

# **Effectiveness of International Efforts to Control Biological Weapons: Activities of the European Union and the Limits of Regime Theory**

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Chapters provided for transfer process  
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This document contains full copies of the following chapters/sections that are submitted for assessment under the transfer process:

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# Chapter 1

## Introduction

This introductory chapter is intended to fulfil a number of functions. First, to provide a description of the context and background of the subject matter of the thesis in order to illustrate why this area of study is of particular interest. This contextual material is deliberately broad as it falls between two areas of study – the control of biological weapons and the activities of the European Union – for which it is rare to find researchers confident in both. Secondly, to outline some assumptions that underpin the research that is to be done. Finally, to elaborate an overview of the structure of the thesis.

*Progress as of transfer date:*

- *This introductory chapter is essentially complete but has not been submitted as part of the transfer package as it is not required. However, members of the transfer panel are welcome to a copy on request. A number of the points within it have been included in the transfer report in any case.*

## **Chapter 2**

### **Theoretical Framework and Research Questions**

#### **Contextualization**

##### ***The Research Problem***

The Research Problem that this thesis seeks to resolve can be defined in the following terms:

In considering its policies regarding the regime to control biological weapons, what were the understandings of the European Union relating to the effectiveness of this regime and how did these understandings affect the policy choices adopted?

In order to come to any conclusions regarding this research problem it is necessary to consider what is generally understood regarding concepts of regime effectiveness and to consider what were the relevant actions of the European Union in this regard and how they were decided.

##### ***Chapter outline***

This chapter provides an overview of the main theoretical focus of this thesis; that is the body of thinking on international regimes that has become known as 'Regime Theory'. A clear understanding of Regime Theory is required in order to have sense of its applicability and its limits. Understandings of the effectiveness of regimes are then explored, together with an examination of how methods of evaluation of effectiveness have been developed. The chapter continues with exploration of what is really meant by describing a regime as effective and whether the concept of effectiveness is an either/or quality or whether there are degrees of this quality. An exploration of the conceptualization of the European Union then follows. The chapter concludes with an elaboration of the research questions to be tackled in this thesis and an outline of the methodology for the tackling of each of these questions.

The following chapter, Chapter 3, will deal with existing understandings and examinations of the regime to control biological weapons and, utilizing lessons learned from earlier analysis, that chapter will examine methodological issues.

##### **Commonalities of Regime Theory and EU Integration Theories**

There are a number of commonalities between Regime Theory and theories relating to the EU and its development/integration. On the most basic level, both deal with interested parties

coming together in circumstances in which they believe that acting in some form of coordinated or collective manner produces an outcome that is preferable to one that would be achieved by any actions on an individual basis.

In both cases, the literature providing understandings of how relevant entities are created is more extensive and more compelling than the literature on how such entities continue or make policy.

Both areas of conceptualization have also suffered from assumptions of path dependency.

### ***Assumptions of path dependency***

Any conceptualization of an artifact that has been created by human action is prone to suffer from assumptions that because the artifact exists the artifact's coming into being in that form was inevitable. This applies whether the artifact is a political structure or an artifact that is a manifestation of a particular technology. In relation to both of these types of artifact, a concept of 'path dependency' has been highly prevalent in the literature.

In developments in both international politics and in technological innovation there have been assumptions that there were pathways to be followed and sometimes an implication that these pathways contained an element of inevitability. For example, the path of technological innovation was considered to be distinct from the society that created it. Technological artifacts were examined in isolation. Yet examinations of the history of the typewriter and the adoption of the QWERTY keyboard layout, the adoption of the clutch-brake-accelerator arrangement in motor vehicles, or the battle for video standards between Betamax and VHS illustrate that the derivation of all of these were in interaction with society. There was no inevitability in the outcome. There is now a considerable literature on the interaction between technological innovation and society.<sup>1</sup> The same pattern of examination can be identified in the analysis of international arrangements. Early writings examined international arrangements in isolation with later analysis taking into account some of the domestic political aspects of policy making, including influences on individual policy makers.

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1. See, in particular, the writings of Andy Stirling on innovation issues.

Within innovation literature the concept of path dependency has been supplemented by concepts such as the 'adjacent possible'. Kauffman, a complexity theorist, defined this as the 'set of configurations, reachable from any configuration in one step' and that this 'plays a role in formalizations of the self-organization of biological and other complex systems'.<sup>2</sup> The notion of the 'adjacent possible' has been applied in areas as diverse as biology, physics, economics and innovation.<sup>3</sup>

It is relevant to the subject matter of this thesis to understand that what may be interpreted with hindsight as a path-dependent trajectory of development of a regime or development of the European Union could have been simply a sequence of adoption of next steps within the adjacent possible at each stage.

### **Regimes and Regime Theory**

It should be of little surprise that literature in the realm of international relations on the subject of international regimes reflects the diversity of theoretical approaches that have been used in the study of international relations since the Second World War. These range from realist state-centric approaches that are dismissive of international regimes exercising influence on the behaviour of states, to neoliberal approaches which interpret creation of regimes as a demonstration of self-interest and rational choice, to constructivist approaches that explain compliance through the lenses of norms and rule following.

One of the pioneers of 'Regime Theory', Stephen D Krasner, defined regimes as institutions consisting of:

implicit or explicit principles, norms, rules, and decision making procedures around which actors' expectations converge in a given area of international relations. Principles are beliefs of fact, causation, and rectitude. Norms are standards of behavior defined in terms of rights and obligations. Rules are specific prescriptions or proscriptions for action. Decision-making procedures are prevailing practices for making and implementing collective choice.<sup>4</sup>

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2. Stuart Kauffman and Lee Smolin, 'A possible solution to the problem of time in quantum cosmology', *Santa Fe Institute Working Paper no 97-03-020*, 5 March 1997, 15 pp, citing: Stuart Kauffman, 'Investigations on the character of autonomous agents and the worlds they mutually create', Santa Fe Institute preprint, 1996.
  3. The most recent application of this concept to innovation is: Steven Johnson, *Where Good Ideas Come From: The Natural History of Innovation*, (London: Allen Lane/Penguin, 2010), 336 pp.
  4. Stephen D Krasner (ed.), *International Regimes*, (Ithaca, NY: Cornell University Press, 1983), 372 + x pp at p 2; It is worthy of note that many commentators omit the words 'implicit or explicit'

This has become known as the ‘consensus definition’ notwithstanding that there is no consensus that this is the most appropriate definition but that there is simply a majority view.<sup>5</sup> While Krasner is credited with this definition, he himself acknowledges the prior work of others in this area. Nevertheless, for the purposes of discussion this will be referred to herein as the Krasner definition. The Krasner definition has been referred to as ‘classic and famously vague’.<sup>6</sup>

A second definition that is often referred to is that by Keohane in which he defines regimes as:

institutions with explicit rules, agreed upon by governments, that pertain to particular sets of issues in international relations.<sup>7</sup>

The Keohane definition is explicit in focusing on the actions of states. While the Krasner definition does not limit regime activity to states, the focus of the book it is quoted from is on state activities. It is noteworthy that there is some friction between Krasner and Keohane, the latter referring to the Krasner definition as ‘a collective definition, worked out at a conference on the subject’.<sup>8</sup>

Notwithstanding that many analysts distinguish between principles, norms and rules in relation to the Krasner definition, Keohane calls this a ‘false dichotomy’ and elaborates on this point by pointing out:

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from the beginning of the quote when using this definition. See, for example, Hasenclever, et al., 1996.

5. While many academics use the term ‘consensus’ to mean a large majority, the term is used in international diplomacy to mean a lack of dissension — a criterion that the Krasner definition certainly does not fulfil. It should be noted further that while lack of dissension is very similar to unanimity in favour, there are subtle differences which users of the term should be aware of, especially if a consensus document or consensus declaration is being referred to. Within EU circles, the term ‘unanimity’ includes situations in which abstentions are declared. In UN circles, a consensus would not normally be considered to have been achieved if there was any explicit expression of abstention.
6. Radoslav S Dimitrov, Detlef F Sprinz, Gerald M DiGiusto and Alexander Kelle, ‘International Nonregimes: A Research Agenda’, *International Studies Review*, vol 9, (2007), pp. 230–58.
7. Robert O Keohane, *International Institutions and State Power: Essays in International Relations Theory*, (Boulder: Westview Press, 1989), p. 4, , as cited in: Andreas Hasenclever, Peter Mayer and Volker Rittberger, ‘Theories of International Regimes’, *Cambridge Studies in International Relations*, (Cambridge: CUP, 1997), p 12.
8. Robert O Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*, (Princeton: Princeton University Press, 1984), p 57. It is also noteworthy that Keohane does not list Krasner in the acknowledgements to this book.

at the margin norms and rules cannot be sharply distinguished from each other [and] it is difficult if not impossible to tell the difference between an 'implicit rule' of broad significance and a well-understood, relatively specific operating principle.<sup>9</sup>

Some authors try to compare norms, or at least a subset of norms, with legally-binding rules.<sup>10</sup> This ambiguity has its uses in declaratory policies, but creates difficulties for analysis at a political level. Other authors have been more explicit and have attempted to draw out some of the distinctions while recognizing certain key similarities:

legally binding measures, of course, carry the greatest obligation: only legal norms need be treated as obligatory in international relations. Norms of a political or moral nature do not enjoy the same status ... However, the decisive factor is whether the provisions are perceived as binding; if they are, their formal status is of less importance.<sup>11</sup>

There will be situations within this thesis where distinctions between principles, rules and norms will be less significant than the common aspect they share which is that they form an obligation or expectation of some sort.

Outside of Regime Theory, there are many other uses of the term 'regime' in the literature. The major part of the variation in the use of the term derives from the adoption of this word that was already in more general use by certain authors who then used the term with a more specific meaning.<sup>12</sup> However, it would be erroneous to simply assume that the adoption of

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9. Robert O Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*, (Princeton: Princeton University Press, 1984), p 59.

10. Ethan A. Nadelmann, 'Global Prohibition Regimes: The Evolution of Norms in International Society', *International Organization*, vol 44, no 4, (Autumn 1990), pp 479-526.

11. Sverre Lodgaard, 'The building of confidence and security at the negotiations in Stockholm and Vienna', *World Armaments and Disarmament: SIPRI Yearbook 1986* (Stockholm/Oxford: Stockholm International Peace Research Institute/Oxford University Press, 1986), p 427.

12. For example, John Simpson, has defined the nuclear non-proliferation regime in the following terms: 'The measures put in place to deter the spread of nuclear weapons, more commonly known as the nuclear non-proliferation regime, comprise an integrated network of unilateral, bilateral, regional and multilateral treaties and other standard-setting arrangements. Collectively, these measures provide a comprehensive framework for the behaviour of states, international organizations and other actors in the nuclear area. These measures constitute a global regime which has been evolving since the end of the Second World War.' Emily Bailey, Richard Guthrie, Darryl Howlett and John Simpson, 'Volume I: The Evolution of the Nuclear Non-Proliferation Regime' (Sixth Edition), *PPNN Briefing Book*, Programme for Promoting Nuclear Non-Proliferation, March 2000, p 3. Other researchers dealing with WMD control issues have a broad interpretation of the term 'regime': 'Despite the discrimination inherent in the [nuclear] non-proliferation regime, it thus serves the security objectives of all states that desire peace. This assessment can be sustained only if — *within the framework of the regime* — leading parties take effective steps to foster peaceful resolution of conflicts in trouble-prone regions and to contain and reverse arms races, not only between the industrialized states but also between antagonists in the South.' [emphasis added] Harald Müller, David Fischer and Wolfgang Kötter, *Nuclear Non-Proliferation and Global Order*, (Stockholm/Oxford: SIPRI/OUP, 1994), p 9. A note within the book states that Harald Müller was the lead author of the chapter this quote was taken

this sort of term from the general to the specific means that the specific suggested definition is locked into place with no possibility of other interpretations. In addition there has been somewhat loose further use of the term in other forms such as ‘verification regime’.

While both the Krasner and the Keohane definition define regimes as institutions, it is important to note that there is a distinction between international institutions and international organizations. While organizations would fall within the Keohane definition of regimes, they are generally regarded as being outwith the Krasner definition. However, international organizations may in their own right be valuable contributors to international regimes that they are part of — for example, the OPCW in the regime to control chemical weapons.

The field of study of international institutions has itself been known as ‘International organization’ and the journal of that name has been a key focal point of this field.<sup>13</sup> It is in this journal that many of the early articles on Regime Theory were published, including versions of most of the chapters of the Krasner 1983 book.<sup>14</sup>

It is important to note that Regime Theory is not the only suggestion offered to explain the observed phenomena. Buzan notes that Regime Theory stands in contrast to the Rationalist/Grotianist/International Society research strand of the English School.<sup>15</sup>

### **The origins of and impetus behind Regime Theory**

The impetus behind the initial work on defining regimes was in a particular subject area:

The original normative concern ... was a desire to understand the consequences for the international economic order of a relative decline in American dominance.<sup>16</sup>

With this economic aspect in relation to a particular country as the focus, it is immediately apparent why many of the early papers on Regime Theory were published in the United States. However, as the application of this theory was broadened, the literature on the theory

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from.

13. See, for example, J Martin Rochester, ‘The Rise and Fall of International Organization as a Field of Study’, *International Organization*, vol 40, no 4, (Autumn 1986), p 777-813.
14. The chapters appear in the vol 36, no 2, (Spring 1982) edition of the journal.
15. Barry Buzan, ‘The English School: an underexploited resource in IR’, *Review of International Studies*, vol 27, no 3, (July 2001), p 475.
16. Marc A. Levy, Oran R. Young and Michael Zürn, ‘The Study of International Regimes’, *European Journal of International Relations*, 1995, vol 1, no 3, pp. 267–330.

derived from a more diverse body of authors. A few early authors also tackled regimes outside predominantly economic areas.<sup>17</sup>

The economic basis of development of Regime Theory was made explicit by Keohane who noted 'my study focuses on relations among the advanced market-economy countries'.<sup>18</sup> However, politics and economics are inextricably linked and the possibility of separation of anything that is purely economic from anything that is purely political is rare.

It would be an error to assume that there is a single 'Regime Theory', although many authors equate Keohane's 1989 contractualist (or functional) theory<sup>19</sup> that has become known as 'neoliberal institutionalism' with the term.<sup>20</sup>

Other analysts view the study of regimes to be 'regime analysis' rather than an area of study based on a coherent body of 'regime theory':

Regime analysis as such is not a full-fledged theory, but rather a conceptual framework that needs to be 'filled' with theories. Most studies on international regimes have indeed made use of several types of social science theories, in particular, structural approaches (e.g. hegemonic stability theory), game theory, public choice theory, functional theory and cognitive approaches. In line with what we said before, none of these theories should a priori be regarded as superior. Every theory has particular strengths and weaknesses in terms of selecting, organizing and relating the information we observe in reality.<sup>21</sup>

### **Critiques of Regime Theory**

A number of critiques of Regime Theory are presented here which challenge assumptions about regime types, the limitations of state centredness and the difficulty of analysing single elements in a complex international system.

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17. See, for example, Ernst B Haas, 'Is there a Hole in the Whole? Knowledge, Technology, Interdependence, and the Construction of International Regimes', *International Organization*, vol 29, no 3, (Summer 1975), [special edition: *International Responses to Technology*], pp 827-76.
  18. Robert O Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*, (Princeton: Princeton University Press, 1984), p 6. Also worth noting from the same page ... 'I begin with the premise that even where common interests exist, cooperation often fails'.
  19. Robert Keohane, *International Institutions and State Power: Essays in International Relations*, (Boulder, CO: Westview Press, 1989).
  20. Andreas Hasenclever, Peter Mayer and Volker Rittberger, 'Theories of International Regimes', *Cambridge Studies in International Relations*, (Cambridge: CUP, 1997), 248 + x pp at p 28.
  21. Thomas Bernauer, *The chemistry of regime formation*, Geneva: United Nations Institute for Disarmament Research, 1993), p 10.

Critiques relating to measures of effectiveness are provided within the discussion of regime effectiveness that appears later in this chapter.

