup>



**Map 18.** The region within the Arctic Ocean known as the "Area" that lies beyond the 200-mile territorial limit of all Arctic-rim states.

Source: United Oil and Gas Consortium Management Corp, <http://www.unoilgas.com>

Before Russia and the other four 'Arctic Five' states can divide the "Area" between themselves, they will need to overcome one issue. That issue relates to the continued legitimacy of Western-orientated multilateral international institutions and universal adherence to laws such institutions promulgate. The United States National Intelligence Council has suggested that by 2025 global governance will be comprised of a patchwork of overlapping, but often ad hoc and fragmented systems, with shifting coalitions of states, international organisations,

<sup>80</sup> See Hauzhang Tao, *Sun Tzu: The Art of War*, Wordsworth, Ware, Hertfordshire, 1993, p. 73.

<sup>81</sup> Howard, *op. cit.*, pp. 1-3.

social movements, non-governmental organisations and companies. This fragmentation of interests and actors will further erode prospects for the United Nations to strengthen consensus among its members for effective multilateral action.<sup>82</sup> At a sub-global level the European partners to NATO already express a fear that America, being preoccupied by its strategic competition with China and global terrorism, will no longer see the alliance as vital to its security and thus lose interest in this longstanding multilateral institution.<sup>83</sup> One test foreseen for both the United Nations and the multilateral international system as a whole is the re-emergence of strategic rivalries especially, but not exclusively, centred on access to resources such as energy and water. Disputes over these resources could return the world to an international system reminiscent of the late nineteenth century which was characterized by arms racing, territorial expansion and military rivalries.<sup>84</sup>

Although generally echoing the National Intelligence Council's predictions, the United Kingdom Ministry of Defence maintains that while the United Nations Charter framework will remain in place, the legal prohibition on the use of force is likely to come under increasing pressure when resource security adversely affects national survival. Under such circumstances a state may well interpret the legal framework in a manner that legitimizes its use of force.<sup>85</sup> In the future, securing access to resources could stimulate a complete disregard for any legal provisions that inhibit non Arctic-rim states from cementing, by military force if necessary, their right to exploit the minerals beneath the Arctic Ocean.

China's concerns over how the existing international system may deny it access to Arctic resources were discussed in Chapter Thirteen. Unsurprisingly, therefore, recent Chinese statements have become more bellicose in their assertion that the "Arctic Five" states need to recognise the interests of non-Arctic states. Although the Chinese maintain they have no formal Arctic strategy, several Chinese academics have recently encouraged their government to "Grasp this historic opportunity and recognise the political, economic and military value of the Arctic and then re-evaluate China's rights in the Arctic region and adjust its

---

<sup>82</sup> National Intelligence Council, *op. cit.*, p. 81.

<sup>83</sup> See Economist, 'The future of NATO: Fewer dragons, more snakes,' *The Economist*, Volume 397, No. 8708, November 13, 2010, p. 26.

<sup>84</sup> National Intelligence Council, *op. cit.*, p. 82.

<sup>85</sup> Ministry of Defence (UK), 'Global Strategic Trends – Out to 2040,' *op. cit.*, p. 18.

strategic plan.”<sup>86</sup> These academics have also raised the alarmist possibility of an alliance among the Arctic states that could further disadvantage China.<sup>87</sup> Equally bellicose statements have been attributed to the Russian President who, in a recent truculent address to his country’s Security Council in March 2010 maintained that Russia must be prepared to defend its claims to the Arctic’s mineral riches. This bellicose rhetoric only served to further heightened security tensions that have come to exist between Russia and Canada. President Medvedev predicted that climate change will spark conflicts once the ice melts exposing new areas for exploration.<sup>88</sup> In September 2008, Moscow endorsed the “fundamentals of state policies of the Russian Federation in the Arctic for the period up to 2020 and beyond:” one fundamental was the need to settle the outer limits of the continental shelf beyond the 200 nautical mile limit,<sup>89</sup> i.e. Russian sovereignty over a sector of the “Area.”

China stands ready to exploit interstate tensions over the question of resource access that will arise between the great powers,<sup>90</sup> including, no doubt, tensions over sovereignty of the “Area.” China is not the only non-Arctic state with an expressed interest in the future governance of the Arctic. Japan, North Korea and South Korea have shown a keen interest in access to Arctic minerals.<sup>91</sup> Furthermore, India, in a concerted effort to secure access to energy resources ahead of China, is seeking to exploit oil reserves in the Russian Arctic which is likely to bring India into a “strategic and economic tussle” with China.<sup>92</sup> A ‘resource union’ between India and Russia would be viewed with concern by China given that it views both countries as strategic opponents and Russia as a potential military challenger.<sup>93</sup>

---

<sup>86</sup> See Jakobson, Linda, ‘Preparing for an ice-free Arctic (3),’ *Chinadialogue*, April 21, 2010, <http://www.chinadialogue.net/article/show/single/en/3584-Preparing-for-an-ice-free-Arctic> (28 April 2010).

<sup>87</sup> *Ibid.*

<sup>88</sup> See Associated Press, ‘Canada-Russia Arctic tensions rise,’ *The Canadian Press*, March 17, 2010, <http://www.cbc.ca/world/story/2010/03/17/arctic-russia017.html> (23 November 2010).

<sup>89</sup> See Zysk, Katarzyna, ‘Russia’s Arctic Strategy: Ambitions and Constraints,’ *Joint Force Quarterly*, Issue 57, 2<sup>nd</sup> Quarter, 2010, p. 106

<sup>90</sup> See Secretary of Defense, ‘Military and Security Developments Involving the People’s Republic of China 2010,’ Annual Report to Congress, *Department of Defense*, 2010, p. 15.

<sup>91</sup> Jakobson, ‘Preparing for an ice-free Arctic (3),’ *op. cit.*

<sup>92</sup> See Chitnis, Nandu, ‘India in Bid for Shares in Russia’s Arctic Oil Reserves,’ 24 September 2010, <http://ecopolitology.org/2010/09/24/india-to-bid-for-share-in-russia-arctic-oil-reserves/> (23 November 2010).

<sup>93</sup> Secretary of Defense, ‘Military and Security Developments Involving the People’s Republic of China 2010,’ *op. cit.*, p. 38.

So could the “Area” be transformed into a non-traditional regional security complex or a shatterbelt?

Despite the five littoral states having endorsed militarisation as a means of prosecuting their individual claims within the high Arctic, it is questionable as to whether these states will have an unfettered right to dictate the region’s future. This would be especially true for the “Area” which is considered by some non-Arctic states to be the “property of all of the world’s people.”<sup>94</sup> This question could be resolved in one of three ways. First, it could be resolved in the manner suggested by Klaus Dodds, that during a period when interstate goodwill prevails, all states with interests in Arctic affairs subscribe to a political governance arrangement similar to the treaty arrangement instituted by the Antarctic Treaty Parties in the late 1950s. Even though this suggestion has been made on numerous occasions, to date it has never found favour amongst the Arctic-rim states. Unless unanimity exists among all interested parties, adopting this option would perpetuate the *status quo*, which is already unsatisfactory to both Arctic and non-Arctic states alike. In terms of regional security complex theory, as long as the *status quo* remains the “Area” would continue to be an unstructured insecure region. The second option is for the United Nation to resolve through UNCLOS a division of the “Area” among the Arctic-rim states that is universally accepted. This would preclude the involvement within the “Area” of all non-Arctic-rim states unless invited to participate in the region’s development by an Arctic-rim state. From a security complex theory viewpoint this option would simply enlarge the area encompassed by the petro-supercomplex.” Thirdly, should the awarding of sovereignty not be accepted universally, and especially not by the emerging great powers, or should the United Nations fail to decide upon the issue, then the prospects of a peaceful resolution appear slim. The most probable outcome is that interested states that hold the necessary technical, economic and military capabilities will unilaterally exploit the “Area” for its resources. The resultant ‘resource rush’ could temporarily establish an unsustainable non-traditional regional security complex or supercomplex which would eventually disintegrate to be replaced by a shatterbelt or under the worst-case scenario, a resource war.

---

<sup>94</sup> Jakobson, ‘Preparing for an ice-free Arctic (3),’ *op. cit.*



The sixth essential element identifies the reasons why a shatterbelt appears the most probable future security structure for the “Area.”

*[C]ompetition for control over a geographic region by strategically important states is indicative of a ‘shatterbelt region’ that can overlay regional security complexes, unstructured security regions or a grouping of the two.* There is no certainty that under UNCLOS the United Nations will be able to award the five Arctic states sovereignty over the “Area,” for such a proposition would inevitably be contested by non-Arctic great powers. Other states with no interest in the Arctic may also wish to contest the United Nations proposal for no other reason than it might set an unwelcome precedent for the settlement of sovereignty claims elsewhere in the world, including Antarctica. Worst still, in the decades ahead the authority of the United Nations took unto itself to instigate international agreements could be declared void by ‘disadvantaged’ states. While to date China has adopted a wait-and-see approach to Arctic developments, in other regions it has not shied away from using or threatening to use military force in the process of securing access to resources. A dispute with neighbouring states over resources beneath the South China Sea is an illustration of China’s aggressive approach to resolving its hydrocarbon insecurity.<sup>95</sup> The bellicosity of Russia illustrates that the peaceful resolution of ownership over the “Area” is not assured. Furthermore, confronted by renewed great power interest in the Arctic, America’s President George W. Bush issued, in 2009, the first new Arctic directive in fifteen years, which placed an emphasis on the creation of “greater capabilities and capacity, as necessary, to protect

---

<sup>95</sup> *Ibid.*, p. 17.

United States air, land, and sea borders in the Arctic region” along with an “increase Arctic maritime domain awareness in order to protect maritime commerce, critical infrastructure, and key resources.”<sup>96</sup> The United States seeks, like the other Arctic-rim states, to extend its sovereignty into the “Area.”

If the “Area” becomes subsumed into the Exclusive Economic Zones of the Arctic-rim countries, then the boundaries of the Arctic petro-supercomplex would simply be extended northwards. An overlaying shatterbelt is an unlikely consequence of such a territorial rearrangement. A more likely scenario established in the absence of international cooperation, suggests that states will seek to secure, probably by force-of-arms, access to the region’s energy and mineral resources. Under this scenario the criteria necessary for a shatterbelt to form would be present especially if strategic mistrust evident amongst great powers elsewhere in the world comes to clouds their relations in the Arctic.<sup>97</sup>

### **Antarctica: from a past proto-complex to a future shatterbelt**

Regional security complex theory suggests that as unstructured regions continue to retreat they would most likely be replaced by proto-complexes. Changes to one or more of the essential elements that characterized such security complexes<sup>98</sup> also determined the transformational path taken towards achieving a different status. In the post-Cold War era the unstructured region that was central Africa evolved into two quite distinct proto-complexes – regions where there is sufficient security interdependence to delineate a region and differentiate it from its neighbours, but where the regional security dynamic is too weak to make the region a fully-fledged

---

<sup>96</sup> See The United States President, ‘National Security Presidential Directive /NSPD-66,’ *The White House*, January 9, 2009, <http://www.fas.org/irp/offdoc/nspd.66.htm> (23 November 2010).

<sup>97</sup> See Carr, Edward, ‘Brushwood and gall,’ *The Economist*, Vol. 397, No. 8711, December 4, 2010, *A special report on China’s place in the world*, p. 5.

<sup>98</sup> See Buzan, Barry, *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*, Pearson, Harlow, 1991, p. 211.

regional security complex<sup>99</sup> – one, in West Africa became centred on Nigeria while the other, the Horn, which for the present, is centred on Ethiopia.<sup>100</sup>

Plausibly, the above process is not the only evolutionary mechanism through which an unstructured region can metamorphose into a proto-complex. Unlike the African experience, Antarctica could be seen to have passed through an intermediary transformation — that of a *pre-complex*. This pre-complex<sup>101</sup> stage could have become established in 1917 when Great Britain claimed sovereignty over the Antarctic Peninsula and amalgamated that claim with its claim over the Falkland Islands to create the Falkland Island Dependency. This pre-complex would have collapsed upon the end of Second World War hostilities. Although their Antarctic claims were predated by some three decades by Great Britain, the respective territorial claims of Argentina and Chile over the Antarctic Peninsula pitched all three states against each other. It was during the Second World War, however, that Antarctica, or at least the Antarctic Peninsula, garnered the strategic significance necessary to provoke a heightened level of security interdependence among these and other competing states.

Initial militarisation of Antarctica came about as the consequence of Anglo-Argentine rivalry<sup>102</sup> and a need by the British to establish observatories on the Antarctic Peninsula to provide valuable meteorological information – ‘*Operation Tabarin*.’<sup>103</sup> Furthermore, German submarines prowled the ocean north of the Antarctic Peninsula harassing ships transporting food to Europe from the Atlantic coast of Latin America,<sup>104</sup> while German commerce raiders ventured into Antarctic waters to harass allied shipping and whaling fleets.<sup>105</sup> With the defeat of Germany, Great Britain’s hegemony over Antarctica waned only to be replaced by that of the United States.

---

<sup>99</sup> Buzan and Wæver, *op. cit.*, p. 491.

<sup>100</sup> *Ibid.*, p. 260. Buzan and Wæver raise the spectre that Egyptian-Ethiopian conflict for control of the Nile River and the usage to which its waters can be put holds the potential to turn the Horn proto-complex into a sub-complex within the Middle Eastern conflict formation.

<sup>101</sup> “Pre-complex” stage is formed when a set of bilateral security relations seems to have the potential to bind together into an regional security complex, but has not yet achieved sufficient cross-linkages among actors – in this instance states – to do so. *Ibid.*, p. 490.

<sup>102</sup> See Millegan, Kris, ‘Operation Highjump,’ 30 October 2001, <http://south-pole.com/p0000150.htm> (29 November 2010).

<sup>103</sup> See Moneta, Carlos J., ‘Antarctica, Latin America, and the International System in the 1980s: Towards a New Antarctic Order?’ *Journal of Interamerican Studies and World Affairs*, Vol. 23, No. 1, February 1981, p. 42.

<sup>104</sup> *Ibid.*

<sup>105</sup> Millegan, *op. cit.*

Underscoring its changed status the United States undertook *Operation Highjump*, which according to the popular press was mounted “primarily as a lap in the race for uranium.”<sup>106</sup> This naval foray occurred during a period of rising acrimony between Great Britain and Argentina which nearly resulted in naval conflict. In 1948, the British cruiser *HMS Nigeria* and accompanying frigate *HMS Snipe* when on a patrol to the South Shetland Islands intercepted an Argentine flotilla capable of forcing an opposed landing comprising the cruisers *Veinticinco de Mayo* and *Admirante Brown*, six destroyers, two transports and various support vessels.<sup>107</sup> If indeed Argentine intensions were to execute a forced landing on British Antarctic Territory then the presence of the Royal Navy provided timely intervention. Tensions between Great Britain and Argentina on the Antarctic Peninsula were further exacerbated by the Hope Bay incident of 1952, when Argentine soldiers fired shots over the heads of British personnel as they disembarked to rebuild a station that four years earlier had be destroyed by fire. And just a year later Britain forcibly removed Argentine and Chilean huts that it considered were too close to its own facilities.<sup>108</sup>

The United States needed to resolve the Argentine-British-Chilean imbroglio over the Antarctic Peninsula, for the impasse was diverting British military interest away from the increasingly important European theatre. Even if ‘expansionist’ Great Britain withdrew from Antarctica a sovereignty conundrum would still overlay the Antarctic Peninsula reflecting the historical terse relationship between Argentina and Chile. The origin of this tension dates back to Latin American Wars of Independence of the nineteenth century when, as independent states, both countries failed to resolve overlapping claims to six hundred thousand square miles of Patagonian territory<sup>109</sup> and the ownership of three barren islands – Picton, Lennox and Nueva – in the Beagle Channel, south of Tierra del Fuego.<sup>110</sup> However, past resolution of both disputes has not eliminated every opportunity for

---

<sup>106</sup> *Ibid.*

<sup>107</sup> See Beck, Peter, *The International Politics of Antarctica*, Croom Helm, London, 1986, p. 34.

<sup>108</sup> See Chaturvedi, Sanjay, *The Polar Regions: A Political Geography*, John Wiley, Chichester, 1996, p. 109.

<sup>109</sup> See Hutchison, Cathel, ‘Conflict Between Chile & Argentina,’ *ehow*, July 20, 2010, [http://www.ehow.com/print/about\\_6751533\\_conflict\\_between\\_chile\\_argentina.html](http://www.ehow.com/print/about_6751533_conflict_between_chile_argentina.html) (1 December 2010).

<sup>110</sup> Laudy, Mark, ‘The Vatican Mediation of the Beagle Channel Dispute: Crisis Intervention and Forum Building,’ p. 295, <http://www.wilsoncentre.org/subsits/ccpdc/pubs/words/11.pfd> (2 December 2010).

either one of these disputes to once again sour relations between these neighbouring states as witnessed by recent (2010) reopening of old wounds over one hundred miles of contested land known as the ‘Southern Icefields’ – a region reported to contain the second largest reserve of potable water in the world.<sup>111</sup>

The increase in United States’ Antarctic activity was viewed with misgivings by other nations with interests in the continent. On Stonington Island the British viewed the Americans with suspicion, while Argentina and Chile saw *Operation Highjump* as a direct threat to their territorial claims. Australia and New Zealand were also fearful that some malevolent military intent lay behind the renewed attention America was showing Antarctica. International concerns forced America to adopt a new strategy. In order to calm these fears the United States proposed that Antarctica become a territory under international trusteeship or under an eight-power condominium – the seven claimant states plus America. Only New Zealand, among the seven claimant nations, was willing to surrender sovereignty to such a cause.<sup>112</sup> There was a suggestion that New Zealand could better assert its right to a slice of Antarctic territory by partnering the United States in a joint claim.<sup>113</sup> While this suggestion might have led to improved co-operation between the two countries, New Zealand’s adamant stance over the rightfulness of its claim to the Ross Dependency scuttled the proposal.<sup>114</sup>

Despite Russian involvement in Antarctica since the Thaddeus Bellinghausen expedition of 1819-21, the Soviet Union was denied a copy of the American proposal for an international treaty. This caused Moscow to proclaim that it would not recognise any change to the governance of Antarctica to which it was not a party. The Soviet response only served to ensure that future American policies were designed to guarantee that the Soviet Union was given no opportunity to participate in an Antarctic settlement and administration or present

---

<sup>111</sup> See Fendt, Lindsay, ‘Old wounds were reopened between Chile and Argentina this week: a long-time border dispute in the nations’ southern Patagonia region,’ South Atlantic News Agency, May 20, 2010, <http://en.mercopress.com/2010/05/20/argentina-revives-long-time-border-dispute-with-chile> (2 December 2010).

<sup>112</sup> See Fogg, G. E., *A History of Antarctic Research*, Cambridge University Press, Cambridge, 1992, p. 167.

<sup>113</sup> *Ibid.*, p. 168.

<sup>114</sup> See Dodds, Klaus, *Pink Ice*, Tauris, London, 2002, p. 79.

it with an excuse to become a claimant nation.<sup>115</sup> Such was the nature of Cold War politics.

Undeterred by American attitudes, the Soviet Union, in 1955, advised all claimant states that it would mount a significant Antarctic expedition and establish several bases primarily in the sector claimed by Australia. In February 1956, to the booming of guns, the Soviet Union hoisted its flag over *Mirny*, a station on the edge of the Antarctic continent. While the Australians did not protest such ceremony,<sup>116</sup> they became hysterical at the thought of the Red Flag flying so close to the South Pole. Many Australians believed that the Soviets would use science as a pretext to establish numerous missile bases on Antarctica.<sup>117</sup> Thus, American attempts to internationalise the politics of Antarctica achieved little other than to make the existing situation worse. The final impetus, which ultimately resulted in the Antarctic Treaty, was the growing interest in Antarctica by newly independent states such as India. However, the seven claimant states along with America successfully resisted Indian pressure to have Antarctica placed under United Nations stewardship.

Scientifically, the International Geophysical Year (IGY) was considered a success, but this success could hardly hide the fractiousness of the politics that gave it birth. The claimant countries only agreed to unfettered passage of scientists and the establishment of scientific bases on the clear understanding that such access would not void their sovereignty claims. When the Soviet Union was invited to participate in IGY, hysteria in Australia reached new heights fuelled by fears that any Soviet Antarctica installation could easily be used to launch missiles on Melbourne or Sydney.<sup>118</sup> It was during this period that Great Britain finally accepted that its dominance over the affairs of Antarctica had now passed to the United States. The IGY clearly demonstrated that a gulf now existed between old and new Antarctic powers. While the United States produced thirteen tons of information at the end of its Antarctic programme, Britain funded less research than either Argentina or Chile.<sup>119</sup>

---

<sup>115</sup> See Sullivan, Walter, 'Antarctica in a Two Power World,' *Foreign Affairs*, Vol. 36, No. 1, 1957, p. 164.

<sup>116</sup> Dodds, *op.cit.*, p. 82.

<sup>117</sup> *Ibid.*, p. 83.

<sup>118</sup> *Ibid.*, p. 84.

<sup>119</sup> *Ibid.*, p. 85.

The Antarctic Treaty was signed in Washington D.C. on December 1, 1959 by the representatives of the twelve countries that had participated in the International Geophysical Year. The Treaty took effect on 23 June 1961. Fortunately for the Southern Oceanic Rim States negotiations for the Treaty were completed during a brief period of reduced East–West tension<sup>120</sup> and signed some five months before the rift consequent upon the U-2 spy plane affair. According to Beck, if the Treaty had not become a reality before the U-2 affair, then in all likelihood Antarctica would have been turned into a testing ground for nuclear weapons.<sup>121</sup>

Within the limits of regional security complex theory, a proto-complex in Antarctica is a plausible response to the interstate interplay that occurred on the cusp of the Cold War, for the continent, unlike the Arctic, was not overlaid by either superpower. The most likely location where a classical proto-complex would form was along the Antarctic Peninsula where three countries had overlapping claims and military adventurism was not unknown. While the security dynamics of a proto-complex may not be as strong as those of a regional security complex, the essential elements are the same for both. For the Antarctic Peninsula proto-complex the essential elements are discussed below:

*[A] boundary, which differentiates the regional security complex from its neighbours. This intra-Antarctica proto-complex would likely divide the continent into two segments – “the Peninsula” the parameters of which would be 25° West, the extent of the British claim and 90° West, the extent of the Chilean claim. The balance of the continent, pre-Operation Highjump, given the military weakness of all other claimant countries, would have remained ‘unstructured.’ Post-Operation Highjump, and given the hegemonic intensions of America, the other claimant countries might have aggregated their claims to form a single security entity: possibly a standard regional security complex created through Regional Order*

---

<sup>120</sup> Fogg, *op. cit.*, p. 177.

<sup>121</sup> Beck, *op. cit.*, p. 64.

typology. An equally plausible alternative was for the United States as the hegemonic power to have forcibly overlaid the entire continent to prevent both conflict on the Peninsula and to extinguish any territorial aspirations held by the Soviet Union.

Conceptually, the “Peninsula” proto-complex could have formed a sub-complex within the South American regional security complex in a manner similar to the Malvinas/Falkland Islands. This would be an acknowledgement that other Latin American states i.e. Brazil and Peru had interests as prospective claimant states in the future of Antarctica.<sup>122</sup>

*[An]anarchic structure, which means that the regional security complex must be composed of two or more autonomous units, but geographical contiguity is not mandatory.* Antarctica, subsequent to the voyages of Captain James Cook, has never suffered from a lack of interested actors, be they private enterprises or states. The Peninsula proto-complex would have comprised two Latin American states – Argentina and Chile and one external non-geographically contiguous great power, Great Britain.

*[P]olarity, which covers the distribution of power among the units.* Although militarily weakened by the Second World War, Great Britain, after the cessation of hostilities was still a great power of at least one magnitude greater than either Argentina or Chile.

*[S]ocial construction, which covers the patterns of amity and enmity among the units.* In the immediate post-Second World War years there existed tension along the Antarctic

---

<sup>122</sup> See Child, Jack, *Antarctica and South American Geopolitics: Frozen Lebensraum*, Praeger, New York, 1988, pp. 133-167.



Peninsula between Argentina, Chile and Great Britain, with all three sending warships to Antarctica in support of their claim.<sup>123</sup> The enmity that characterized this period eventually waned between Argentina and Chile, for by 1948 both countries had committed themselves to cooperate in the Antarctic and to mutual recognition of their Antarctic rights in South American Antarctica.<sup>124</sup> However, these amicable relations had collapsed by the time the Falkland Islands War commenced with Argentina accusing Chile of secretly supporting Great Britain.<sup>125</sup>

*[T]he intensity of security externalities on both regional and non-regional units. The Argentinean-Chilean-British imbroglio created security complications for the United States and the Western Alliance as neither could afford for Great Britain becoming embroiled in confrontation in the South Atlantic when yet another European war appear immanent. Indeed, one of the objectives of *Operation Highjump* was to bring an end to this imbroglio through a show of United States military power. What would have aggravated this situation had these three states been aware that the secret objective of *Operation Highjump* was to claim for America “sovereignty over the largest practicable area of the Antarctic continent.”<sup>126</sup> Had the American forcibly followed through on this objective an entirely different security dynamic would have arisen on the continent, especially given the revived interest of the Soviet Union in Antarctica.*

---

<sup>123</sup> *Ibid.*, p. 111.

<sup>124</sup> *Ibid.*, p. 73.

<sup>125</sup> See Hastings, Max and Simon Jenkins, *The Battle for the Falkland Islands*, Michael Joseph, London, 1983, p. 142.

<sup>126</sup> See Mitchell, Barbara and Jon Tinker, *Antarctica and its resources*, Earthscan, London, 1980, p. 12.

Under the above scenario the geopolitical drivers that would have given rise to a proto-security complex emanated entirely from within the politico-military sector of security complex theory and would have been driven by the divisive politics of the Cold War. Paradoxically, the science that helped to sustain claims over Antarctica also played a powerful role in alleviating tension over this contested continent.<sup>127</sup>

The overt display of military power by the United States would have prevented mistrust between the three claimant countries from transforming Peninsula proto-complex into a shatterbelt. While the Soviet Union, whose military involvement could have contributed to the creation of a shatterbelt had it supported Argentina and/or Chile, displayed little interest in Antarctic politics during this period. Therefore, element six does not apply.

Mistrust of another state's long-term political, military and economic objectives may have many sources, both imagined and real. One state may hold fears that another has ambitions to acquire territory or resources or to exploit or dominate it in some way. Ideological differences such as the fear of communism can also be the cause of strategic mistrust.<sup>128</sup> Strategic mistrust can equally arise in the anarchic arena of geopolitics when one or more states challenge the *status quo* causing structural tension between themselves and defenders of the prevailing international order. The cause and probable outcome of such a challenge is often explained in terms of "power-transition theory" – an international relations theory with a long record of empirical support.<sup>129</sup>

---

<sup>127</sup> Dodds, *op. cit.*, p. 76.

<sup>128</sup> See Garrett, Banning, 'The Need for Strategic Reassurance in the 21st Century,' *Arms Control Association*, Washington, D.C., March 2001, <http://www.armscontrol.org/print/810> (13 December 2010).