### **General critique**

The creation of a body of theory relating to regimes was not universally supported. The classic general critique of Regime Theory was provided by Susan Strange in 1982.<sup>22</sup> She noted criticisms on five counts:

first, that the study of regimes is, for the most part a fad, one of those shifts of fashion not too difficult to explain as a temporary reaction to events in the real world but in itself making little in the way of a long-term contribution to knowledge. Second, it is imprecise and woolly. Third, it is value-biased, as dangerous as loaded dice. Fourth, it distorts by overemphasizing the static and underemphasizing the dynamic element of change in world politics. And fifth, it is narrowminded, rooted in a state-centric paradigm that limits vision of a wider reality.

It should be noted that the use of the term 'paradigm' in this context is itself 'imprecise and woolly'. It is also possible to note that if Regime Theory were 'for the most part a fad' it would be unlikely to be being debated in such detail some 30 years later.

Other commentators also found the concept of regimes insufficiently specific:

In fact the regime concept, as used by adepts of this approach, has never been clearly defined ... Definitions of the concept cover a mixed bag of subjects reflecting different meanings.<sup>23</sup>

Not only are these definitions of regimes criticised, but the fact that there are many other definitions in use has been commented upon. One of the contributors to the Krasner edited volume started his contribution with the following words:

Grappling with the problem of trying to describe and explain patterns of order in the anarchic world of international politics, scholars have fallen into using the term 'regime' so disparately and with such little precision that it ranges from an umbrella for all international relations to little more than a synonym for international organizations.<sup>24</sup>

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22. Susan Strange, 'Cave! Hic Dragones: A Critique of Regime Analysis' which appears in: *International Organization*, vol 36, no 2, (Spring 1982), pp 479-96 and Stephen D Krasner (ed.), *International Regimes*, (Ithaca, NY: Cornell University Press, 1983), pp 337-54.
  23. Pierre de Senarclens, 'Regime Theory and the Study of International Organizations, *International Social Science Journal*, vol 45, no 4, pp. 453-62. [*as quoted in Levy et al ... year?\**]
  24. Arthur A Stein, 'Coordination and Collaboration: regimes in an anarchic world', in Stephen D Krasner (ed.), *International Regimes*, (Ithaca, NY: Cornell University Press, 1983), p 115.

Other scholars have felt that bringing forward definitions for regimes had brought about more confusion than clarification:

Despite attempts to clarify the concept, confusion reigns. What used to be simple, commonly understood distinctions between order and disorder, cooperation and conflict, and international institutions and international behavior have become blurred from prolonged exposure to deep scholarly rumination.<sup>25</sup>

Realists have criticised the emphasis on regimes/institutions and perhaps the most cited realist critique of regimes is that of Mearsheimer on the realist belief that international institutions have 'minimal influence on state behavior'<sup>26</sup> and that 'Institutions are not a form of world government. States themselves must choose to obey the rules they created'.<sup>27</sup>

It is worth noting that realists from the days of EH Carr have stressed the limitations of international institutions.<sup>28</sup> Those realists that do take issues of international cooperation seriously argue that issues of power and of direct benefits to states are uppermost in regime formation where the world view is of a zero-sum game. This followed directly from the views of Kenneth Waltz who suggested the distribution of material capabilities within the international system of states was key to shaping any international order.<sup>29</sup> To Waltz, the primary ordering principle in the international system is power, rather than international law or international institutions.<sup>30</sup>

From this realist perspective, perceived direct benefits from regimes are more important than any contributions that norms provide. The neoliberalist and constructivist perspectives have the role of norms at the core of their understandings of regimes. However, questions of power still have a role to play:

Neoliberals readily concede that cooperation is affected by power relationships, but argue that constellations of interests (which are not readily reduced to configurations of

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25. J Martin Rochester, 'The Rise and Fall of International Organization as a Field of Study', *International Organization*, vol 40, no 4, (Autumn 1986), p 800.

26. John J Mearsheimer, 'The False Promise of International Institutions', *International Security*, vol 19, no 3 (Winter 1994-1995), p 7.

27. John J Mearsheimer, 'The False Promise of International Institutions', *International Security*, vol 19, no 3 (Winter 1994-1995), p 9.

28. This point is inserted in order to recognise what so much of the literature says, even though the point is fundamentally in error. If it were correct, there would have been no individuals with a realist perspective in the 1920s (i.e., before Carr) who might have questioned the collective abilities of the League of Nations, for example.

29. Kenneth N Waltz, *Theory of International Politics* (New York: Random House, 1979), pp 97-99.

30. Kenneth N Waltz, *Theory of International Politics* (New York: Random House, 1979), pp 97.

power) and prevailing expectations — which, in turn, are strongly influenced by the presence and content of international institutions — are at least as important.<sup>31</sup>

Nonetheless, norms and the regimes built around them are only as potent as the perception of their importance by those who might be influenced by them. When norms come into direct contest with issues of national interest, political forces come into play that are often beyond the theories espoused in the study of international relations other than the most basic tenets of realism. An example of this is the Bush Administration rejection of certain norms as hindering national security interests in the early part of the 21st century.

One of the difficulties of power-based analysis of regimes is that this is often accompanied by an assumption that governments operate as unified entities. Indeed, this is rarely the case:

Most governments are not, in fact, the equivalent of a single individual with a single purpose and the ability to control completely the government's actions. Rather, each government consists of numerous individuals, many of them working in large organizations. Constrained, to be sure, by the shared images of their society, those individuals nevertheless have very different interests and priorities, and they are concerned with very different questions. Many of them are preoccupied by events at home and deal with events abroad only as these events interact with and affect their ability to pursue their interests at home. Others are concerned directly with what happens abroad but do not agree on what should be done. At any one time a government is concerned with countless issues and problems at home and abroad.<sup>32</sup>

The liberal perspective is a counterpoint to this, as societies within countries are understood to be comprised of individuals and privately constituted groups which seek to promote their independent interests. By this understanding, a government should reflect the interests of the society from which it derives (or from a segment of that society) and these interests will be further reflected in the international behaviour of states.

Indeed, this relates to one of the fundamental difficulties with Regime Theory in some areas of application — the assumption that cooperation has to be enhanced in an anarchic world of states, where states are fundamentally rivals.

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31. Andreas Hasenclever, Peter Mayer and Volker Rittberger, 'Theories of International Regimes', *Cambridge Studies in International Relations*, (Cambridge: CUP, 1997), 248 + x pp at p 23.

32. Morton H Halperin and Priscilla A Clapp with Arnold Kanter, *Bureaucratic Politics and Foreign Policy*, (Washington DC: Brookings Institution Press, 2006; 2nd edition), p 362.

### ***Assumptions about regime types***

Does Regime Theory equally apply to all forms of regime, and if it does not, can the theory underpin equally valid understandings to these different types of regime?

To take an example to illustrate this point, imagine that there is “Motor Vehicle Theory” that suggests that to be a motor vehicle, an item must have particular defining characteristics — say, wheels, a mechanical method of propulsion, a method of steering. This might be the starting point for much literature about motor vehicles. However, understanding whether a particular motor vehicle is capable of being used to move two boxes from one place to another is not enhanced by discussion under motor vehicle theory of how well colour coordinated the interior is; nor by discussion of whether the occupants have comfortable seats or other aspects that might relate to enjoyment of the ride.

To extend this analogy, how far could the same body of writings be applied to a sports car and a 7.5 tonne lorry? Is it correct to assume equivalence or similarity between the regime relating to behaviour in open waters, centred on the Law of the Sea Convention, with that relating to control of biological weapons? That the concept of regimes has been stretched to include a wide variety of disparate international activities has been recognised:

For the international organization field, the concept of regime has meant almost intellectual chaos. The problem is that the term has been stretched to embrace everything from a patterned set of interactions (an international system), to any form of multilateral coordination, cooperation, or collaboration (provision of collective goods), to formal rules (international law), to formal machinery (international organization).<sup>33</sup>

Ruggie recognised in 1975 that not all regimes were similar. He identified three purposes for regimes: ‘Acquiring a capability’, ‘Making effective use of a capability’ and ‘Coping with consequences of use of a capability’. Alongside this, he identified four ‘instrumentalities’ relating to the relationship between a regime and national behaviour: ‘A Common Framework for national behavio[u]r’, ‘A joint facility coordinating national behavio[u]r’, ‘A common policy integrating national behavio[u]r’ and ‘A common policy substituted for independent national behavio[u]r’.<sup>34</sup>

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33. J Martin Rochester, ‘The Rise and Fall of International Organization as a Field of Study’, *International Organization*, vol 40, no 4, (Autumn 1986), p 800.

34. John Gerard Ruggie, ‘International Responses to Technology: Concepts and Trends’, *International Organization*, vol 29, no 3, [special edition on: *International Responses to Technology*] (Summer

Keohane overtly stated that his study was on international regimes relating to money, trade and oil.<sup>35</sup> There appears to be no evidential basis for an assumption that an international technology control/arms control regime such as that to control biological weapons should share key characteristics with regimes in these areas.

### ***State centredness***

While the Krasner consensus definition contains no reference as to whether the actors need be governments or even to have any official authority, by defining regimes in terms of decision-making procedures Krasner, perhaps inadvertently, introduces a circular argument which results in analysis using this definition being focused on states — as, under this definition, participants in a regime must have some form of authority to adopt decisions.

The introduction of consideration of decision-making procedures, requires that regimes become a matter of policy for the actors. Combined with the reference within the definition to ‘a given area of international relations’ means policy has to be made by the actors within the regime and this can therefore only be done at a level of governance. This assumption of policy being made at a high level can, wittingly or unwittingly, lead to lack of attention to contributions to the regime at a lower level.

Some analysts have noted that Regime Theory derives much of its analytical bite through focus on states as unified rational actors.<sup>36</sup> Other analysts note the difficulty of treating states as rational actors. As noted earlier (see page B-10), governments are not like individual people and do not instantaneously acquire a unified perspective on any issue. Therefore it is not possible to apply rational actor model analysis to governments as a whole. Indeed:

The rational actor model simplifies and obscures the persistently neglected fact of bureaucracy as the ‘maker’ of government policy is not one calculating decision-maker, but rather a conglomerate of large organizations and political actors who differ substantially about what their government should do on an particular issue and who compete in attempting to affect both governmental decisions and the actions of their government.<sup>37</sup>

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1975), pp 557-83, see in particular the table at p 572.

35. Robert O Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*, (Princeton: Princeton University Press, 1984), p 15.

36. Lisa L. Martin and Beth A. Simmons, ‘Theories and Empirical Studies of International Institutions’, *International Organization*, vol 52, no 4, (Autumn,1998) [special edition: *International Organization at Fifty: Exploration and Contestation in the Study of World Politics*], p 738.

The state-centred nature of Regime Theory has meant some analysts have questioned its applicability to a regime such as that to control biological weapons:

Whether the framework of regime analysis is still adequate to conceptualize and understand this plethora of activity [within the regime to control biological weapons] is debatable. Although regime analysis was, in part, intended as a shift away from realist conceptions of international relations with its acknowledgement of normative factors and of the influence of domestic politics on state behaviour, regime analysis is still a largely state-centred framework. However, the biological weapons problem is no longer (if, indeed, it ever was) one that is solely confined to or manageable by states.<sup>38</sup>

### ***Non-equality of states***

Within most analysis of regimes, and in particular the behaviourist model of regimes, there has to be expectations by actors within a system of the behaviour of others; but are all actors equal? There may be obvious economic and political differences between states, yet the differences run deeper and have far more subtle effects. To take an example, would an assurance by a state about enactment of technology controls under the aegis of an international regime be perceived the same no matter which state gives it? To extend this example further, would the reaction by officials in most countries be the same to an identical statement that might be given in the names of Iran, Kiribati or Switzerland?

As cited earlier, Keohane notes 'my study focuses on relations among the advanced market-economy countries', (see page B-7). Clearly relations between market-economy and non-market-economy countries might be somewhat different. This market-economy focus is prevalent in writing on Regime Theory.

### ***One element in a complex system***

A particular issue in a situation such as the regime to control biological weapons is that it exists in a broader context. For example, the negotiations on the Biological Weapons Convention were heavily influenced by factors relating to nuclear weapons, in the form of the SALT negotiations, and to chemical weapons, and in particular their transport across the United

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37. Graham T Allison and Morton H Halperin, 'Bureaucratic Politics: A Paradigm and Some Policy Implications', *World Politics*, vol 24 (Spring 1972), pp 40-79 at 42.

38. Daniel Feakes, Brian Rappert and Caitriona McLeish, 'Introduction: A Web of Prevention?', in: Brian Rappert and Caitriona McLeish (eds.), *A Web of Prevention: Biological Weapons, Life Sciences and the Governance of Research*, (London: Earthscan, 2007), pp 1-13 at p 7.

States. It follows that if an analysis of the development of the regime to control biological weapons during the period 1968-72 did not take these factors into account it would not be able to adequately explain how events unfolded. Nonetheless, there exists, even in respected academic literature, a number of myths about the Nixon Administration's renunciation of biological weapons.

Although most analysts recognise broader contexts that regimes sit within, Regime Theory can fail to take account of such wider political situations which can contain many influences that are not directly related to a regime but which may impinge upon it. This is a consequence of developing parsimonious theory and need not be a failing so long as application of Regime Theory in any particular circumstance takes these broader contexts into account.

### **General Regime Theory conclusions**

The study of regimes is not contiguous with Regime Theory, yet Regime Theory has come to influence much of the scholarly analysis of regimes. While there is no single Regime Theory, there are common threads.

Regime Theory covers a diversity of regime types — including those that cover international finance, trade, oil, security through military cooperation as well as security through control of materials and technologies. Each of these issue areas has unique characteristics and this diversity of issues, purposes and instrumentalities are too broad for a general theory to apply in all cases. Key variations mean that understandings that might be valid in one flavour of regime, such as one relating to economic cooperation, may not apply in another, such as technology control or arms control.

A key question remains regarding evaluating regime effectiveness. If a problem such as the threats and risks associated with hostile uses of the life sciences is to be tackled through regime activities then a more nuanced understanding of effectiveness is required in order to assist development of better policies and activities under the auspices of the regime.

### **Understanding effectiveness of regimes**

In the early development of Regime Theory, the focus of understanding of the effectiveness of a regime was on how it affected the interaction of the states involved. For example, some of

the most respected promoters of Regime Theory note that measures of effectiveness should include evaluation of the purposes of a regime, but that:

The most fundamental and most widely discussed of these purposes is the enhancement of the ability of states to cooperate in the issue area.<sup>39</sup>

Within the realm of Regime Theory, there is no consensus on what effectiveness is. An early example deriving from hegemonic stability theory posits that a regime is effective if it results in cooperative behaviour among the participants that they would have been unlikely to have carried out if the regime had not existed. However, this can be very difficult to test except in specific circumstances that occur by chance or by exploration through counterfactuals. Moreover, in the period of this case study, the supposed hegemon, the United States, was at odds on key policy issues with many of the other BWC States Parties.

A further consideration is that there is a difficulty in defining precisely what an effect is:

When regimes analysts looked for effects, these were understood to be outcomes influenced by a constellation of rules rather than just tasks performed by a collective international agency.<sup>40</sup>

Within the remit of Regime Theory, there is much written about the defining characteristics of a regime, much about how participants operate or act together within a regime and some about what the situation might be if there wasn't a particular regime in place. However there is relatively little written about the level of effectiveness of the type of regime being examined in this thesis in achieving the principles for which it was established. A clear example of where measures of effectiveness are important would be the international efforts to eradicate smallpox or polio. While cooperation and interaction between the major players are key aspects of whether the eradication effort succeeds, the most significant measure of success/failure in such a regime would be the numbers of cases of infections that occur in each year of the continuing effort.<sup>41</sup>

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39. Andreas Hasenclever, Peter Mayer and Volker Rittberger, 'Theories of International Regimes', *Cambridge Studies in International Relations*, (Cambridge: CUP, 1997), 248 + x pp at p 2.