<sup>129</sup> See Lemke, Douglas, 'The Continuation of History: Power Transition Theory and the End of the Cold War,' *Journal of Peace Research*, Vol. 34, No. 1, P. 23. Power-transition theory holds that the internal growth of a country determines its power. Once a country achieves power parity (rough equality) with the international systems dominant state it could become dissatisfied with the international *status quo* and require specific changes be made, which are likely to be resisted by the system's dominant state. The combination of power parity and the rising power's negative evaluation of the *status quo* provide the necessary conditions for war. This war is fought for control of the 'rules of the game,' or *status quo* of the international system. Should the rising power be victorious in this conflict its expectation is that it will restructure the international system to its liking - diplomatically, economically and militarily. However, so long as the dominant power holds a preponderance of power the great power system will be at peace. Only when a rising power is dissatisfied and has obtained power parity with the dominant power is war amongst the world's most powerful states anticipated by power-transition theory. *Ibid.*, p. 25. In the contemporary world China's continuing rise as both an economic and military power will likely exacerbate Sino-American tensions in the years ahead causing Northeast Asia's multipolarity to become unbalanced resulting in an attempt by the United States to prevent the rising power that is

Replacement of British influence over matters Antarctica by the revisionist policies of the United States, especially its proposal to internationalize the continent, caused diplomatic panic within the claimant countries. More broadly, the long-term implication of the American proposal reactivated Soviet interest in the region. The Soviets were vehement in their denouncement of any proposal to internationalize Antarctica that excluded them from the decision-making process. By 1950, the military and political language of the Cold War had impinged upon the international politics of Antarctica and Great Britain began to realize that its disputes with Latin American countries over Antarctica could no longer be isolated.<sup>130</sup>

The emergence of the Soviet Union as an interested party meant that the United States and the claimant countries had to consider a wider constituency of concerned states. In an era where ideological conflict became the principal determinant in international relations, hysterical rhetoric served to further inflame nascent concerns within southern hemisphere countries about the future intentions of the Soviets in Antarctica. Some articles printed by the Australian press sought to convince readers that the Russians would use science as a cover to locate missile stations in the frozen wastes of Antarctica.<sup>131</sup> Even more alarmist pronouncements were carried by the American media, for example under the title “Red Threat from Antarctica” the following warning was made:

*At the frozen bottom of the earth Russia is moving into a position from which its missile squadrons could outflank the free world. Half of Antarctica is rapidly turning from white to red... From the snowy Antarctic coasts and plateau Russia is in a position to have the entire Southern Hemisphere within easy missile range... The earliest Antarctic threat involves the use of missile-launching conventional submarines operating out of the Soviet*

---

China from becoming the regional hegemon. (See Mearsheimer, John J., *The Tragedy of Great Power Politics*, W. W. Norton, New York, 2001, p. 400). Robert Kaplan maintains that the transition of power between the United States and China could represent the signal drama of the age. (See Kaplan, Robert D., ‘The Geography of Chinese Power: how far can Beijing reach on land and at sea,’ *Foreign Affairs*, Vol. 89, No. 3, May/June 2010, p. 41.

<sup>130</sup> Dodds, *op. cit.*, p. 81.

<sup>131</sup> *Ibid.*, p. 82.

*Union's increasing number of Antarctic bases... The Soviets can put their ICBM's on Antarctica itself... New York, Washington, Chicago, Denver, Seattle, Los Angeles...would be reachable... South America and Africa would become much more sensitive to Soviet pressure as the shadow of Soviet missiles might spread across both continents... Meanwhile, Soviet tractors bearing red flags are moving through Antarctic in increasing numbers.*<sup>132</sup>

Even responsible journalists were given to argue that: "Its [Antarctica's] vastness provides a sanctuary from which aircraft could dominate the waters that, apart from the vulnerable Panama and Suez Canals, provide the only ready link between the Atlantic and Pacific and Atlantic and Indian Oceans."<sup>133</sup> Such rhetoric not only serves to amplify a nascent sense of vulnerability and the invocation of "self-defence," but could become an important means of mobilizing public opinion on behalf of foreign ventures: a common use to which *speech acts* are put. In that sense, the Antarctic was not immune from such pressures.<sup>134</sup>

Bellicose rhetoric, on-going fractiousness displayed by claimant countries, strategic mistrust, revisionist tendencies of both superpowers and existential pressures of a Northern Hemisphere Cold War could readily have caused the Antarctic proto-security complex to expand and metamorphose into a shatterbelt, overlaying not only Antarctica, but also encompassing all Southern Oceanic Rim States. If it is possible to insert a theoretical criterion from the typology of security complex theory to geopolitics, then Antarctica, during the first decade and a half of the Cold War, could have been categorized as a *pre-shatterbelt*. That is a region where there appears to exist a set of political-military relations hold the potential to bind superpowers, great powers and regional powers into a shatterbelt, but yet the existing cross-linkages between these powers proved to possess insufficient force to do so. Ultimately, no shatterbelt formed. Klaus Dodds was given to comment that the most remarkable feature about this period was that whilst English-language reports on Antarctica were filled with dire strategic predictions

---

<sup>132</sup> Cited in Dodds, Klaus, *Geopolitics in Antarctica: Views from the Southern Oceanic Rim*, John Wiley, Chichester, 1997, p. 36.

<sup>133</sup> See Sullivan, W., *Quest for a Continent*, Secker and Warburg, London, 1957, p. 357.

<sup>134</sup> Dodds, *Geopolitics in Antarctica*, op. cit., p. 36.

and fears of Soviet expansionism, twelve states were participating in a series of negotiations destined to remove tension and strife from the international politics of Antarctica.<sup>135</sup>

### **Antarctica: tomorrow's shatterbelt**

Ratification of the Antarctic Treaty by the protagonist states of the early Cold War era did guarantee the prevalence of peace across the greater Antarctic region. However, Argentina and Great Britain continued to display animosity towards each other. One notable incident in their contest over sovereignty of the Malvinas/Falkland Islands occurred near the islands of South Georgia in 1976 when an Argentine naval vessel, *Admiral Storni* was ordered to fire across the bows of a British Scientific research ship, *Shackleton*. A flurry of naval activity followed, including the diversion of the British frigate *Chichester* to the Falkland Islands during its passage home to Great Britain from Hong Kong.<sup>136</sup> Later in the same year the Argentine navy landed a team of some fifty 'technicians' on South Thule in the South Sandwich group of islands.<sup>137</sup> However, it was in 1982 that the most serious incident occurred with the Argentine invasion of the Falkland Islands and their reclaim by a British military task force.

One seemingly innocuous declaration at the United Nations ultimately resulted in a war over sovereignty for this remote and often forgotten South Atlantic archipelago. In August 1964, the British representative at the United Nations, Lord Caradon, declared that the interests of the Falkland Islanders must be paramount in deciding the Island's future. This simple declaration committed Great Britain and Argentina to engage in a seventeen year diplomatic battle and a three month military confrontation.<sup>138</sup> The antagonism generated by this long-drawn-out conflict can be considered the causal factor behind the creation of a *Malvinas/Falkland Island sub-complex* within the boundary of the much larger South American regional security complex. This proposal resolves the Malvinas/Falkland Islands conundrum highlighted in Chapter Four. To justify this

---

<sup>135</sup> *Ibid.*

<sup>136</sup> Hastings *et al.*, *op. cit.*, p. 29.

<sup>137</sup> *Ibid.*, p. 32.

<sup>138</sup> *Ibid.*, p. 15.

assertion, this sub-complex must comply with the same four essential elements that define regional security complexes.<sup>139</sup>

*[A] boundary which differentiates the [sub]-complex from its neighbouring RSCs.* The perimeter of the sub-complex encompasses only the sovereign territory of Argentina and the Falkland Islands archipelago. A defined boundary delineates the sub-complex from the all-encompassing South American regional security complex.

*[An] anarchic structure, which means that the [sub]-complex must be composed of two or more autonomous units, but geographical contiguity is not mandatory.* The Falkland Islands have been a colony of Great Britain since 1833. The autonomous units of this sub-complex are Argentina and Great Britain, although the latter has no geographical contiguity with this sub-complex.

*[P]olarity, which covers the distribution of power among the units.* Although, during the “Seventeen Years War” Great Britain embarked on restructuring (reducing the size) of its military forces, such restructuring did not deny its status as a great power. In 1982 Argentina was no more than a regional power.

*[S]ocial construction, which covers the patterns of amity and enmity among the units.* The Argentineans claimed sovereignty over the Malvinas/Falkland Islands in 1820, but unwillingly consented to transfer its sovereignty to Great Britain thirteen years later. This transfer of sovereignty has often clouded relations between these two

---

<sup>139</sup> Buzan and Wæver, *op. cit.*, p. 492.

states, but the enmity that is displayed is primarily a response to competing claims to Antarctic territory.<sup>140</sup>

The causal factors behind this three-month war were entirely traditional in character and consistent with the conjoint criteria for securitisation embodied in the political-military security sectors.<sup>141</sup> While the desire to control the region's potentially lucrative wild fish, oil and natural gas reserves may have been a contributing factor behind Argentina's ill-conceived invasion of the Falkland Archipelago,<sup>142</sup> such non-traditional environmental factors appeared to have engendered less public emotion amongst Argentineans than did the desire to reinsert Argentine sovereignty over the islands.

Irrespective of what importance is attached to the respective causal factors, the *Malvinas/Falkland Island sub-complex* developed because it met the theoretical criteria required of a standard regional security complex. Yet, once Chile sided with Great Britain against Argentina<sup>143</sup> a new and more dangerous geopolitical extension replaced the *Malvinas/Falkland Island sub-complex* developed. According to Phillip Kelly and Luisa Pérez, the alignment of Chile with Great Britain against Argentina created a shatterbelt,<sup>144</sup> but unlike the sub-complex it did not survive beyond the end of hostilities.

The Falkland Islands conflict transformed the South Atlantic into an area of major international concern. Although the region had in the past warranted only scant attention that changed during the 1970s for a variety of reasons: anxiety in the United States over increased Soviet naval activity; continuing political instability and uncertainty in Southern Africa; increased awareness of the importance of undersea resources and concerns over the future status of Antarctica.<sup>145</sup> Unlike the North Atlantic, where the military strength of the NATO was evident, a strategic vacuum formed in the South Atlantic in the absence of a

---

<sup>140</sup> Child, *op. cit.*, p. 72.

<sup>141</sup> See Buzan, Barry, Ole Wæver and Jaap de Wilde, *Security: A New Framework for Analysis*, Lynne Rienner, Boulder, 1998.

<sup>142</sup> See Taylor-Innes, J. P., 'Antarctica's potential for International Conflict and its implications for New Zealand,' *Royal New Zealand Navy*, 1996, p. 12.

<sup>143</sup> Hastings *et al.*, *op. cit.*, p. 142.

<sup>144</sup> See Kelly, Phil and Luisa Pérez, "'Shatterbelts' of the Americas," <http://historicaltextarchives.com/print.php?action=section&artid=415> (24 May 2010).

<sup>145</sup> See Hurrell, Andrew, 'The politics of South Atlantic security: a survey of proposals for a South Atlantic Security Organisation,' *International Affairs*, Vol. 59, No. 2, Spring 1983, p. 179.

similar alliance. This strategic vacuum was not total because the Inter-American Treaty of Reciprocal Assistance (Rio Treaty of 1947) which covers the South American sector of the South Atlantic as far as the South Pole. Indeed, it is the Rio Treaty that provides an avenue through which Argentina, Brazil and Chile claim a special responsibility for Antarctica to the benefit of their various claims over the continent.<sup>146</sup> In the wake of the Falkland Islands War and in recognition of a divergence of security interests and perceptions within and between the Southern African and Southern Cone South American countries, the prospect of a South Atlantic Treaty Organisation (SATO) coming into being remains remote.<sup>147</sup> In Argentine geostrategic thinking much of the geographical rectangle SATO alliance would have secured against Soviet infiltration has now in been transformed into a shatterbelt.<sup>148</sup>

If the Falkland Islands War was in part motivated by Argentina's desire to control the region's potentially lucrative oil and natural gas reserves, then the 2010 reported discovery of a possibly 700 million barrel oil reservoir beneath the island's Exclusive Economic Zone will do little to improve relations between Argentina and Great Britain. Analysts believe that up to sixty billion barrels of oil might lie beneath the waters of this United Kingdom territory.<sup>149</sup> However, other industry commentators remain sceptical that such a discovery has indeed occurred given that exploratory wells drilled as recently as 1998 failed to establish the presence of commercial quantities of oil in the same region.<sup>150</sup>

Argentine nationalism made resolution of the "Seventeen Years' War"<sup>151</sup> impossible prior to the Argentinean invasion of the Falkland Islands. Contemporary nationalistic cries of "Las Malvinas son Argentinas!" (The Malvinas are Argentine!), resonate well with national politics and public

---

<sup>146</sup> Child, *op. cit.*, p. 30.

<sup>147</sup> Hurrell, *op. cit.*, p. 192.

<sup>148</sup> See Ceresole, Norberto, 'The South Atlantic: War Hypothesis,' in Philip Kelly and Jack Child (eds.), *Geopolitics of the Southern Cone and Antarctica*, Lynne Rienner, Boulder, 1988, p. 61.

<sup>149</sup> See Hawkes, Steve, 'Falkland oil is like North Sea,' *The Sun*, 05 June 2010, <http://www.thesun.co.uk/sol/homepage/news/3001329/> (15 December 2010).

<sup>150</sup> See Lawler, Alex, 'ANALYSIS-Falkland oil hopes survive Desire's setback,' *Reuters*, December 10, 2010, <http://af.reuters.com/article/energyOilNews/idAFLDE6B917Y20101210?sp=true> (17 December 2010).

<sup>151</sup> Hastings *et al.*, *op. cit.*, pp. 15-44.



discourse<sup>152</sup> and could further deepen the existing South Atlantic security cleavage. If recoverable oil reserves are found then ‘old wounds’ over the Island’s sovereignty could once again propel these two protagonist countries towards conflict. The absence of placatory statements from either the Argentine or United Kingdom polities renders a peaceful resolution to this intractable problem difficult – a situation not made easier by a reported statement quoting retired naval officers that “Argentina could retake the Falkland Islands with ‘barely a shot fired’ because [2010] defence cuts will cripple the Royal Navy.”<sup>153</sup> Great Britain’s political position is also somewhat different from that which prevailed three decades ago. The support it garnered from Latin American countries in 1982 has now evaporated with the Rio Group of countries now unanimously supporting Argentina’s claim to the archipelago.<sup>154</sup> Given this contemporary military/political juxtaposition, then should the future prove the Falkland Islands to be “a southern Persian Gulf”<sup>155</sup> then the party’s belligerent speech acts could formalize the Malvinas/Falkland Islands as a *pre-petropolitan security complex*. If a petro-security complex formed then it would overlay the previously discussed classical security sub-complex. However, the geographical composition of the former complex will ultimately be determined by the number of countries directly affected by its security externalities.

While current oil exploration in the South Atlantic is restricted to the North Falkland Basin, equally promising exploration opportunities exist in the South Falkland Basin, the southern limit of which extends beyond the latitude of Cape Horn.<sup>156</sup> Thus, resource exploration continues to “creep” ever nearer to Antarctica. Over the next twenty-five years this process is likely to accelerate as the disregard for the current rule-based international order intensifies.<sup>157</sup> Throughout the Southern Ocean illegal extraction of both living and non-living resources is

---

<sup>152</sup> See Goni, Uki, ‘Falklands Oil Reopens Old Wounds,’ *Time*, March 13, 2010, <http://www.time.com/time/printout/0,8816,197135,00.html> (17 December 2010).

<sup>153</sup> See Bingham, John and Thomas Harding, ‘Navy cuts would lead to Argentina taking Falklands ‘without shot fired,’ *The Telegraph*, 23 October 2010, <http://www.telegraph.co.uk/news/worldnews/southamerica/falklandisland/8082122/> (17 December 2010).

<sup>154</sup> See O’Toole, Molly, ‘The New Falklands War: Why Britain will lose to Argentina, or should, this time,’ *Newsweek*, Vol. CLV, No. 11, March 15, 2010, p. 29.

<sup>155</sup> Goni, *op. cit.*

<sup>156</sup> See Economist, ‘Oil and troubled waters: Drilling a vein of nationalism,’ *The Economist*, February 18, 2010, <http://www.economist.com/node/15546482/print> (15 December 2010).

<sup>157</sup> See Ministry of Defence, *Defence White Paper 2010*, Ministry of Defence, Wellington, November 2010, p. 10.

expected to become more prevalent and in a worst-case scenario resource extraction will be undertaken in the presence of or with the active support of military forces.<sup>158</sup> Despite treaty limitations there could be significant competition for energy and fishing resources, with rising and emerging powers challenging the existing (Western) patterns of exploitation.<sup>159</sup>

Of the continent proper, some commentators consider it has already lost its reputation as a land of seals, ice and penguins and gained a new image as a region of iron, coal and oil.<sup>160</sup> Hence international cooperation through scientific research might well be replaced by aggressive nationalistic activities associated with natural resource acquirement.<sup>161</sup> Comments are once more surfacing, as they did in the late 1970s and early 1980s, of a looming land and resource grab<sup>162</sup> ahead of what has been describe as the “Battle for Antarctica.”<sup>163</sup> Moreover, China now acknowledges that Antarctica’s economic (mineral) wealth is as important as its strategic position. And the United States Coast Guard considers “the ice-cold South Pole could prove a fiercely hot battlefield” in a resource deprived world.<sup>164</sup>

A great power scramble for Antarctica’s mineral wealth is a plausible extension of the recent upsurge in the global hunt for and the acquisition of mineral reserves elsewhere in the world, notably in Africa.<sup>165</sup> As more accessible reserves become either exhausted or their ownership lies with competing commercial or state organisations, companies and countries in the search for new reserves will quite naturally turn their attention to the last vast potential reservoir of mineral resources on Earth – Antarctica. The geopolitics of this search became evidence in early 2010 when on a visit to Antarctica, members of a senior Chinese political delegation, mentioned that their visit was in part, an investigation for

---

<sup>158</sup> *Ibid.*, p. 26.

<sup>159</sup> Ministry of Defence (UK), ‘Global Strategic Trends – Out to 2040,’ *op. cit.*, p. 63.

<sup>160</sup> See Mbarido, Alfordlo, ‘Let’s take another look at Antarctica,’ <http://www.articlegarden.com/article.php?id=291899&act=print> (9 June 2010).

<sup>161</sup> See Brady, Anne-Marie, ‘China’s Rise in Antarctica,’ *Asian Survey*, Vol. 50, No. 4, 2010, p. 784.

<sup>162</sup> For examples of such concerns see Barbara, Mitchell, ‘Resources in Antarctica: Potential for conflict,’ *Marine Policy*, April 1977, pp. 91-101, Barbara Mitchell and Lee Kimball, ‘Conflict over the Cold Continent,’ *Foreign Policy*, No. 35, Summer 1979, pp. 124-141 and M. J. Peterson, ‘Antarctica: the last great land rush on earth,’ *International Organization*, Vol. 34, No. 3, Summer 1980, pp. 377-403.

<sup>163</sup> See Rozoff, Rick, ‘Scramble for World Resources: Battle for Antarctica’ *Global Research*, May 16, 2009, <http://www.globalresearch.ca/PrintArticle.php?articleId=13639> (13 October 2010).

<sup>164</sup> Rozoff cites an article that appeared in the newspaper *Chinese People’s Daily* on 4 December 2007. *Ibid.*

<sup>165</sup> See Alden, Chris, *China in Africa*, Zedbooks, London, 2007, p. 3.

minerals and resources.<sup>166</sup> Other countries are more clandestine about their intentions. In 2002 the Russians had sought to reassure treaty parties that: “The Russian geological scientific programs...must not be mistaken for mineral exploitation.”<sup>167</sup> Likewise, South Korea has also talked about exploiting Antarctic minerals.<sup>168</sup>

Although Ceresole’s South Atlantic shatterbelt failed to materialize during the Cold War, his vision has merit since southern world’s natural and energy resources traveling to the northern industrialized states have to transit either the South Atlantic or South Pacific. As the stabilizing affects inherent in the existing Western hegemony over Antarctica weaken, international rivalry over possession and transportation of resources could prompt formation of a shatterbelt covering both the Southern Ocean and Antarctica.<sup>169</sup> Under these circumstances any shatterbelt is unlikely to be a geopolitical extension of a previously established regional security complex. The need to access resource will become so imperative that competing states will opt to secure their resource needs by force-of-arms, knowing full well that such action will precipitate the “Battle for Antarctica.” Under these circumstances there will be no opportunity for either a security complex or a shatterbelt to form; instead the continent will be torn apart by one or more resource wars.

---

<sup>166</sup> See Chandler, Jo, ‘China flags polar resource goals,’ *The Age*, Melbourne, January 7, 2010, <http://www.theage.com.au/action/printArticle?id=1019090> (9 June, 2010).

<sup>167</sup> See Darby, Andrew, ‘China flags its Antarctic intent,’ January 12, 2010, <http://www.nationaltimes.com.au/action/printArticle?id=1029319> (9 June 2010).

<sup>168</sup> *Ibid.*

<sup>169</sup> Kelly and Pérez, *op. cit.*

## Chapter Sixteen

### Conclusion: A Bleak Future

This thesis is self-consciously theoretical in character. In common with many social science theories it could be portrayed – unjustifiably one would hope – as idle conjecture and thus of limited relevance in explaining happenings in the “real world.” Paul Nitze, a prominent American defence and foreign policy-maker during the Cold War wrote: “Most of what has been written under the heading of ‘political science’ ...since World War II has been ... of limited value, if not counterproductive, as a guide to the actual conduct of policy.”<sup>1</sup> This view suggests that theory has no place beyond academia and that policy-makers should rely solely upon common sense, intuition, and practical experience to carry out their duties.

Such a view undervalues the inherent worth of theories in understanding the contemporary world and consequently to making intelligent decisions. Indeed, without international relations theories to rely upon it would be difficult for both academics and policy-makers to comprehend their surroundings. Likewise, it is difficult to deny the fact that it would be impossible to make sense of an increasingly complex world without simplifying theories.<sup>2</sup>

The thesis is constructivist in character. It embodies an acceptance that international security as a concept can operate both within and beyond the traditional military-political understanding of that concept. In this way, security is neither exclusively objective (there is a real threat) or subjective (there is a perceived threat), but the outcome of a process of securitization. Securitization is inter-subjective (a shared understanding) and hence socially constructed. Successful securitisation is not decided by the securitizer (usually the political elite) but by the audience of the *speech act*. The crucial question to be answered is whether or not the audience accepts that something is an existential threat to a

---

<sup>1</sup>Cited in Mearsheimer, John J., *The Tragedy of Great Power Politics*, W. W. Norton, New York, 2003, p. 8.

<sup>2</sup>*Ibid.*

shared value?<sup>3</sup> It will be through this political process that communities will decide whether each polar region should be saved for its intrinsic value or secured for its resource wealth. The answer to this question will determine the future security architecture of both the Arctic and Antarctica.

The method by which both traditional and non-traditional existential threats can transmogrify an existing security arrangement into a security complex has been explained in Part I. The original four descriptive elements Buzan *et al* considered essential for the formation of a classical regional security complex have within the thesis been supplemented with two additional elements. Buzan's aphorism mandating geographical contiguity amongst units (states) has been ameliorated through the inclusion of a fifth element – "security externalities" – a theoretical concept borrowed from the typology of Regional Orders. Combining elements from two different typologies has led to the "hybridisation" of the original theory.

Buzan and his cohorts leave unanswered the question as to whether the formation of a security complex is an end in itself or an intermediary step along a continuum linking peace with war. Interestingly, Buzan conceives a world where peace may not mean harmony between states, but war is ruled out as a legitimate instrument of foreign policy except for the purpose of defence against military attack.<sup>4</sup> However, the unabated rise of intra-regional tensions that result in conflict denies the universality of this view: hence, regions must be capable of evolving beyond mere security complexes. In recognition of this evolutionary process the "hybrid" theory has been further amended by including a sixth element – shatterbelts – a concept drawn from the ontology of Geopolitics.

Hybridisation has occasioned a 'new' theory that reflects the six essential elements:

*A security complex is a set of states that are so interlinked by one or more security externalities that their security problems cannot be reasonably considered independently from one another.*

---

<sup>3</sup> See Buzan, Barry, Ole Wæver and Jaap de Wilde, *Security: A New Framework for Analysis*, Lynne Rienner, Boulder, 1998, p. 31.

<sup>4</sup> See Buzan, Barry, *People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era*, Pearson, Harlow, 1991, p. 172.

*Intrusion of outside adversarial great powers into a security complex would transform the complex into a shatterbelt and bring the possibility of conflict escalation.*

This new theory provides a useful analytical tool with which to explain why a nexus of natural resource scarcity and climate change will precipitate changes to the existing security architecture in each Polar Regions: changes that acknowledge the probable establishment of both security complexes and shatterbelts.

The drive by both developed and developing countries towards increased material prosperity is a known cause of behavioural changes within societies. Historically, these behavioural changes have resulted in changes to consumption, diet and health patterns. The proportion of the world's population considered middle-class has increased rapidly over the past thirty years and, by 2030, an additional two billion people could deliver thirty per cent of humanity into the global middle-class.<sup>5</sup> Furthermore, a considerable portion of this bulge could appear as early as 2020, when China's middle-income class trebles to 450 million<sup>6</sup> and Africa's mineral rich economies spawn a materialistic middle-class.<sup>7</sup> Consumption of food, water, energy and minerals remains positively correlated to increased prosperity despite efforts towards conservation, recycling and environmentalism.<sup>8</sup> The downside of prosperity driven by consumer consumption is that it will further exacerbate the looming worldwide shortage of many natural resources.<sup>9</sup>

Energy and non-energy resource scarcity have become critical strategic and economic agenda items for both existing and emerging major powers. Contemporary societal anxieties have been aggravated by a substantial rise in

---

<sup>5</sup>See Wilson, Dominic and Raluca Dragusanu, 'The Expanding Middle: The Exploding Middle Class and Falling Global Inequality,' *Goldman Sachs*, Global Economic Paper No. 170, July 7, 2008, p. 3.

<sup>6</sup>A figure cited by the Boston Consulting Group in a report published late in 2010. See Adams, Christopher, 'Bonanza expected from big carrier,' *New Zealand Herald*, Auckland, January 13, 2011, p. B1.

<sup>7</sup>See Economist, 'African lions look set to outpace economic tigers,' *New Zealand Herald*, Auckland, January 13, 2011, p. B2. The rising 'Lion' economies are Angola, Chad, Ethiopia, Mozambique, Nigeria and Rwanda: South Africa is seen as the economic laggard amongst this grouping.

<sup>8</sup>See Ministry of Defence(UK), *Global Strategic Trends – Out to 2040*, Fourth Edition, *Development, Concept and Doctrine Centre*, p. 109.

<sup>9</sup>Wilson and Dragusanu, *op. cit.*, p. 3

commodity prices which have culminated in what has been called a “super-cycle” of price increases.<sup>10</sup> No doubt influencing, but also being influenced by this super-cycle, is a rise in resource nationalism: a phrase used to describe the drive by governments of commodity-rich countries to exploit demand for their endowments by securing a greater share of natural resource rents.<sup>11</sup> The reverse of the ‘resource nationalism coin’ is “consumer country resource nationalism;” the aggressive competition among consuming countries for the same resource.<sup>12</sup> As major powers worldwide, but particularly in Asia, compete for access to key commodity supplies, energy and resource nationalism, plus a beggar-thy-neighbour attitude to control over supplies, denotes commodities as a potential source of interstate rivalries, tensions and conflicts.