40. Lisa L. Martin and Beth A. Simmons, 'Theories and Empirical Studies of International Institutions', *International Organization*, vol 52, no 4, (Autumn, 1998) [special edition: *International Organization at Fifty: Exploration and Contestation in the Study of World Politics*], p 737.

41. More extreme examples could be cited to make this point even stronger. Imagine a regime to stop the tides; a Convention to Nullify Unwanted Tidalflows (CNUT), for example. Would the simple fact that CNUT could not stop the tides have any impact on whether this regime should

A new direction in trying to come to terms with questions of effectiveness was attempted in the environmental arena in the 1990s by a research team headed by Oran Young. Young's approach can be distinguished from much that had been written before.<sup>42</sup>

Young's team recognized that effectiveness could be approached in five separate ways; none of which might be expected to provide a complete answer in evaluating effectiveness in any particular circumstance. The five approaches are:

- problem-solving, which might be summarised by the question: how far does the regime assist in alleviating the problem?
- legal, how well are contractual obligations met?
- economic, is the regime efficient?
- normative, are the embedded norms being absorbed?
- political, does the process of regime activity improve the political situation?

Each of these approaches has its own advantages and limitations, many of which are recognized by the members of Young's team. Aspects of these approaches contribute to the analysis later in this chapter and in Chapter 4.

### ***Escaping circular arguments***

Measures of effectiveness are hampered by one of the circular arguments involved within the definitions of regimes. By defining a regime as an entity that contains rules, if any participant were no longer to be in compliance with the rules, that participant would no longer be a member of the regime and therefore the regime remains effective. This circular logic is implicitly recited by Hasenclever et al. who, acknowledging the writings of Nollkaemper,<sup>43</sup> note:

if the 'effectiveness' of a rule is defined technically as the extent to which the behavio[u]r of those subject to the rule conforms to it, the rules of regimes, by definition, are not ineffective.<sup>44</sup>

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be considered a success or failure and the only measure should be if there happened to be close participation amongst those involved? How about a regime to control pink elephants?

42. Oran R Young, *The Effectiveness of International Environmental Regimes: Causal Connections and Behavioural Mechanisms*, (Cambridge, MA: MIT Press, 1999), 326 + xiv pp.

43. The reference cited by Hasenclever et al. was: André Nollkaemper, 'On the Effectiveness of International Rules', *Acta Politica*, vol 27, (1992), pp49-70 at p 49.

44. Andreas Hasenclever, Peter Mayer and Volker Rittberger, 'Theories of International Regimes',

This may be perfectly acceptable logic for a regime relating to trade, for example, where non-participants may be essentially irrelevant to the regime. However, for a regime where global security is involved, this logic does not work as a reference point for effectiveness.

***Distinguishing between the ‘overall regime’ and the ‘disaggregated regime’***

In order to come to any form of assessment of a regime, a substantive question that has to be resolved is what is meant by a regime.

For the purposes of this thesis, the two key possible interpretations of what a regime is are as follows:

- the regime in totality, including all national, sub-national, multinational and supranational contributions, irrespective of the motivation or derivation of the contributions (referred to here as the ‘overall regime’);
- the co-operative elements of the *overall regime* without including contributions to the *overall regime* that would have taken place if the regime had not existed. (referred to here as the ‘disaggregated regime’).

There are clearly a number of methodological concerns dealing with evaluating either the *overall regime* or the *disaggregated regime* in any particular issue area, most notably in disaggregation from the overall. These will be discussed with other methodological issues in relation to the research questions (see pages B-40–43).

Clearly, the *overall regime* is better for assessment of what Young and his team refer to as ‘problem solving’ effectiveness while the *disaggregated regime* is better for theorists wishing to assess the contributions of regimes over what might have happened if they had not existed. The *disaggregated regime*, is essentially equivalent to the dependent variable in most Regime Theory studies.

There is an underlying question that will need to be resolved during the work of this thesis, does an understanding of effectiveness of the *disaggregated regime* have any value other than for satisfying academic curiosity if there is no understanding of the effectiveness of the *overall regime*?

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*Cambridge Studies in International Relations*, (Cambridge: CUP, 1997), 248 + x pp at p 15.

### ***Effectiveness vs Regime Theory***

It is perfectly possible for a regime to be evaluated for its success in one aspect or another without Regime Theory being invoked, as was done before Regime Theory itself was developed.<sup>45</sup>

Neither effectiveness nor cooperative behaviour are simply on-off activities. As well as any new participant engaging in cooperative behaviour, increased cooperative behaviour by an existing participant would increase effectiveness of the regime by this measure. But how should cooperative behaviour itself be measured? One aspect of cooperative behaviour within a regime that included controls on technologies might be a national export control arrangement — but are all export control arrangements equal, or does an export control arrangement that has a greater probability of preventing an export that would be against the principle of the regime be considered to constitute a greater level of cooperative behaviour?

The opposite of this argument provides a clearer answer. If a regime can only exist in one of two states ‘effective’ or ‘not effective’ without any gradation of these states, then a regime with 100 participants but only 1 that had engaged in any form of cooperative behaviour that they would not have engaged in were it not for the regime would be considered equal to a regime in which all 100 had engaged in new behaviour. To anyone interested in analysis of regimes in order to understand what would make better policy to achieve aims and objectives that might be encompassed within the principles and norms of regimes this would be an absurd proposition.

Hence, a distinction between the concepts of *overall regime* and *disaggregated regime* has particular importance in the evaluation of regimes.

### ***Differences between regimes***

The difficulties of applying understandings deriving from regimes in one issue area to regimes in a second issue area was explored in the section on critiques of Regime Theory above. These argument also apply to issues relating to effectiveness.

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45. See, for example, Inis L. Claude jr, ‘Collective Legitimization as a Political Function of the United Nations’, *International Organization*, vol 20, no 3 (Summer 1966), pp 367-79.

One problem in some of the literature is that questions are too generalised — for example, some analysts pose a simple question ‘are regimes effective?’

This question has direct parallels with the question ‘are laws effective?’ To test this question, would it be considered valid to study compliance with laws relating to road traffic, for example, and then presume the results would be valid for crimes of violence? In simple terms, would knowledge of levels of compliance with laws on speeding provide any evidence for understanding compliance with laws on murder?

This is not to say that analytical tools to assess one regime or one law could not be used to analyse another successfully, but simply that it is not possible to presume that the results from a regime (or group of regimes) in one area, such as trade, could be applied to a regime (or group of regimes) in another area, such as security, unless detailed analysis of the circumstances has been made.

### **Assessment of effectiveness of regimes**

In order to develop understandings of how assessment of regimes could be improved,

Underdal proposed three questions:

- (i) What precisely constitutes the object to be evaluated?
- (ii) Against which standard is the object to be evaluated?
- (iii) How do we operationally go about comparing the object to our standard?<sup>46</sup>

These three questions have been much cited, but essentially boil down a common system of assessment that exists in a wide variety of circumstances — from an identified starting point, identify the best-case scenario that might have been possible then attempt to identify what progress has been made towards this scenario. It is, perhaps, an illustration of the paucity of ideas in this field that these three questions are cited so often.

The baseline, end point and the real-life situation can be used in measuring systems in a number of ways. How far has progress been made from the baseline? What progress towards the end point is needed? Is the real-life situation closer to the baseline or the end point?

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46. Arild Underdal, ‘The Concept of Regime “Effectiveness”’, *Cooperation and Conflict*, vol 27, no 3, 1992, pp 227-40.

The method within the study of regimes that has become predominant for using this technique of assessment has become known as the ‘Oslo-Potsdam solution’ and is essentially an effort to quantify a baseline and an idealised end-point and to compare these with the situation in real life.

However, not all aspects of effectiveness are directly measurable. In a case such as that of the regime to control biological weapons, the effectiveness of the *overall regime* may be contested as it is not possible to determine with absolute certainty how many efforts to acquire such weapons may be being carried out in a covert manner.<sup>47</sup>

### ***Creating a baseline for assessment***

Any assessment requires a baseline — that is the point at which progress (or otherwise) is measured from. However, such a baseline does not have to be at the start of a regime. Indeed, an assessment of effectiveness could be from one particular moment to another — has regime *X* been effective from time *A* to time *B* or after a particular event; or has the level of effectiveness increased or decreased over the relevant period?

In evaluating effectiveness of either an *overall regime* or a *disaggregated regime*, the most extreme comparison that can be made is that of the situation in which no regime exists.

Three distinct methodologies have been brought forward to promulgate a baseline assessment: before and after snapshots; counterfactuals; and regimes covering only part of a jurisdiction.

### ***Before and after snapshots***

A popular way of attempting to create a baseline is to examine the situation before a regime was in place. In the case of regimes this can be difficult to isolate a situation in which a regime does not exist for the simple reason that if there is a policy concern that an issue has to be tackled, it is likely that those policy making bodies would already be doing some activity in the issue area. This makes it hard to establish a baseline for comparison. Moreover, it may be that

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47. Even if the Biological Weapons Convention were to have universal membership and a set of comprehensive verification arrangements, there would still be no absolute guarantee that no covert acquisition efforts were taking place.

many states could have been giving consideration to some form of activity in the issue area for which there is the prospect of a regime being created but have not yet acted in anticipation that a regime may be created. Such hesitation in action is especially prominent in issue areas where legislation requiring definitions is needed in implementing policy or where the same government department has competing policy priorities.<sup>48</sup> Getting a slot in a legislative calendar can be difficult and no government department would wish to introduce two sets of legislation on the same topic within only a few years of each other if such a situation can be avoided. As noted by a former Director of the Geneva Branch of the United Nations Department for Disarmament Affairs, writing about why some Pacific island countries had not joined the BWC:

It must be remembered, however, that in these small countries the resources required to get the legislation onto the legislative calendar are competing intensely for the attention of their governments with other formal measures.<sup>49</sup>

To create a hypothetical example to illustrate the point, suppose there is a growing concern in a number of countries that there should be some form of collective action relating to the global trade in 'widgets'. In most of these countries, policy on the trade in widgets may not have been fully developed, not least because each country perceives a benefit in having, for example, a common definition of what a widget is that has not yet been reached. If no regime is established, for whatever reason, most of these countries will adopt a policy on widget trade in any case. Any before and after analysis of any international regime on widget trade may possibly over-estimate the effectiveness of the regime in encouraging policy adoption as the motivations for action existed prior to the regime being formed. Nevertheless, such an analysis would correctly identify the effect of the regime in promoting common standards.

These arguments also apply to situations where some states are outside of a regime, as the regime may influence behaviour of states not within it.

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48. The presentation to Parliament of the UK implementing legislation for the Chemical Weapons Convention was alleged to have been delayed from its original suggested dates by the Secretary of State because, as the Royal Society of Chemistry put it: 'Post Office privatisation is more important, in his view', [No author listed], 'Heseltine drags feet on CWC', *Chemistry in Britain*, September 1994, p 695.

49. Tim Caughley, 'Pacific Islands', in: BioWeapons Prevention Project, *Building a Global Ban: Why States Have Not Joined the BWC*, April 2009, pp 17-19 at p 17.

### *Counterfactuals*

A second popular way of attempting to create a baseline is to carry out a thought experiment to create an estimate of what the situation would have been if a regime had not existed. This concept is referred to within the Oslo-Potsdam solution as the ‘non-regime counterfactual’ or ‘NR’.

The limitations of analysis of regimes through counterfactuals have been long recognised:

Regime analysis has suffered from conceptual problems with the dependent variable; that is, the outcome to be explained. Firstly, the definition of the dependent variable — usually related to regime formation, regime change, regime decline, or regime effects — tends to be unclear in many studies. One of the reasons for this circumstance is that many inquiries are preoccupied with theoretical aspects of regime analysis and provide only selective empirical evidence to support their hypotheses and assumptions. ... in cases where the dependent variable is well defined, it is often oversimplified, for example dichotomized as the existence or non-existence of an international regime in a particular issue-area.<sup>50</sup>

Indeed, the usefulness of the comparison of the no-regime counterfactual has itself been questioned:

The no-regime counterfactual does not suffice as the only evaluative criteria because it gives only a very vague indication of how well a regime serves the purpose it has been designed for.<sup>51</sup>

The greatest limitation of counterfactuals is that their use relies on judgement. A judgement is, when all is said and done, no more or less than a guess — albeit an educated guess. This element of guesswork creates large possibilities for error margins in any baseline for assessment.

When a short timescale is chosen for assessment, such as two or three years, the errors that might be introduced through counterfactuals can be kept to a minimum. When counterfactuals are used to assess a situation that continues over a number of decades greater errors can be introduced.

International relations are an accumulation of non-linear processes and are therefore essentially chaotic. This means that a small change in initial conditions can lead to significant

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50. Thomas Bernauer, *The chemistry of regime formation*, United Nations Institute for Disarmament Research/Dartmouth Publishing, (1993), p 77.

51. Carsten Helm and Detlef Sprinz, ‘Measuring the Effectiveness of International Environmental Regimes’, *Journal of Conflict Resolution*, vol 44, no 5, October 2000, pp 630-52 at 634.

changes to the outcome. This is recognised by analysts of regimes, and in particular the Nash equilibrium<sup>52</sup> that is often used as a no regime counterfactual:

the Nash equilibrium is not always robust against small changes in the assumptions about the model's parameters. In fact, even minor changes in the assumptions can sometimes make a substantial difference to the conclusions.<sup>53</sup>

A common error in counterfactuals relating to the regime to control biological weapons is to assume that if the conditions had not existed to bring the negotiations for the Biological Weapons Convention to a successful conclusion in 1971 then there would have been no BWC. This disregards the possibility that conditions might have been conducive some years later.

#### *Regimes covering only part of a jurisdiction*

One approach that formed a baseline for work by the team lead by Oran Young was to examine the impact of an air pollution regime on the USSR as the Long-Range Transboundary Air Pollution (LRTAP) Convention only applied west of the Urals in that country.<sup>54</sup> However, while this might be superficially attractive, the team makes no reference to the system of governance by decree that existed in that country at the time and the greater complications of running such a system in circumstances in which different standards were applying in separate parts of the country. This would tend to reduce the variation in national policy between the two areas. Indeed, as Young's team acknowledges, a major part of the reduction in the European area was achieved by moving some of the most polluting activities east of the Urals.

Should two regimes be considered to be equally effective if both reduce the problem or issue the regime is designed to counter by an equal amount, but one achieves the reduction absolutely and the other achieves it by simply transferring the problem from one place to another?

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52. A Nash equilibrium is arrived at when each player's strategy is a best reply to the strategies of the other players. This usually assumes that there is no cooperative behaviour between the players. There is normally more than one Nash equilibrium possible for any individual set of circumstances.

53. Jon Hovi, Detlef F Sprinz and Arild Underdal, 'The Oslo-Potsdam Solution to Measuring Regime Effectiveness: Critique, Response, and the Road Ahead', *Global Environmental Politics*, vol 3, no 3, August 2003, pp 74-96 at 86-87.

54. Oran R Young, *The Effectiveness of International Environmental Regimes: Causal Connections and Behavioural Mechanisms*, (Cambridge, MA: MIT Press, 1999), 326 + xiv pp at pp 189-90.

### ***Defining an end point for assessment***

In any system of assessment there is a requirement to have a benchmark of what could have been achieved in order to measure real progress against it. However, should such an end point be placed realistically, taking into consideration broader political and economic contexts as examples, or should it be based on what could have happened in an idealised world?

The problem of where to place the end point, and the problems of pragmatism over idealism is summarized by Underdal in the following terms:

it may be argued that the concern with regime effectiveness provides no role for some purely hypothetical frontier that is not generally achievable given the institutional constraints under which actors *actually* operate. To qualify as 'potential', a solution must be accessible within the kinds of setting that do in fact exist or can feasibly be brought about.<sup>55</sup>

There may be circumstances in which it is more realistic to evaluate a regime against a pragmatic end point rather than an idealised end point.

### ***Idealised end point issues***

The idealised end point may be conceptualised in a number of ways. This concept is referred to within the Oslo-Potsdam solution as the 'collective optimum' or 'CO'.

However, what constitutes the idealised end point is not easily defineable, except in limited cases. For example, for a regime relating to reducing emissions of particular substances an idealised end point might simply be taken as zero; but there could be certain uses for such substances that might not have significant negative impacts but which bring particular benefits. Indeed, this is why many agreements only include partial reductions as a practically achievable objective. However, in the real world such clear-cut cases are rare, especially as many regimes have more than one principle, norm or rule that has to be considered in evaluation of effectiveness.

If the objectives or goals of any particular policy process, whether an international regime or in domestic politics, are then influenced by questions of what might be practically

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55. Arild Underdal, 'The Concept of Regime "Effectiveness"', *Cooperation and Conflict*, vol 27, no 3, 1992, pp 227-40 at p 233 [emphasis in original].

achievable, an understanding is needed of how such objectives or goals were reached in order to make an assessment of regime effectiveness.

The pressures on defining objectives or goals can also apply in the opposite direction, making it only possible to adopt an aspirational goal that is known by those that adopted it as being unachievable. An example of this is the question of targets for progress on universality adopted at the First Review Conference of the Chemical Weapons Convention as part of an Action Plan on the issue. It became politically impossible to adopt a target that was not 100 per cent even though this was not achievable within the proposed timescale.

### *Pareto optimization*

One method of examining what might be considered an idealised end point is embodied in a concept known as the Pareto frontier. Pareto-optimal solutions are derived from non-zero sum conditions<sup>56</sup> Underdal summarizes the Pareto frontier as ‘when no further increase in benefits to one party can be obtained without thereby leaving one or more prospective partner(s) worse off’.<sup>57</sup> It can be understood that there may be many Pareto-optimal solutions to any particular set of circumstances and this range of solutions is represented by the frontier.

Pareto optimization is based on economic principles and while there may be some crossover into other areas, the economic derivation of this abstraction/conceptualization has to be recognized in order to consider when it is appropriate to apply it to a particular set of circumstances.

Within the Oslo-Potsdam solution, the collective optimum is often equated with the Pareto frontier. This is an approach favoured by Helm and Sprinz.<sup>58</sup>

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56. Under zero-sum conditions there is no basis for regimes as a loss by one participant represents a gain by another. See, for example, Stephen D Krasner, ‘Global Communications and National Power: Life on the Pareto Frontier’, *World Politics*, vol 43, April 1991, pp 336-66.

57. Arild Underdal, ‘The Concept of Regime “Effectiveness”’, *Cooperation and Conflict*, vol 27, no 3, 1992, pp 227-40 at p 233.

58. Carsten Helm and Detlef Sprinz, ‘Measuring the Effectiveness of International Environmental Regimes’, *Journal of Conflict Resolution*, vol 44, no 5, October 2000, pp 630-52.

### *Irreversibility issues*

A further aspect of defining the idealised end point is whether measures for promoting irreversibility should be included. Irreversibility measures are those that reduce the possibility of those activities prohibited under the regime being restarted. The assessment of irreversibility measures provides an example of the difficulties of quantification of effectiveness of regimes.

This is clearly illustrated by comparing two hypothetical environmental regimes that have reduced emissions to their stated target. Each would have an identical (100 per cent) quantitative score on effectiveness of emissions reductions and would, on a superficial level, be considered equally effective. Yet suppose one of these had active measures in place to prevent future emissions above the target level while the other did not.<sup>59</sup> In such circumstances, could these regimes be considered equivalently effective?

It therefore follows that a truly idealised end point has to include irreversibility measures. But how should such measures be quantified? If no attempt to reverse the goals of the regime is made, then such measures are untested. Nevertheless, it could be the presence of such measures that deterred any attempt towards a reverse. Yet, as not all such measures are equivalent — a comprehensive reporting mechanism is very different from an arrangement for voluntary provision of information — there is no clear method for quantification and therefore some qualitative assessment has to be made.

Irreversibility measures increase the ability of a regime to withstand external shocks. For some analysts, a distinction is made between regime effectiveness and robustness.<sup>60</sup> For the purposes of this thesis, robustness will be considered as an element of effectiveness.

### *Other end point definition difficulties*

Difficulties with measuring or defining an idealised end point go beyond simple contestation. There are situations where the idealised end point can only be elaborated in general terms —

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59. Such measures might also prove useful if a new, more strict, emissions reduction target were to be introduced at a later stage.

60. See, for example, Frank Schimmelfennig, 'Arms Control Regimes and the Dissolution of the Soviet Union: Realism, Institutionalism and Regime Robustness', *Cooperation and Conflict*, vol 29, no 2, 1994, pp 115-48 and Harald Müller, 'Regime Robustness, Regime Attractivity and Arms Control Regimes in Europe', *Cooperation and Conflict*, vol 30, no 3, 1995, pp 287-97.

‘an end to conflict’ or ‘global free trade’ — which don’t easily translate into easy quantitative measurements.

Furthermore, there are situations where developments in other fields mean that the context of the idealised end point is changing, or is perhaps even unknowable. A good example of such a situation is the regime to control biological weapons.

For the regime to control biological weapons, two distinct changes have happened which will influence the perceived idealised end point for at least some of the participants in the regime. The first of these is the new political context relating to international perceptions of the significance of terrorism and the concerns that those carrying out terrorist acts could utilise biological weapons. The second of these is the rapid development within the life sciences that includes, but is not limited to, the rise of synthetic biology. These two evolving influences are fundamental to the new frame of reference relating to the dual-use nature of the problem as elaborated in Chapter 1, (see page A-3).

The new political context relating to terrorism concerns means that some participants within the regime perceive that new measures are needed to counter new and emerging threats. It goes without saying that to measure effectiveness against new and emerging threats requires the definition of a different end point from that which might have existed earlier.

The rapid advances in the life sciences mean that it is only possible to estimate what may be of concern in the five to ten year timeframe. As many measures within a regime such as that to control biological weapons are introduced and implemented within a similar timeframe, it is not possible to know what the effectiveness will be of these measures in the light of changing circumstances.

### ***Measuring the real-life progress***

Once a baseline and a an end point have been established, an assessment of the effectiveness of a regime can be made once the real-life progress from the baseline towards the end point can be established. The concept of real-life progress is referred to within the Oslo-Potsdam solution as the ‘actual performance’ or ‘AP’.

The distinction between the *overall regime* and the *disaggregated regime* is important here as each of these may produce different results.

Measuring progress has an inherent difficulty as it hard to accurately<sup>61</sup> measure certain activities. In the case of the regime to control biological weapons, for example, if one measure of effectiveness were to relate to how difficult it was for a country to acquire biological weapons is it enough to simply count the number of potential supplier countries that have systems to control exports? As there is a great variation in how well individual export control systems work would this number have any meaning? There can also be deliberate efforts to reduce the effectiveness of a dual-use goods regime within a country's governance system.<sup>62</sup>

This difficulty of measurement is made much simpler in cases where a regime is just regulating one tangible function, such as the emissions of one particular substance or a discrete group of substances. This is perhaps a contributory factor in this sort of regime being the focus of effectiveness evaluations.

### ***Problems with Oslo-Potsdam and related regime effectiveness assessment systems***

There has been a long-recognised problem that there are many activities of governments that are not easily quantifiable.<sup>63</sup>

The Oslo-Potsdam solution has a particular fundamental problem – NR, AP and CO are all based on judgements and assumptions, so error margins for each of these individual judgements are compounded. Indeed, humans are notoriously bad at instinctive quantitative judgements and error margins are often severe.<sup>64</sup>

There are a number of underlying assumptions to the Oslo-Potsdam work. For example, the quantitative work by Sprinz and Helm in 1999<sup>65</sup> includes a number of equations with

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61. The key term here is accuracy, as measurement in such circumstances may be subject to false precision.

62. See, for example, the Matrix Churchill case within the United Kingdom and the resulting Scott Inquiry.

63. See, for example, United Kingdom, Comptroller and Auditor General [National Audit Office], *Measuring the Performance of Government Departments*, HC301 (Session 2000-01), 22 March 2001.

64. An often cited illustration of human inabilities to quantify probabilities is the Monty Hall problem.

65. Detlef F Sprinz and Carsten Helm, 'The Effect of Global Environmental Regimes: A Measurement Concept', *International Political Science Review*, vol 20, no 4, October 1999, pp 359-69.

variables relating to costs. By placing them in the same equation there is the implicit assumption that the relevant costs — abatement costs and costs of mitigating damage above a threshold — all share the same dimensions and that the ‘political coefficient’ that might influence the perception of damage (but somehow not influence abatement) is dimensionless. This would be reasonable if all costs could be related to a financial equivalent, but there are many non-financial costs in regimes. Within the realm of environmental policy, a key issue that has continued since the beginning of concerns about environmental protection has been the difficulty of assigning financial values to environmental impacts.

Moving beyond environmental issues to other forms of regime, the equivalent equation in an area such as the regime to control biological weapons would have to replace the environmental damage term with one that would include loss of security and damage (injury) from possible use of such weapons. What should be given as the cost of a life?

The equations of Sprinz and Helm are highly reminiscent of the pseudo formulae that the tabloid press likes encouraging academics to come up with to fill their news pages, such as a calculation of the most depressing day of the year.<sup>66</sup>

A numerical value for effectiveness of a regime may satisfy a certain type of curiosity, but what does such a quantification tell us? Is there any benefit for understanding a regime to control something for security purposes from knowing a score for one regime in, for example, the area of trade? Does a numerical value of effectiveness provide any form of information that would allow practitioners within the regime to improve it?

More useful for practitioners involved in efforts to try to improve a regime would be a method of evaluating regime effectiveness that would identify or highlight areas in which the regime might be enhanced.

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66. [no author listed], ‘Feeling depressed? Welcome to Blue Monday - officially the most miserable day of the year’, *Daily Mail*, 18 January 2010, <<http://www.dailymail.co.uk/news/article-1244005/Feeling-depressed-Welcome-Blue-Monday-club.html>>.

*Credibility of the situation as presented by Underdal*

The case made by authors such as Underdal is substantially undermined, at least in the situation as it relates to the regime to control biological weapons, by comments such as this one:

I suspect, though, that most governments in the industrialized world in fact tend not to pay much attention to the costs of international problem-solving efforts — at least as far as transaction costs in the most basic sense are concerned (salaries, office costs, travel and accommodation expenses, etc.)<sup>67</sup>

While this might be true of some countries such as Norway, Sweden and Switzerland in situations where some of the costs are marginal, the subject of costs comes up in decision making processes within regimes on a regular basis. Take, for example, the situation at the Sixth BWC Review Conference and the position of Japan over whether the proposed Implementation Support Unit should have two or three staff members, which was entirely based on financial issues.<sup>68</sup> This situation in 2006 was by no means unique and similar examples can be found going back long before the publication of the quoted article.

That this statement ended up in the final article raises issues of the credibility of the journal as well as a simple question such as this should have been picked up by both editors and reviewers. The clear implication is that this is a guess about a key issue without the author checking any possible evidence base. As the suspicion elaborated in the quote is far from the correct situation in the real world, there has to be a concern that the author, reviewers and editors are not familiar with the realities of international decision making. Moreover, it would seem that none of these individuals were sufficiently familiar with any individual negotiators to contact them to check this detail. This inevitably weakens the credibility of the rest of the arguments in the article. Nonetheless, Underdal should be given credit for being transparent in his speculation.

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67. Arild Underdal, 'The Concept of Regime "Effectiveness"', *Cooperation and Conflict*, vol 27, no 3, 1992, pp 227-40 at p 229.

68. Richard Guthrie, "'First reading" completed: Article X consultations to continue', *BWPP Review Conference Reports no 8*, 29 November 2006, p 2.

## **Conclusions relating to effectiveness**

The key conclusion of this section is simple. Although the existing methods that have been used to understand effectiveness that have been identified within this chapter provide lessons and some tools for application in relation to a regime such as that to control biological weapons, none are suitable in their entirety for the task required here. This therefore requires that some form of new approach will be needed.

The existing literature on understanding success or failure in a regime like that to control biological weapons is weak. Much focuses on how 'robust' a regime is, rather than its effectiveness. There is much less written on aspects such as cooperation, within the framework of Regime Theory, in the regime to control biological weapons than there is in literature on regimes relating to trade issues, for example.

Robustness may be defined as the ability of a regime to deal with external challenges and influences. Clearly a regime that falls apart is not likely to be effective in advancing its objectives. Therefore, while robustness is a significant contributor to effectiveness of a regime, it can be only one factor in an overarching assessment of effectiveness of an individual regime.

Much of the assessment of effectiveness relates to whether a regime enhances cooperation between states, rather than whether the regime is effective at achieving its objectives. Much literature is focused on individual legal instruments rather than the broader regimes. Some analysis relies on highly contested techniques such as the use of counterfactual scenarios. Other analysis looks at regime effects in individual states involved in a regime. Taken with the new frame of reference resulting from the dual-use nature of the biological weapons problem (see page A-3), new measures for success/failure will need to be developed.

There are significant limits to traditional thinking about success or failure in NACD regimes. For example, each of the three criteria identified by Halperin & Schelling for successful arms control (see page C-7) — increased stability, reduced destructive power and cutting the financial burden — has some relevance to the modern regime to control biological weapons, but even collectively they are a poor measure of success/failure of this particular regime in its current context. For example, how should this set of criteria place a value on

capabilities to stop sensitive materials and technologies falling into the possession of non-state actors?

There are further reasons to believe that examining regime success/failure as a measure of effectiveness appears somehow to be heretical. It is worth remembering the perspective that: ‘The most fundamental and most widely discussed of these purposes is the enhancement of the ability of states to cooperate in the issue area’ (see page B-15) For a regime such as one relating to trade, this would be a useful measure of success if 99 per cent of regime members were cooperating with enhanced ability — any other member would essentially be irrelevant. But on the other hand, according to this measure a weapons-control regime in which over 99 per cent of the participants had been cooperating extremely well would also be seen as effective by this ‘most fundamental’ measure, even if one country had caused millions of fatalities with the weapons that were supposed to be under control. As this proposition is clearly absurd, new suggestions for evaluating success/failure are required.

### **Conceptualizing the European Union**

In laying out the theoretical framework for this thesis, some understanding of the conceptualization of the EU is required. This section is not intended to provide a comprehensive background to the conceptualization of the EU, as understandings of policy making within the EU in fields relevant to the regime to control biological weapons will be explored in Chapter 5. It is beyond the scope of this thesis to deal with the broader context of these theories in depth and therefore this section is designed to provide a brief overview of those aspects most relevant to the subject matter of this thesis. As there is considerable overlap between theories of European integration with some elements of Regime Theory it is relevant to explore some of these at this point. Moreover, there are authors that have written from a theoretical perspective both on regimes and on the EU and its antecedents.

### ***Theories of European Integration***

Just as Regime Theory has been influenced by general trends in theorization of international relations through ideas such as rational choice models or constructivism, so have theories regarding European integration. This is particularly true of early writings on the formation of

the European institutions which were focused on the creation of these institutions rather than continued activities:

we can say clearly that the early literature on the EC sought to explain the process of European *integration* (rather than, say, policy-making), and that in doing so it drew largely (but not exclusively) on theories of international relations.<sup>69</sup> [emphasis in original]

A particular issue regarding conceptualization of the EU and its antecedents is the *sui generis* nature of what has resulted — that the EU is a unique species in a family of its own. This means that any theory, model or concept relating to the EU may be untestable or incomparable against any other situation. Some analysts, such as Hix,<sup>70</sup> have suggested the unique characteristics of the EU make it a difficult subject for analysis through the existing theories and tools of international relations.

A question that has to be answered in any longitudinal analysis is that of what is meant by the European Union at any individual moment. Following the entry into force of the Lisbon Treaty, the EU contains within it a number of disaggregable parts — the Member States, the Commission, the Council, the Parliament and the Court of Justice. Each of these component parts has developed since the start of European integration. Theories that can assist in understanding the development of the EU have to incorporate these developments. Aspects of theories that might have applied in one phase of this development might not in another.