Exacerbating problems of supply is an unrelenting public demand for increased private wealth. Any disruption to the flow of resources into the civilian economy poses a severe threat to the continuance of political institutions and, through the process of contagion, to the wider region. The “Arab Spring” uprising of 2011, serves as a dramatic illustration of how a decline in the standard of living, when combined with resource shortages, can be a powerful force for political change.<sup>13</sup> Similar or worse developments might easily be replicated across the planet as those without the means of survival invade or migrate to countries with greater resource abundance – thus producing endless struggles between resources “haves” and “have-nots.”<sup>14</sup>

As little as thirty-five years ago when “master strategist and futurologist” Herman Kahn was envisaging a scenario for the world two hundred years hence, it was still possible to be disparaging about climate change for there were no

---

<sup>10</sup> See Herberg, Mikkal E., ‘Introduction: Asia’s Rising Energy and Resource Nationalism,’ in Gabe Collins, Andrew S. Erickson, YufanHao, Mikkal E. Herberg, Liewelyn Hughes, Weihua Liu, and Jane Nakano, *Asia’s Rising Energy and Resource Nationalism: Implications for the United States, China, and the Asia-Pacific Region*, NBR Special Report #31, National Bureau of Asian Research, Seattle, September 2011, p. 3.

<sup>11</sup> See Butler, Anthony, ‘Beware the hazards of resource nationalism,’ *Business Day*, 10 June 2011, <http://www.businessday.co.za/articles/Content.aspx?id=145475> (4 October 2011).

<sup>12</sup> See Ward, Halina, ‘Resource nationalism and sustainable development: a primer and key issues,’ *International Institute for Environmental Development*, March 2009, p. 11.

<sup>13</sup> See Anderson, Lisa, ‘Demystifying the Arab Spring,’ *Foreign Affairs*, Vol.90, No. 3, May/June 2011, pp. 2-7.

<sup>14</sup> See Klare, Michael, ‘The Coming Resource Wars,’ *ZNet*, 13 March, 2006, [http://www.zmag.org/content/print\\_article.cfm?itemID-9900&sectionID-56](http://www.zmag.org/content/print_article.cfm?itemID-9900&sectionID-56) (31 May 2006).

indications of an imminent greenhouse gas catastrophe.<sup>15</sup> Today, however, that catastrophe appears only too real, which gives the words of Professor Clive Hamilton a common-sense ring of truth:

*One of the most striking features of the global warming debate has been how, with each advance in climate science, the news keeps getting worse.*<sup>16</sup>

Exacerbating the worst effects of a changing climate is a global political process driven by self-interest. In a number of developing countries the need to maintain political stability through economic growth has, despite frequent proclamations to the contrary, prevented any significant curbing of greenhouse gas emissions. The future prospects for achieving a dramatic emissions reduction appear poor given that both the 2009 and 2010 United Nations climate change conferences ended in failure<sup>17</sup> and few positive outcomes are expected to emerge from the 2011 Durban conference.<sup>18</sup> Without dramatic worldwide reductions in greenhouse gases the world appears set to experience no less than 3.2 degrees Celsius of warming. Unfortunately, given the current lack of public will to change behaviour, combined with political ambivalence, the world is now firmly on course to experience a rise in the average global temperature of six degrees Celsius over the next one hundred years.<sup>19</sup>

Contemporary scientific research strengthens the more pessimistic nuances highlighted in Chapters Nine and Ten. A recent British Geological Survey report<sup>20</sup> on future resource availability has prompted commentators to recommend that

---

<sup>15</sup>See Kahn, Herman, William Brown and Leon Martel, *The Next 200 Years: A Scenario for America and the World*, William Morrow, New York, 1976, p. 176.

<sup>16</sup>See Hamilton, Clive, *Requiem for a Species: Why we resist the truth about Climate Change*, Allen&Unwin, Crows Nest, New South Wales, 2010, p.1.

<sup>17</sup>See Carrington, Damian, 'Cancún deal leaves hard climate tasks to 2011,' *Guardian Weekly*, 17-30 December 2010, p. 1.

<sup>18</sup>See Spenser, Chris, 'What can a Deal in Durban Deliver?' *International Institute for Sustainable Development*, June 28, 2011, <http://climate-1.iisd.org/policy-updates/what-can-a-deal-in-durban-deliver/htm> (27 September 2011).

<sup>19</sup>See McCarthy, Michael, 'Catastrophic rise in temperature tipped by study,' *New Zealand Herald*, Auckland, November 19, 2009, p. A11.

<sup>20</sup>See British Geological Survey, 'Risk List 2011,' 11 September 2011, <http://www.bgs.ac.uk/download/stat.cfm?id=2063> (27 October 2011).



states should immediately act to secure future access to raw materials.<sup>21</sup> Whilst an article in the *New Scientist* suggests that even previous worst-case scenarios could underestimate the severity and timing of climate change.<sup>22</sup> Even prior to the publication of these cautionary warnings global attention had become focused on both Polar Regions, primarily on the Arctic, as localities worthy of explorative attention. Inevitably, interstate competition and region-wide insecurity will parallel improved accessibility to polar resources.

Under these inimical circumstances, the “hybrid” theory anticipates that the contemporary Arctic could be transformed into an enmity orientated hydrocarbon-security complex. The theory also highlights that any unilateral awarding of sovereignty over the High Arctic which precludes non-Arctic energy deprived great powers will be violently contested. The presence of one or more belligerent great powers in the High Arctic would turn the region into a shatterbelt and possibly precipitate a resource war.

Antarctica is a continent devoid of sovereign states and over which no country has hegemony. Whilst states continue to honour the Antarctic Treaty there appears little impetus for Antarctica to be transformed from an unstructured region into a classical regional security complex. Even if the Treaty were to fail, conflicting sovereignty claims among some Southern Oceanic Rim States are unlikely to engender sufficient intergroup security interdependence as to create an austral regional security complex. Moreover, even the induction of an extra-regional great power into this grouping of states, be it a great power with hegemonic aspirations and capabilities, will not to produce a continent-wide regional security complex. What is less certain, however, is whether in the absence of the Treaty inter-claimant country animosities would transform the Antarctic Peninsula into a security sub-complex or even a shatterbelt.

As the twenty-first century unfolds stresses imposed upon civilization will both multiply and intensify. Economically, there will be a widening of the income gap between the worlds rich and poor. Socially, the poorest billion will remain trapped at a subsistence level while the richest billion become wealthier with each

---

<sup>21</sup> See Hislop, Hannah, ‘We need to act now to secure access to raw materials in the future,’ *The Guardian*, 11 October 2011, <http://www.guardian.co.uk/sustainable-business/secure-access-raw-materials-green/> (27 October 2011).

<sup>22</sup> Le Page, Michael, ‘Climate Change: What we Know – and what we don’t,’ *New Scientist*, Vol. 212, No. 2835, 22 October 2011, p. 40.

year that passes. Environmentally, the burgeoning global human population will likely result in a proliferation of refugees as once productive land turns to desert and food and water become increasingly scarce commodities. Politically, twenty-first century stresses will become a cause of conflict within and between societies as access to living and non-living resources becomes constricted.<sup>23</sup>

Additionally, as future societies are presented with a dramatic reduction in the quality of life due to climate change they will be forced to implement one of several coping strategies: they can adapt or, where adaptation is impossible, they will be presented with the options of flee, fight or die. Anecdotal evidence would suggest conflicts caused by climate change are probable outcomes for societies already suffering from a multitude of other ills.<sup>24</sup> There is little doubt that the future harbours no shortage in either number or variety of ills to threaten societies.

In a world where societies will struggle to supply the basic necessities of life, the United States Department of Defense foresees nuclear arms proliferation as inevitable.<sup>25</sup> The same conclusion was reached by an academic enquiry into the national security implications of abrupt climate change.<sup>26</sup> Both enquiries suggest that if proliferation and climate problems are not tackled in a comprehensive manner, then one could impede solving the other. Providing countries continue to acquire nuclear power and nuclear weapons, arms races and threat perceptions could damage international relations and undermine cooperative climate policies. Conversely, a deteriorating climate could undermine human and international security, incentivising the use of nuclear weapons to protect resources and interests.<sup>27</sup> Under either scenario the world would beget a series of zero-sum conflicts of interest.<sup>28</sup>

If conflicts in the past have been fought over access to food, water and living space – the essential elements of *lebensraum* – then in tomorrow's

---

<sup>23</sup> See Brown, Lester R., *Plan B 3.0: Mobilizing to Save Civilization*, W. W. Norton, New York, 2008, p. 107.

<sup>24</sup> See Buhaug, Halvard, Nils Petter Gleditsch and Ole Magnus Theisen, *Implication of Climate Change for Armed Conflict*, The World Bank, Washington, D.C., 2008, p. 18.

<sup>25</sup> Klare, *ibid.*

<sup>26</sup> See Schwartz, Peter and Doug Randall, 2003, 'An Abrupt Climate Change Scenario and its Implications for United States National Security,' pp. 1-2.

[http://bloodbanker.typepad.com/submerging\\_markets/Pentagon.pdf](http://bloodbanker.typepad.com/submerging_markets/Pentagon.pdf) (30 May 2005).

<sup>27</sup> See Scheffran, Jürgen, *Climate Change, Nuclear Risks and Nuclear Disarmament: From Security Threats to Sustainable Peace*, World Future Council, University of Hamburg, 2009, p. 17.

<sup>28</sup> See Axelrod, Robert, *Conflict of Interest: A Theory of Divergent Goals with Applications to Politics*, Markham Publishing, Chicago, 1970, p. 5.

congested world there can be little expectation that history will not repeat itself.<sup>29</sup> For states, the security problems of the future will revolve around how to make secure an increasingly fearful populace in a world of relentless climate change and ever greater competition for land and resources. Rather than turning to interstate warfare, states will instead turn towards exploiting those few remaining unexploited regions of the world over which state sovereignty is either absent or contested. For all states, this will become an issue of survival.

During this period the world will be also undergoing a transition from a single superpower to a multiplicity of great powers resulting in the replacement of today's single "international community" by multiple "communities" each centred on a great power. As a result of this transition, the rule-based international order that has served the traditional Western alliances well will come under increasing pressure as international institutions struggle to forge consensus amongst constituent member states.<sup>30</sup> In an atmosphere of declining consensus existing international agreements, contracts and treaties may not be honoured, thus ultimately representing nothing more than waste paper.<sup>31</sup>

By the year 2035, many of today's security complexes and shatterbelts are likely be of only historical significance, for the then contemporary security architecture, covering both global and regional domains, will be determined by the emerging great powers. New security complexes will be formed by securitisation of resources and the impact of climate change. As recognition grows over the dire consequences these issues represent, interstate relationships will deteriorate and antagonisms will establish shatterbelts where there were none previously. Evidence of this metamorphosis is already present.

Although in the past there have been notable political disagreements across the Cold War East-West divide, contemporary Arctic relations have been amicable and stable. These harmonious relations have lead one commentator to postulate that the region can reliably be called a "zone of peace."<sup>32</sup> The same

---

<sup>29</sup> See Molvær, Reidulf, 'Environmentally Induced Conflict? A discussion based on Studies from the Horn of Africa,' *Bulletin of Peace Proposals*, Vol. 22, No. 2, 1991, p. 183.

<sup>30</sup> See New Zealand Government, *Defence Capability Plan*, Ministry of Defence, Wellington, September 2011, p. 9.

<sup>31</sup> Ross, Robert S., 'China's Naval Nationalism,' *International Security*, Vol. 34, No. 2, Fall 2009, p. 71.

<sup>32</sup> See Holte, Nils Johan, *The Arctic region is at a time of Geopolitical transition. Will this transpire through aggressive competition or as peaceful change?* Royal College of Defence Studies, London, 2009, p. 22.

commentator also surmises that the Arctic region could readily evolve into a regional security complex comprised of peaceable states<sup>33</sup>— a security community. However, this sanguine view is not shared by the Head of Norway’s Northern Regional Command, who argues that the simultaneous presence of unsettled borders, natural resources and armed forces “has proved definitely not to be the right recipe for peace.”<sup>34</sup>

The geostrategic importance of the Arctic Ocean region will be determined primarily by the countries that have the most to gain or lose from a changed climate over the High North. In the immediate post-Cold war era (1991) these states established the Arctic Council – comprised of the five Arctic littoral states plus Finland and Sweden – and although this institution has no responsibility for regional security, it is the principal organisation for resolution of regional problems. Today, however, the future of the Arctic appears less likely to be decided by the Arctic Council than by a recently established (2010) ‘Arctic Club,’ the membership of which is restricted to the five littoral states. Meetings of this select group are not open to observers from Arctic ‘near-abroad’ states or representatives from the region’s indigenous peoples. Establishment of this forum has bred suspicion amongst the excluded states as to the motive behind its formation. All suspect that the Arctic Club is planning to divide the Arctic’s mineral wealth amongst themselves.<sup>35</sup>

Anxiety over the intentions of the Arctic Club has served to heighten concerns amongst all Arctic states as to the territorial ambitions of their near neighbours – particularly Russia –for it is the Arctic states themselves that pose the greatest threat to regional security. A lesser, but ever present threat to peace comes from those extra-regional states, i.e. China, Japan, and South Korea, along with the European Union, which maintain an interest in exploiting the region’s hydrocarbon potential. Through a reluctance to commit political and military resources to the region the United States has by default permitted Russia to strategically dominate the Arctic. Any attempt by the United States to remedy this situation will not be achieved without increasing tensions throughout the

---

<sup>33</sup>*Ibid.*, p. 8.

<sup>34</sup>*Ibid.*, p. 23.

<sup>35</sup> See Seidler, Christopher, ‘Deciding the Arctic’s Future Behind Closed Doors,’ *Spiegel Online*, 29 March 2010, <http://www.spiegel.de/international/world/0,1518,druck-686209,00.html> (13 September 2011).

Arctic and the wider region. On the question of outer continental shelf (the *Area*) delimitations, it would be in the mutual interest of all five littoral states to coordinate their submissions to the Commission on the Limits of the Continental Shelf (CLCS) in order to prevent protracted conflicts – both inside and outside of courts.<sup>36</sup> However, in a unilateral move to secure immediate sovereignty over the regions resource wealth Russia has signalled its intention to file an independent claim with the CLCS to annex 380,000 square miles of Arctic seabed that lies beyond its Exclusive Economic Zone.<sup>37</sup>

The rise of Russian influence within the Arctic is eliciting different responses from each side of the Atlantic Ocean. The Europeans, particularly the Scandinavians, are discussing securing their northern borders by creating a new regional institution, a mini-NATO alliance, responsible for *keeping an eye on Polar bears and Russians*.<sup>38</sup> Canada has cautioned against such a development on the grounds that it will only antagonize Russia and exacerbate existing interstate tensions. It would also serve to increase the influence of two NATO member states – Great Britain and France – in a region where according to the Canadian Prime Minister, “they don’t belong.”<sup>39</sup> Moreover, the Canadians are resentful of increased European participation in the Arctic since European Arctic policies generally run counter to Canadian interests.<sup>40</sup>

These geopolitical tensions exaggerate existing security anxieties harboured by most, if not all, Arctic states.<sup>41</sup> Claims and counter-claims to sovereignty over Arctic resources are shaping the region’s geostrategic environment. Societal pressure on states to secure hydrocarbon resources can result in autarchic behaviour that would rapidly transform the Arctic into a petroleum supra-complex spanning three continents. The presence of two previously antagonistic

---

<sup>36</sup> See Depledge, Duncan and Klaus Dodds, ‘The UK and the Arctic: The Strategic Gap,’ *RUSI Journal*, Vol.156, No. 3, June/July 2011, p. 74.

<sup>37</sup> See Pakistan Defence, ‘Russia’s Arctic sea grab,’ *World defence Network*, 15 August 2011, <http://www.defence.pk/forums/world-affairs/124959-russias-arctic-sea-grab.html> (19 August 2011).

<sup>38</sup> See Khantsevich, Olesya, ‘Scandinavians threaten to create a mini-NATO,’ *RT*, 18 January 2011, <http://rt.com/politics/press/nezavisimaya/scandinavians-geopolitics-russia-arctic/en/> (5 October 2011).

<sup>39</sup> See Barrera, Jorge, ‘While Harper talked tough with NATO on Arctic, U.S. believed PM all bark no bite,’ *APTN National News*, 11 May 2011, <http://aptn.ca/pages/news/2011/05/11/while-harper-talked-tough-with-nato-on-arctic-us-beleved-pm-all-bark-no-bite/> (7 September 2011).

<sup>40</sup> *Ibid.*

<sup>41</sup> See Howard, Roger, ‘Russia’s New Front Line,’ *Survival*, Vol.52, No. 2, April-May 2010, p. 142.

superpowers – Russia and the United States – within this complex will, if their relations outside of the Arctic deteriorate, create a shatterbelt and ultimately bring the region to a state of war. War is also a probable outcome should Arctic countries contrive to deny non-Arctic great powers sovereignty over resources within the *Area*. If the Arctic was ever a *zone of peace* that time is quickly passing, for as enmity supplants amity Arctic states must prepare themselves for a series of zero-sum conflicts of interest.

The Arctic provides a window through which to view Antarctica's future. The existing treaty regime cannot indefinitely shield Antarctica from the consequences of a world facing a burgeoning population, a rising middle class, climatic change and scarcity of natural resources. By mid-century individual great powers, coerced by necessity, will seek to exploit Antarctica and in so doing become embroiled in numerous resource initiated imbroglios. As competition and animosity grow more intense the prospect of Antarctica being transformed into a shatterbelt correspondingly increases. Under this scenario the future appears bleak for, like the Arctic, Antarctica appears destined to become a locus of restricted resource conflicts.

Yet, there is another scenario, equally as bleak, the result of the Treaty failing and thereby facilitating the division of Antarctica into discrete sovereign territories: each being the dominion of an extra-regional neo-imperialistic great power. Under this scenario the existing territorial claims in Antarctica would immediately be declared void through a lack of international recognition. Although appalling to contemplate, the division of Antarctica among great powers is not improbable given that *de-jure* Antarctica remains international territory. This scenario is also predicated on the certainty that deposits in exploitable quantities of minerals will be discovered, which would collapse the Treaty and set the territorial division mechanism in motion. Such a division is already being discussed by Russian commentators.<sup>42</sup> As was the case thirty years ago when anticipation of mining Antarctica was at a zenith,<sup>43</sup> the very notion of territorially dividing Antarctica will spark the last great land rush on earth.

---

<sup>42</sup> See '\$2 billion of Russian money will melt in Antarctica,' *RT Question More*, 22 October, 2010, <http://rt.com/politics/press/gazeta-ru/2-billion-of-russian-money-will-melt-in-antarctica.html> (22 August 2011).

<sup>43</sup> See Peterson, M. J., 'Antarctica: the last great land rush on earth,' *International Organization*, Vol. 34, No. 3, Summer 1980, pp. 377-403.

In the ensuing turmoil it is unlikely that parties to the existing treaty regime could enforce any rules on states not parties to the Antarctic Treaty or supplementary conventions. Many of the future great powers which would have an interest in exploiting Antarctic are not Claimant, Consultative, or Non-Consultative Treaty member states. Equally in doubt is whether the current unanimity among Treaty member states not to exploit Antarctica will continue when each is faced with a choice, rooted in self-interest, of retaining or dismantling the Protocol on Environmental Protection to the Antarctic Treaty. Dismantle this protocol and the Treaty will unravel.

Given that the Arctic is likely to become a contested militarized region once excavation of minerals begins, it is conceivable that the same fate awaits Antarctica once its mineral wealth is validated and countries stake claims to the last frontier.<sup>44</sup> The militarisation of Antarctica would present all six Southern Oceanic Rim States with a security problem unlike any they have confronted in the past sixty years.

Antarctica would be transformed into a security complex shaped by a union of countries with a shared interest in resource exploitation, but vastly different political ideologies and strategic objectives. For that reason, a security complex is probably just a transitory stage towards the formation of a shatterbelt. Hence the Southern Ocean will come to represent a common theatre of maritime operations for all Southern Oceanic Rim States. Under such circumstances their defence community of interest would be best served through a security alliance: an austral treaty organisation which could be a contemporary interpretation of the proposed 1980s South Atlantic Treaty Organisation. Although this new alliance would involve non-traditional security partners, geography is the ultimate determiner of all communities of interest and thereby alliance membership.

The confluence of numerous disparate issues discussed in this thesis make geopolitical changes in both Polar Regions inevitable. With change comes the possibility of security transformations; the Arctic into a security complex and Antarctica into a shatterbelt. Furthermore, the 'transition world' will likely lack the necessary political cohesion to prevent either region from sliding into 'resource' anarchy. Under this reality, austral states as unprepared as New

---

<sup>44</sup> See Warner, Gale, 'Staking Claims on the Last Frontier,' *Sierra*, July/August 1984, pp. 50-54.

Zealand have little time, probably no more than twenty years, to shed their lethargy towards their own southern defence and embark upon a capability enhancement programme commensurate with securing their sub-polar border. Prevarication, when faced with such a disagreeable outlook, could be a tempting, but totally unrealistic option to indulge for the future has a tendency to remorselessly overwhelm those who procrastinate.



## Bibliography

- 1939, "Warmer World," *Time*, p. 27.
- 1974, "Another Ice Age?" *Time*,  
<http://www.time.com/time/printout/0,8816,944914,00.htm> (28 August 2008).
- 1995, "House of Debt," *The Economist*, pp. 14-15.
- 2003, "The global menace of local strife," *The Economist*, Vol. 367, No. 8325, pp. 23-25.
- 2004, "Breaking the ice," *The Economist*, p. 34.
- "Democratic Ideals and Reality,"  
<http://geography.about.com/library/misc/mackinder.htm?terms=political+theory> (10 February 2004).
- 2007, "Drawing lines in melting ice," *The Economist*, pp. 47-48.
- 2008, "Korean Icebreaker will assist Polar Research," *Antarctica*, Vol. 26, No 3, p. 46.
- "Russia tones naval brawn in Indian Ocean," *PRESSTV*,  
<http://www.presstv.ir/pop/Print/?id=73994> (10 September 2009).
- "Animal Feed Responsible for One-Third of World's Fish Catch,"  
<http://www.redorbit.com/modules/news/tools.php?tool=print&id=1594702>  
 (17 February 2010).
- 2009, *International Relations Theory*, <http://www.irththeory.com/know.htm>  
 (1 October 2009).
- "Testing their metal," *The Economist*, Vol. 393, No. 8654, pp. 69-70.
- "Go forth and multiply a lot less," *The Economist*, Vol. 393, No. 8655, pp. 29-31.
- "Who cares?" *The Economist*, Vol. 393, No. 8660, p. 16.
- 2010, "\$2 billion of Russian money will melt in Antarctica," *RT Question More*,  
<http://rt.com/politics/press/gazeta-ru/2-billion-of-russian-money-will-melt-in-antarctica.html> (22 August 2011).
- "Military drive puts fuel from algae within reach," Auckland, *New Zealand Herald*, p. A7.
- "The clouds of unknowing," *The Economist*, Vol. 394, No. 8674, pp. 69-72.

- 2011, "Another go at being friends," *The Economist*, Vol. 398, No. 8716, pp. 25-26.
- AAP, January 23, 2008, "Nuclear dawn for the West," Auckland, *New Zealand Herald*, p. B1.
- Abbott, Chris, Paul Rogers & John Sloboda, 2006, *Global Responses for Global Threats: Sustainable Security in the 21<sup>st</sup> Century*, Oxford, Oxford research Group.
- Adams, Christopher, January 13, 2011, "Bonanza expected from big carrier," Auckland, *New Zealand Herald*, p. B1.
- Adger, W. Neil, 1999, "Social Vulnerability to Climate Change and Extremes in Coastal Vietnam", *World Development*, Vol. 27, No. 2, pp. 249-269.
- Adler, Emanuel and Michael Barnett, 1998, *Security Communities*, Cambridge University Press, Cambridge.
- Ager, D, 20 June 1985, "Ore that launched a thousand ships," *New Scientist*, pp. 28-29.
- Akasofu, Syun-Ichi, 2007, "Storm in a Teacup over Climate Change," *Far Eastern Economic Review*, Vol. 170, No. 7, pp. 27-31.
- Alden, Chris, 2007, *China in Africa*, London, Zed Books.
- Aleklett, Kjell, Mikael Höök, Kristofer Jakobsson, Michael Lardelli, Simon Snowden and Bengt Söderbergh, 2010, "The Peak of the Oil Age," *Energy Policy*, Vol. 38, No. 3, pp. 1398-1414.
- Aleksandrova, A. A., 1980, *The Arctic and Antarctic: their division into geobotanical areas*, Cambridge, Cambridge University Press.
- Alley, R. B., J. Marotzke, W. D. Nordhaus, J. T. Overpeck, D. M. Peteet, R. A. Pielke, R. T. Pierrehumbert, P. B. Rhines, T. F. Stocker, L. D. Talley and J. M. Wallace, 2003, "Abrupt Climate Change," *Science*, Vol. 299, pp. 2005-2009.
- American Chemical Society, 2009, "Ice That Burns May Yield Clean Sustainable Bridge to Global Energy Future," *ScienceDaily*, <http://www.sciencedaily.com/release/2009/03/090323143858.htm> (1 September 2010).
- Anderson, Alun, 2009, *After the Ice: Life, Death, and Geopolitics in the New Arctic*, New York, HarperCollins.

- Anderson, Ewan W. and Liam D. Anderson, 1998, *Strategic Minerals*, Chichester, John Wiley & Sons.
- Anderson, Lisa, 2011, "Demystifying the Arab Spring," *Foreign Affairs*, Vol.90, No. 3, pp. 2-7.
- Andreski, Stanislav, 1980, "On the Peaceful Disposition of Military Dictatorships", *Journal of Strategic Studies*, Vol. 3, No. 3, pp. 3-10.
- Ansley, Greg, July 1, 2009, "Up to 10,000 boat people ready to flee," Auckland, *New Zealand Herald*, p. A15.
- April 14, 2010, "Fears on population, refugees haunt Rudd," Auckland, *New Zealand Herald*, p. A14.
- January 16, 2010, "Abbott shows green credentials as he puts pressure on Rudd," Auckland, *Weekend Herald*, p. A25.
- Anwar, Dewi Fortuna, 2006, "Resource Issues and Ocean Governance in Asia Pacific: An Indonesian Perspective," *Contemporary Southeast Asia*, Vol. 28, No. 3, pp. 466-489.
- Appenzeller, Tim, June 2007, "The Big Thaw," *National Geographic*, pp. 56-71.
- Appleman, Philip (ed.), 2004, *Thomas Robert Malthus: An Essay on the Principle of Population*, New York, Norton.
- Archer, Clive (ed.), 1988, *The Soviet Union and Northern Waters*, London, Routledge.
- Arctic Council, 2004, *Impacts of a Warming Arctic*, Arctic Climate Impact Assessment (ACIA), Cambridge, Cambridge University Press.
- Arctic Marine Shipping Assessment, 2009, "Arctic Marine Geography, Climate and Sea Ice," pp. 16-35.  
[http://www.arctic.gov/publication/AMSA/arctic\\_marine\\_geography.pdf](http://www.arctic.gov/publication/AMSA/arctic_marine_geography.pdf)  
 (17 August 2010).
- Armstrong, Terence, 1949, "The Voyage of the *Komet* along the Northern Sea Route," *Polar Record*, Vol. 35, pp. 291-295.
- Associated Press, 1 April 2004, "UN studies environmental catalysts for warfare", Auckland, *The New Zealand Herald*.
- 2006, "China to set up strategic reserves for copper, uranium, other minerals," <http://www.tradingcharts.com/futures/4/9/78557194.html>  
 (11 May 2006).