The term ‘European Union’ has a history that predates its formal use in treaties and agreements directly related to European integration. For example, when the Federal Republic of Germany deposited its instrument of ratification to the nuclear Non-Proliferation Treaty on 2 May 1975 it made a declaration that included the following:

no provision of the Treaty may be interpreted in such a way as to hamper the further development of European unification, especially the creation of a European Union with appropriate competence<sup>71</sup>

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69. Mark A Pollack, ‘Theorizing EU Policy-Making’, in: Helen Wallace, Mark A Pollack and Alasdair R Young (eds.), *Policy Making in the European Union* [sixth edition], (Oxford: OUP, 2010), pp 15-44 at 17.

70. Simon Hix, *The Political System of the European Union*, (Basingstoke: Palgrave, 1999), 427 + xx pp.

71. As reproduced in: United Nations, *Status of Multilateral Arms Regulation and Disarmament Agreements* [third edition], (New York: United Nations, 1987), 190 + iv pp at p 89. None of the depositaries publicly challenged this aspect of the declaration.

### *Origins of European integration*

In the first decade of the twenty-first century it is easy to forget the influence of the wars in Europe in the first half of the twentieth. With barely twenty-one years between the two world wars, many politicians and officials with key responsibilities were of an age where they would have personally lost friends and relatives in the First World War and to have seen the hopes of preserving peace dashed only two decades after ‘the war to end all wars’. That policies might have been selected by this generation with future avoidance of war in mind should not be surprising.

Indeed, the declaration by Robert Schuman on 9 May 1950 that is marked by many as the formal start of the European integration effort — and hence why ‘Europe Day’ is celebrated on 9 May — firmly placed the proposal for the establishment of what became the European Coal and Steel Community (ECSC) not only in the cause of peace but in the prevention of future wars:

The coming together of the nations of Europe requires the elimination of the age-old opposition of France and Germany. Any action taken must in the first place concern these two countries. ... [The government of France] proposes that Franco-German production of coal and steel as a whole be placed under a common High Authority, within the framework of an organization open to the participation of the other countries of Europe. The pooling of coal and steel production should immediately provide for the setting up of common foundations for economic development as a first step in the federation of Europe, and will change the destinies of those regions which have long been devoted to the manufacture of munitions of war, of which they have been the most constant victims. *The solidarity in production thus established will make it plain that any war between France and Germany becomes not merely unthinkable, but materially impossible*<sup>72</sup> [emphasis added]

Notwithstanding this, it is important not to fall into a trap that assumes the propaganda of the time supporting the bold efforts of particular political figures tells the whole story. While the ECSC had very firm roots in the efforts to prevent further war, the later communities, and in particular the European Economic Community (EEC), were also subjected to other influences in their creation. For example, Alan Milward has argued that there were many economic dilemmas in the individual countries that could be resolved most favourably for all concerned by supranational efforts. These included opening up trade into unified markets,

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72. As reproduced at <[http://europa.eu/abc/symbols/9-may/decl\\_en.htm](http://europa.eu/abc/symbols/9-may/decl_en.htm)>.

social policy and agricultural policy.<sup>73</sup> As these influences all promoted outcomes that could take a similar form, it is impossible to accurately assess with clarity which influence was greater.

### *Neo-functionalism*

At the time of the negotiation of the ECSC, the most widely expressed conception of what was occurring was essentially functionalist — that a new arrangement would be established to fulfil a set of functions that its creators had decided upon.

Within a few years, and with the negotiations of the later Communities — the European Atomic Energy Community (Euratom) and the EEC — a neo-functionalist perspective became predominant, based initially primarily on a concept of *spillover*. This posits that where arrangements have been considered to be successful in an area of policy, there is a subsequent pressure to expand those arrangements or make similar arrangements in other areas of policy. A suggested major motivation for this is to ensure the success of the original policy area. This early neo-functionalist perspective is best characterised by Ernst Haas in his 1958 work.<sup>74</sup>

Haas focused mostly on functional spillover but this concept includes political spillover. Other aspects of neo-functionalism included suggestions of *elite socialization* — that those involved in governance would focus more on the supranational arrangements than national arrangements — and that a similar process would take place in interest groups, such that *supranational interest groups* would come to be more influential than their national counterparts.

While limitations of understandings based on neo-functionalism were identified very early, it remains the baseline against which other theories of European integration are compared. As the European institutions developed, it became clear that neo-functionalism could not explain much of what was happening. The slowdown in integration in the 1960s and 1970s would have been unexpected to a neo-functionalist, but was explicable by other

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73. Alan Milward, *The European Rescue of the Nation-State* [second edition], (London: Routledge, 2000), [this edition contains the original 1992 text with an additional preface], 466 + xvi pp.

74. Ernst B Haas, *The uniting of Europe: Political, Social, and Economic Forces, 1950-1957* [third edition], (Notre Dame: Notre Dame Press, 2004) [this edition contains the original 1958 text as published by Stanford University Press together with updated prefaces from 1968 and 2003], 552 + xl + \*lvi.

forms of political understanding, notably a resurgence in confidence in the Member States. A similar challenge to theories occurred during the political discussions within the EU in the last decade of the 20th century over whether the EU should deepen its integration or widen its membership. There were no absolute victors in this debate, with both processes taking place to some extent. The resulting situation would have been very different had other political decisions been taken.

One analyst has noted that ‘neo-functionalism lacked a theoretically solid base for its observations’.<sup>75</sup>

It is notable that the spillover aspects of neo-functionalism can also be interpreted as simply a sequence of adjacent possible circumstances — once arrangements in one area had been shown to operate in an acceptable manner, then the creation of arrangements in similar or connected areas would have then become part of the adjacent possible in a way that they had not been previously.

One of the aims of the neo-functionalists was to see whether the processes for integration in Europe could be applied in other geographical areas such as Latin America. However, such analysis missed basic geographic differences<sup>76</sup> and the European project retains a unique character.

The work of Haas and his contemporaries has been treated unfairly in some ways in remaining a focus of criticism. It describes the early years of a process that began some 60 years ago. In most forms of innovation — whether political, economic or technological — the earliest periods of any particular innovation have a different character to later periods. The neo-functionalist perspective unfortunately also suffers from errors resulting from over-simplification of basic facts.<sup>77</sup>

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75. Carsten Strøby Jensen, ‘Neo-functionalism’, in: Michelle Cini and Nieves Pérez-Solórzano Borrágán, *European Union Politics* [third edition], (Oxford: OUP, 2010), pp 71-85 at p 74.

76. Gian Luca Gardini has illustrated some of these geographical differences very clearly. For comparison, the industrial heartland of the original ECSC members was in a fairly coherent bloc (and therefore had good internal communications) in a swath through Europe from the banks of the Rhine to northern Italy; while in Latin America, by contrast, the equivalent industrial base spread is around the coastline with few internal communications links which would allow exploitation of an opening up of markets or of other forms of economic or political interaction.

77. For example, the 2004 introduction of the classic Haas text starts with the words: ‘The organization analyzed in these pages ceased to exist on July 1, 1967: the European Coal and Steel

### *Inter-governmentalism*

Before starting any analysis on inter-governmentalism a distinction has to be made between the use of the term in theoretical literature and in EU processes.

In EU circles, inter-governmentalism refers to the activities of the Member States and the Council. Other inputs into the EU, such as the European Parliament and the Commission, as well as civil society inputs, are seen as outside the scope of inter-governmentalism. Chris Patten, in one of his last speeches in the European Parliament as Commissioner for External Relations stated:

All Member States should acknowledge what those actually doing the work of CFSP have long understood — that mere inter-governmentalism is a recipe for weakness and mediocrity for a European foreign policy of the lowest common denominator.<sup>78</sup>

Within the EU institutions, annual budgets are based on proposals by the Commission which have to be agreed by the Parliament and the Council. This takes budgetary authority away from the direct control of inter-governmentalist influences.

However, in academic literature the term has a significantly different meaning, typified by the work of Stanley Hoffman in the 1960s. This work was itself a reflection of growing confidence within national governments and a desire by some to re-examine the balance of costs and benefits of individual country versus collective (including supranational) activities.

From an inter-governmentalist perspective, governments of the Member States are the drivers of policy within the EU. As such, this perspective shares much with the state-centred

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Community (ECSC) merged with what was then called the European Communities, now the European Union'. While it is true that the separate High Authorities and Assemblies for the three communities were indeed merged on this date (to form the Commission of the European Communities and the European Parliament, respectively) the ECSC retained a separate legal identity until its expiry in 2002. Indeed, the College of Commissioners would have to meet in separate (but normally sequential) meetings of each Community to take formal decisions in the remit of each of the Community treaties because they each retained their own legal personality. Moreover, if Haas were to be correct, the ECSC could not have adopted the controversial Commission Decision No 3010/91/ECSC of 15 October 1991 on capacity reduction, which would have saved much political argument! In his 1968 introduction, Haas is much clearer that he is only referring to the High Authority of the ECSC that ceased to be and that the Community itself still existed.

78. Chris Patten, European Parliament, 12 March 2003, referring to another speech of his in June 2000. The use of the term is not limited to Patten; Leon Brittan, in a speech in Bonn on 23 May 1993, a time when the Maastricht Treaty had been signed but not yet brought into force, noted 'As the Community grows and takes in new members there will inevitably be strong pressures to revert to mere intergovernmentalism, or to accept a multi-speed Europe, or more use of variable geometry'.

aspects of Regime Theory. Moreover, the realist and neo-realist perspectives of power lead to the same zero-sum game assumptions for both Regime Theory and inter-governmentalism.

Hoffman was writing at a time when governance within the Communities was based on the powers of the High Authorities and the Assembly had only a limited role (and was not directly elected from many states). Hence, the term was unlikely to have been used by practitioners in the way it is used in current times.

### *Liberal intergovernmentalism*

Histories of theorizing and conceptualizing regarding European integration note that there was little in the way of overarching theories developed in this field in the 1970s and 1980s. However, in the broader field of international relations, there was much work on issues such as transnational relations, for example, that input into analysis of European developments.<sup>79</sup>

During the 1990s, Andrew introduced new work that he described as liberal intergovernmentalism.<sup>80</sup> Moravcsik described developments in Europe almost as a policy market in which demand for outcomes (based on liberal, sometimes neo-liberal, conceptualizations) met supply of outcomes (based on intergovernmental conceptualizations). These two conceptualizations are mediated through the European institutions.

Liberal intergovernmentalism is perhaps better at describing big decisions with significant repercussions than more routine, day-to-day policy making. There is criticism that it provides a framework of analysis rather than a true theory; yet it does indeed include the key point of a theory — that it provides a suggestion of how one thing leads to another. It has been starting to replace neo-functionalism as the baseline for assessment of other theoretical work on the EU within academic literature.

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79. See, for example, see the two articles by Joseph S Nye Jr and Robert O Keohane in *International Organization*, vol 25, no 3 (Summer 1971): 'Transnational Relations and World Politics: An Introduction', pp 329-49; and 'Transnational Relations and World Politics: A Conclusion', pp 721-48.

80. Andrew Moravcsik, *The Choice for Europe: Social Purpose and State Power from Messina to Maastricht*, (London: Routledge, 1999), 514 + xii pp. [Note: this book was initially published by Cornell University Press in 1998.]

### **Some conclusions regarding theories drawn upon in this thesis**

There should be little surprise that there is considerable overlap between Regime Theory and theories of European integration as, after all, the European Union is a regime itself — it certainly embodies ‘principles, norms, rules, and decision making procedures’, although the subject area ‘around which actors’ expectations converge in a given area of international relations’ is very broad! It is therefore extremely atypical as a regime.

Both sets of theories are much better at developing understandings of cooperation or integration than of policy making. This lacuna on policy-making has implications for understandings of regimes in general, and of effectiveness in particular.

The key test of effectiveness of any activity is how well it achieves whatever is defined as the primary objective of that activity. The history of the EU shows how hard it can be to define a primary activity — were the original Communities established to prevent war or to improve economic performance? Both were clearly in the minds of key players at the time. Yet the world has moved on and the current players may not have the same understandings or aims as their predecessors.

Luckily, for the regime to control biological weapons the situation is much simpler. Nevertheless, the global circumstances that pertained at the time of the negotiation of the BWC are very different to those today. These changing goalposts can mean that an measure of effectiveness in one timeframe may be less relevant in another.

Just as varying styles of music become popular for particular periods or as hemlines rise and fall, so there is a fashion element in the social sciences. This is sometimes beneficial as new analytical techniques or concepts are applied within short periods of time to a variety of areas of study. However it can also be limiting as the popularity of use of a technique or concept may be more to do with its fashionable nature at the time, or that it is being promoted by those with the loudest voices, rather than it being the most useful to bring forward greater understanding. This has the consequence, in some cases, of making the study of theories of international relations a study of the academic community in the subject area rather than a study of how international relations are actually carried out.

## **The Research Problem and Research Questions**

As noted at the beginning of this chapter, the Research Problem that this thesis seeks to resolve can be defined in the following terms:

In considering its policies regarding the regime to control biological weapons, what were the understandings of the European Union relating to the effectiveness of this regime and how did these understandings affect the policy choices adopted?

In order to come to any conclusions regarding this question it is necessary to consider what is generally understood regarding concepts of regime effectiveness and to consider what were the relevant actions of the European Union in this regard and how they were decided.

### **Tackling the research questions**

#### ***RQ 1 — Success/failure in the regime to control biological weapons***

The first Research Question tackled in this thesis is:

How should success or failure in a regime such as that to control biological weapons be measured or categorised?

The starting point for this question is the existing body of literature on the subject of effectiveness of regimes. This will be added to by the author's own thinking.

To be effective, a regime must be a success on some set of terms. However, a regime which has many facets may be regarded as effective even if there are failings relating to some facets, so long as the successes outweigh the failings.

To come to a final answer to answer this question a range of practitioners as well as theorists will have to be engaged on the issue. Some can be contacted via e-mail but some formal interviews should be carried out.

#### ***RQ 1a — Multiple axes for success/failure***

This Research Question has a number of sub-questions, the first of which is:

Should success/failure be measured on more than one axis?

In providing suggestions for RQ1 and receiving feedback, it is probable, if not to say inevitable, that no single measure for measuring success/failure will be identifiable and that multiple axes will be needed in order to establish an overall measure of effectiveness. It therefore follows that part of the engagement process will also involve how developments along these

different axes might influence each other. It will only be possible to come to an overall understanding of what effectiveness in the regime may be by including all of the possible axes for success/failure.

#### *RQ 1b — Matching effectiveness to obligations*

The second sub-question is:

Can the possible benchmarks or criteria used within assessment of regime effectiveness be related to principles, norms and rules (i.e., obligations) within the regime?

The first task for this sub-RQ is to identify the principles, norms and rules within the regime to control biological weapons. An initial working premise is that the greater the number of the principles, norms and rules encompassed within the benchmarks and criteria the more that might be learned from understanding effectiveness. There is also a need, through interaction with practitioners, to establish whether the perceptions of principles, norms and rules are common across countries or whether these vary between countries, or even vary between officials in countries. A comparison with the thinking of analysts may also prove helpful.

#### *RQ 1c — Distinguishing the net contribution of the regime*

The third sub-question is:

How much of the evaluation can be related to the *disaggregated regime* as well as the *overall regime*?

This question presents the greatest methodological difficulty owing to the inherent difficulties of distinguishing the disaggregated regime.

Identification of influences on some regime elements will result through examination of the document trail and subsequent interviews. This process of looking at individual elements may also assist in identifying which elements might usefully be focused upon for future efforts to improve the regime.

Just because a complete answer to this question cannot be found, this does not mean that it is not worth seeking a partial answer so long as the limitations of a partial answer are elaborated. The following elaborations or emphases are therefore needed:

- that the answer is not whole (obvious but not trivial);

- that there is a potential to be unwittingly misled by a partial answer; and
- identification, where possible, of what is known to be unknown.<sup>81</sup>

### ***RQ 2 — The EU and the regime to control biological weapons***

The second Research Question tackled in this thesis is:

As the EU focused on the regime to control biological weapons following the events of 2001, how did it understand the effectiveness of the regime?

The bulk of the work on this question and its sub-questions will be through examination of the document trail and subsequent interviews. All EU Working Papers in BWC meetings are available, together with the on-the-record interventions in the meetings.

From this information it is possible to construct the chronological sequence of decision making and identify critical junctures in policy development.

#### ***RQ 2a — Political context***

This Research Question has a number of sub-questions, the first of which is:

What was the impact of overarching political influences, such as the EU WMD Strategy, on perceptions of and interactions with the regime to control biological weapons?

Much of EU policy making involves deciding detailed policy actions from the general guidance at a high political level.

However, this was not a one-way street, as the situation within the arena of biological weapons will have had an influence on the derivation of the WMD Strategy — but how influential was this (in each direction) and how can this influence be best characterised?

#### ***RQ 2b — How policies were decided***

Second sub-question:

In translating broad policy guidance into detailed actions, what decision making mechanisms were used and how did these take into account any aspects of perceived effectiveness of the regime to control biological weapons?

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81. Curses should be placed on Donald Rumsfeld for his unknown unknown comments. The concept of known unknowns and unknown unknowns had been around in the literature on safety issues for many years before Rumsfeld made his comments ...

Within the EU there are many decision-making mechanisms and other means for officials from Member States and the EU institutions to consult with one another. Some of these are at the very highest political levels, but there are also others at expert level, such as the CODUN and CONOP working groups. How is the balance struck between the political and the technical?

*RQ 2c — Narrow or broad perspectives*

Third sub-question:

effectiveness of the overall regime or the disaggregated regime?

Does the disaggregation matter to anyone but theorists? On the other hand, how else can certain cooperative measures be evaluated and new measures to be focused?

When EU practitioners discuss the regime, do they think of the value-added of the regime, beyond that which governments would be doing in any case, or are they focused on the overall regime?

### **Some notes on methodology**

While most of the discussion on methodology appears in Chapter 3 of this thesis, it is worth noting at this point that the key methodological challenge that arises from this thesis is the lack of a previously tested method for understanding effectiveness of a regime such as that to control biological weapons. While the existing methods that have been used to understand effectiveness that have been identified within the thesis provide lessons and some tools for application in the chosen area, none are suitable in their entirety for the task required here. The following chapter examines methodologies that have been used in earlier studies of the regime to control biological weapons.

It is possible to identify a relatively clear document trail outlining most of the major development in EU policy in this area. Taken together with other documentary sources from EU Member States and some academic commentary this provides a skeleton that of analysis that can be fleshed out through the use of interviews with officials involved in policy development and with those present at critical meetings.

However, there is only a small proportion of officials that have been involved with biological weapons across the period covered by this thesis, although those with longevity

may have been disproportionately influential, especially as at least some policy developments followed on from meetings at which there were only a few officials present.

This could lead to difficulties of separating individual policy perspectives from national policy perspectives and from EU policy perspectives. However, this in itself might be a useful finding and may illustrate whether detailed policy formulation is led by a limited number of officials.

As noted earlier, there is a particular difficulty of disaggregating the effects of the regime from what would have happened if the regime had not existed. There is a further difficulty of disaggregating the influence of the EU on its Member States. The temptation to treat the EU as a black box is high, but doing this would cause a loss of valuable information.

In working towards trying to understand the full picture of policy development in this area, it is worth heeding words of Jez Littlewood on this subject:

the fact remains that no one ever has a 'full picture' because no one can ever know what is really in the minds of other negotiators and diplomats. And the diplomats themselves are at the mercy of their political masters in their respective capitals.<sup>82</sup>

### **What is hoped to be achieved in this thesis**

There are a number of aims of this thesis, which will be dealt with here from the general to the specific. The broad, general contextual aim of this thesis is to contribute to an improved understanding of the control of dual-use materials and technologies and the role of the EU in such control. Many of the conceptual and implementation issues that relate to the control of dual-use biological materials and technologies have some applicability in other areas of dual-use control. As the EU Member States are both major producers and major consumers of dual-use materials and technologies, the EU has a particular role to play. As 'Regime Theory' is the framework within which arrangements to control dual-use risks and threats are often discussed, this theory will be the major one to be examined in comparison with activities that have actually taken place.

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82. Jez Littlewood, *The Biological Weapons Convention: A Failed Revolution*, (Aldershot: Ashgate Publishers, 2005), 250 + ix pp at p 4.

Inevitably, given the nature of a PhD thesis, the contribution of this thesis toward these general aims is likely to be modest.

### ***Value added in specific areas***

There are two specific areas in which it is hoped that this thesis will bring particular added value. Each relates, at least in part, to the specific Research Questions, or sub-questions, tackled in the thesis.

#### *Understanding regime effectiveness*

The existing literature on understanding regime effectiveness in general terms and on success or failure in a regime like that to control biological weapons in particular is weak. Much focuses on how ‘robust’ a regime is, rather than its effectiveness. Much of the assessment of effectiveness relates to whether a regime enhances cooperation between states, rather than whether the regime is effective at achieving its objectives. Much literature is focused on individual legal instruments rather than the broader regimes. Some analysis relies on highly contested techniques such as the use of counterfactual scenarios. Other analysis looks at regime effects in individual states involved in a regime. Taken with the new frame of reference resulting from the dual-use nature of the biological weapons problem, new measures for success/failure will need to be developed. This thesis contains some suggestions for new measures that may help future analyses of this and similar regimes.

#### *Understanding EU processes*

There is a tendency amongst some commentators to regard the EU as something akin to a ‘black box’ — while simplifying the study of the role of the EU in international events, this approach brings a number of limitations with it. This thesis will attempt to unpick some of the processes that operate within the EU.

The formation of policy at a high level within the EU on major day-to-day political issues is well documented, although the specifics vary on a case-by-case/policy-by-policy basis. However, there exists a whole raft of policy areas for which there is a need for action to be taken by the EU and its Member States in a collaborative or co-operative manner, but for which

there is no great incentive for the political 'higher ups' to get involved in detail. The issue of biological weapons is one of these areas — the broad thrust of policy can be easily summarized as reducing the threat of biological weapons while keeping hindrance to the peaceful purposes of the life sciences to a minimum. But what of the detail? Such a broad thrust of policy has to be turned into practical activity in one way or another.

While it is hoped that a greater understanding of the EU development of policy in the field of WMD in general and in biological weapons in particular will shed light on other areas of EU security policy making, there are more specific advances that are hoped for in this regard.

It is clear from discussions with officials that the process of interaction between Member States, the Council and the Commission through Working Groups such as CODUN and CONOP is considered to be of significance in the development of EU policy; yet the academic literature regarding these Working Groups is sparse.

## **Chapter 3**

# **The Regime to Control Biological Weapons and Methodologies Used to Analyse It**

The regime to control biological weapons does not exist in isolation. Biological weapons form one category of 'weapons of mass destruction' (WMD) and understandings of the issues surrounding biological weapons are influenced by more general WMD issues. The primary responses to WMD issues on an international scale has been through non-proliferation, arms control and disarmament (NACD) measures which contribute to the relevant regimes. It is only once these issues have been examined that it is possible to present existing understandings of the regime to control biological weapons in a proper context.

The aim of this chapter is to explore the regime to control biological weapons, discuss how it is perceived and illustrate why biological weapons, and the responses to the challenges they offer, differ from the other types of weapons. From this starting point, it is then possible to examine issues relating to the effectiveness of the regime.

This chapter is in four parts. The chapter starts by examining the differences between the types of 'weapons of mass destruction' in order to illustrate those factors that make biological weapons distinctive. This examination is started by looking at the derivation of the term 'weapons of mass destruction'. The second section examines concepts relating to NACD regimes. The third section explores the breadth of the regime to control biological weapons and some of the significant elements that contribute to the regime. Relevant developments in the regime during the period of the case study are elaborated. The fourth section of this chapter examines the differing understandings that have been reached regarding the regime to control biological weapons. The chapter is rounded off with conclusions and judgements regarding which previous understandings are built upon or contribute to the work undertaken within this thesis.

This chapter is supplemented by Appendix I which includes further details about elements that contribute to the regime.

## **Distinctions between types of WMD**

The term ‘weapons of mass destruction’ is commonly understood to encompass biological, chemical and nuclear weapons. In some contexts, including the context of this thesis, the term is also used in its broadest sense to include possible delivery systems for these weapons such as ballistic missiles. However, there are a number of distinctions between the types that should be elaborated in order to better understand them. In particular, an understanding of the distinctive nature of biological weapons will help reinforce this choice of case study.

## ***History and context of the term WMD***

Examining the history of the term ‘weapons of mass destruction’ is a worthwhile activity as it is an illustration of how ‘conventional wisdom’ can impede understanding of events as few researchers go back to the source materials.<sup>1</sup> However, it must be noted the use of the term has not been consistent.<sup>2</sup>

On 5 September 1947 the United Nations Commission for Conventional Armaments debated definitions of ‘weapons of mass destruction’. This debate arose in the third meeting of the Working Committee of the Commission which found it needed to clarify its terms of reference which were essentially to consider all armaments that were not weapons of mass destruction. The majority of the working committee was of the opinion that the best way to arrive at a definition of conventional armaments would be to start by defining weapons of mass destruction.<sup>3</sup> Four days later, a resolution was adopted which read:

The Working Committee resolves to advise the Security Council ... that weapons of mass destruction should be defined to include atomic explosive weapons, radio active material weapons, lethal chemical and biological weapons, and any weapons developed in the future which have characteristics comparable in destructive effect to those of the atomic bomb or other weapons mentioned above.<sup>4</sup>

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1. Another classic item of misleading conventional wisdom is that the UN was founded in 1945. While the Charter was signed that year, the UN itself dates from 1 January 1942 and is based on the eight principles elaborated in the Atlantic Charter of 14 August 1941.
  2. One account of the history of the term WMD, particularly in the context of US Government activities, can be found in: W Seth Carus, ‘Defining “Weapons of Mass Destruction”’, *Occasional Paper 4*, Center for the Study of Weapons of Mass Destruction, National Defense University [Washington, D.C.], pp 49 + xii.
  3. Working committee of the United Nations Commission on Conventional Armaments, Summary record of the third meeting held at Lake Success, New York, 5 September 1947, UN doc. S/C.3/SC.3/SR.3, dated 6 September 1947.
  4. *Letter from the Chairman of the Working Committee of the Commission on Conventional Armaments addressed to the Chairman of the Commission on Conventional Armaments and enclosed resolution*,

This resolution was not published as a formal UN document until July 1948, and it was formally adopted by the Commission a month later, hence this definition is often referred to as the '1948 definition'.

### ***Distinctive characteristics of biological weapons***

A biological weapon is one that works through the disease-causing or 'pathogenic' effects of organisms. Disease might be caused by the actions of a micro-organism itself or by the effects of substances produced by living things. Such substances are known as 'toxins'.<sup>5</sup> Toxins, being toxic chemicals, may also be counted as chemical weapons.<sup>6</sup> Sometimes the production of a toxin happens within the host, for example in a disease such as anthrax.<sup>7</sup>

Biological warfare — whether by a state, a non-state group or as a criminal act — stems from any attempt to induce disease in an enemy. It has a history that goes back even before the discovery of micro-organisms or the development of germ theory, when diseased carcasses of animals would be catapulted into besieged cities and castles with the hope of spreading the affliction. In other words, biological warfare is the deliberate inducement of disease for hostile purposes.

For a number of decades the term 'bacteriological warfare' was used as bacteria were the only clearly identified class of microbes. When the science had become clearer, the usage 'bacteriological (biological) warfare' became common to ensure that there was no ambiguity that this included other microbes such as viruses and fungi. This term was adopted for use in texts such as UN General Assembly resolutions.<sup>8</sup> Over time, this has simply become 'biological warfare'.

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[letter dated 9 September 1947], UN doc. S/C.3/24, dated 28 July 1948.

5. Some commentators make specific distinctions between biological weapons and toxin weapons. See, for example, Erhard Geissler (ed.), *Biological and Toxin Weapons Today*, (Stockholm/Oxford: SIPRI/OUP, 1986), pp 4-7.
6. Some definitions have referred specifically to diseases caused by micro-organisms and toxins derived from them which would therefore exclude ricin (derived from castor beans) or other toxins such as snake venom.
7. The disease anthrax arises from the production of two toxins by *Bacillus anthracis* in a mammalian host. However, these toxins are not suitable as weapons in themselves as they can only enter cells to produce their pathogenic effect if they are in combination with a particular protective antigen also secreted by *B anthracis*.
8. It should be noted, however, that the adoption of this term was the focus of much argument on the sidelines of the General Assembly, with disagreements between the UK, USA and USSR. See,

There has been a variety of additional terms used to describe biological warfare over the years, for example, 'microbial warfare', 'microbiological warfare' and 'germ warfare'. These terms are essentially synonymous.

Pathogenic microbes used as biological agents have particular characteristics, not least because they are living organisms. This means that they can reproduce. For infectious diseases, anyone who is infected becomes a host within which more of the pathogen is produced. It also means that, compared with nuclear or chemical weapons, only a small quantity of active biological agent is required. For diseases such as smallpox, each host can infect more people, but for others such as anthrax, the possibilities for human-to-human infection is extremely limited.

It must be stressed that there is a great deal of difference between a biological agent and a biological weapon. For an agent to be used as a weapon it has to be distributed in such a way as to cause disease in the intended victims. Therefore a biological warfare programme is not limited to production of agents, but also to their methods of delivery. While effective dispersal of biological agents is not simple, it would be within the reach of the majority of states which have the technical capability to produce biological agents. In addition there are doctrinal considerations to be taken into account — is it worth producing a biological warfare capability without training forces in how to use it and without putting into place a decision-making process regarding the circumstances it might be used in?

In summary, the use of biological weapons — whether in warfare or as a terrorist or criminal act — is nothing more than the deliberate inducement of disease, possibly using materials and technologies that may also be obtainable for peaceful purposes. Countering this therefore includes questions of public health and reduction in the threat of all disease. There is much common ground in responses to outbreaks of disease, whether they stem from natural, deliberate or accidental (such as a laboratory incident) causes.

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for example, Airgram from the US Mission to the United Nations to the Department of State (Drafted by Alan F. Neidle, David L. Aaron, and Richard L. McCormack on 21 December, and cleared by Peter S. Thacher, Committee I Executive Officer), 24 December 1968, Department of State, Central Files, DEF 18-6, marked 'Confidential'.

## **Non-proliferation, Arms Control and Disarmament (NACD) Regimes**

Regimes to control weaponry together with associated materials and technologies fall within three overlapping types — non-proliferation, arms control and disarmament. As the overlaps between these three types can be significant, they are often referred to collectively. There is no consensus on the precise definitions of these terms and policy implications. It should be noted that there are times when one or other of the terms is used, perhaps inadvertently, as a shorthand for all three types of regime.

The distinctions between non-proliferation, arms control and disarmament become significant when questions of effectiveness are under evaluation. As noted in chapter 2, in any system of assessment there is a requirement to have a benchmark of what could have been achieved in order to measure real progress against it (see page B-24). It is therefore important to understand what the limits are in each of these types of regimes.

This section briefly examines the distinctions between these types of agreements and then examines some common elements such as verification and decisions on non-compliance.

It is also worth noting that there are contexts within which these terms carry overtones. For example, the term disarmament has been very closely associated with the United Nations. Another example is the connection of the term non-proliferation with the NPT and its nuclear haves and have-nots, leading to an association with concepts of discrimination. This is further illustrated by the difference of opinion in the negotiations for the Comprehensive Test Ban Treaty (CTBT) over the role of the treaty as either a disarmament or non-proliferation measure. The holdout states (India, Israel and Pakistan) saw the treaty as leading to nuclear disarmament, while the nuclear-weapon states (China, France, Russia, UK, and USA) saw the treaty as a means to bring the holdout states into the non-proliferation regime.<sup>9</sup> This was the focal point of the disagreement over provisions in the negotiated text which remains a key issue in preventing that treaty's entry into force.