- 2010, “Canada-Russia Arctic tensions rise,” *The Canadian Press*, <http://www.cbc.ca/world/story/2010/03/17/arctic-russia017.html> (23 November 2010).
- Association for the Study of Peak Oil & Gas, 2003, “Oil and Gas Liquid 2004 Scenario,” <http://www.peakoil.net/uhdsg/2004Scenario.jpg> (4 June 2004).
- Atkins, James E., 1991, “Heading Towards War,” *Journal of Palestine Studies*, Vol. XX, No. 3, pp. 16-30.
- Attali, Jacques, 2009, *A Brief History of the Future*, Crows Nest, New South Wales, Allen & Unwin.
- Austin, J. L., 1962, *How to do Things with Words*, Oxford, Clarendon Press.
- Austin, Mark, 2010, “If the Falklands oil saga comes to war, Britain is on her own,” *The Mirror*, <http://www.mirror.co.uk/news/top-story/2010/02/28/if-the-falklands-oil-saga-comes-to-war-Britain-is-on-her-own-115875-22076343/> (22 September 2010).
- Australian Broadcasting Corporation, 2000, “South of no North,” [http://www.abc.net.au/southnorth/film\\_talent\\_profiles.htm](http://www.abc.net.au/southnorth/film_talent_profiles.htm) (2 June 2004).
- Australia, Commonwealth of, 2000, *Our Future Defence Force*, Canberra, Defence Publishing.
- Australian Government, *Defending Australia in the Asia Pacific Century: Force 2009*, Defence White Paper 2009, Department of Defence, [http://www.defence.gov.au/whitepaper/doc/defence\\_white\\_papaer\\_2009.pdf](http://www.defence.gov.au/whitepaper/doc/defence_white_papaer_2009.pdf) (6 July 2009).
- Autesserre, Séverine, 2008, “The Trouble With Congo: How Local Disputes Fuel Regional Conflict,” *Foreign Affairs*, Vol. 87, No. 3, pp. 94-110.
- Axelrod, Robert, 1970, *Conflict of Interest: A Theory of Divergent Goals with Applications to Politics*, Chicago, Markham.
- Ayoob, Mohammed, 1995, *The Third World Security Predicament*, Boulder, Lynne Rienner.
- Ayson, Robert and Desmond Ball (eds.), 2006, *Strategy and Security in the Asia-Pacific*, Crows Nest, NSW, Allen & Unwin.
- Baer, Robert, 2008, *The Devil We Know: Dealing with the new Iranian superpower*, New York, Random House.
- Bagaric, Mirko, December 24, 2009, “Only self-interest will drive us to act on climate,” Auckland, *The New Zealand Herald*, p. A13.

- Bahree, Bhushan and Chip Cummins, 2006, "Crude Calculation: In oil's new era, power shifts to countries with reserves," New York, *Wall Street Journal*, p. A.1.
- Baker, David, 1981, *The Shape of Wars to Come*, Cambridge, Patrick Stephens.
- Ball, Desmond and David Horner (eds.), 1992, *Strategic Studies in a Changing World: Global, Regional and Australian Perspectives*, Canberra, Australian National University.
- Banks, Michael, 1989, "System analysis and the Study of Regions," *International Studies Quarterly*, Vol. 13, No. 1, pp. 335-360.
- Barber, Laurie, 1982, "Keeping New Zealand's back door closed," *New Zealand International Review*, Vol. VII, No. 3, pp. 13-14.
- Barber, Laurie and Ken Henshall, 1999, *The Last War of Empires: Japan and the Pacific War*, Auckland, David Bateman.
- Barley, Shanta, 2009, "A World 4°C Warmer," *New Scientist*, Vol. 204, No. 2728, pp. 14-15.
- Barma, Naazneen, Ely Ratner and Steven Weber, 2007, "A World without the West," *The National Interest*, July/August 2007, pp. 23-30.
- Barnaby, Wendy, 2009, "Do nations go to war over water?" *Nature*, Vol. 458, pp. 282-283.
- Barnett, Harold J., 1958, "The Changing Relation of Natural Resources to National Security," *Economic Geography*, Vol. 34, No. 3, pp. 189-201.
- Barnett, Harold J. and Chandler Morse, 1963, *Scarcity and Growth*, Baltimore, John Hopkins Press.
- Barnett, Jon, 2001, *The Meaning of Environmental Security*, London, Zed Books.
- 2001, "Security and Climate Change," *Tyndall Centre Working Paper No. 7*.
- 2004, *Global Warming and the Security of Atoll Countries*, Christchurch, University of Canterbury, Macmillan Working Paper Series, No. 9.
- Barnett, Sarah, 2009-2010, "Man of the moment," Auckland, *New Zealand Listener*, Vol. 221, No. 3633, pp. 18-21.
- 2010, "Morsel Combat," Auckland, *New Zealand Listener*, Vol. 222, No. 3639, pp. 17-18.
- Barnett, T. P., J. C. Adams and D. P. Lettenmaier, 2005, "Potential impact of a warming climate on water availability in snow dominated regions," *Nature*, Vol.438, No. 17, pp. 303-309.

- Barrera, Jorge, 2011, "While Harper talked tough with NATO on Arctic, U.S. believed PM all bark no bite," *APTN National News*, <http://aptn.ca/pages/news/2011/05/11/while-harper-talked-tough-with-nato-on-arctic-us-beleved-pm-all-bark-no-bite/> (7 September 2011).
- Barrett, Peter, 1979, "The Search for Wealth," *New Zealand International Review*, Vol. VI, No. 6, pp. 7-8.
- Bauch, Chris T., Alison P. Galvani and David J. D. Earn, 2003, "Group interest versus self-interest in smallpox vaccination policy," *Proceedings of the National Academy of Science of the United States of America*, Vol. 100, No. 18, pp. 10564-10567.
- Baumeister, Christiane and Luca Benati, 2010, "Unconventional Monetary Policies and the Great Recession," *European Central Bank*, Working Paper Series No. 1258, pp. 1-50, <http://www.ecb.int/pub/pdf/scpwps/ecbwp1258.pdf> (11 November 2010).
- BBC News, 2010, "Hillary Clinton: South Sudan referendum is a 'time bomb,'" <http://www.bbc.co.uk/news/world-africa-11241359> (7 October 2010).
- Beary, Brian, 2008, "Race for the Arctic: Who owns the region's undiscovered oil and gas?" *CQ Global Researcher*, Vol. 2, No. 8, pp. 213-242.
- Beck, Peter J., 1986, *The International Politics of Antarctica*, London, Croom Helm.
- June 1987, "A Cold War; Britain, Argentina and Antarctica," *History Today*, pp. 16-23.
- 1989, "A new polar factor in international relations," *The World Today*, Vol. 45, No. 4, pp. 65-68.
- 1990, "Antarctica enters the 1990s: an overview," *Applied Geography*, Vol. 10, pp. 247-263.
- Beckett, Margaret, British Foreign Secretary, 24 October 2006, "Berlin speech on climate and security," British Embassy, Berlin, <http://www.britischebotschaft.de/en/news/item/061024.htm> (15 May 2007).
- Bedi, Rahul, 2003, "Now its Russia's turn to look east," *Asiatimes*, <http://www.atimes.com> (10 September 2009).

- July 17, 2009, “Nation stays under radar with sub,” Auckland, *New Zealand Herald*, p. A20.
- Beech, Hannah, 2010, “Asia’s New Cold War,” *Time*, Vol. 176, No. 15, pp. 26-27.
- Beedham, Brian, September 5<sup>th</sup> 1992, “Defence in the 21<sup>st</sup> Century: Meet your unbrave new world,” *The Economist*, pp. 3-20.
- Bell, Ruth Greenspan, 2006, “What to do about Climate Change,” *Foreign Affairs*, Vol. 85, No. 3, pp. 105-113.
- Bennett, Geoffrey, 1962, *Coronel and the Falklands*, London, Batsford.
- Bennett, Mia, 2010, “Russia reaffirms desire to exploit Arctic resources; Canada reacts,” *The Arctic*, <http://arctic.foreignpolicyblogs.com/2010/03/24/russia-reaffirms-desire-to-exploit-arctic-resources> (6 September 2010).
- Bennett, Olivia (ed.), 1991, *Greenwar: Environment and Conflict*, London, Panos Publications.
- Bent, David, James Goodman, Richard Hardymont, Iain Watt and Katja Wessling, 2008, “Climate futures: responses to climate change in 2030,” London, *Forum for the future*, pp. 1-76.
- Bergin, Anthony and Marcus Haward, 2007, *Frozen Assets: Securing Australia’s Antarctic future*, Canberra, Australian Strategic Policy Institute.
- Berkes, Fikret, Rob Huebert, Helen Fast, Micheline Manseau, and Alan Diduck (eds.), 2005, *Breaking Ice*, Calgary, University of Calgary Press.
- Berman, Ilan, 2008, “Chill wind blows over claims to Arctic lands,” *Janes Defence Weekly*, Vol. 45, No. 43, p. 29.
- Bernhardt, J. Peter A., 1975, “Sovereignty in Antarctica,” *California Western International Law Journal*, Vol. 5, pp. 297-349.
- Bernstein, Richard and Ross H. Munro, 1997, “The Coming Conflict with America,” *Foreign Affairs*, Vol. 76, No. 2, pp. 18-32.
- Bert, Wayne, 2003, *The United States, China and Southeast Asian Security: A Changing of the Guard?* Basingstoke, Palgrave MacMillan.
- Bertram, G. C. L., *Antarctic Today and Tomorrow*, Dunedin, University of Otago.
- Bezan, Darrow, 2009, “Donald Rumsfield Unknown Unknowns,” Video presentation, [http://www.youtube.com/watch?v=\\_RpSv3HjpEW](http://www.youtube.com/watch?v=_RpSv3HjpEW) (29 March 2010).

- Big News, 2004, "U.K. joins U.S. in Royal Dutch/Shell probe,"  
<http://www.bignewsnetwork.com/?sid=7823769ff7659387> (8 June 2004).
- Bin, Yu, "China-Russia Relations: One Year Later: Geopolitics or  
 Geoeconomics?" [http://csis.org/files/media/isis/pubs/0203qchina\\_russia.pdf](http://csis.org/files/media/isis/pubs/0203qchina_russia.pdf)  
 (20 August 2009).
- Bingham, John and Thomas Harding, 2010, "Navy cuts would lead to Argentina  
 taking Falklands 'without shot fired,'" *The Telegraph*,  
<http://www.telegraph.co.uk/news/worldnews/southamerica/falklandisland/8082122/> (17 December 2010).
- Birol, Fatih, 2007, "Oil Market Outlook and Policy Implications," Testimony  
 presented to United States Senate Committee on Energy and Natural  
 Resources on behalf of the International Energy Agency, pp. 1-22.  
<http://www.iea.org/> (8 February 2010).
- 2009, "World Energy Outlook 2009," *International Energy Agency*,  
 Conference paper presented in Moscow.
- 2010, "World Oil Outlook to 2030," *International Energy Agency*,  
<http://www.iea.org/speech/2001-2002/birol.pfd> (24 February 2010).
- Black, Jeremy, 2001, *War in the New Century*, London, Continuum.
- Bloomfield, Lincoln P., 1981, "The Arctic: Last Unmanaged Frontier," *Foreign  
 Affairs*, Vol.60, No.1, pp. 87-105.
- Blouet, Brian W (ed.), 2005, *Global Geostrategy: MacKinder and the Defence of  
 the West*, London, Frank Cass.
- Blyth, William and Nicholas Lefevre, 2007, "Energy security and Climate Change:  
 An Assessment Framework," *International Energy Agency*, p. 81,  
[http://www.iea.org/textbase/papers/2004/EnergySecurity\\_%20ClimateChange\\_COP10.pdf](http://www.iea.org/textbase/papers/2004/EnergySecurity_%20ClimateChange_COP10.pdf) (1 July 2009).
- Bobbitt, Philip, 2003, *The Shield of Achilles: The Long War and the Market State*,  
 Westminster, MD, Alfred A. Knopf.
- Bogdanar, Vernon (ed.), 1991, *The Blackwell Encyclopaedia of Political Science*,  
 Oxford, Blackwell.
- Bolton, John, November 6, 2008, "Mr President, the foreign policy priorities,"  
 Auckland, *New Zealand Herald*, p. A15.



- Bongaarts, John and Rodolfo A. Bulatao (eds.), 2000, *Beyond Six Billion: Forecasting the World's Population*, Committee on Population, Washington, D.C., National academy Press.
- Booth, Ken and Peter Vale, 1995, "Security in southern Africa: after apartheid, beyond realism," *International Affairs*, Vol. 71, No. 2, pp. 285-304.
- Borger, Julian, November 28, 2008, "Rich World buys rights to the fields of the poor," Sydney, *The Guardian Weekly*, pp.1-2.
- Borgerson, Scott C., 2008, "Arctic meltdown: The Economic and Security Implications of Global Warming," *Foreign Affairs*, Vol. 87, No. 2, pp. 63-77.
- Boslough, Mark, Mark Ivey, Mark Taylor, Bernard Zak and George Backus, 2008, "The Arctic as a Test Case for an Assessment of Climate Impacts on National Security," Sandia Report, Sand2008-7006, Albuquerque, *Sandia National Laboratory*, pp. 1-84.
- Boswell, Randy, 2009, "Russian report suggests conflict over Arctic possible," *CanWest News Service*,  
<http://www.canada.com/news/Russia+report+suggusts+conflict+over+Arctic+possible/1593393.htm> (2 September 2010).
- 2010, "Arctic is source of conflict, international competition," *CanWest News Service*,  
<http://www.globalmaritimes.com/sitemap/Arctic+source+conflict+international+competition> (28 April 2010)
- Boulding, Kenneth, 1959, "National Images and International System," *Journal of Conflict Resolution*, Vol. 3, No. 2, pp. 120-132.
- Bourne, Joel K., 2007, "Green Dream," *National Geographic*, Vol. 212, No. 4, pp. 38-59.
- Boyle, Stewart and John Ardill, 1989, *The Greenhouse Effect*, London, New English Library.
- Bradshaw, Michael, 2006, "Battle for Sakhalin," *World Today*, Vol. 62, No. 11, pp. 18-19.
- Bradsher, Keith, 2010, "Amid Tension, China Blocks Vital Exports to Japan," *The New York Times*,  
<http://www.nytimes.com/2010/09/23/business/global/23rare.html>  
 (7 October 2010).

- Brady, Anne-Marie, 2010, "China's Rise in Antarctica?" *Asian Survey*, Vol. 50, No. 4, pp. 759-785.
- Brainard, Lael and Derek Chollet (eds.), 2007, *Too Poor for Peace? Global poverty, Conflict, and Security in the 21<sup>st</sup> Century*, Washington, D.C., Brookings Institution Press.
- Brandt Commission (Independent Commission on International Development Issues), 1980, *North-South: A Programme for Survival*, London, Pan Books.
- Brennan-Galvin, Ellen, 2002, "Crime and Violence in an Urbanizing World," *Journal of International Affairs*, Vol. 56, No. 1, pp. 123-145.
- Brennkecke, H. J., 1954, *Ghost Cruiser H.K. 33*, London, William Kimber.
- Brigham, Lawson W., September-October 2007, "Thinking about the Arctic's Future: Scenarios for 2040," *The Futurist*, pp. 27-34.
- British Petroleum, 2002, "Proved oil reserves at end of 2002," <http://www.bp.com> (4 June 2004).
- Broecker, Wallace S., 1997, "Thermohaline Circulation, the Achilles Heel of Our Climate System: Will Man-Made CO<sub>2</sub> Upset the Current Balance?" *Science*, Vol. 278, pp. 1582-1588.
- Brown, Amanda, May 16, 2007, "We have five years to save the planet: WWF," Auckland, *New Zealand Herald*, A13.
- Brown, Chris, 1997, *Understanding International Relations*, Basingstoke, MacMillan.
- Brown, Colin, April 3, 2007, "Old foes still as far apart as ever," Auckland, *New Zealand Herald*, p. B3.
- Brown, Lester, 2004, "Troubling New Flows of Environmental Refugees," *Earth Policy Institute*, No. 33, <http://www.earth-policy.org/Updates/Update33-printable.htm> (20 June 2007).
- 2004, *Outgrowing the Earth: The Food Security Challenge in an Age of Falling Water Tables and Rising Temperatures*, New York, Earth Policy Institute.
- 2008, *Plan B 3.0: Mobilizing to save Civilization*, New York, W. W. Norton.
- Brown, Michael E. (ed.), 2003, *Grave New World: Security Challenges in the 21<sup>st</sup> Century*, Washington, D.C., Georgetown University Press.
- Brown, Neville, 1989, "Climate, ecology and international security," *Survival*, Vol. XXXI, No. 6, pp. 519-532.

- April 1989, “The ‘greenhouse effect’: a global challenge,” *The World Today*, pp. 61-64.
- 1990, “Planetary Geopolitics,” *Millennium*, Vol. 19, No. 3, pp. 447-460.
- Brown, Oli, Anne Hammill and Robert McLean, 2007, “Climate change as the ‘new’ security threat: implications for Africa,” *International Affairs*, Vol. 83, No. 6, pp. 1141-1154.
- Brubaker, R. Douglas and Willy Østrem, 1999, “The Northern Sea Route Regime: Exquisite Superpower Subterfuge?” *Ocean Development and International Law*, No. 30, pp. 299-331.
- Bryer, Gary C., 2001, *Gaia’s Wager*, Oxford, Rowman & Littlefield.
- Brzezinski, Zbigniew, 1997, *The Grand Chessboard: American Primacy and its Geostrategic Imperatives*, New York, Basic Books.
- Buckley, Richard (ed.), 1994, *World Fishing: Harvesting the oceans*, Cheltenham, European Schoolhouse Publishing.
- 1995 *Antarctica: Protecting the last wilderness*, Cheltenham, European Schoolbook Publishing.
- 1997, *Climate Change: What’s happening to the Weather?* Cheltenham, Buxton Press.
- Buhaug, Halvard, Nils Petter Gleditsch and Ole Magnus Theisen, 2008, *Implication of Climate Change for Armed Conflict*, Washington, D.C., The World Bank, pp. 1-48.
- Bull, Hedley, 1977, *The Anarchical Society*, Basingstoke, MacMillan.
- Bulloch, John and Adel Darwish, 1993, *Water Wars: coming Conflicts in the Middle East*, London, Victor Gollancz.
- Buncombe, Andrew, December 9, 2009, “Cities swollen by refugee flood,” Auckland, *New Zealand Herald*, p. A20.
- 2010, “Disputed island gobbled up by sea,” Auckland, *New Zealand Herald*, p. A18.
- Burrows, Mathew and Gregory F. Treverton, 2007, “A Strategic View of Energy Futures,” *Survival*, Vol. 49, No. 3, pp. 79-90.
- Buszynski, Leszek, 2009, “Sino-Japanese Relations: Interdependence, Rivalry and Regional Security,” *Contemporary Southeast Asia*, Vol. 31, No. 1, pp. 143-171.

- Butler, Anthony, 2011, "Beware the hazards of resource nationalism," *Business Day*, <http://www.businessday.co.za/articles/Content.aspx?id=145475> (4 October 2011).
- Buzan, Barry, 1981, "Naval power, the law of the sea, and the Indian Ocean as a Zone of Peace," *Marine Policy*, Vol. 5, No. 3, pp. 194-204.
- 1991, *People, States and Fear: An agenda for international Security Studies in the Post-Cold war Era*, Harlow, Pearson.
- 1991, "New Patterns of Global Security in the Twenty-First Century," *International Affairs*, Vol. 67, No. 3, pp. 431-451.
- 1995, "The Present as a Historic Turning Point," *Journal of Peace Research*, Vol. 30, No. 4, pp. 385-398.
- 2004, *The United States and the Great Powers: World Politics in the Twenty-First Century*, Cambridge, Polity Press.
- Buzan, Barry and Richard Little, 1994, "The Idea of "International System": Theory Meets History," *International Political Science Review*, Vol. 15, No. 3, pp. 231-255.
- Buzan, Barry, Ole Wæver and Jaap de Wilde, 1998, *Security: A new Framework for Analysis*, Boulder, Lynne Rienner.
- Byers, Bruce, 1991, "Ecoregions, State Sovereignty and Conflict," *Bulletin of Peace Proposals*, Vol. 22, No. 1, pp. 65-76.
- Byers, Michael, 2009, *Who Owns the Arctic?: Understanding Sovereignty Disputes in The North*, Vancouver, Douglas & McIntyre.
- Cable, Vincent, 1995, "What is international economic security?" *International Affairs*, Vol. 75, No. 2, pp. 305-324.
- Calder, Kent E. 1996, "Asia's Empty Tank," *Foreign Affairs*, Vol. 75, No. 2, pp. 55-69.
- Caldwell, Nathaniel French, 1990, *Arctic Leverage: Canadian Sovereignty and Security*, New York, Praeger.
- Calhoun, Craig, 1997, *Nationalism*, Buckingham, Open University Press.
- Callister, Debra J., 1992, *Illegal Tropical Timber Trade: Asia-Pacific*, Cambridge, TRAFFIC International.
- Campbell, Colin J. and Jean H. Laherrère, 1998, "The End of Cheap Oil," *Scientific America*, <http://www.dieoff.com/page140.htm> (8 June 2004).

- Campbell, Kurt M. (ed.), 2008, *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change*, Washington, D.C., Brookings Institution.
- Campbell, Kurt M., Alexander T. J. Lennon and Julianne Smith, 2007, *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change*, Washington, D.C., Centre for Strategic and International Studies.
- Carnaghan, Matthew and Allison Goody, 2006, *Canada Arctic Sovereignty*, PRB 05-61E, Ottawa: Parliamentary Information and Research Service, <http://www2.parl.gc.ca/content/LOP/ResearchPublication/prb0561-e.htm> (17 August 2010).
- Carpenter, Ted Galen, 1991, "The New World Disorder," *Foreign Policy*, No. 84, pp. 24-39.
- Carr, E.H., 1939, *The Twenty Years' Crisis 1919-1939*, London, MacMillan.
- Carrington, Damian, 2010, "Cancún deal leaves hard climate tasks to 2011," *Guardian Weekly*, pp. 1-2.
- Carter, Bob, 2008. "New Zealand Speculative Global Warming Policy: A Failure of Duty to Care," James Cook University, unpublished meeting notes.
- Cha, Victor D., 2000, "Globalization and the Study of International Security," *Journal of Peace Research*, Vol. 37, No. 3, pp. 391-403.
- Chan, Steve, 1984, "Mirror, Mirror on the Wall ... are the Freer Countries more Pacific?" *Journal of Conflict Resolution*, Vol. 28, No. 4, pp. 617-648.
- Chandler, Jo, 2010, "China flags polar resource goals," *The Age*, Melbourne, <http://www.theage.com.au/action/printArticle?id=1019090> (9 June, 2010).
- Chase, Robert S., Emily B. Hill and Paul Kennedy, 1996, "Pivotal States and U.S. Strategy," *Foreign Affairs*, Vol. 75, No. 1, pp. 33-53.
- Chaturvedi, Sanjay, 1996, *The Polar Regions: A Political Geography*, Chichester, John Wiley.
- Chew, Allen F., 2006, "Russia at War 1941-1945," *Great Victory Society*, Fort Leavenworth, <http://www.russian-victory.ru/> (11 March 2010).
- Child, Jack, 1988, *Antarctica and South American Geopolitics: Frozen Lebensraum*, New York, Praeger.
- 1990, "Latin *lebensraum*: the geopolitical of Ibero-American Antarctica," *Applied Geography*, Vol. 10, No. 4, pp. 287-305.

- Chipman, John, 1992, "The Future of Strategic Studies: Beyond Grand Strategy," *Survival*, Vol. 34, No. 1, pp. 109-131.
- Chitnis, Nandu, 2010, "India in Bid for Shares in Russia's Arctic Oil Reserves," <http://ecopolitology.org/2010/09/24/india-to-bid-for-share-inrussia-arctic-oil-reserves/> (23 November 2010).
- Choucri, Nazli and Robert C. North, *Nations in Conflict: National growth and International Violence*, San Francisco, W. H. Freeman.
- Churchill, R. R. and A. V. Lowe, 1988, *The law of the sea*, Manchester, Manchester University Press.
- Churchill, Winston S., 1948, *The Second World War: The Gathering Storm*, London, The Reprint Society.
- 1952, *The Grand Alliance*, London, Reprint Society.
- Clad, James, December 1, 1983, "Breaking the ice," *Far Eastern Economic Review*, pp. 25-26.
- Claes, Dag Harald, Øyvind Østerud and Øistein Harsem, 2010, "The New Geopolitics of the High North," *Paper presented at the 51<sup>st</sup> ISA Convention in New Orleans*, pp. 1-21.
- Clinton, Bill, 2001, "The Struggle for the Soul of the 21<sup>st</sup> Century," <http://www.australianpolitics.com/news/2001/01-12-14.shtml> (4 January 2010).
- Clover, Charles, 1999, "Dreams of the Eurasian Heartland," *Foreign Affairs*, Vol. 78, No. 2, March 1999, pp. 1-8.
- Coal Industry Advisory Board, 2003, "World Coal Demand and Supply Prospects," *International Energy Agency*, pp. 1-4.
- Cohen, Ariel, 2007, "Russia's race for the Arctic," *The Heritage Foundation*, <http://www.heritage.org/Press/Commentary/ed080807a.cfm?> (20 August 2009).
- 2010, "From Russian Competition to Natural Resource Access: Recasting U.S. Arctic Policy," *Backgrounder*, The Heritage Foundation, No. 2421, <http://report.heritage.org/bg2421> (1 September 2010).
- Cohen, Ariel, Lajos F. Szaszdi, and Jim Dolbow, 2008, "The New Cold War: Reviving the U.S. Presence in the Arctic," *Backgrounder*, The Heritage Foundation, No. 2202,

[www.heritage.org/Research/EnergyandEnvironment/bg2202.cfm](http://www.heritage.org/Research/EnergyandEnvironment/bg2202.cfm)

(31 August 2010).

Cohen, David, 2007, "Earth audit," *New Scientist*, Vol. 194, No. 2605, pp. 34-41.

Cohen, Saul B., 1982, "A new map of global geopolitical equilibrium: a developmental approach," *Political Geography Quarterly*, Vol. 1, No. 3, pp. 223-241.

——— 1984, "Asymmetrical States and Global Geopolitical Equilibrium," *SAIS Review*, Vol. 4, No. 2, pp. 193-212.