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9. Richard Guthrie, 'Significant Multilateral NACD Agreements: the scope and challenge of implementation', in J. Marshall Beier and Steven Mataija, *Cyberspace and Outer Space: Transitional Challenges for Multilateral Verification in the 21st Century*, York Centre for International and Security Studies, 1997, pp. 41–52.

## ***Non-Proliferation***

The basic concept of the term proliferation is that of spread or development and therefore the concept of non-proliferation is to reduce the possibility of such spread or development. The concept derives from the biological sciences and was later applied to issues relating to the spread of weapons.

The *Oxford English Dictionary* provides the following example of usage from the *Daily Chronicle* of 2 December 1905:

The theory of the Imperial Cancer Research Committee that cancer is entirely due to the proliferation of cancer cells, and that to stop this proliferation would be to cure cancer.<sup>10</sup>

In its biological sense, the term proliferation embodies an implicit understanding that the proliferation spreads from something that exists. When the term was first achieving prominence in its use in relation to nuclear weapons, the proliferation was indeed also spreading from something that existed, whether ‘horizontal proliferation’ — the spread of nuclear capabilities to new countries — or ‘vertical proliferation’ — the development of more advanced capabilities within a country that already had nuclear weapons.

When used in relation to biological weapons the situation is slightly more complicated as there are no declared biological weapons programmes being carried out by any government in the world.<sup>11</sup> The concept of proliferation in this circumstance relates more to new countries acquiring a capability for biological weapons rather than the materials and technologies spreading from one country to another.

Some forty years ago, Robert Neild highlighted the differences between non-proliferation and disarmament with reference to the nuclear Non-Proliferation Treaty which was about to be opened for signature:

[the NPT] is not a disarmament measure. ... What it does is to invite non-nuclear countries, most of whom do not want to go nuclear anyway, to abstain from doing so, and to propose a system of restraints on the supply of fissile material which will make it harder than before for most non-nuclear powers to go nuclear. The main point, however, is that non-proliferation ... seems unlikely to be effective for long if the great

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10. As cited under the entry ‘proliferation’ in the *Oxford English Dictionary*, 2nd edition, (Oxford: Oxford University Press, 1989), vol XII (Poise-Quelt), p 606.

11. This does not rule out the possibility of undeclared biological warfare programmes. The number of possible or potential undeclared programmes has been reduced by at least two in the last decade with the cessation of the Libyan research efforts and the removal of Saddam Hussein.

powers do not do something to stop their arms race. Otherwise it will simply be a measure that confirms the nuclear dominance of the existing nuclear powers.<sup>12</sup>

### ***Arms control***

An arms control agreement is premised on the assumption that some of the participating countries possess, or have possessed in the past, the weapons or objects that are the subject of control. Arms control thus involves a slightly different approach to that of non-proliferation, notwithstanding that for a country that did not possess any items prohibited under a treaty, there would be little distinction between the effects of an arms control or a non-proliferation treaty on the internal activities of that country.<sup>13</sup>

The concept of arms control became highly theorised during the Cold War period, although this analysis often neglected or dismissed arms control efforts in the inter-war years. Most published work, much of which originated in the United States, was heavily focused on nuclear weapons and the Cold War superpower rivalry.

Two American analysts, Halperin and Schelling, established three critical criteria for successful arms control that are often cited: increased stability; reduced potential for destruction; and decreasing the cost of defence policies and postures. These authors noted:

We believe that arms control is a promising, but still only dimly perceived, enlargement of the scope of our military strategy. It rests essentially on the recognition that our military relation with potential enemies is not one pure conflict and opposition, but involves strong elements of mutual interest in the avoidance of a war that neither side wants, in minimizing the costs and risks of the arms competition, and in curtailing the scope and violence of war in the event it occurs.<sup>14</sup>

Arms control can lead to a reduction in weapons, and therefore to partial disarmament. However, arms control measures can also include numerical ceilings on treaty-limited items that do not require any party to remove such an item from service or destroy it. This situation is more accurately referred to as 'arms limitation'.

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12. Robert Neild, *What Has Happened to Disarmament?*, David Davies Memorial Institute of International Studies Annual Memorial Lecture, April 1968.

13. There may, however, be significant implications for the external activities or foreign policy of a country in this situation as there may be greater domestic political support for a treaty that treated all states equally rather than one that allowed some states to retain types of weapons or objects that are prohibited to others.

14. Schelling and Halperin, 1961: 1, via Tuerlings p 29.

## ***Disarmament***

Disarmament can best be summarized as a case of arms control leading to zero for a particular class of weapon or other controlled item.

The concept of disarmament evolved during the twentieth century.<sup>15</sup> In particular, in the decades immediately following the Second World War, the concept of ‘general and complete disarmament’ was predominant in international diplomacy. For example, UN General Assembly resolution 1378 (XIV), adopted on 20 November 1959, referred to an aim of ‘general and complete disarmament under effective international control’. However, this ambitious target proved impossible to achieve. The final efforts towards general and complete disarmament through the adoption of one international arrangement came with the agreement between the United States and the Union of Soviet Socialist Republics of the the McCloy-Zorin Principles<sup>16</sup> which noted that ‘disarmament is general and complete and war is no longer an instrument for settling international problems’ and called for phased reductions of weapons and an ‘International Disarmament Organization’ with wide inspection powers to carry out verification. Notwithstanding the agreement of principles, no treaty resulted from these proposals.

### *The move away from ‘general and complete disarmament’*

In the early 1960s, emphasis was moving away from general and complete disarmament to means by which parts of this problem could be solved. These means became known as ‘collateral measures’, the most famous of which is the 1968 nuclear Non-Proliferation Treaty.<sup>17</sup> Other collateral measures included proposals for a fissile material cut-off, prohibitions on

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15. See, for example, Victor Lefebure, *Scientific Disarmament: A Treatment Based on the Facts of Armament*, (London: Victor Gollancz, 1931), 320 pp; and Dick Richardson, *The Evolution of British Disarmament Policy in the 1920s*, (London: Pinter, 1989), 265 + vi pp.
  16. The McCloy-Zorin Principles were a set of criteria for disarmament agreed by the USA and USSR and published on 20 September 1961. The Principles specifically included ‘elimination of all stockpiles of nuclear, chemical, bacteriological, and other weapons of mass destruction, and the cessation of the production of such weapons’.
  17. While many commentators date the genesis of the Non-Proliferation Treaty with the adoption by the United Nations General Assembly of resolution 1665 (XVI) [the ‘Irish resolution’] on 5 December 1961, this resolution was borne by a frustration that negotiations on disarmament measures were taking too long and that delays in disarmament could lead to widespread proliferation of nuclear weapons. It may be argued that the adoption of the Irish resolution was a milestone on the passage from ‘general and complete’ measures to ‘partial’ or ‘collateral’ ones.

nuclear testing, establishment of nuclear-weapon-free zones (including outer space and the sea bed), and a non-aggression pact between the two power blocs. Bans on biological and chemical weapons were also put in this group by some states. Over twenty proposals for collateral measures were put to the Eighteen Nation Disarmament Conference in the early 1960s. Nonetheless, resolutions were still being passed by the UN General Assembly on general and complete disarmament, such as resolution 2602E (XXIV), adopted on 16 December 1969 which also added the phrase ‘strict and’ thus referring to an aim of ‘general and complete disarmament under strict and effective international control’.

Of the still relevant collateral measures listed above, only the fissile material cut-off has not been achieved.<sup>18</sup> Moreover, much of the early work on such a cut-off was predicated on the assumption that a nuclear-weapon-free world had already been achieved, for example:

[This paper] assumes that an international agreement would have been reached that no country should manufacture or retain nuclear weapons, and that the Control Organization’s duty would be to ensure that such an agreement was demonstrably being adhered to.<sup>19</sup>

### ***Common threads and particular issues***

#### *Systems of verification under NACD regimes*

Most NACD regimes include some form of verification system or a means of raising compliance issues within them. As will be seen later, verification has been a controversial issue in the regime to control biological weapons. All successful systems of verification for international regimes share certain characteristics:

- they contain a coherent system of measures that complement one another;

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18. The requirement for a non-aggression pact between the two power blocs could be said to have become irrelevant since the end of the Cold War. The Comprehensive Test Ban Treaty was opened for signature in September 1996, but is not yet in force. While prospects for CTBT entry into force do appear to be hampered it is worth noting that this sort of statement has been regularly made about several treaties. For example, ‘It is by no means certain that the Non-Proliferation Treaty will ever enter into force’ — Mason Willrich, *Non-Proliferation Treaty: Framework for Arms Control*, The Michie Company, 1969; the author was a former Assistant General Counsel in the US Arms Control And Disarmament Agency.

19. United Kingdom, *The Technical Possibility of International Control of Fissile Material Production*, ENDC/60, 31 August 1962.

- they gather relevant information on activities related to the instrument(s) being verified; and
- they are each contained within a framework that allows information gathered to be used as required, in a timely manner, to promote confidence and compliance with the instrument(s) being verified, or to indicate that non-compliance has taken place.

It is only when all of these are fulfilled that any verification system can satisfy the political and security concerns of its participants.

Historically, verification systems have been regarded in a similar way:

A system of safeguards cannot be adequate unless it possesses the following characteristics:

- (a) It is technically feasible and practicable;
- (b) It is capable of detecting promptly the occurrence of violations;
- (c) It causes the minimum interference with, and imposes the minimum burdens on, any aspect of the life of the individual nations.<sup>20</sup>

The Chemical Weapons Convention contains its own verification arrangements through its Organization for the Prohibition of Chemical Weapons. The nuclear Non-Proliferation Treaty requires States Parties to have safeguards arrangements with the International Atomic Energy Agency. Neither the BWC nor the Geneva Protocol has any formal verification and compliance mechanisms or institutions associated with it.

### *Breakout issues*

The elimination of an entire class of weapon brings with it particular problems. The potential for one state to be able to possess a prohibited weapon after all other similar weapons have been destroyed is of greatest concern with regard to any form of disarmament. Breakout could take one of two forms: (i) the concealment of existing weapons during the disarmament process; and (ii) the manufacture of new weapons.<sup>21</sup> This is of particular concern where

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20. United Nations Commission for Conventional Armaments, August 1948. Note: in this period the uses of the terms 'verification' and 'safeguards' are almost indistinguishable; almost all verification proposals are based on calculating material balances and inspection. However, as organisms can reproduce and die, material balance as a technique has limitations in the biological field.

21. As there has been no formal case of biological disarmament under the BWC the concealment of existing weapons might be thought of as less likely. However, two countries, Iraq and Russia (and prior to that the USSR), have carried out activities that are considered by most analysts to be contrary to Article I of the BWC at one time or another.

possession of prohibited weapons could lead to a strategic imbalance, such as in processes of nuclear disarmament.<sup>22</sup> [It is worth noting that, as the nuclear-weapon states have all foresworn the possession of the other forms of weapons of mass destruction, these states would have a greater concern that a regime for nuclear disarmament is complied with.<sup>23</sup>]

A second decision for a state wishing to breach its treaty obligations and implement a breakout capability would be to choose whether to carry out prohibited activities at an undeclared facility or to carry out prohibited activities under the cover of declared, peaceful activities.<sup>24</sup>

Verification is a key element of disarmament arrangements and normally has an enhanced role in any such arrangement compared with non-proliferation and arms control arrangements:

major states will not disarm and remain disarmed without adequate verification that other states are doing the same. Any government therefore which is sincere in seeking an honest and lasting agreement on disarmament will accept as well as require adequate international verification that obligations are being loyally observed. Since this cannot be one-sided, willingness to accept adequate international verification is the real test of the sincerity of any government about disarmament.<sup>25</sup>

The above words were written as the last global discussions on a WMD-free world were coming to an end. At the time, the major states of the world were looking at the issue of 'general and complete disarmament', of which a world free of WMD was a major component. The issues relating to disarmament were similar as the world moved on to controls relating to specific types of weapons.

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22. For a discussion of the implications of breakout see Robert Neild, 'Cheating in a Disarmed World', *Disarmament and Arms Control: An International Quarterly Journal*, vol I, no 2, Autumn 1963.

23. It has been clear that there has been considerable interplay between weapon of mass destruction types in the policy formulations of the nuclear-weapon states. For example, it is not just coincidence that the UK renounced chemical weapons at the same time as its nuclear weapon programme reached a certain level of maturity. This form of reasoning may also have been a factor in the renunciation of chemical weapons by India in 1997. It was certainly a factor in the UK's termination of its offensive chemical programme in 1956.

24. For a discussion on how this choice might be made by a non-compliant state and how verification regimes can make either form of breakout far more difficult, see Douglas J MacEachin, 'Routine and Challenge: Two Pillars of Verification', *The CBW Conventions Bulletin*, 39, March 1998, pp 1-3.

25. Sir Michael Wright GCMG, *Disarm and Verify: An Explanation of the Central Difficulties and of National Positions*, Chatto & Windus, 1964, p x. The author was British Delegate to the Test Ban and Disarmament Conferences 1958-63.

The increased verification efforts required for increased disarmament (and therefore the smaller number of weapons of a particular type) is illustrated by the 'Wiesner curve':

The level of intensity of inspection to monitor a disarmament agreement is in some way proportional to the degree of disarmament. In other words, the more completely weapons of all kinds are eliminated the greater will be the necessity for an inspection system sufficiently sensitive to discover small discrepancies in the size of remaining forces.<sup>26</sup>

### *Decisions on non-compliance*

All major post-war multilateral non-proliferation, arms control and disarmament treaties have mechanisms to use the United Nations Security Council as final arbiter as to whether any case of non-compliance with treaty obligations has occurred. However, without a clear understanding of what should be done in the case of non-compliance, any NACD regime is fundamentally weakened.<sup>27</sup> An unanswered question is what should happen if key states in an alleged treaty violation are permanent members of the Security Council with a power of veto.<sup>28</sup>

In the case of the BWC, complaints of non-compliance with Convention can be made to the Security Council under Article VI and assistance provided under Article VII if the Council decides there has been a violation of the Convention.

### *NACD regime conclusions*

It is clear that NACD regimes have long been seen by political authorities as having to be effective in order to have support — hence the resolutions on 'effective' or 'strict and effective' international control. Yet there is rarely any detailed description of how these authorities understand effectiveness.

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26. Jerome B. Wiesner, 'Inspection for disarmament', in Louis Henkin (ed.), *Arms Control, Issues for the Public*, Columbia University/Prentice Hall, 1961, pp 112–40. See also his article 'Comprehensive arms-limitation systems' in Donald G. Brennan (ed.), *Arms Control, Disarmament, and National Security*, George Braziller, 1961, pp 198–233. For a more recent interpretation of Wiesner's work, see Allan S. Krass, 'Nuclear verification in the post-Cold War era', in John B. Poole & Richard Guthrie (eds.), *Verification 1993*, VERTIC/Brassey's, 1993, pp. 69–76.

27. The classic description of this is contained within: Fred Charles Iklé, 'After Detection — What?', *Foreign Affairs*, January 1961, pp 208–20.

28. Ironically, Iklé's work dates from a time that most NACD efforts were bilateral rather than multilateral, with both sides being permanent members of the UN Security Council.

As noted in the introduction to this section, the distinctions between the concepts of non-proliferation, arms control and disarmament become significant when questions of effectiveness are under evaluation as in any system of assessment there is a requirement to have a benchmark of what could have been achieved in order to measure real progress against it (see also page B-24). It is therefore important to understand what the limits are in each of these types of regimes.