——— 1990, "The World Geopolitical System in Retrospect and Prospect," *Journal of Geography*, Vol. 89, No. 1, pp. 2-12.

——— 1991, "Global Geopolitical Change in the Post-Cold War Era," *Annals of the Association of American Geographers*, Vol. 81, No. 4, pp. 551-580.

Cohen-Tanugi, Laurent, 2008, *The shape of the World to Come*, New York, Columbia University Press.

Coker, Christopher, 1998, *Twilight of the West*, Boulder, Westview Press.

——— 2004, *The Future of War*, Oxford, Blackwell.

Collier, Paul, 2007, *The Bottom Billion: Why the Poorest Countries Are Failing and What Can Be Done About It*, New York, Oxford University Press.

Collins, Gabe, Andrew S. Erickson, Yufan Hao, Mikkal E. Herberg, Liewelyn Hughes, Weihua Liu, and Jane Nakano, 2011, *Asia's Rising Energy and Resource Nationalism: Implications for the United States, China, and the Asia-Pacific Region*, NBR Special Report #31, Seattle, National Bureau of Asian Research.

Commission on International Development Issues, 1979, *North-South: A Programme for Survival*, London, Pan Books.

Conca, Ken, 1998, "The Environment-Security Trap," *Dissent*, Vol. 45, No. 3, pp. 40-45.

Conca, Ken and Geoffrey D. Dabelko, 2004, *Green Planet Blues*, Boulder, Westview.

Connell, John, 1993, "Climatic Change: A New Security Challenge for the Atoll States of the South Pacific," *Journal of Commonwealth & Comparative Politics*, Vol. XXXI, No. 2, pp.173-192.

Connelly, Philip and Robert Perlman, 1975, *The Politics of Scarcity*, London, Royal Institute of International Affairs.

- Cornell, Svante E. and Maria Sultan, 2000, "The Asian Connection: The New Geopolitics of Central Asia," *Caspian Brief*, Cornell Caspian Consulting, pp. 1-10.
- Cornes, Richard and Todd Sandler, 1996, *The Theory of Externalities, Public Goods and Club Goods*, Cambridge, Cambridge University Press.
- Cotton, James, 1999, "The "haze" over Southeast Asia: Challenging the ASEAN Mode of Regional Engagement," *Pacific Affairs*, Vol. 72, No. 3, pp. 331-351.
- Crichton, Michael, November 6<sup>th</sup>, 2005, "Complexity Theory and Environmental Management," Speech to the Washington Centre for Complexity and Public Policy, Washington DC., <http://www.crichton-official.com/speech-complexity.html> (14 April 2008).
- Cripps, Emily, 1999, "The Legal Status of Ice in the Antarctic Region," *Australian Law Students Association*, <http://www.alsa.asn.au/files/acj/1996/cripps.html> (2 September 2010).
- Crocker, Chester A., Fen Osler Hampson and Pamela Aall, (eds.), 2001, *Turbulent Peace: The Challenges of Managing International Conflict*, Washington, United States Institute of Peace Press.
- Cuny, Fredrick C., 1999, *Famine, Conflict and Response*, West Hartford, Connecticut, Kumarian Press.
- Daalder, Ivo H., 2003, "The End of Atlanticism," *Survival*, Vol. 45, No. 2, pp. 147-166
- Dabelko, Geoffrey D. and P. J. Simmons, 1997, "Environment and Security: Core Ideas and US Government Initiatives," *SAIS Review*, Vol. 17, No. 1, pp.127-146.
- Darby, Andrew, 2010, "China flags its Antarctic intent," <http://www.nationaltimes.com.au/politics/china-flags-its-antarctic-intent-20100111-m287.html> (9 June 2010)
- David, Steven R., 1989, "Why the Third world Matters," *International Security*, Vol. 14, No. 1, pp. 50-85.
- 1992-93, "Why the Third World Still Matters," *International Security*, Vol. 17, No. 3, pp. 127-159.
- De Backer, Willy, 2008, "Developing Europe's Energy Security: Is the Arctic the Future Frontier?" *Friends of Europe-Statoilhydro*, Café Crossfire Debate,



- Brussels,  
[http://www.friedsofeurope.org/portals/6/download/CC/CC\\_statoil\\_19-09-08\\_09\\_19\\_CC.Energy\\_Security\\_and\\_the\\_Arctic\\_SoD.pdf](http://www.friedsofeurope.org/portals/6/download/CC/CC_statoil_19-09-08_09_19_CC.Energy_Security_and_the_Arctic_SoD.pdf) (16 November 2010).
- de Freitas, Chris, January 15, 2011 “Emotion clouding underlying science of global warming,” Auckland, *New Zealand Herald*, p. A11.
- Delpech, Thérèse, 2007, *Savage Century: Back to Barbarism*, Washington, Carnegie Endowment for International Peace.
- de Mesquita, Bruce, Bueno, 2009, “Recipe for Failure,” *Foreign Policy*,  
[http://www.foreignpolicy.com/articles/2009/10/16/recipe\\_for\\_failure?print](http://www.foreignpolicy.com/articles/2009/10/16/recipe_for_failure?print)  
 (25 March 2009).
- Deming, David, December 10, 2007, “Year of global cooling,” *The Washington Times*, <http://www.washingtontimes.com/news/2007/dec/19/year-of-global-cooling/print/> (28 August 2008).
- Demko, George J. and William B. Wood, 1999, *Reordering the World: Geopolitical Perspectives on the 21<sup>st</sup> Century*, Boulder, Westview Press.
- de Onis, Juan, 2008, “Brazil’s Big Moment,” *Foreign Affairs*, Vol. 87, No. 6, pp. 110-122.
- Depledge, Duncan and Klaus Dodds, 2011, “The UK and the Arctic: The Strategic Gap,” *RUSI Journal*, Vol.156, No. 3, pp. 72-79.
- Dequan, Zhai, September 14, 2006, “Reaching Out to Africa,” *Beijing Review*, pp. 14-15.
- De Soysa, Indra, 2001, “New World (Dis)Order? Testing the Effects of Trade & FDI on New World Models of Civil Conflict, 1989-99,” Paper presented at the International Studies Association (ISA) on ‘Globalization’, Hong Kong, <http://www.isanet.org/archive/soysa.html> (4 May 2006).
- 2002, “Paradise is a Bazaar? Greed, Creed, and Governance in Civil War, 1980-99,” *Journal of Peace Research*, Vol. 39, No. 4, pp. 395-416.
- Deudney, Daniel and G. John Ikenberry, 2009, “The Myth of the Autocratic Revival,” *Foreign Affairs*, Vo. 88, No. 1, pp. 77- 93.
- Deutsch, Karl W., *et al*, 1957, *Political Community and the North Atlantic Area*, Princeton, New Jersey, Princeton University Press.
- De Wit, Maarten J., 1985, *Minerals and Mining in Antarctica*, Oxford, Clarendon Press.

- Diamond, Jared, 2005, *Collapse: How Societies Choose to Fail or Succeed*, New York, Viking.
- Diamond, Larry, 2008, "The Democratic Rollback: The resurgence of the Predatory State," *Foreign Affairs*, Vol.87, No. 2, pp. 36-48.
- February 2009, "How to Save Democracy", *Newsweek: Special Edition – Issues 2009*, pp. 20-22.
- Dietrich, R. V. and Brian J. Skinner, 1990, *Gems, Granites, and Gravels*, Cambridge, Cambridge University Press.
- Dobell, Graeme, 2007, *China and Taiwan in the South Pacific: Diplomatic Chess versus Pacific Political Rugby*, Sydney, Lowy Institute.
- Dodds, Klaus, 1997, *Geopolitics in Antarctica: Views from the Southern Oceanic Rim*, Chichester, John Wiley.
- 2002, *Pink Ice*, London, Tauris.
- Dokken, Karin, 2001, "Environment, security and regionalism in the Asia-Pacific: is environmental security a useful concept?" *The Pacific Review*, Vol. 14, No. 4, pp. 509-530.
- Douglas Jackson, W. A., (ed.), 1964, *Politics and Geographic Relationships*, Englewood Cliffs, N.J., Prentice-Hall.
- Drezner, Daniel W., 2007, "The New New World Order," *Foreign Affairs*, Vol. 86, No. 2, pp. 34-46.
- Drohan, Madelaine, 2004, *Making a Killing: How and Why Corporations use Armed forces to do Business*, Guilford, Lyon Press.
- Dugger, John A., 1978, "Exploiting Antarctic Mineral Resources-Technology, Economics, and the Environment," *University of Miami Law Review*, Vol. 33, pp. 315-339.
- Dunphy, Harry and Martin Crutsinger, October 11, 2010, "Currency wars loom as finance talks fail," Auckland, *New Zealand Herald*, p. B20.
- Dupont, Alan, 1998, *The Environment and Security in Pacific Asia*, Adelphi Paper 319, Oxford, Oxford University Press.
- 2008, "The Strategic Implications of Climate Change," *Survival*, Vol. 50, No. 3, pp. 29-54.
- Dusevic, Tom, May 10, 2004, "Hands Off My Petroleum," *Time*, pp. 36-41.
- Dutton, Denis, 1975, "The Cooling World," *Newsweek*, [http://denisdutton.com/cooling\\_world.htm](http://denisdutton.com/cooling_world.htm) (28 April 2008).

- Dyer, Gwynne, 2008, *Climate Wars*, First edition, Melbourne, Scribe.
- 2010, *Climate Wars*, Second edition, Melbourne, Scribe.
- Earth Council, *The Ecological Benchmark: How Much Nature is there per Global Citizen?*  
<http://www.ecouncil.ac.cr/rio/focus/report/english/footprint/benchmark.htm>  
 (9 May 2006).
- Eberstadt, Nicholas, 1991, "Population Change and National Security," *Foreign Affairs*, Vol. 70, No. 3, pp. 115-130.
- Eckes, A. E., 1979, *The United States and the Global Struggle for Minerals*, Austin, University of Texas Press.
- Economist, 2007, "Drawing lines in melting ice," *The Economist*, Vol. 384, No. 8542, pp. 47-48.
- 2009, "Who cares?" *The Economist*, Vol. 393, No. 8660, p. 16.
- 2010, "The future of NATO: Fewer dragons, more snakes," *The Economist*, Volume 397, No. 8708, November 13, pp. 26-28.
- 2010, "Oil and troubled waters: Drilling a vein of nationalism," *The Economist*, <http://www.economist.com/node/15546482/print> (15 December 2010).
- 13 January 2011, "African lions look set to outpace economic tigers," Auckland, *New Zealand Herald*, p. B2.
- Economy, Elizabeth C., 2007, "The Great Leap Backwards?" *Foreign Affairs*, Vol. 86, No. 5, pp. 38-59.
- Edwards, Michael J., 1996, "Climate Change, Worst-Case Analysis and Ecocolonialism in the Southwest Pacific," *Pacifica Review*, Vol. 8, No. 1, pp. 63-80.
- 1999, "Security Implications of a Worst-case Scenario of Climate Change in the South-west Pacific", *Australian Geographer*, Vol. 40, No. 3, pp. 311-330.
- Ehrlich, Paul R. and Anne H. Ehrlich, 1990, *The Population Explosion*, New York, Simon & Schuster.
- Elferink, Alex G. Oude and Donald R. Rothwell, 2001, *The Law of the Sea and Polar Maritime Delimitation and Jurisdiction*, The Hague, Martinus Nijhoff.
- Elliott, Michael, 2007, "Go Tell it on the Mountain," *Time*, pp. 42-44.

- Elliott, Wendy and Tina Tin, 2008, *Ice breaker: Pushing the Boundaries for Whales*, WWF, pp. 1-11.
- Elvin, Mark, 1993, "Three Thousand Years of Unsustainable Growth: China's Environment from Archaic Times to the Present Day," *East Asian History*, No. 6, pp. 7-46.
- Ember, Carol R. and Melvin Ember, 1992, "Resource Unpredictability, Mistrust, and War," *Journal of Conflict Resolution*, Vol. 36, No. 2, pp. 242-262.
- Engdahl, F. William, 2007, "Darfur? It's the Oil, Stupid...",  
<http://www.engdahl.oilgeopolitics.net> (20 August 2009).
- Engler, Mark, 2008, *How to rule the world: the coming battle over the global economy*, New York, Nation Books.
- "Erebus", February 1979, "A Limited Antarctic Warfare Capability for Australia - Part 1," *Pacific Defence Reporter*, pp. 35-48.
- Evans, L. T., 1998, *Feeding the Ten Billion: Plants and population growth*, Cambridge, Cambridge University Press.
- Fairclough, A. J. Winter, 1991, "Global Environmental and Natural Resource Problem-Their Economic, Political, and Security Implications," *Washington Quarterly*, pp. 81-98.
- Falkenmark, Malin, 1990, "Global Water Issues Confronting Humanity," *Journal of Peace Research*, Vol. 27, No. 2, pp. 177-190.
- Fara, Patricia, Peter Gathercole, and Ronald Laskey (eds.), 1996, *The Changing World*, Cambridge, Cambridge University Press.
- Fearson, James D., 1995, "Rationalist explanation for war," *International Organization*, Vol. 49, No. 3, pp. 379-414.
- Feldman, Gene Carl, 1994, "Arctic Ocean Geography," *Smithsonian Institute*,  
[http://seawifs.gsfc.nasa.gov/OCEANPLANET/HTML/oceanography\\_geography\\_Arctic.html](http://seawifs.gsfc.nasa.gov/OCEANPLANET/HTML/oceanography_geography_Arctic.html) (17 August 2010).
- Fendt, Lindsay, 2010, "Old wounds were reopened between Chile and Argentina this week: a long-time border dispute in the nations' southern Patagonia region," South Atlantic News Agency,  
<http://en.mercopress.com/2010/05/20/argentina-revives-long-time-border-dispute-wth-chile> (2 December 2010).
- Ferguson, Niall, 2004, "A World Without Power," *Foreign Policy*, pp. 32-39.

- January 21, 2006 “Tomorrow, when the war began,” Auckland, *New Zealand Herald*, p. B14.
- 2006, “The Next War of the World,” *Foreign Affairs*, Vol. 85, No. 5, pp. 61-74.
- 16 April 2010, “When Empires Crumble,” Sydney, *The Australian Financial Review*, p. 10.
- 2010, “Complexity and Collapse: Empires on the Edge of Chaos,” *Foreign Affairs*, Vol. 89, No. 2, pp. 18-32.
- Fesharaki, Fereidun, 1999, “Energy and the Asian Security Nexus,” *Journal of International Affairs*, Vol. 53, No. 1, pp. 85-99.
- Feshbach, Murray and Alfred Friendly, 1992, *Ecocide in the USSR: Health and Nature Under Siege*, New York, Basic Books.
- Fettweis, Christopher J., 2000, “Sir Halford MacKinder, Geopolitics, and Policymaking in the 21<sup>st</sup> Century,” *Parameters*, pp. 58-71, <http://www.carlisle.army.mil/usawc/parameters/00summer/fettweis.htm> (22 July 2009).
- 2003, “Revisiting MacKinder and Angell: The Obsolescence of Great Power Geopolitics,” *Comparative Strategy*, Vol. 22, pp. 109-129.
- Field, Catherine, June 25, 2008, “No one’s celebrating as EU turns 50,” Auckland, *New Zealand Herald*, p. B2.
- Fikret Berkes, Rob Huebert, Helen Fast, Micheline Manseau, and Alan Diduck (eds.), 2005, *Breaking Ice: Renewable Resource and Ocean Management in the Canadian North*, Calgary, University of Calgary Press.
- Fischer, G., K. Frohberg, M.L. Parry and C. Rosenzweig, 1994, “Climate change and world food supply, demand and trade,” *Global Environmental Change*, Vol. 4, No. 1, pp. 7-23.
- Flint, Colin, 2006, *Introduction to Geopolitics*, London, Routledge.
- Flournoy, Michéle, 2009. “Rebalancing the Force: Major Issues for QDR 2010,” *Centre for Strategic and International Studies*, Washington, D.C.
- Flournoy, Michéle and Shawn Brimley, 2009, “The Contested Commons,” *Quadrennial Defense Review 2010*, The United States Department of Defense, [http://www.defense.gov/home/feature/2009/0509\\_qdr/flournoy-article.html](http://www.defense.gov/home/feature/2009/0509_qdr/flournoy-article.html) (4 August 2010).

- Fogg, G. E., 1992, *A History of Antarctic Science*, Cambridge, Cambridge University Press.
- Folger, Tim, 2010, "Viking Weather," *National Geographic*, Vol. 217, No. 6, pp. 48-67.
- Förare, Jonas (ed.), 2008, *Water for food*, Stockholm, The Swedish Research Council.
- Foresight, 2011, *The Future for Food and Farming (2011)*, London, The Government Office for Science.
- Foroohar, Rana, June 9, 2008, "The Coming Energy Wars," *Newsweek*, pp. 14-18.
- Foroohar, Rana and Mac Margolis, 2010, "The Scary New Rich," *Newsweek*, Vol. CLV, No. 11, p. 20-23.
- Foster, Peter, 2006, "Pain for people lacking 'paani'," Auckland, *New Zealand Herald*.
- Foster, Phillip, 1992, *The World Food Problem*, Boulder, Lynne Rienner.
- Fox, Robert, 1985, *Antarctica and the South Atlantic*, London, British Broadcasting Corporation.
- Fraga, Arminio, November 2010-February 2011, "Brace Yourself: Currency War is the Next Crisis," *Newsweek*, pp. 40-41.
- Frankel, Joseph, 1970, *National Interest*, London, Pall Mall.
- Freedman, Lawrence, 1985, *Atlas of Global Strategy*, London, MacMillan.
- 1998, "International Security: Changing Targets," *Foreign Policy*, No. 110, pp. 48-63.
- Friedberg, Aaron L., 1993/94, "Ripe for Rivalry: Prospects for Peace in a Multipolar Asia," *International Security*, Vol. 18, No. 3, pp. 5-33.
- Friedman, George, 2010, *The Next 100 Years: A Forecast for the 21<sup>st</sup> Century*, Melbourne, Black Inc.
- Friedman, George and Meredith LeBard, 1991, *The Coming War with Japan*, New York, St. Martin's Press.
- Friedman, Thomas L., 2009, *Hot, Flat, and Crowded*, London, Penguin.
- Gamble, Jessa, 2009, "Arctic Landgrab," *Scientific America*, Vol. 19, No. 1, pp. 58-63.
- Garrett, Banning, 2010, "The Need for Strategic Reassurance in the 21st Century," *Arms Control Association*, Washington, D.C., <http://www.armscontrol.org/print/810> (13 December 2010).

- Gat, Azar, 2007, "The Return of Authoritarian Great Powers," *Foreign Affairs*, Vol.86, No. 4, pp. 59-69.
- Georgescu-Roegen, W., 1971, *The Entropy Law and the Economic Process*, Cambridge, Harvard University Press.
- Ghosh, Bobby, 2010, "Birth Pains," *Time*, Vol. 176, No. 15, pp. 28-31.
- Christian Aid, 2011, *Human tide: the migration crisis*, [http://www.christianaid.org.uk/Image/human\\_tide3\\_tcm15\\_23335.pdf](http://www.christianaid.org.uk/Image/human_tide3_tcm15_23335.pdf) (28 September 2011).
- Gilbert, Geoffrey, *World Population*, Santa Barbara, ABC-CLIO, 2001.
- Gillett, Jack, 2005, *Population*, London, Hodder Murray.
- Gillett, Nathan P., Daithi A. Stone, Peter A. Stott, Toru Nozawa, *et al.*, 2008, "Attribution of polar warming to human influence," *Nature Geoscience*, Vol. pp. 750-754.
- Gimpl, M. L. and S. R. Dakin, 1984, "Management and Magic," *Californian Management Review*, pp. 125-136.
- Giragosian, Richard, August 13, 2004, "Energy Security in East Asia," Washington, D.C., *Institute for the Analysis of Global Security*, pp.1-12, <http://www.iags.org/n0813042.htm> (7 May 2007).
- Glasby, G.P., (ed.), 1990, *Antarctic Sector of the Pacific*, Amsterdam, Elsevier.
- Glassner, Martin Ira, 1985, "The view from the near north—South Americans view Antarctica and the Southern Ocean geopolitically," *Political Geography Quarterly*, Vol. 4, No. 4, pp. 329-342.
- Glassner, Martin Ira and Chuck Fabrer, 2004, *Political Geography*, Hoboken, N.J., Wiley.
- Gleick, Peter H., 1989, "The Implications of Global Climate Change for International Security," *Climate Change*, Vol. 15, pp. 309-325.
- 1991, "Environment and Security: The Clear connection," *Bulletin of the Atomic Scientists*, Vol. 47, No. 3, pp. 17-21.
- 2004, *The World's Water 2004-2005*, Washington, D.C., Island Press.
- Global Witness, 2002, "The Logs of War: The Timber Trade and Armed Conflict," *Fafo*, <http://www.globalwitness.org> (20 June 2006).
- Goldman, Marshall I., 2008, *Petrostate: Putin, Power and the New Russia*, New York, Oxford University Press.



- Goldsmith, Edward, 2005, "Feeding the World under climate change," *Pacific Ecologist*, No. 10, pp. 15-23.
- Goldstone, Jack A., 2002, "Population and Security: How Demographic Change can Lead to Violent Conflict," *Journal of International Affairs*, Vol. 56, No. 1, pp. 3-22.
- 2010, "The New Population Bomb," *Foreign Affairs*, Vol. 89, No. 1, pp. 31-43.
- Goni, Uki, 2010, "Falklands Oil Reopens Old Wounds," *Time*, <http://www.time.com/time/printout/0,8816,197135,00.html> (17 December 2010).
- Gordon, R. B., M. Bertrum and T. E. Graedel, 2006, "Metal stocks and sustainability," *Proceedings of the National Academy of Sciences of the United States of America*, Vol. 103, No. 5, pp. 1209-1214.
- Gore, Al, 2006, *an inconvenient truth*, Bloomsbury, London.
- Græger, Nina, 1996, "Environmental Security?" *Journal of Peace Research*, Vol. 33, No. 1, pp. 109-116.
- Graff, James, 2007, "Fight for the Top of the World," *Time*, No. 38, pp. 20-27.
- Gray, Colin S., 1971, "The Arms Race Phenomenon," *World Politics*, Vol. 24, No. 1, pp. 39-79.
- 1974, "The Urge To Compete: Rationales for Arms Racing," *World Politic*, Vol. 26, No. 2, pp. 207-233.
- 1996, "The continued primacy of geography," *Orbis*, Vol. 40, No. 2, pp. 1-13.
- 2005, *Another Bloody Century: Future Warfare*, London, Weidenfield & Nicolson.
- Grigg, William Norman, 2006, "Beijing Cornering Strategic Minerals," *New American*, [http://www.thenewamerican.com/artman/publish/printer\\_3318.shtml](http://www.thenewamerican.com/artman/publish/printer_3318.shtml) (11 May 2006).
- Gurr, Ted Robert, 1985, "On the Political Consequences of Scarcity and Economic Decline," *International Studies Quarterly*, Vol. 29, pp. 51-73.
- Guterres, Antonio, 2008, "Climate change, natural disasters and human displacement: a UNHCR perspective," *United Nations High Commissioner for Refugees*, <http://www.uhcr.org/climate> (13 April 2010).



- Guzzini, Stefano, 2005, "The Concept of Power: a Constructivist Analysis," *Millennium*, Vol. 33, No. 3, pp. 495-521.
- Haass, Richard N., 2008, "The Age of Nonpolarity: What Will Follow U.S. Dominance," *Foreign Affairs*, Vol. 87, No. 3, pp. 44-56.
- Hackett, General Sir John, 1980, *The Third World War: August 1985*, Berkeley, New York.
- Hadley Centre (British Meteorological Organisation), "Climate Change Predictions from the Hadley Centre," [http://www.met-office.gov.uk/research/hadley\\_centre/models/modeldata.html](http://www.met-office.gov.uk/research/hadley_centre/models/modeldata.html) (10 May 2005).
- Hall, Sam, 1987, *The Fourth World: The Heritage of the Arctic and its Destruction*, London, Bodley Head.
- Hamilton, Clive, 2010, *Requiem for a Species: Why we resist the truth about Climate Change*, Crows Nest, New South Wales, Allen&Unwin.
- Hamilton-Hart, Natasha, 2006, "Singapore's Climate Change Policy: The Limits of Learning," *Contemporary Southeast Asia*, Vol. 28, No. 3, pp. 363-384.
- Hansom, James D. and John E. Gordon, 1998, *Antarctic Environments and Resources*, Harlow, Longman.
- Hanson, Stephanie, 2007, "U.S. Africa Command (AFRICOM)," *Council on Foreign Relations*, <http://www.cfr.org/publications/13255/> (24 February 2010).
- Hanzhang, Tao, 1993, *Sun Tzu: The Art of War*, Ware, Hertfordshire, Wordsworth.
- Harding, Thomas, 2010, "A cruise missile in a shipping box on sale to rogue bidders," *Telegraph.co.uk*, <http://www.telegraph.co.uk/news/worldnews/europe/russia/7632543/A-cruise-missile-in-...> (27 April 2010).
- Hare, F. Kenneth, 1984, "Recent climate experience in the arid and semi-arid lands," *Desertification Control Bulletin*, Vol. 10, pp. 15-22.
- Hargreaves, D. and S. Fromson, 1983, *World Index of Strategic Minerals*, Aldershot, Gower.
- Harries; Owen, 1993, "The Collapse of "The West," *Foreign Affairs*, Vol. 72, No. 4, pp. 41-53.

- Harrington, Caitlin, 2008, "Eyeing up the new Arctic," *Janes Defence Weekly*, Vol. 45, No. 3, pp. 22-27.
- Harris, Stuart (ed.), 1984, *Australia's Antarctic Policy Options*, Canberra, Australian National University.
- Harris, Tobias, 2008, "Japan Accepts its 'Middle-Power Fate,'" *Far Eastern Economic Review*, Vol. 171, No. 6, pp. 45-49.
- Harrington, Caitlin, 2008, "Eyeing up the new Arctic," *Janes Defence Weekly*, Vol. 45, No. 3, pp. 22-27.
- Hassol, Susan Joy, 2004, *Impact of a Warming Arctic: Arctic Climate Impact Assessment*, Cambridge, Cambridge University Press.
- Hastings, Max and Simon Jenkins, 1983, *The Battle for the Falklands*, London, Michael Joseph.
- Hart, B. H. Liddell, 1992, *History of the Second World War*, London, Pan Macmillan.
- Hawkes, Steve, 2010, "£3 billion Falkland oil boost," *The Sun*, <http://www.thesun.co.uk/sol/homepage/news/money/city/3145751/3billion-Falkland-Island-oil-boost.html> (21 September 2010).
- 2010, "Falkland oil is like North Sea," *The Sun*, <http://www.thesun.co.uk/sol/homepage/news/3001329/> (15 December 2010).
- Haxel, Gordon B., James B. Hedrick and Greta J. Orris, 2002, "Rare Earth Elements—Critical Resources for High Technology," *United States Geological Survey*, [http://minerals.usgs.gov/minerals/commodity/rare\\_earth/](http://minerals.usgs.gov/minerals/commodity/rare_earth/) (26 May 2006).
- Hayes, Jonathan Leif, 2008, "Kosovo's independence could cost NATO dear," *Jane Defence Weekly*, Vol. 45, No. 10, p. 23.
- Heinberg, Richard, 2007, *Peak Everything: Waking Up to the Century Of Declines*, Gabriola Island, BC, Canada, New Society Publishers.
- Hellman, Christopher and Travis Sharp, 2008, "The FY2009 Pentagon Spending Request – Global Military Spending," *Centre for Arms Control and Non-Proliferation*, <http://www.armscontrolcentre.org/policy/securityspending/article/fy09> (12 February 2009).

- Hembry, Owen, 2010, "Russian wheat crisis may help NZ farmers," Auckland, *New Zealand Herald*, p. B16.
- Hennock, Mary, Adam B. Kushner and Jason Overdorf, 2008, "The Real Space Race is in Asia," *Newsweek*, Vol. CLII, No. 13, pp. 52-55.
- Hensel, Paul R. and Paul F. Diehl, 1994, "Testing empirical propositions about shatterbelts, 1945-76," *Political Geography*, Vol. 13, No. 1, pp. 33-51.
- Hentz, James J. and Morten Bøås, (eds.), 2003, *New and Critical Security and Regionalism. Beyond the Nation State*, Aldershot, Ashgate Publishing.
- Herr, R A and B W Davis (eds.), 1994, *Asia in Antarctica*, Canberra, Australian National University.
- Higuera, José, 2008, "Chile shows interest in Typhoon buy," *Janes Defence Weekly*, Vol. 45, No. 31, p. 8.
- Hilbrooke, Richard, 2008, "The Next President: Mastering a Daunting Agenda," *Foreign Affairs*, Vol. 87, No. 5, pp. 2-24.
- Hill, Christopher, 2003, *The Changing Politics of Foreign Policy*, Basingstoke, Palgrave MacMillan.
- Hill, John, 1983, *New Zealand and Antarctica*, Wellington, Government Printer.
- Hirsch, Robert L., 2008, "Mitigation of maximum world oil production: Shortage scenarios," *Energy Policy*, Vol. 36, No. 2, pp. 881-889.
- Holdsworth, Nick, August 20, 2007, "Russian rearmament raises spectre of return to Cold War," Auckland, *New Zealand Herald*, p. B3.
- Holsti, Ole R., "Theories of International Relations," [www.duke.edu/~pfeaver/holsti.pdf](http://www.duke.edu/~pfeaver/holsti.pdf) (2 October 2009).
- Holte, Nils Johan, 2009, *The Arctic region is at a time of Geopolitical transition. Will this transpire through aggressive competition or as peaceful change?* London, Royal College of Defence Studies.
- Homer-Dixon, Thomas, 1994, "Environmental and Demographic Threats to Canadian Security," *Canadian Foreign Policy*, Vol. 2, No. 2, pp. 7-40.
- 1996, "Strategies for Studying Causation in Complex Ecological-Political Systems," *Journal of Environment & Development*, Vol. 5, No. 2, pp. 132-148.
- 1999, *Environment, Scarcity, and Violence*, Princeton, Princeton University Press.

- 2006, *The Upside of Down: Catastrophe, Creativity, and the Renewal of Civilization*, Washington, Island Press.
- Homer-Dixon, Thomas and Jessica Blitt, 1998, *Ecoviolence: Links among Environment, Population, and Security*, Lanham, Rowman & Littlefield.
- Hosenball, Mark and Michael Hirsh, 2009, “There’s a World of Trouble Out There,” *Newsweek*, Vol. CLIII, No. 10, pp. 38-39.
- Hough, Peter, 2004, *Understanding Global Security*, London, Routledge.
- Howard, Roger, 2009, *The Arctic Gold Rush: The New Race for Tomorrow’s Natural Resources*, London, Continuum.
- 2010, “Russia’s New Front Line,” *Survival*, Vol. 52, No. 2, pp. 141-156.
- Huebert, Rob, Spring 1999, “Canadian Arctic Security Issues,” *National Journal*, pp. 203-229.
- 1999, “Canadian Arctic Security Issues: Transformation in the post-Cold War era,” *International Journal*, No. 54, pp. 203-229.
- 2008, “Canadian Arctic Security: Preparing for a Changing Future,” *Behind the Headlines*, Vol. 65, No. 4, pp.14-21.
- 2009, “Canadian Arctic Sovereignty and Security in a Transforming Circumpolar World,” *Foreign Policy for Canada’s Tomorrow* No 4, *Canadian International Council*, pp. 1-51, <http://www.canadianinternationalcouncil.org> (19 October 2009).
- 2010, *The Newly Emerging Arctic Security Environment*, Calgary, The Canadian Defence & Foreign Affairs Institute.
- Hunt, Lord Julian, 2010, “China needs to wean itself off Old King Coal,” Auckland, *New Zealand Herald*, p. A13.
- Huntington, Samuel P., 1962, *Changing Patterns of Military Politics*, New York, Free Press of Glencoe.
- 1993, “Why International Primacy Matters,” *International Security*, Vol. 17, No. 4, pp. 68-83.
- 1997, *The Clash of Civilizations*, New York, Touchstone.
- 1999, “The Lonely Superpower,” *Foreign Affairs*, Vol. 78, No. 2, pp. 35-49.
- Hurrell, Andrew, 1983, “The politics of South Atlantic security: a survey of proposals for a South Atlantic Security Organisation,” *International Affairs*, Vol. 59, No. 2, pp. 179-193.

- Hurst, Cindy, 2006, "China's Oil Rush in Africa," Washington, D.C., *Institute for the Analysis of Global Security*, pp. 1-22, <http://www.iags.org> (7 May 2007).
- 2007, "China's Global Quest for Energy," Washington, D.C., *Institute for the Analysis of Global Security*, pp. 1-23, <http://www.iags.org> (7 May 2007).
- Hutchison, Cathel, 2010, "Conflict Between Chile & Argentina," ehow, [http://www.ehow.com/print/about\\_6751533\\_conflict\\_between\\_chile\\_argentina.html](http://www.ehow.com/print/about_6751533_conflict_between_chile_argentina.html) (1 December 2010).
- Hveem, Helge, 1979, "Militarization of Nature: Conflict and Control over Strategic Resources and some Implications for Peace Policies," *Journal of Peace Research*, Vol. XVI, No. 1, pp. 1-26.
- Ienaga, Saburō, 1978, *The Pacific War 1931-1945*, New York, Pantheon Press.
- Ignotas, Miles, 1975, "Seizing Arab Oil," *Harpers*, Vol. 2500, No. 1498, pp. 45-62.
- Independent Commission on International Development Issues, 1980, *North-South: A Programme for Survival*, London, Pan Books.
- International Arctic Research Centre, 2004, "Impacts of a Warming Arctic," Cambridge University Press, <http://www.cambridge.org> (10 August 2010).
- International Institute of Strategic Studies, 2008, *Strategic Survey 2008*, Vol. 08, No. 1, pp. 33-71.
- International Panel on Climate Change, 1990, *The Potential Impacts of Climate Change: Impacts on Agriculture and Forestry*, Geneva, World Meteorological Organisation.
- 1997, *The Regional Impact of Climate Change: An Assessment of Vulnerability*, [http://www.gcrio.org/ipcc\\_doc.html](http://www.gcrio.org/ipcc_doc.html) (30 May 2005).
- 2007, *Contributions of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change: Summary for Policymakers*, IPCC Summary Report (2007), p.9.
- 2007, *Fourth Assessment Report: Working Group I: The Physical Science Basis, Mean Temperature*, [http://www.ipcc.ch/publications\\_and\\_data/ar4/wg1/en/ch10s10-1-mean-temperature.html](http://www.ipcc.ch/publications_and_data/ar4/wg1/en/ch10s10-1-mean-temperature.html) (16 March 2010).

- International tropical Timber Organisation, 2005, "World Timber Situation 2004," <http://www.ittis.org/index.htm> (7 June 2006).
- Isaac, Joanne and Steve Turton, 2009, "Expansion of the tropics: Evidence and implications," *James Cook University*, pp.1-16.
- Jaffe, Amy Myers and Steven W. Lewis, 2002, "Beijing's Oil Diplomacy," *Survival*, Vol. 44, No. 1, pp. 115-134.
- Jakobson, Linda, 2010, "Preparing for an ice-free Arctic (1), (2) & (3)," *Chinadialogue*, <http://www.chinadialogue.net/article/show/single/en/3584-Preparing-for-an-ice-free-Arctic> (28 April 2010).
- Jay, Paul, 2008, "Canadian researchers call for end to 'politicization' of science," *CBC News*, <http://www.cbc.ca/technology/story/2008/10/09/scientists-letter.html> (27 April 2009).
- Jenkins, Mark, 2010, "True Colors: The Changing Face of Greenland," *National Geographic*, Vol. 217, No. 6, pp. 34-47.
- Jensen, Mead L. and Alan M. Bateman, 1979, *Economic Mineral Deposits*, New York, John Wiley & Sons.
- Jervis, Robert, 1978, "Cooperation under the Security Dilemma," *World Politics*, Vol. XXX, No. 2, pp. 167-214.
- 1982, "Security regimes," *International Organization*, Vol. 36, No. 2, pp. 357-378.
- Jessup, Peter, August 17, 2004, "Fish expert sounds warning," Auckland, *New Zealand Herald*, p. A10.
- Johnson, J. V., 1993, "An Examination of the Military Implications of Australia's Continued Claims to a Large Part of Antarctica," *Australian Defence Force Journal*, No. 99, pp. 13-24.
- Johnston, Nicole, 2001, "North American company patents ice berg towing," <http://www.abc.net.au/worldtoday/s423378.htm> (1 June 2004).
- Jones, Clive and Caroline Kennedy-Pipe (eds.), 2000, *International Security in a Global Age*, London, Frank Cass Publishers.
- Joffe, Josef, 2007/ 2008, "Why the World Still Needs Mr. Big," *Newsweek Special Issues*, pp.26-27.
- Joshi, Aniruddha Dhairyadhar, 2006, *The Third World War*, Mumbai, Lotus Publications.

- Joyner, Christopher C., 1990, "Antarctica and the Indian Ocean States: The Interplay of Law, Interests, and Geopolitics," *Ocean Development and International Law*, Vol. 21, pp. 41-70.
- 1998, "United States Legislation and the Polar Oceans," *Ocean Development & International Law*, Vol. 29, pp. 265-290.
- 1998, *Governing the Frozen Commons*, Columbia, University of South Carolina Press.
- Kahl, Colin H., 1998, "Population Growth, Environmental Degradation, and State-Sponsored Violence," *International Security*, Vol. 23, No. 2, pp. 80-119.
- Kahn, Herman, William Brown and Leon Martel, 1976, *The Next 200 Years: A Scenario for America and the World*, New York, William Morrow.
- Kahn, Jeremy, 2008, "The New India," *Newsweek*, Vol. CLII, No. 13, p. 40.
- Kamenetsky, Ihor, 1961, *Secret Nazi Plans for Eastern Europe*, College and University Press, New Haven, Connecticut.
- Kaplan, Robert D., 1994, "The Coming Anarchy," *Atlantic Monthly*, Volume 273, No. 2, pp. 44-76.
- 2000, *The Coming Anarchy: Shattering the Dreams of the Post-Cold War*, New York, Random House.
- June 2005, "How We Would Fight China," *Atlantic Monthly*, pp. 49-62.
- 2009, "Centre Stage for the Twenty-first Century: Power Plays in the Indian Ocean," *Foreign Affairs*, Vol. 88, No. 2, pp. 16-32.
- 2009, "The Revenge of Geography," *Foreign Policy*, pp. 96-105.
- 2010, "The Geography of Chinese Power: how far can Beijing reach on land and at sea," *Foreign Affairs*, Vol. 89, No. 3, pp. 22-41.
- 2010, *Monsoon: The Indian Ocean and the Battle for Supremacy in the 21st Century*, Collingwood, Australia, Schwartz Media.
- Kapur, Ashok, 2003, *Regional Security Structures in Asia*, London, Routledge Curzon.
- Karl, Thomas R., Jerry M. Melillo and Thomas C. Peterson (eds.), 2009, *Global climate Change Impacts in the United States*, New York, Cambridge University Press.

- Kasperson, Jeanne X., Roger E. Kasperson and B. L. Turner II (eds.), 1995, *Regions at Risk: Comparison of Threatened Environments*, Tokyo, United Nations University.
- Kates, Robert and Thomas Parris, 2003, "Long-term Trends and a Sustainability Transition," *Proceedings of the National Academy of Sciences*, Vol. 100, No. 14, pp. 8062-8067.
- Kaysen, Carl, 1990, "Is War Obsolete? A Review Essay," *International Security*, Vol. 14, No. 4, pp.42-64.
- Keen, David, 1998, "The Economic Functions of Violence in Civil Wars," *Adelphi Paper*, 320, International Institute for Strategic Studies, London.
- Kelly, Philip L., 1986, "Escalation of regional conflict: testing the shatterbelt concept," *Political Geography Quarterly*, Vol. 5, No. 2, pp. 161-180.
- 1997, *Checkerboards & Shatterbelts: The Geopolitics of South America*, Austin, University of Texas Press.
- Kennedy, Paul, 1987, *The Rise and Fall of the Great Powers*, New York, Random House.
- Kerr, Richard A., 1998, "Warming's Unpleasant Surprise: Shivering in the Greenhouse?" *Science*, Vol. 281, No. 5374, pp. 156-158.
- 1999, "The Little Ice Age – Only the Latest Big Chill," *Science*, Vol. 284, No. 5423, p. 2069.
- 2002, "A Warmer Arctic Means Change for All," *Science*, Vol. 297, pp. 1490-1492.
- Keyuan, Zou, 1993, "China's Antarctic policy and the Antarctic Treaty System," *Ocean Development & International Law*, Vol. 24, pp. 237-255.
- Khalidi, Walid, 1991, "The Gulf Crisis: Origins and Consequences," *Journal of Palestine Studies*, Vol. XX, No. 2, pp. 5-28.
- Khan, Stephen and Kathy Marks, June 12-13, 2004, "Big money stripping seas bare," Auckland, *New Zealand Herald*, p. B18.
- Khanna, Parag, 2008, *The Second World: Empires and Influence in the New Global Order*, New York, Random House.
- Khantsevich, Olesya, 2011, "Scandinavians threaten to create a mini-NATO," *RT*, <http://rt.com/politics/press/nezavisimaya/scandinavians-geopolitics-russia-arctic/en/> (5 October 2011).



- Kinney, Douglas, 1989, *National Interest/National Honor: The Diplomacy of the Falklands Crisis*, New York, Praeger.
- Kister, Chad, 2005, *Arctic Melting*, Monroe, Common Courage Press.
- Klare, Michael T., 2000, "Resource Competition and World Politics in the Twenty-First Century," *Current History*, Vol. 99, No. 641, pp. 403-407.
- 2001, *Resource Wars: The New Landscape of Global Conflict*, New York, Metropolitan Books.
- 2001, "The New Geography of Conflict," *Foreign Affairs*, Vol. 80, No. 3, pp. 49-61.
- 2004, "Oil Wars Transforming the American Military into a Global Oil-Protection Service," *Tomgram*, <http://www.tomdispatch.com/blog/1888/> (1 February 2010).
- 2004, *Blood and Oil*, London, Penguin.
- 2006, "The Coming Resource Wars," *ZNet*, [http://www.zmag.org/content/print\\_article.cfm?itemID-9900&sectionID-56](http://www.zmag.org/content/print_article.cfm?itemID-9900&sectionID-56) (31 May 2006).
- 2008, *Rising Powers, Shrinking Planet: The New Geopolitics of Energy*, New York, Holt.
- Klare, Michael T. and Yogesh Chandrani (eds.), 1998, *World Security Challenges for a New Century*, New York, St. Martin's Press.
- Kluger, Jeffrey, 2008, "Back to the Moon," *Time*, No. 46, pp. 42-45.
- Knecht, G. Bruce, 2006, *Hooked*, Crows Nest, Australia, Allen&Unwin.
- Kobasyashi, Kenji, 2004, "Forecasting Supply and Demand up to 2030," *International Energy Agency*, pp. 1-34, <http://www.iea.org/> (17 February 2010).
- Kolbert, Elizabeth, 2009, "Outlook: Extreme," *National Geographic*, Vol. 215, No. 4, pp. 60-65.
- Kotkin, Stephen, 2009, "The Unbalanced Triangle," *Foreign Affairs*, Vol. 88, No. 5, pp. 130-138.
- Krajick, Kevin, 2007, "Race to Plumb the Frigid Depths," *Science*, Vol. 315, pp. 1525-1528.
- Kramer, Margueritte and Bruce Russett, 1984, "Images of World Futures," *Journal of Peace Research*, Vol. 21, No. 4, pp. 317-336.

- Kumar, Nikhil, November 12, 2010, "Demand will drive cost to US\$200 by 2035, says agency," Auckland, *The Business Herald*, p. 7.
- Kupchan, Charles A. and Clifford A. Kupchan, 1991, "Concerts, Collective Security, and the Future of Europe," *International Security*, Vol. 16, No. 1, pp.114-161.
- Kurlantzick, Joshua, March 1, 2010, "The Downfall of Human Rights," *Newsweek*, pp. 30-35
- Kvitashvili, Elisabeth, 2005, *Forests and Conflict*, Washington, D.C., USAID.
- Lackenbauer, P. Whitney, "An Integrated Approach to Canada's Arctic," *Behind the Headlines*, Vol. 65, No. 4, pp. 21-26.
- Lachenbruch, Arthur H. and B. Vaughan Marshall, 1986, "Changing Climate: Geothermal Evidence from Permafrost in the Alaskan Arctic," *Science*, Vol. 234, No. 4777, pp. 689-696.
- Lacy, Mark J., 2005, *Security and Climate Change: International Relations and the Limits of Realism*, Abingdon, Routledge.
- Lake, David A. and Patrick M. Morgan (eds.), 1997, *Regional Orders: Building Security in a New World*, Pennsylvania, Pennsylvania University Press.
- Lall, Marie, 2007, "India's Energy Juggling Act," *Far Eastern Economic Review*, Vol. 170, No. 5, pp. 46-49.
- Lampton, David M., 2007, "The faces of Chinese Power," *Foreign Affairs*, Vol. 86, No. 1, pp. 115- 127.
- Laszlo, Ervin, 1994, *Vision 2020: Reordering Chaos for Global Survival*, Yverdon, Gordon and Breach.
- 2006, *The Chaos Point: The World at the Crossroads*, London, Piatkus Books.
- Laudy, Mark, "The Vatican Mediation of the Beagle Channel Dispute: Crisis Intervention and Forum Building," p. 295,  
<http://www.wilsoncentre.org/subsits/ccpdc/pubs/words/11.pfd> (2 December 2010).
- Lawler, Alex, 2010, "ANALYSIS-Falkland oil hopes survive Desire's setback," *Reuters*,  
<http://af.reuters.com/article/energyOilNews/idAFLDE6B917Y20101210?sp=true> (17 December 2010).

- Layne, Christopher, 1993 "The Unipolar Illusion: Why New Great Powers Will Rise," *International Security*, Vol. 17, no. 4, pp. 5-51.
- Leahy, Stephen, 2010, "Climate Change: Arctic shelf leaking potent greenhouse gas," *Inter Press Service News Agency*, pp. 2.  
<http://www.ipsnews.net/print.asp?idnews=50565> (22 March 2010).
- Le Billon, Philippe (ed.), 2005, *The Geopolitics of Resource Wars*, Abingdon, Routledge.
- Lee, Henry and Dan A. Shalmon, 2007, "Searching for Oil; China's Initiatives in the Middle East," *Environment*, Vol. 49, No. 5, pp. 8-21.
- Lee, John, 2009, "China's Africa Gambit," *Time*, Vol. 174, No. 19, p. 48.
- Lee, Oliver M., 2008, "The Geopolitics of America's Strategic Culture," *Comparative Strategy*, Vol. 27, pp. 267-286.
- Lesser, Ian O., 1989, *Resources and Strategy*, New York, St. Martin's Press.
- Leisinger, Klaus, Karin Schmitt and Rajul Pandya-Lorch, 2002, *Six Billion and Counting: Population Growth and Food Security in the 21st Century*, Washington, International Food Policy Research Institute.
- Lemke, Douglas, 2002, *Regions of War and Peace*, Cambridge, Cambridge University Press.
- Le Quéré, Corinne, R. Raupach, Josep S. Canadell, Gregg Marland, *et al.*, 2009, "Trends in the sources and sinks of carbon dioxide," *Nature Geoscience*, pp. 1-6.
- Levy, Jack S., 1987, "Declining Power and the Preventative Motivation for War," *World Politics*, Vol. XL, No. 1, pp. 82-107.
- Levy, Marc A., 1995, "Is the Environment a National Security Issue," *International Security*, Vol. 20, No. 2, pp. 35-62.
- Li, Li, February 1, 2007, "Mercury Rising," *Beijing Review*, pp. 18-21.
- Liebman, Alex, 2005, "Trickle-down Hegemony: China's "Peaceful Rise" and Dam Building on the Mekong," *Contemporary Southeast Asia*, Vol. 27, No. 2, pp. 281-304.
- Light, Margot, 2006, "Gassy Issues," *World Today*, Vol. 62, No. 11, pp. 20-22.
- Lindsey, George, 1989, *Strategic Stability in the Arctic*, Adelphi Papers 241, London, International Institute for Strategic Studies.
- Lindsey, G R, 1977, "Strategic Aspects of the Polar Regions," *Behind the Headlines*, Vol. XXXV, No. 6, pp. 1-24.

- Lipschutz, Ronnie D., 1995, *On Security*, New York, Columbia University Press.
- Little, Walter, 1987, "International conflict in Latin America," *International Affairs*, Vol. 63, No. 4, pp. 589-601.
- Loescher, Gil and James Milner, 2005, *Protracted Refugee Situation: Domestic and International Security Implications*, Adelphi Paper 375, Oxon, Routledge.
- Lonergan, Steve, 1999, "Environmental Degradation and Population Displacement," *Aviso*, No. 2, Global Environmental Change and Human Security (GECHS), <http://www.gechs.org/asviso/02/index.html> (25 November 2009).
- Long, Joey, 2001, "Desecuritizing the Water Issue in Singapore-Malaysia Relations," *Contemporary Southeast Asia*, Vol. 23, No. 3, pp. 504-532.
- Lovelock, James, 2006, *The Revenge of Gaia: Earth's Climate in Crisis and the Fate of Humanity*, New York, Basic Books.
- 2009, *The Vanishing Face of Gaia: A Final Warning*, Camberwell, Australia, Penguin.
- Lovett, Richard A., 2007, "Russia's Arctic Claim Backed by Rocks, Officials say," *National Geographic News*, September 21, <http://news.nationalgeographic.com/news/pf/47871933.html> (31 August 2010).
- Lucas, Edward, 2008, *The New Cold War*, New York, Palgrave MacMillan.
- Lukin, Alexander, 2003, *The Bear Watches the Dragon*, New York, M. E. Sharp.
- Lundquist, Thomas R., 1977, "The Iceberg Cometh? International law relating to Antarctic Iceberg Exploitation," *National Resources Journal*, No.17, pp. 1-41.
- Luttwak, Edward N., 1990, "From Geopolitics to Geo-Economics: Logic of Conflict, Grammar of Commerce," *National Interest*, No. 20, pp. 17-23.
- 1994, "Where are the Great Powers? At Home with the Kids," *Foreign Affairs*, Vol. 73, No. 4, pp. 23-28.
- Lynas, Mark, 2004, *High Tide: How Climate Crisis is engulfing our Planet*, London, Harper Perrenial.
- 2008, *Six Degrees: Our Future On A Hotter Planet*, Washington, D.C., National Geographic.

- Macalister, Terry, 2009, "Oil: Future World Shortages are being Drastically Underplayed," *The Guardian*, <http://www.globalpolicy.org/> (8 February 2010).
- 2010, "Climate change could lead to Arctic conflict, warns senior Nato commander," *Guardian*, <http://www.guardian.co.uk/environment/2010/oct/11/nato-conflict-arctic-resources/print> (13 October 2010).
- McCarthy, James J. and Malcolm C. McKenna, 2000, "How Earth's Ice is Changing," *Environment*, Vol. 42, No. 10, pp. 8-18.
- McCarthy, Michael, November 19, 2009, "Catastrophic rise in temperature tipped by study," Auckland, *New Zealand Herald*, p. A11.
- MacFarquhar, Neil, 2009, "Refugees Join List of Climate Change Issues," *New York Times*, <http://www.globalpolicy.org/social-and-economic-policy/the-environment/climate-change/> (9 June 2009).
- MacKenzie, Alistair, 2007, "Deep-Ice Drilling," *e.nz magazine*, Vol. 8/6, pp. 4-10.
- MacKinder, Sir Halford J., 1943, "The Rounding World and the Winning of the Peace," *Foreign Affairs*, Vol. 21, No. 4, pp. 595-605.
- MacKinnon, Ian, December 30, 2010, "Mineral deal shows level of panic," Auckland, *New Zealand Herald*, p. A15.
- McGwire, Michael, 1991, *Perestroika and Soviet National Security*, Washington, D.C., Brooking Institution.
- McKie, Robin, June 16, 2006, "Our last chance to save Earth is melting away," Auckland, *New Zealand Herald*, pp. A12-13.
- McNeil, J. R., 2000, *Something New Under the Sun: Environmental History of the Twentieth Century World*, New York, W. W. Norton.
- 2005, "Diamond in the Rough: Is There a Genuine Environmental Threat to Security?" *International Security*, Vol. 30, No. 1, pp. 178-195.
- McSweeney, Bill, 1999, *Security, Identity and Interests*, Cambridge, Cambridge University Press.
- Ma Jun, 2004, *China's Water Crisis*, Norwalk, Eastbridge.
- Mabey, Nick, 2008, *Delivering Climate Security: International Security Response to a Climate Changed world*, The Royal United Services Institute, Whitehall Paper 69, Abingdon, Routledge.

- Mahbubani, Kishore, 1993, "The Dangers of Decadence," *Foreign Affairs*, Vol. 72, No. 4, pp.10-14.
- 2008, "The Case Against the West: America and Europe in the Asian Century," *Foreign Affairs*, Vol. 87, No. 3, pp. 111-124.
- 2008, *The New Asian Hemisphere: The Irresistible Shift of Global Power to the East*, New York, Pacific Affairs.
- Malthus, Thomas Robert, 1798, *An Essay on the Principle of Population*, Harmondsworth, Penguin.
- Manzi, Jim, 2007, "Game Plan: what conservatives should do about global warming," *National Review*, Vol. LIX, No. 11, pp. 31-34.
- Marinov, Irina and Warren Judd, 2006, "Ocean carbon," *New Zealand Geographic*, No. 81, pp. 24-28.
- Martin, James, 2007, *The Meaning of the 21<sup>st</sup> Century: A Vital Blueprint for Ensuring Our Future*, London, Eden Project Books.
- Martin, Tony, 2005, "Report on Foreign Fishing Vessel Security Issues in the Pacific Island Region," *Secretariat of the Pacific Community*, Suva, pp. 1-69.
- Mason, Colin, 2003, *The 2030 Spike: Countdown to global Catastrophe*, London, Earthscan.
- Mason, Rowena, September 2, 2010, "Tanker's voyage opens way for shipping shortcut," Auckland, *New Zealand Herald*, p. A18.
- Massie, Robert K., 2007, *Castles of Steel: Britain, Germany and the Winning of the Great War at Sea*, London, Vintage Books.
- Mathews, Jessica Tuchman, 1989, "Redefining Security," *Foreign Affairs*, Vol. 68, No. 2, pp. 162-177.
- Matthews, Owen, January 20, 2007, "Pipeline politics may backfire," Auckland, *Weekend Herald*, p. B12.
- Matthews, Owen and Sami Kohen, 2008, "Heading Both Ways," *Newsweek*, Vol. CLII, No. 13, p.38.
- "Mauritius Foreign Relations," <http://countrystudies.us/mauritius/25.htm> (3 September 2009).
- Mayall, James (ed.), 1982, *The Community of States: A Study in International Political Theory*, London, Allen & Unwin.

- Mbaro, Alfordlo, "Let's take another look at Antarctica,"  
<http://www.articlegarden.com/article.php?id=291899&act=print>  
 (9 June 2010).
- Meadows, Dennis L., William W. Behren III, Donella H. Meadows, Roger F. Naill, Jørgen Randers and Erich K. O. Zahn (eds.), 1974, *Dynamic Growth in a Finite World*, Cambridge, Massachusetts, Wright-Allan Press.
- Meadows, Donella H., Dennis L. Meadows, Jørgen Randers and William W. Behrens III, 1974, *Limits to Growth*, New York, University Books.
- Meadows, Donella H., Jorgen Randers and Dennis Meadows, 2004, *Limits to Growth: The 30 Year Update*, White River Junction, Vermont, Chelsea Green Publishing.
- Mearsheimer, John J., 1990, "Back to the Future: Instability in Europe After the Cold War," *International Security*, Vol. 15, No. 1, pp. 5-56.
- 1995, "The False Promise of International Institutions," *International Security*, Vol. 19, No. 3, pp. 5-49.
- 2001, *The Tragedy of Great Power Politics*, New York, Norton.
- Meyer, Karl and Shareen Brysac, 2001, *Tournament of Shadows: The Great Game and the Race for Empire in Asia*, London, Abacus Book.
- Miall, Hugh, 2007, *Emerging Conflict and Peaceful Change*, New York, Macmillan.
- Michel, Serge, May/June 2008, "When China Met Africa," *Foreign Policy*, pp. 39-46.
- Miguel, Edward, Shanker Satyanath and Ernest Sergenti, 2004, "Economic Shocks and Civil Conflict: an Instrumental Variables Approach," *Journal of Political Economy*, Vol. 112, No. 4, pp. 725-753.
- Millegan, Kris, 2001, "Operation Highjump," <http://south-ole.com/p0000150.htm>  
 (29 November 2010).
- Millennium Assessment Board, 2005, *Millennium Ecosystem Assessment Synthesis Report*, New York, United Nations,  
<http://www.millenniumassessment.org> (6 April 2005)
- Miller, Dale T., 1999, "The Norm of Self-Interest," *American Psychologist*, Vol. 54, No. 12,  
<http://faculty-gsb.stanford.edu/millerd/does/docs/1999amerpsyc.html>  
 (27 December 2009).



- Miller, Donald and Domenico (eds.), 2005, *Beyond Benefit Cost Analysis: Accounting for Non-Market Values on Planning Evaluation*, Aldershot, Ashgate.
- Millar, Sean and Adrienne Puckey, 2008, "A Brief Introduction to Climate Change and Peak Oil for New Zealand," *Sustainable Energy Forum*, p. 27, <http://www.sef.org.nz/views/ccpo.text.pdf> (1 July 2009).
- Mingst, Karen, 1999, *Essentials of International Relations*, New York, W. W. Norton.
- Ministry of Defence (NZ), 2010, *Defence White Paper 2010*, Wellington, Ministry of Defence.
- Ministry of Defence (UK), 2010, "Global Strategic Trends – Out to 2040," Fourth Edition, *Development, Concepts and Doctrine Centre*, London, pp. 1-168.
- Ministry of Defence (NAVY), 1995, *War with Japan*, London, HMSO.
- Ministry for the Environment, 2004, "Developing the Scenarios," *Environmental stewardship for a prosperous New Zealand*, <http://www.mfe.govt.nz/publications/climate/effects-impacts-may04/html/page5.html> (11 November 2009).
- Ministry of Land and Resources, 2002, "China's Exploitable Mineral Resources Decreasing," People's Daily Online, [http://english.peopledaily.com.cn/200201/17/print20020117\\_88826.html](http://english.peopledaily.com.cn/200201/17/print20020117_88826.html) (2 June 2002).
- Mitchell, Barbara, April 1977, "Resources in Antarctica: Potential for conflict," *Marine Policy*, pp. 91-101
- Mitchell, Barbara and Lee Kimball, 1979, "Conflict over the Cold Continent," *Foreign Policy*, No. 35, pp.124-141.
- 1979, "The U.S. Position," *New Zealand International Review*, Vol. VI, No. 6, p.10.
- Mitchell, Barbara and Jon Tinker, 1980, *Antarctica and its resources*, London, Earthscan.
- Mitchell, Bruce, 1976, "Politics, Fish, and International Resource Management: The British-Icelandic Cod War," *Geographical Review*, Vol. 66, No. 2, pp. 127-138.



- Molvær, Reidulf K., 1991, "Environmentally Induced Conflicts? A discussion based on Studies from the Horn of Africa," *Bulletin of Peace Proposals*, Vol. 22, No. 2, pp.175-188.
- Moneta, Carlos J., 1981, "Antarctica, Latin America, and the International System in the 1980s: Towards a New Antarctic Order?" *Journal of Interamerican Studies and World Affairs*, Vol. 23, No. 1, pp. 29-68.
- Morello, Danielle, 1997, "Soccer War," *International Conflict and the Environment*, No. 35, <http://www.american.edu/TED/ice/soccer/.htm> (27 November 2003).
- Morgan, Gareth, 2010, "What to watch out for in 2010," *New Zealand Listener*, Vol. 222, No. 3638, pp. 14-22.
- Morgenthau, Hans J., revised by Kenneth W. Thompson and W. David Clinton, 2005, *Politics Among Nations: The Struggle for Power and Peace*, New York, McCraw Hill.
- Mörner, Nils-Axel, 2007, *The Greatest Lie Ever Told*, JOFO Grafiska A.
- Morris, Irwin L., Joe A. Oppenheimer and Karol Edward Soltan (eds.), 2004, *Politics from Anarchy to Democracy*, Stanford, Stanford University Press.
- Morris, Michael A. (ed.), 1990, *Great Power Relations in Argentina, Chile and Antarctica*, London, MacMillan.
- Morse, Edward L., 1999, "A New Political Economy of Oil," *Journal of International Affairs*, Vol. 53, No. 1, pp. 1-29.
- Mortished, Carl, January 2, 2010, "New decade brings changing of the guard," Hamilton, *Waikato Times*, p. C2.
- Moss, Trefor, 2009, "Climate of war," *Janes Defence Weekly*, Vol. 46, No. 16, pp. 24-29.
- Mueller, John, 1989, *Retreat from Doomsday: The Obsolescence of Major War*, New York, Basic Books.
- Munshi, Millie and Claudia Carpenter, July 2, 2008, "High-flying commodities at crossroad," Auckland, *New Zealand Herald*, p. C6.
- Münz, Rainer and Albert F. Reitener, 2007, *Overcrowded World? Global Population and International Migration*, London, Haus Publishing.
- Murdoch, James C. and Todd Sandler, 2002, "Economic Growth, Civil Wars, and Spatial Spillovers," *Journal of Conflict Resolution*, Vol. 46, No. 1, pp. 91-110.

- Murphy, Colum, 2005, "Friction on the Thai-Malay Fault Line," *Far Eastern Economic Review*, Vol. 168, No. 10, pp.21-25.
- Mychajlyszyn, Natalie, 2008, *The Arctic: Canadian Security and Defence*, PRB 08-13E, Ottawa: Parliamentary Information and Research Service, <http://www2.parl.gc.ca/content/LOP/ResearchPublication/prb0813-e.htm> (16 August 2010).
- Myer, Ransom A. and Boris Worm, 2003, "Rapid worldwide depletion of predatory fish communities," *Nature*, Vol.423, pp.280-283.
- Myers, Norman, 1989, "Environment and Security," *Foreign Policy*, No. 74, pp. 23-41.
- 1993, "Environmental Refugees in a Globally Warmed World," *BioScience*, Vol. 43, No. 11, pp. 752-761.
- 2005, "Environmental Refugees: An Emergent Security Issue," Conference paper delivered to the 13<sup>th</sup> Economic Forum, Prague, [http://www.osce.org/documents/eea/2005/05/14488\\_en.pdf](http://www.osce.org/documents/eea/2005/05/14488_en.pdf) (26 November 2009).
- National Intelligence Council, 2008, "Global Trends 2025: A Transformed World," *United States Government Printing Office*, [http://www.dni.govt/nic/NIC\\_2025\\_project.html](http://www.dni.govt/nic/NIC_2025_project.html) (23 November 2008).
- National Snow and Ice Data Centre, 2010, *State of the Gyrosphere*, University of Colorado, [http://nsidc.org/sotc/sea\\_ice.html](http://nsidc.org/sotc/sea_ice.html) (9 September 2010).
- National Strategy Information Centre, 1981, *Strategic Minerals: A Resource Crisis*, New York, Council on Economics and National Security.
- Neumann, Iver B., 1994, "A region-building approach to Northern Europe," *Review of International Studies*, Vol. 20, pp. 53-74.
- New Zealand Antarctic Survey, 2007, "Warming Risks Antarctic Sea Life," *Antarctica*, Vol. 25, No. 4, p. 66.
- New Zealand Government, 2011, *Defence Capability Plan*, Wellington, Ministry of Defence, pp. 1-40.
- Nielsen, Jens Kaalhaug, 2001, "Greenland's geopolitical reality and its political-economic consequences," *DUPI Working Paper No. 2001/6*, pp. 1-26.

- Nilssen, Lawrence R., 1988, "Nordic NATO in transition: Towards turbulence in the 1990s?" *Airpower Journal*, <http://www.airpower.maxwell.af.mil/airchronicles/apj/apj88/sum88/nilssen.html> (16 August 2010).
- North, Robert C., 1977, "Towards a Framework for the Analysis of Scarcity and Conflict," *International Studies Quarterly*, Vol. 21, No. 4, pp. 569-591.
- Nye, Joseph S., 2003, "U.S. Power and Strategy After Iraq," *Foreign Affairs*, Vol. 82, No. 4, pp. 60-73.
- Nye, Joseph S. and Sean M. Lynne-Jones, 1988, "International Security Studies," *International Security*, Vol. 12, No. 4, pp. 5-27.
- Oceanographer of the Navy, 2001, "Naval operations in an iceless Arctic," *Office of Naval Research, Naval Ice Centre, United States Arctic Research Commission*, <http://www.natice.noaa.gov/icefree/Arcticscenario.pdf> (10 August 2010).
- Oechel, Walter C., Terry Callaghan, Tagir Gilmanov, Jarle I. Holten, Barrie Maxwell, Ulf Molau and Bjartmar Sveinbjörnsson (eds.), 1996, *Global Change and Arctic Terrestrial Ecosystems*, New York, Springer.
- Office of the Secretary of Defense, 2006, *Military Power of the People's Republic of China 2006*, Washington, D.C., United States Department of Defense.
- 2009, *Military Power of the People's Republic of China 2009*, Washington, D.C., United States Department of Defense.
- Ohlsson, Lief (ed.), 1995, *Hydropolitics: Conflicts over Water as a Development Constraint*, London, Zed Books.
- Okonski, Kendra (ed.), 2003, *Adapt or Die: The science, politics and economics of climate change*, London, Profile Books.
- O'Loughlin, John, "Ordering the "Crush Zone": Geopolitical Games in Post-Cold War Eastern Europe," University of Colorado, [johno@colorado.edu](mailto:johno@colorado.edu) (27 July 2009).
- O'Loughlin, John and Herman Van Der Wusten, 1990, "Political geography of panregions," *Geographical Review*, Vol. 80, No. 1, pp.1-20.
- Opschoor, Johannes B., 1989, "North-South Trade, Resource Degradation and Economic Security," *Bulletin of peace Proposals*, Vol. 20, No. 2, pp. 135-142.

- Organisation for Economic Cooperation and Development, 2007, "Climate Change and Africa," *Briefing Paper No. 1*, <http://www.oecd.org/dataoecd/17/20/39921733.pdf> (22 October 2009).
- Osherenko, Gail and Oran R. Young, 1989, *The Age of the Arctic: Hot Conflicts and Cold Realities*, Cambridge, Cambridge University Press.
- O'Toole, Molly, 2010, "The New Falklands War: Why Britain will lose to Argentina, or should, this time," *Newsweek*, Vol. CLV, No. 11, pp. 28-29.
- Ó Tuathail, Gearóid, Simon Dalby and Paul Routledge (eds.), 2006, *The Geopolitics Reader*, London, Routledge.
- Paarlberg, Robert L., 1996, "Rice Bowls and Dust Bowls: Africa, Not China, Faces a Food Crisis," *Foreign Affairs*, Vol. 75, No. 3, pp. 127-132.
- Page, Edward A. and Michael Redclift (eds.), 2002, *Human Security and the Environment International Comparisons*, Cheltenham, Elgar.
- Pakistan Defence, 2011, "Russia's Arctic sea grab," *World defence Network*, <http://www.defence.pk/forums/world-affairs/124959-russias-arctic-sea-grab.html> (19 August 2011).
- Pan, Peter P., 2010, "Battle is underway for access to Kazakhstan's uranium deposits," *Washington Post*, <http://www.washingtonpost.com/wp-dyn/content/article/2010/02/24/AR2010022403242.html> (25 February 2010).
- Paskal, Cleo, 2010, *Global Warring: How Environmental, Economic and Political Crises will Redraw the World Map*, New York, Palgrave MacMillan.
- Pastor, Robert A. (ed.), 1999, *A Century's Journey: How the Great Powers Shaped the World*, New York, Basic Books.
- Pauly, Daniel, July 29, 2003, "Major trends in global marine fisheries," *IGBP*, <http://www.igbp.kva.se/congress/banffprog.html#Day3> (12 November 2004).
- Pearce, Fred, 1991, "Wells of conflict on the West Bank," *New Scientist*, Vol. 130, No. 1771, pp. 26-28.
- 2007, *With Speed and Violence: Why Scientists Fear Tipping Points in Climate Change*, Boston, Beacon Press.
- 2007, "Climate report 'was watered down'," *NewScientist*, Vol. 193, No. 2594, p. 10.

- Peluso, Nancy Lee and Michael Watts, 2001, *Violent Environments*, New York, Cornell University Press.
- Perlez, Jane, 1999, "U.S. weighs using food as support for Sudan rebels," <http://members.tripod.com/platforum/food.htm> (19 June 2006).
- Perry, Alex, May 7, 2007, "How to Prevent the Next Darfur. Step one: Get serious about climate change," *Time Magazine*, No. 17, pp. 32-34.
- 2008, *Falling off the Edge: Travels through the Dark Heart of Globalization*, New York, Bloomsbury.
- Peterson, M. J., 1980, "Antarctica: the last great land rush on earth," *International Organization*, Vol. 34, No. 3, pp. 377- 403.
- Peterson, Peter G., 2002, "The shape of Things to Come: Global Aging in the Twenty-first Century," *Journal of International Affairs*, Vol. 56, No. I, pp. 189-231.
- Petrov, Vladimir, 2008, "Chavez seeks closer military ties with Russia," Vol. 45, No. 31, p. 8.
- Phillips, Nicola, 2006, "Doors Open and Closed," *The World Today*, Vol. 62, No. 11, pp. 15-17.
- Pickles, Andrew, 1987, *An Introduction to Likelihood Analysis*, Norwich, Geo Books.
- Pillsbury, Michael (ed.), 2002, *Chinese Views of Future Warfare*, Honolulu, University Press of the Pacific.
- Plimer, Ian, 2009, *heaven+earth*, Kaukapakapa, Howling At The Moon Publishing.
- Ploch, Lauren, 2009, "Madagascar's 2009 Political Crisis," *Congressional Research Service*, CRS Report for Congress, pp. 1-10, <http://www.crs.gov> (21 August 2009).
- Pochat, Victor, "Dams & Development programme-International Policy in Shared River Basins," United Nations Environmental Programme, <http://www.unep.org/dams/files/Condependium/Report-inter.rivers.pdf> (14 June 2009).
- Porter, Gareth and Janet Welsh Brown, 1996, *Global Environmental Politics*, Boulder, Westview Press.
- Posen, Barry, 2003, "Command of the Commons: The Military Foundation of U.S. Hegemony," *International Security*, Vol. 28, No. 1, pp. 5-46.

- Postel, Sandra L. and Aaron T. Wolf, September/October 2001, "Dehydrating Conflict," *Foreign Policy*, pp. 60-67.
- Press Trust of India, 1998, "UN may drop "peace zone" proposal for Indian Ocean," Bombay, *Indian Express Newspaper*,  
<http://www.expressindia.com/news/ie/daily/19980430/12050684.html>  
 (3 September 2009).
- Price, Alfred, 1986, *Air Battle Central Europe*, London, Sidgwick & Jackson.
- Prins, Gwyn, 2002, *The Heart of War*, London, Routledge.
- 2004, "AIDS and global security," *International Affairs*, Vol. 80, No. 5, pp. 931-952.
- Prins, Gwyn and Robbie Stamp, 1991, *Top Gun and Toxic Whales: The Environment and Global Security*, London, Earthscan.
- Prior, Stuart, 1997, "Antarctica: View from a Gateway," *CSS Working paper 5/97*, Centre for Strategic Studies, Victoria University of Wellington, pp. 1-28.
- Quan, Xiao-Wei, Henry F. Diaz and Martin P. Hoerling, 2004, "Change of the Tropical Hadley Cell since 1950," *NOAA-CIRES*, Boulder, Colorado,  
<http://www.cdc.noaa.gov/people/quantiao/PDF/HCPaper.pdf> (21 May 2009).
- Randerson, James, 2009, "UK's ex-science chief predicts century of 'resource' wars," *The Guardian*,  
<http://www.guardian.co.uk/environment/2009/feb/13/resource-wars-david-king/print> (9 June 2009).
- Rathford, Michael, "The Nostradamus Code: World War III 2008-2012,"  
<http://www.nostradamus.org> (9 January 2008).
- Ravenhill, John, 1990, "The North-South balance of power," *International Affairs*, Vol. 66, No. 4, pp. 731-748.
- Reilly, David, 2000, "Shatterbelts and conflict behaviour: The effect of globalisation on 'high risk' states," *Geopolitics*, Vol. 5, No. 3, pp. 48-77.
- Renner, Michael, Hilary French and Erik Assadourian (eds.), 2005, *State of the World: Global Security 2005*, London, Earthscan.
- Renton, Alex, 2009, "Suffering the Science: Climate change, people, and poverty," *130 Oxfam Briefing Paper*, p.16. [www.oxfam.org](http://www.oxfam.org) (7 July 2009).
- Reuters, March 21, 2002, "Giant ice shelf shatters," Auckland, *New Zealand Herald*, p. A10.

- 2008, “Malaria, dengue the sting in climate change,” *stuff.co.nz*, <http://www.stuff.co.nz/world/727768> (26 April 2010).
- Reuters *et al.*, September 26, 2009, “Power shifts to emerging nations,” Auckland, *Weekend Herald*, p. A20.
- Rice, Condoleezza, 2008, “Rethinking the National Interest: American Realism for a New World,” *Foreign Affairs*, Vol. 87, No. 4, pp. 2-26.
- Rice, Susan E., 2006, “The Threat of Global Poverty,” *The National Interest*, Vol. 83, pp. 76-82.
- Rice, Susan E., Corinne Graf and Janet Lewis, 2006, *Poverty and Civil War: What Policymakers Need to Know*, Global Economy and Development Working Paper #02, Washington, D.C., Brookings Institution.
- Roberts, Paul, 2005, *The End of Oil*, London, Bloombury.
- Robert S., 2009, “China’s Naval Nationalism,” *International Security*, Vol. 34, No. 2, pp. 46-81.
- Robinson, Simon, 2006, “Nigeria’s deadly Days,” *Time*, No. 20, pp. 38-43.
- 2008, “India’s Secret War,” *Time*, No. 22, pp. 32-37.
- Roche, David, 2008, “Another Empire Bites the Dust,” *Far Eastern Economic Review*, Vol. 171, No. 8, pp. 11-14.
- Rogers, Paul and Malcolm Dando, 1992, *A Violent Peace: Global Security After the Cold War*, London, Brassey’s (UK).
- Rolls, Mark G., 2002, *The ‘Arms Dynamic’ in South-East Asia During the Second Cold War*, Aldershot, Ashgate.
- Roseguant, Mark W., Michael S. Paisner, Siet Meijir and Julie Witcover, 2001, “2020 Global Food Outlook: Trends, Alternatives and Choices,” *International Food Policy Research Institute*, Washington, D.C.
- Rosecrance, Richard, 1996, “The Rise of the Virtual State,” *Foreign Affairs*, Vol. 75, No. 4, pp. 45-61.
- Ross, Michael L., 2004, “What Do We Know About Natural Resources and Civil War?” *Journal of Peace Research*, Vol. 41, No. 3, pp. 337-356.
- 2008, “Blood Barrels: Why Oil Wealth Fuels Conflict,” *Foreign Affairs*, Vol. 87, No. 3, pp. 2-8.
- Ross, Tim, Holly Watt and Christopher Hope, February 4, 2011, “China and US shoot satellites in standoff,” Auckland, *New Zealand Herald*, p. A18.



- Roucek, Joseph S., 1986, "The Geopolitics of the Antarctic: The Land is Free for Scientific Work But its Wealth of Minerals has Excited Imperialist Claims," *American Journal of Economics and Sociology*, Vol. 45, No. 1, pp. 69-77.
- Rowlands, Ian, Winter 1991, "The security challenges of global environmental change," *Washington Quarterly*, pp. 99-114.
- Roy-Chaudhury, Rahul, 2000, *India's Maritime Security*, New Delhi, Knowledge World.
- Rozoff, Rick, 2009, "Scramble for World Resources: Battle for Antarctica," *Global Research*,  
<http://www.globalresearch.ca/PrintArticle.php?articleId=13639>.  
(14 October 2010).
- Runge, C. Ford and Benjamin Senauer, 2007, "How Biofuels Could Starve the Poor," *Foreign Affairs*, Vol. 86, No. 3, pp. 41-53.
- Rusi, Alpo M., 1998, *Dangerous Peace: New Rivalry in World Politics*, Boulder, Westview Press.
- Russett, Bruce, 1981, "Security and the Resource Scramble: Will 1984 be like 1914?" *International Affairs*, Vol. 58, pp. 42-58.
- Russett, Bruce and William Antholis, 1992, "Do Democracies Fight Each other? Evidence from the Peloponnesian War," *Journal of Peace Research*, Vol. 29, No. 4, pp. 415-434.
- Sach, Jeffrey D., 2008, *Common Wealth: Economics for a Crowded Planet*, New York, Penguin.
- Saffu, Yaw, 1992, "The Bougainville Crisis and Politics in Papua New Guinea," *The Contemporary Pacific*, Vol. 4, No. 2, pp. 325-343.
- Sample, Ian, 2008, "Final warning," *New Scientist*, Vol. 198, No. 2662, pp. 32-37.
- Scambos, T. A., *et al.*, 2004, "Glacier acceleration and thinning after ice shelf collapse in the Larsen B embayment, Antarctica," *Geophysical Research Letters*, Vol. 31, pp. 1-4.
- Scheffran, Jürgen, 2009, *Climate Change, Nuclear Risks and Nuclear Disarmament: From Security Threats to Sustainable Peace*, University of Hamburg, World Future Council, pp. 1-24.
- Schnauberg, Allan, 1980, *The Environment: From Surplus to Scarcity*, Oxford, Oxford University Press.



- Schultz, Barry and Paul Michael Wihbey, 2003, "African Oil: A Priority for U.S. National Security and African Development," *African Oil Policy Initiative Group*, Washington, D.C., pp. 1-19.
- Schwartz, Peter and Doug Randall, 2003, "An Abrupt Climate Change Scenario and its Implications for United States National Security," pp. 1-22.  
[http://bloodbanker.typepad.com/submerging\\_markets/Pentagon.pdf](http://bloodbanker.typepad.com/submerging_markets/Pentagon.pdf) (30 May 2005).
- Schweller, Randall L., 1992, "Domestic Structure and Preventive War: Are Democracies More Pacific?" *World Politics*, Vol. 44, No. 2, pp. 235-269.
- 1994, "Bandwagoning for Profit: Bringing the Revisionist State Back In," *International Security*, Vol. 19, No. 1, pp. 72-107.
- Scott, Michon, 2010, "Disintegration: Antarctic warming claims another ice shelf," *NASA Earth Observatory*,  
<http://earthobservatory.nasa.gov/Features/WilkinsIceSheet/> (7 September 2010).
- Scott, Robin, 2007, *Fortress New Zealand*, Christchurch, Lifetech Consultants.
- Secretary of Defense, 2010, *Quadrennial Defense Review Report*, Washington, D.C., United States Department of Defense.
- 2010, "Military and Security Developments Involving the People's Republic of China 2010," Annual Report to Congress, *Department of Defense*, pp. 1-83.
- Seidler, Christopher, 2010, "Deciding the Arctic's Future Behind Closed Doors," *Spiegel Online*, <http://www.spiegel.de/international/world/0,1518,druck-686209,00.html> (13 September 2011).
- Sellick, R.G. (ed.), 2001, *Antarctica: First Impressions 1773-1930*, Fremantle, Fremantle Art Centre Press.
- Sempa, Francis P., "MacKinder's World,"  
[http://www.geocities.com/eurasia\\_uk/macworld.html](http://www.geocities.com/eurasia_uk/macworld.html) (10 February 2004).
- Serreze, M. C., et al., 2003, "A record minimum Arctic sea ice extent and area in 2002," *Geophysical Research Letters*, Vol. 30, No. 3, pp. 10.1 to 10.4.
- Shackleton, Nicholas, 2001, "Climate Change Across the Hemispheres," *Science*, Vol. 291, No. 5501, pp. 58-59.
- Shapiro, Robert, 2008, *Futurecast 2020: A Global Vision of Tomorrow*, London, Profile Books.

- Shapley, Deborah, 1985, *The sixth Continent: Antarctica in a Resource Age*, Resources for the Future Inc., Washington, D.C.
- Shaxson, Nicholas, 2007, "Oil, corruption and the resource curse," *International Affairs*, Vol. 83, No. 6, pp. 1123-1140.
- Shepherd, Andrew and Duncan Wingham, 2007, "Recent Sea-Level Contributions of the Antarctic and Greenland Ice Sheets," *Science*, Vol. 315, pp. 1529-1532.
- Shibuya, Eric and Jim Rolfe (eds.), 2003, *Security in Oceania in the 21<sup>st</sup> Century*, Honolulu, Asia-Pacific Centre for Security Studies.
- Sidhu, Waheguru Pal Singh and Jing-dong Yuan, 2003, *China and India: Cooperation or Conflict*, Boulder, Lynne Rienner.
- Simmon, A. John, 1993, *On the Edge of Anarchy*, Princeton, N.J., Princeton University Press.
- Simon, Sheldon W., 1996, "Alternative Visions of Security in the Asia Pacific," *Pacific Affairs*, pp. 381-396.
- Simons, Graig, 2010, "Climate Summit's Big Failure," *Newsweek*, Vol. CLV, No. 3, pp. 8-9.
- Sinclair, Ewan, 2008, *Changing Climate of New Zealand's Security: Risk and resilience in a Climate Affected Security Environment*, Working Paper 08/11, Wellington, Institute of Policy Studies, pp.1-68.
- Small, Dennis, 2007, "Beyond Terrorism: The sustainable security paradigm," *Pacific Ecologist*, No. 13, pp. 4-7.
- Smil, Vaclav, 1993, *Global Ecology: Environmental change and social flexibility*, London, Routledge.
- 2004, *China's Past, China's Future: Energy, Food, Environment*, New York, RoutledgeCurzon.
- 2006, *Transforming the Twentieth Century*, New York, Oxford University Press.
- Smith, Adam, 2008, "Rising Power," *Time*, No. 30, p. 9.
- Smith, Dan and Janani Vivekananda, 2007, *A Climate of Conflict: The links between climate change, peace and war*, London, International Alert.
- Smith, David, 2007, *The Dragon and the Elephant: China, India and the New World Order*, London, Profile Books.

- Smolka, H. P., 1938, "Soviet Strategy in the Arctic," *Foreign Affairs*, Vol. 16, No. 2, pp. 272-278.
- Solomon, Eldra Pearl, Linda R. Brig, Diana W. Martin and Claude Villee, 1993, *Biology*, Fort Worth, Saunders College Publishing.
- Song, Yann-Huei, 1997, "The Canada-European Union Turbot Dispute in the Northwest Atlantic: An Application of the Incident Approach," *Ocean Development & International Law*, Vol. 28, pp. 269-311.
- Sorrel, Steve, Jamie Speirs, Roger Bentley, Adam Brandt and Richard Miller, 2009, "Global Oil Depletion," *UK Energy Research Centre*, pp. 1-228.
- Spanier, John and Robert L. Wendzel, 1996, *Games Nations Play*, Washington, D.C., Congressional Quarterly Inc.
- Spenser, Chris, 2011, "What can a Deal in Durban Deliver?" *International Institute for Sustainable Development*, <http://climate-1.iisd.org/policy-updates/what-can-a-deal-in-durban-deliver/htm> (27 September 2011).
- Spletstoeser, John F. and Gisela A. M. Dreschhoff, 1990, *Mineral Resources Potential of Antarctica*, Washington, American Geophysical Union.
- Spratt, David and Philip Sutton, 2008, *Climate Code Red: the case for emergency action*, Carlton North, Scribe.
- Steeman, Marta, June 14, 2006, "Call of the wild for oil explorers," *Hamilton, Waikato Time*, p. 7.
- Steingart, Gabor, 2008, *The War for Wealth*, New York, McGraw-Hill.
- Stelzer, Irwin, 2007, "Why they call it a dismal science," *Hudson Institute*, [http://www.hudson.org/index.cmf?fuseaction=publication\\_details&id=5306](http://www.hudson.org/index.cmf?fuseaction=publication_details&id=5306) (1 July 2009).
- Stern, Andy, 2005, *Who won the Oil Wars?* London, Collins & Brown.
- Stevenson, Jonathan, 2004, "Africa's Growing Strategic Resonance," *Survival*, Vol. 45, No. 4, pp. 153-172.
- Stewart, Thomas A., 1993, "The New Face of American Power," *Fortune Magazine*, [http://money.cnn.com/magazines/fortune/fortune\\_archive/1993/07/26/78121/index.htm](http://money.cnn.com/magazines/fortune/fortune_archive/1993/07/26/78121/index.htm) (20 August 2009).
- Stott, Peter A., Nathan P. Gillett, Gabriele C. Hegerl, David J. Karoly *et al.*, 2010, "Detection and attribution of climate change: a regional perspective," *Wiley Interdisciplinary Reviews of Climate Change*, pp. 1-20.

- Strange, Hannah, Frank Pope and Deborah Haynes, 2010, "British drilling for Falklands oil threatens Argentine relations," *The Times*, [http://business.timesonline.co.uk/business/industry\\_sector/natural\\_resources/article7025799.ece](http://business.timesonline.co.uk/business/industry_sector/natural_resources/article7025799.ece) (21 September 2010).
- Subrahmanyam, K., 1990, "Alternative Security Doctrines," *Bulletin of Peace Proposals*, Vol. 21, No. 1, pp. 77-85.
- Sugden, David, 1982, *Arctic and Antarctic: A Modern Geographical Synthesis*, Oxford, Basil Blackwell.
- Suliman, Mohamed, (ed.), 1999, *Ecology, Politics & Violent Conflict*, London, Zed Books.
- Sullivan, W., 1957, *Quest for a Continent*, London, Secker and Warburg.
- Sullivan, Walter, 1957, "Antarctica in a Two-Power World," *Foreign Affairs*, Vol. 36, No. 1, pp. 154-166.
- Summers, Lawrence H., 2006, "Global anxiety for the middle classes," *The Nation*, <http://nationmultimedia.com/optio/print.php?newsid=30017667> (7 June 2007).
- Sun Tzu, (as translated by Yuan Shibing), 1993, *The Art of War*, Ware, Wordsworth.
- Suter, Keith, 1991, *Antarctica: Private Property or Public Heritage?* London, Zed Books.
- Suzuki, David, 2010, *The Legacy: An Elders Vision for our Sustainable Future*, Vancouver, Greystone Book.
- Swing, John Temple, 2003, "What Future for the Oceans?" *Foreign Affairs*, Vol. 82, No. 5, pp. 139-152.
- Swinney, Clare, 2004, "Putting Out The Fire With Gasoline," *Investigate*, pp. 36-43.
- Sydney Morning Herald, 2006, "Lack of water, energy 'could cause war'," Sydney, *Australian Associated Press*.
- Tainter, Joseph A., 1988, *The Collapse of Complex Societies*, Cambridge, Cambridge University Press.
- Tauthail, Gearóid Ó., Simon Dalby and Paul Routledge, 2006, *The Geopolitics Reader*, London, Routledge.

- Taylor-Innes, J.P., 1996, "Antarctica's potential for International Conflict and its implications for New Zealand," *Commander's Essay*, Royal New Zealand Navy.
- TED Case Studies, 1997, "The Cod War,"  
<http://www.american.edu/TED/icefish.htm> (1 December 2003.)
- Teitelbaum, Michael S., 1991, "The Population Threat," *Foreign Affairs*, Vol. 71, No. 5, pp. 63-78.
- Templeton, Malcolm, 2002, *Protecting Antarctica*, Wellington, New Zealand Institute of International Affairs.
- The United States President, 2009, "National Security Presidential Directive /NSPD-66," *The White House*, <http://www.fas.org/irp/offdoc/nspd.66.htm> (23 November 2010).
- Thomas, Jim, 2009, "Techno-fix or false solution? What technological controversies for solving environmental problems will we see in 2009?" *Ecologist*,  
[http://www.theecologist.org/pages/archive\\_detail.asp?open=y&content\\_id=2053](http://www.theecologist.org/pages/archive_detail.asp?open=y&content_id=2053) (9 June 2009).
- Thompson, Della (ed.), 1995, *The Concise Oxford Dictionary of Current English*, 9<sup>th</sup> edition, Oxford, Oxford University Press.
- Thompson, Jon, 2003, "The Lamp,"  
<http://www.peakoil.net/TheLamp/TheLamp.html> (8 June 2004).
- Thompson, Kenneth W. and David Clinton, 2005, *Politics Among Nations: The Struggle for Power and Peace*, New York, McGraw-Hill.
- Thompson, William R., 1973, "The Regional Subsystem: A Conceptual Explication and a Propositional Inventory," *International Studies Quarterly*, Vol. 17, No. 1, pp. 89-117.
- Thottam, Jyoti, 2009, "A Great Divide," *Time*, Vol. 173, No. 6, pp. 21-25.
- Timberlake, Lloyd, 1988, *Africa in Crisis*, London, Earthscan.
- Toset, Han Petter Wollebæk, Nils Petter Gleditsch and Håvard Hegre, 2000, "Shared rivers and interstate conflict," *Political Geography*, Vol. 19, pp. 971-996.
- Toffler, Alvin, 1970, *Future Shock*, London, Pan Books.
- Trenin, Dmitri, 2006, "Russia Leaves the West," *Foreign Affairs*, Vol. 85, No. 4, pp. 87-96.

- Trivedi, Bijal, 2008, "Dinner's dirty secret," *New Scientist*, Vol. 199, No. 2673, pp. 28-33.
- Tucker, Robert W., 1975, "Oil: The Issue of American Intervention," *Commentary*, Vol. 59, No. 1, pp. 21-31.
- Tymoshenko, Yuliya, 2007, "Containing Russia," *Foreign Affairs*, Vol. 86, No. 3, pp. 69-82.
- Ullman, Richard, 1983, "Redefining Security," *International Security*, Vol. 8, No. 1, pp.129-153.
- Underhill, William, November 29, 2005, "Race begins to exploit the Earth's last Frontier," Auckland, *New Zealand Herald*, pp. A12-13.
- United Nations, 1997, "UN Assessment of Freshwater Resources," <http://www.un.org/ecosocdev/geninfo/sustdev/waterrep.htm> (1 June 2004).
- 2004, "Demographic Yearbook System," <http://www.unstat.un.org/unsd/demographic/products/dyb/dyb2.htm> (22 May 2006).
- 2005, "World Population Prospects: The 2004 Revision Population Database: Executive summary," <http://esa.un.org/unpp> (22 May 2006)
- 2006, "Climate change as dangerous as war: U.N. chief Ban," *Reuter*, <http://nz.news.yahoo.com/070301/5/p/3oe.html> (2 March 2007).
- 2007, *Confronting Climate Change: Avoiding the Unmanageable, Managing the Unavoidable*, New York, United Nations Foundation.
- 2007, "Security Council holds first-ever debate on impact of climate change on peace and security," <http://www.un.org/Docs/Scinfo.htm> (4 May 2007).
- United Nations Development Programme, 2008, "A Primer on Climate Change Adaptation in the Drylands of Africa," *UNDP Report*, [http://www.undp.org/drylands/docs/drought/ADDF3/Background\\_Paper\\_for\\_ADDF3.doc](http://www.undp.org/drylands/docs/drought/ADDF3/Background_Paper_for_ADDF3.doc) (23 October 2009).
- United Nations Environmental Program (UNEP), 2002, "GEO: Global Environmental Outlook 3," <http://www.unep.org/Geo/geo3/english/178.htm> (22 April 2010).
- 2007, "Environmental Degradation Triggers Tensions and Conflict in Sudan," <http://www.unep.org/Documents.Multilingual/Default.Print.asp?DocumentID=512&Arctic> (21 October 2009).

- 2007, *Global Environmental Outlook: GEO<sub>4</sub>*, New York, United Nations.
- 2007, *World population Prospects: The 2006 Revision*, Department of Economic and Social Affairs, ESA/P/WP. 202.
- United Nations Food and Agriculture Organisation (FAO), 1952, “Yearbook of Forest Products,” <http://www.fao.org/waicent/faostat/forestry/products.htm> (22 June 2006).
- United Nations Framework Convention on Climate Change, 2009, *Copenhagen Accord*, FCCC/CP/2009/L.7, pp. 1-5.
- United States Department of Defense, 2006, *Strategic and Critical Materials Report to the Congress*, Washington, D.C.
- United States Department of Energy, 2008, “Methane Hydrates: The Gas Reserves of the Future,” <http://www.fossilenergy.gov/program/oilgas/hydrates.index.html> (1 September 2010).
- United States Environmental Protection Agency, “Agreement Between the Government of the United States of America and the Government of Canada on Air Quality,” <http://www.epa.gov/airmarkets/progsregs/usca/agreement.html> (26 May 2009).
- United States Geological Survey, 2002, “Rare Earth Elements-Critical resources for High Technology,” *U.S. Department of the Interior*, [http://minerals.usgs.gov/minerals/pub/commodity/rare\\_earths/](http://minerals.usgs.gov/minerals/pub/commodity/rare_earths/) (26 May 2006).
- 2008, “Circum-Arctic Resource Appraisal: Estimates of Undiscovered Oil and Gas Deposits North of the Arctic Circle,” *Factsheet 0349*.
- 2010, “Tungsten,” *Mineral Commodity Summaries*, p. 177.
- United States Government, 2009, “World Fact Book,” *Central Intelligence Agency*, <https://www.cia.gov/library/publications/the-world-factbook/geos/xx.html> (2 June 2009).
- Valencia, Mark J. 1997, “Asia, the Law of the Sea and International Relations,” *International Affairs*, Vol. 73, No. 2, pp. 263-283.
- van Creveld, Martin, 1996, “The Fate of the State,” pp. 1-13, [http://www.d-n-i.net/creveld/the\\_fate\\_of\\_the\\_state.htm](http://www.d-n-i.net/creveld/the_fate_of_the_state.htm) (21 August 2008).

- van der Wusten, H. and T. Nierop, 1990, "Functions, roles and form in international politics," *Political Geography Quarterly*, Vol. 9, No. 3, pp. 213-231.
- Vaughan, David G., 2007, "Antarctic Peninsula: rapid warming," British Antarctic Survey,  
[http://www.antarctic.ac.uk/bas\\_research/science/climate/antarctic\\_peninsula.php](http://www.antarctic.ac.uk/bas_research/science/climate/antarctic_peninsula.php) (10 August 2010).
- Vego, Milan, 2009, "The Russian Navy Revitalized: Moscow will use sea power in its quest for greater world influence," *Armed Forces Journal*,  
<http://www.armedforcesjournal.com/2009/04/3989255> (13 August 2010).
- Victor, David G. and Nadejda M. Victor, 2003, "Axis of Oil?" *Foreign Affairs*, Vol. 82, No. 2, pp. 47-61.
- Victor, David G. and Linda Yueb, 2010, "The New Energy Order: Managing Insecurities in the Twenty-first Century," *Foreign Affairs*, Vol. 89, No. 1, pp. 61-73.
- Vidal, John, September 3, 2004, "Meat-eaters devour world's water," *Guardian Weekly*, p. 27.
- Virdia, Maria Rosa, 2003, *Energy to 2050: Scenarios for a Sustainable Future*, International Energy Agency, pp. 1-219.
- von Braun, Joachim and Ruth Meinzen-Dick, 2009, "'Land Grabbing' by foreign Investors in Developing Countries: Risks and Opportunities," *International Food Policy Institute*, Policy Brief 13,  
<http://www.ifpi.org/pubs/bp/bp013.asp> (24 July 2009).
- Von Clausewitz, Carl, (as translated by J. J. Graham), 1997, *On War*, Ware, Wordsworth.
- Wackernagel, Mathis and William Rees, 1996, *Our Ecological Footprint: Reducing Human Impact on the Earth*, Gabriola Island, B.C, Canada, New Society.
- Wackernagel, Mathis, *et al.*, 2002, "Tracking the ecological overshoot of the human economy," *Proceedings of the Academy of Science*, Vol.99, No. 14, pp. 9266-9271, <http://www.pnas.org/cgi/doi/10.1073/pnas.142033699> (2 August, 2006).
- Wain, Barry, April 15, 2004, "More Claims," *Far Eastern Economic Review*, p. 20.



- Wald, Matthew L., January 2007, "Is ethanol, for the long haul," *Scientific America*, pp. 28-35.
- Wallace, John, 1979, "Antarctic Riches," *New Zealand International Review*, Vol. VI, No. 2, pp. 6-8.
- Wallace, Catherine, 1988, *The Antarctic Mineral Convention: Negotiating the rules of the game for future development*, Wellington, Victoria University.
- Walsh, Bryan, 2008, "Solar Power's New Style," *Time*, No. 26, p. 42-43.
- Walt, Stephen M., 1991, "The Renaissance of Security Studies," *International Studies Quarterly*, Vol. 35, No. 2, pp. 211-239.
- 1997, "Why Alliances Endue or Collapse," *Survival*, Vol. 39, No. 1, pp. 156-179.
- 1998, "International Relations: One World, Many Theories," *Foreign Policy*, No. 110, pp. 29-46.
- 1998/99, "Why Europe and America are Drifting Apart," *National Interest*, Vol. 54, No. 3, pp. 3-12.
- Walter, Barbara F., 2004, "Does Conflict Beget Conflict? Explaining Recurring Civil War," *Journal of Peace Research*, Vol. 41, No. 3, pp. 371-388.
- Waltz, Kenneth N., 1979, *Theory of International Politics*, Reading, Massachusetts, Addison-Wesley Publishing.
- 1990, "Nuclear Myths and Political Realities," *The American Political Science Review*, Vol. 84, No. 3, pp. 731-745.
- 1993, "The New World Order," *Millennium*, Vol. 22, No. 2, pp. 187-195.
- Wang, James C. F., 1992, *Handbook on Ocean Politics & Law*, New York, Greenwood Press.
- Wang, Kevin and James Lee Ray, 1994, "Beginners and Winners: The Fate of Initiators of Interstate Wars Involving Great Powers Since 1495," *International Studies Quarterly*, Vol. 38, No. 1, pp. 139-154.
- Ward, Halina, 2009, "Resource nationalism and sustainable development: a primer and key issues," *International Institute for Environmental Development*, pp. 1-58.
- Warner, Gale, 1984, "Staking Claims on the Last Frontier," *Sierra*, pp. 50-54.
- Wasdell, David, 2007, "Political Corruption of the IPCC Report?" *Meridian Programme*, London, p. 1, <http://www.meridian.org.uk> (30 April 2009).

- Washington, W. M., R. Knutti, G. A. Meechl, H. Teng, C. Tebaldi, D. Lawrence, L. Buja, and W. G. strand, 2009, "How much climate change can be avoid by mitigation?" *Geophysical Review Letters*, Vol. 36, L08703, doi:10.1029/2008GL037074.
- Wassermann, Ursula, 1978, "The Antarctic Treaty and Natural Resources," *Journal of World Trade Law*, Vol. 12, No. 2, pp. 174-179.
- Watts, Michael, 2006, "Empire of Oil," *Monthly Review*, Vol. 58, No. 4, pp. 1-17.
- Watzlawick, Paul (ed.), 1984, *The Invented Reality: How Do We Know What We Believe We Know?* New York, W. W. Norton.
- Weart, Spencer R., 2003, *The Discovery of Global Warming*, Cambridge, Harvard University Press.
- Webb, Tim, 2010, "UK firm's Falklands oil find sparks mix of hopes and fears," [Guardian](http://www.guardian.uk/uk/2010/may/06/falklands-oil-discovery-rockhopper), <http://www.guardian.uk/uk/2010/may/06/falklands-oil-discovery-rockhopper> (21 September 2010).
- Weede, Erich, 1984, "Democracy and War Involvement," *Journal of Conflict Resolution*, Vol. 28, No. 4, pp. 649-664.
- Wegren, Stephen K. (ed.), 2003, *Russia's Policy Challenges: Security, Stability, and Development*, New York, M. E. Sharp.
- Weiner, Bernard, 2008, "Violating Spheres of Influence can be Dangerous," <http://www.scoop.co.nz/stories/HL0809/S00050.htm> (7 January 2009).
- Weir, Kay, 2007, "World will be transformed if climate action delayed," *Pacific Ecologist*, No. 13, pp. 10-14.
- Welch, Susan and Robert Miewald, 1983, *Scarce Natural Resources: The Challenge to Public Policymaking*, Beverly Hills, Sage Publications.
- Wells, John, 1991, *Antarctic Resources: A dichotomy of interest*, Canberra, Australian National University.
- Wendt, Alexander, 1992, "Anarchy is what states make of it: the social construction of power politics," *International Organisation*, Vol. 46, No. 2, pp. 391-425.
- 1995, "Constructing International politics," *International Security*, Vol. 20, No. 1, pp. 71-81.

- West, Larry, 2007, "Scholars Predict 50 Million Environmental Refugees by 2010," *About.Com:Environmental Issues*,  
<http://environment.about.com/od/globalwarming/a/enviorefugees.htm>  
 (20 June 2007).
- Westermeyer, William E., 1984, *The Politics of Mineral Resource Development in Antarctica*, Boulder, Westview Press.
- Westing, Arthur H., 1981, "Crop destruction as a means of war," *Bulletin of the Atomic Scientists*, Vol. 37, No. 2, pp. 38-42.
- 1986, *Global Resources and International Conflict*, Oxford, Oxford University Press.
- 1991, "Environmental Security and its Relation to Ethiopia and Sudan," *Ambio*, Vol. 20, No. 5, pp. 168-171.
- Wheeler, Carolynne and Tim Shipman, 2008, "Ex-Mossad head warns Israel could act," Auckland, *New Zealand Herald*.
- White, Rodney R., 1993, *North, South, and the Environmental Crisis*, Toronto, University of Toronto Press.
- Widgren, Jonas, 1990, "International Migration and Regional Stability," *International Affairs*, Vol. 66, No. 4, pp. 749-766.
- Wiebe, Keith (ed.), 2003, *Land Quality, Agricultural Productivity, and Food Security*, Cheltenham, Edward Elgar.
- Williams, Michael C., 2003, "Words, Images, Enemies: Securitization and International Politics," *International studies Quarterly*, Vol. 47, pp. 511-531.
- Wilson, Dominic and Raluca Dragusanu, 2008, "The Expanding Middle: The Exploding World Middle Class and Falling Global Inequity," *Goldman Sachs*, Global Economic Paper No. 170, pp. 1-23.
- Wirsing, Robert G. and Christopher Jasparro, 2006, "Spotlight on Indus River Diplomacy: India, Pakistan, and the Baglihar Dam Dispute," *Asia-Pacific Centre for Security Studies*, Washington, D.C., <http://www.apcss.org>  
 (14 April 2010).
- Wissenbach, Uwe, 2007, "Africa's Attractions," *World Today*, Vol. 64, No. 4, pp. 7-12.
- Wohlstetter, Albert, 1968, "Illusions of Distance," *Foreign Affairs*, Vol. 46, No. 2, pp. 242-255.

- Wolfe, Adam, 2007, "Peace mission 2007 and the S.C.O. Summit," *PINR*,  
[http://www.pinr.com/report.php?ac=view\\_printable&report\\_id=672&language\\_id=1](http://www.pinr.com/report.php?ac=view_printable&report_id=672&language_id=1) (30 September 2008).
- Wolfers, Arnold, 1962, *Discord and Collaboration*, Baltimore, John Hopkins Press.
- Wolfrum, Rüdiger, 1991, *The Convention on the Regulation of Antarctic Mineral Resource Activities*, Berlin, Springer-Verlag.
- Woodbridge, Roy, 2004, *The Next World War*, Toronto, University of Toronto Press.
- Woodward, David, 1953, *The Tirpitz*, London, William Kimber.
- Woolley, John T. and Gerhard Peters, *The American Presidency Project [online]*. Santa Barbara, CA., <http://www.presidency.ucsb.edu/ws/?pid=12332> (31 August 2010).
- Worcester, Maxim, 2008, "China and India: The new African Colonial Masters?" *Institut für Strategie- Politik- Sicherheits- und Wirtschaftsberatung*, Berlin, pp. 1-7.
- World Bank, 2009, "Bringing Poverty and Distributional Lens to Help Tackle Global and National Development,"  
<http://go.worldbank.org/K7LWQUT9LO> (17 November 2009).
- World Nuclear Association, 2009, "World Nuclear Power Reactors & Uranium Requirements,"  
<http://www.worldnuclear.org/info/default.aspx%3fid%3d11520> (27 April 2010).
- World Wildlife Fund, 2005, "An Overview of Glaciers, Glacial Retreat and Subsequent Impact in Nepal, India and China,"  
<http://www.wwf.himalayaglacierreport.2005.pdf> (15 April 2005).
- 2006, *Living Planet Report 2006*, Cambridge, Banson.
- Worm, Boris, *et. al.*, 2006, "Impacts of Biodiversity Loss on Ocean Ecosystem Services," *Science*, Vol. 314, No. 5800, pp. 787-790.
- Wright, Robert, 2000, "Will Globalization Make You Happy," *Foreign Policy*, September/October 2000, pp. 54-64.
- Xin, Zhigang, 2004, "Dissecting China's 'middle class'," *China Daily*,  
[http://www.chinadaily.com.cn/english/doc/2004-10/27/content\\_386060.htm](http://www.chinadaily.com.cn/english/doc/2004-10/27/content_386060.htm) (7 June 2007).

- Xiong, Wei, Erda Lin, *et al.*, 2007, "Climate change and critical thresholds in China's food security," *Climatic Change*, Vol. 81, pp. 205-221.
- Yergin, Daniel, 2006, "Ensuring Energy Security," *Foreign Affairs*, Vol. 85, No. 2, pp. 69-82.
- Yohe, Gary W. and Richard S. J. Tol, 2007, "The *Stern Review*: Implications for Climate Change," *Environment*, Vol. 49, No. 2, pp. 36-41.
- Young, Oran R., 2005, "Governing the Arctic: From Cold War Theatre to Mosaic of Cooperation," *Global Governance*, No. 11, pp. 9-15.
- Young, Oran R. and Gail Osherenko (eds.), 1993, *Polar Politics: Creating International Environmental Regimes*, New York, Cornell University Press.
- Young, Peter Lewis, 1995, "Bougainville – The Seven-Year War," *Jane's Intelligence Review*, Vol. 7, No. 8, pp. 375-379.
- Zagorsky, Alexei, 1995, "The post-cold war security agenda of Russia: implications for Northeast Asia," *Pacific Review*, Vol. 8, No. 1, pp. 77-97.
- Zalaria, Fareed, 2008, "The Rise of the Rest," *Newweek*, Vol. CLI, No. 19, pp.16-23.
- Zehfuss, Maja, 2002, *Constructivism in International relations: the politics of reality*, Cambridge, Cambridge University Press.
- Zellen, Barry Scott, 2009, *Arctic Doom, Arctic Boom: The Geopolitics of Climate Change in the Arctic*, Santa Barbara, Praeger.
- Zimmer, Carl, December 1, 2003, "Zeroing in on Climate Change," *Newsweek*, p. 41.
- Zimmerman, Arthur, December 2004, "Land Tenure as a Determinant of Civil War," Yale University, pp. 1-46,  
<http://www.yale.edu/ycias/ocyprogram/zimmerman.pdf> (31 May 2006).
- Zittel, Werner and Jörg Schindler, 2006, "Uranium Resources and Nuclear Energy," *Energy Watch Group*, EWG-Paper No 1/06, pp. 1-48.
- 2007, "Coal: Resources and Future Production," *Energy Watch Group*, EWG-Paper No. 1/07, pp. 1-47.
- Zumberge, James H., 1979, "Mineral Resources and Geopolitics in Antarctica," *American Scientist*, Vol. 67, pp. 68-77.
- Zysk, Katarzyna, 2010, "Russia's Arctic Strategy: Ambitions and Constraints," *Joint Force Quarterly*, Issue 57, 2<sup>nd</sup> Quarter, pp. 103-110.