Where a regime to control a type of weapon falls within more than one of these categories, the balance of activities in each of these areas must be reached. A particular example of how such a balance can change is provided by the Chemical Weapons Convention as the destruction of declared stocks of chemical weapons approaches its treaty-mandated deadlines. One CWC state party presented its view of this in 2008:

The relative importance of an effective industry verification regime and strengthened non-proliferation measures will grow as the chemical weapons destruction campaign progresses and the disarmament goal of the Convention is achieved.<sup>29</sup>

### **The breadth of the regime to control biological weapons**

As noted in chapter 1 (see page A-4) the regime to control biological weapons is much broader than the BWC. Even as the BWC was being negotiated, it was recognised that the Convention was but one component in the overall regime:

The fact of the matter is that the BWC was never supposed to be a stand-alone countermeasure against BW. Nor was it seen that way by the countries that had studied the weapons closely. The function of the BWC was instead to serve as a consolidating influence within a diverse array of countermeasures. This initially comprised the development and maintenance of the anti-BW protective posture expressly permitted through the General Purpose Criterion, and national intelligence machinery that had at least some capacity for monitoring foreign BW capability. It expanded as national penal codes began to criminalise misuse of pathogenic microbes and toxins, law that could also be directed against terrorists seeking access to such agents. Later, national export control measures would be added to the array as an anti-proliferation measure, with efforts to harmonise the controls subsequently being pursued through the Australia Group. Later still, interest would arise in mobilising the resources of international criminal law to that same end.

Within all this, the primordial function of the BWC was to assert a norm of abstention from BW armament, to reassert the taboo against resorting to the use of BW, and to

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29. Republic of Korea, *Proposal for enhancing the efficiency and cost-effectiveness of Other Chemical Production Facilities inspections*, OPCW document RC-2/NAT.7, dated 8 April 2008.

provide a nucleus around which international action against transgressors could crystallise.<sup>30</sup>

As the limits of the Convention are easier to define, some authors have deliberately selected the Convention as the focus of their analysis rather than the broader regime as this makes analysis much simpler.

Perhaps the best way to illustrate the breadth of regime activities is to provide examples of the types of elements that contribute to the regime. Understanding of the contributions of different elements to the regime is important in order to be able to judge whether the regime is effective at achieving its objectives. What is provided within this chapter is simply an outline of some of the elements. Further details about the history of and developments within the elements of the regime to control biological weapons can be found in Appendix I of this thesis.

### ***Global treaty-based regime elements***

The treaty-based elements listed below are described as global to distinguish them from relevant regional treaties.<sup>31</sup> It should be noted that not all countries have become parties to them.

#### *The Geneva Protocol*

The 1925 Geneva Protocol contains a prohibition on the use of chemical weapons, using a formulation appearing in earlier measures — ‘asphyxiating, poisonous or other gases, and of all analogous liquids, materials or devices’ — but adding a specific phrasing ‘to extend this prohibition to the use of bacteriological methods of warfare’.<sup>32</sup>

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30. George Poste and Julian Perry Robinson, ‘International Control Measures: The Biological Weapons Convention and its Projected Protocol’, in: *Measures for Controlling the Threat from Biological Weapons*, Royal Society, (2000), pp 9-14. The quote ends with – ‘Incorporating compliance-verification measures was not at that time, unlike now, seen as a cost-effective addition to the array, especially since the technical component of such measures was relatively undeveloped.’

31. The Antarctic Treaty requires that Antarctica should only be used for peaceful purposes, the Seabed Treaty prohibits stationing of WMD on the seabed, and the Outer Space Treaty prohibits stationing of WMD in outer space. Each of these is classed as a regional treaty.

32. As the scientific understanding of diseases and their causes have developed, the term ‘bacteriological’ in this context has customarily been taken to include all biological methods of disease.

Although the Geneva Protocol contains no provisions for verification or compliance monitoring measures, it is cited within resolutions from both the General Assembly and the Security Council of the United Nations which empower the Secretary-General to investigate possible breaches of ‘the 1925 Geneva Protocol or other relevant rules of customary international law’. Such investigations were carried out in the 1980s and early 1990s. While most of the investigations related to chemical warfare, the first and last investigations — in south-east Asia and Azerbaijan, respectively — involved toxins that fall within the remit of the BWC.<sup>33</sup> Now commonly referred to as the ‘UN Secretary-General’s mechanism’, this power to investigate is being reinvigorated.<sup>34</sup>

The Geneva Protocol is discussed in more detail in Appendix I (see page **App I-1**).

#### *The 1972 Biological Weapons Convention*

The BWC took control of biological weapons much further than the Geneva Protocol which had simply banned the use of biological weapons in warfare, but did not prohibit states from manufacturing them. Under Article I the BWC States Parties undertake:

never in any circumstances to develop, produce, stockpile or otherwise retain ... microbial or other biological agents, whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes.

Also known as the ‘general purpose criterion’, this criterion relating to types and quantities means that all biological materials fall within the remit of the Convention and that everything is prohibited unless it can be justified.<sup>35</sup>

Under Article IV, BWC States Parties undertake to implement the prohibitions contained in the Convention within their own jurisdictions.

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33. Richard Guthrie, ‘The United Nations Secretary-General’s mechanism to investigate alleged use of biological and chemical warfare’, briefing paper prepared by the Stockholm International Peace Research Institute (SIPRI) for the Swedish Ministry of Foreign Affairs, May 2006 [submitted by the Swedish Government to the United Nations study *Verification in All Its Aspects*]. This paper includes information on the relevant UN resolutions together with a list of investigations undertaken and resulting official documentation.

34. United Nations General Assembly resolution A/RES/60/288, adopted 8 September 2006, encourages ‘the Secretary-General to update the roster of experts and laboratories, as well as the technical guidelines and procedures, available to him for the timely and efficient investigation of alleged use’. This is being acted upon.

35. But note the comments on research by Nicholas Sims later in this chapter.

Like the Geneva Protocol, the BWC has no formal compliance and verification provisions, although it does include a complaints procedure; for some states, this lowers confidence in the compliance of parties to it. The BWC States Parties agreed at a Special Conference in 1994 to establish the 'Ad Hoc Group' to negotiate a legally binding protocol to the Convention that would have included certain measures to strengthen it, including verification measures. The negotiations were brought to a standstill in the middle of 2001 when the United States announced that they would not be able to accept any product that would result from the negotiations.

Article XII of the BWC provides for conferences 'to review the operation of the Convention, with a view to assuring that the purposes of the preamble and the provisions of the Convention ... are being realized' and such Review Conferences have been held in 1980, 1986, 1991, 1996, 2001-02 and 2006. The seventh is scheduled for 2011. Article XII also states that: 'Such review shall take into account any new scientific and technological developments relevant to the Convention'.

The BWC, together with its review processes, meetings and negotiations, is discussed in more detail in Appendix I (see page **App I-2**). An outline of developments in the BWC and the wider regime is also provided in the Appendix (see page **App I-9**).

#### *Other significant treaty-based regime elements*

A number of international treaties provide contributions toward the regime to control biological weapons alongside the Biological Weapons Convention and the Geneva Protocol, although there is no widely accepted or agreed list of what these additional treaties provide. The other significant treaty-based regime elements highlighted here are the Genocide Convention, the Geneva Conventions, and the Cluster Munitions Treaty. However, this list is by no means exhaustive.

A useful guide to treaties that have contributed to NACD regimes is contained in a series of books by Jozef Goldblat.<sup>36</sup>

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36. Each of these books has borne the title *Arms Control* or *Arms Control Agreements*. The most recent edition is: Jozef Goldblat, *Arms Control*, (London: Sage, 2002) [published in association with the Peace Research Institute Oslo and the Stockholm International Peace Research Institute], 396 +

It is also worth noting where proposals had been made for treaty measures that would contribute to the regime but that did not appear in the final agreed treaty. The key example here would be the negotiations for and International Criminal Court.

The 1948 Genocide Convention prohibits acts intended to carry out genocide which is the destruction, in whole or in part, of any distinct national, ethnic, racial or religious group. One act that could be carried out to promote genocide would be the spread of disease.

The four 1949 Geneva Conventions each include prohibitions on 'biological experiments' on protected persons as a grave breach. In 1977, two Additional Protocols were added to these Conventions. Amongst the new provisions introduced were arrangements for an International Fact-Finding Commission to investigate allegations of grave breaches, application of the Conventions to conflicts within states and a prohibition on attacks on foodstuffs.

A prohibition on cluster munitions may not seem at first glance to have much relevance to the control of biological weapons. However, many designs of munitions for dispersal of biological agents have relied upon cluster munitions technologies and the creation of bomblets.<sup>37</sup> Restrictions in the 2009 Cluster Munitions Treaty will reduce the availability of these technologies.

During the negotiations for the Rome Statute for the International Criminal Court there were proposals for the inclusion of use of biological weapons within the definition of war crimes. However, in the final days of negotiation in July 1998, all of these options fell, primarily owing to the issue of whether use of nuclear weapons should be considered a crime.<sup>38</sup>

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xliii pp.

37. For example, anthrax tests on Gruinard Island in 1942 and 1943 involved testing cluster bomb sub-munitions. See the plates in Peter M Hammond and Gradon B Carter, *From Biological Warfare to Healthcare, Porton Down, 1940-2000*, (Basingstoke: Palgrave, 2002), 280 pp.

38. Philippe Kirsch and John T Holmes, 'The Rome Conference on an International Criminal Court: The Negotiating Process', *American Journal of International Law*, vol 93, no 2, January 1999, pp 2-12.

## ***Non-treaty measures with global legal effect***

### ***UN Security Council resolution 1540***

The United Nations Security Council adopted resolution 1540 on 28 April 2004 as a binding measure under Chapter VII of the Charter to counter the threat of terrorist acquisition of unconventional weapons, including biological, chemical and nuclear weapons. The resolution calls on UN member states to present national reports on steps they have taken or intend to take to control materials and technologies that could be used to develop or otherwise acquire such weapons. It is clear that the process of compiling the reports, together with assistance to states provided by the 1540 Committee, has led to the identification of gaps in implementation of the key international instruments, particularly as regards issues related to biological weapons.<sup>39</sup>

### ***International Organizations***

A number of international organizations have roles and responsibilities that contribute to, or overlap with, the regime to control biological weapons. These include the World Health Organization (WHO), the World Organization for Animal Health<sup>40</sup> (OIE, original title Office Internationale des Épizooties) and the Food and Agriculture Organization (FAO). The International Committee of the Red Cross (ICRC) is also included in this category, although its status varies depending on the circumstances.<sup>41</sup>

Of particular note are the new International Health Regulations comprising legally binding provisions for member states of the WHO on sharing epidemiological information about potential transboundary spread of infectious diseases in order to manage public health emergencies of international concern which were agreed in 2005 and entered into force in 2007. The new rules will 'prevent, protect against, control and provide a public health response to

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39. Richard Guthrie, John Hart and Frida Kuhlau, 'Chemical and biological warfare developments and arms control', *SIPRI Yearbook 2005*, (Stockholm/Oxford: SIPRI/Oxford University Press, 2005), p 604.

40. Biological Weapons Convention Secretariat, *The World Organization for Animal Health (OIE)*, doc no BWC/MSP/2004/INF.1, dated 1 November 2004, 5 pp.

41. For example, for BWC meetings, the ICRC is considered an international organization, but for some CWC/OPCW meetings has been considered a non-governmental organization. There is a subtlety often missed in status: the WHO, OIE and FAO are all inter-governmental organizations, which the ICRC is not, although it is an international organization.

the international spread of disease'. The new regulations allow for the WHO Director-General to form a 'determination of a public health emergency of international concern', even if the government of the territory is in disagreement with this conclusion.

All of these organizations have in common that they have interests in the prevention of disease — and suffering or other implications that follow from disease — in humans, animals and plants. As the use of biological weapons is nothing more than the deliberate use of disease (as noted above, see page C-3), the general roles of each of these organizations in the regime to control biological weapons is apparent.

The organizations, and implications such as the 'second diagnosis' problem, are discussed in more detail in Appendix I, (see page **App I-7**).

#### ***Non-treaty-based group arrangements***

The non-treaty-based group arrangements described here are essentially understandings between groups of like-minded states. These arrangements contribute to the regime to control biological weapons in a variety of ways.

The Australia Group is a multilateral forum for the co-ordination of export controls amongst a group of supplier states. This group was originally formed in the mid 1980s to harmonise export control policies in relation to materials that might be used in a biological or chemical weapons programme. The Australia Group has no formal legal basis.<sup>42</sup>

A new form of supply control appeared in 2003 with the creation of the 'Proliferation Security Initiative' (PSI) by the US. PSI is intended to prevent transfers of proliferation-sensitive materials to state and non-state actors who might use them for hostile purposes. Unlike simple export controls, PSI envisages the interdiction of supplies in transit.

These arrangements and their political and practical implications are discussed in more detail in Appendix I, (see page **App I-8**).

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42. Robert J Mathews, 'Chemical and Biological Weapons Export Controls and the "Web of Prevention": A Practitioner's Perspective', in: Brian Rappert and Caitriona McLeish (eds.), *A Web of Prevention: Biological Weapons, Life Sciences and the Governance of Research*, (London: Earthscan, 2007), pp 163-71.

### **Previous analysis and understandings of the regime to control biological weapons**

Analysis of the regime to control biological weapons can be carried out from a number of approaches, many of which have backgrounds distinct from the traditional international relations literature.

The regime to control biological weapons is a response to the perceived threats from biological weapons and the materials and technologies that can be used to create them. It therefore follows that in order to understand analysis of this regime, there is a need to understand how the threats of biological weapons have been perceived in the literature. However, this is not the only way to approach the regime for the purposes of analysis. The lists of approaches outlined here are not exhaustive, but intended to draw out approaches of the most relevance and significance to the subject matter of the thesis.

Within the problem-oriented approaches there are specialized areas such as the study of the implications of scientific developments, the examination of the threats from terrorism and implications for public health.

There are a number of more methodological approaches examined here, such as the chronological approach breaking down developments into discrete events, the narrative focus on particular critical periods and a sectoral approach.

Some of the more methodological approaches outlined here have roots in some of the traditions of International Relations in particular and Political Studies in general. As has been noted elsewhere in this thesis, the study of the regime to control biological weapons can only be carried out in a multi-disciplinary basis, thus the problem-oriented approaches draw on understandings from other fields of study.

#### ***Problem-oriented approaches***

Some authors analyse the regime to control biological weapons in the context of the problems it is intended to counter; this is the approach taken by study groups such as the Stockholm International Peace Research Institute (SIPRI) and the Harvard Sussex Program (HSP).<sup>43</sup>

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43. Full disclosure: the author of this thesis has worked for both of these organizations.

The six-volume series, *The Problem of Chemical and Biological Warfare*, published by SIPRI in the early 1970s remains the most comprehensive documentation on the subject, notwithstanding its age.<sup>44</sup> Indeed, in 2001, the US Department of Defense paid for the series to be scanned as there were few copies of the original books left available.<sup>45</sup> The six-volume series was published as the BWC was being negotiated, with draft copies of some of the volumes being circulated to negotiators.

With regard to evaluation of regime effectiveness, the fifth volume of the six-volume series, *The Prevention of CBW*, is of greatest significance. Within this volume, the study identifies 26 stages in the development of an offensive chemical or biological warfare capability.<sup>46</sup> While not all apply in all circumstances, these identified steps form a useful guide for analytical purposes. This tabulation was the first published attempt to elaborate activities involved in a chemical or biological weapons programme. The table is reproduced in chapter 4 (see page [\*INSERT cross ref\*]). In evaluating the effectiveness of the regime, a first benchmark could be to examine how effective the regime is in relation to each of these stages.

In 1969 and 1970, two reports were issued that influenced international debate, and the negotiations on the BWC. *Chemical and Bacteriological (Biological) Weapons and the Effects of their Possible Use* was prepared by a group of experts and was endorsed and published in the name of the UN Secretary-General in July 1969. The study had been requested in UN General Assembly resolution 2454A (XXIII) adopted on 20 December 1968. The second, *Health Aspects of Chemical and Biological Weapons*, was published by the World Health Organization in 1970. This report had initially been prepared as a contribution to the work of the UN Secretary-General's group of experts and an earlier version had been circulated in 1969, hence this is sometimes referred to as being published in the earlier year.

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44. Stockholm International Peace Research Institute, *The Problem of Chemical and Biological Warfare*, [six volume series], (Stockholm: SIPRI, 1971-73). The six volumes are: I *The Rise of CB Weapons* [1971]; II *CB Weapons Today* [1973]; III *CBW and the Law of War* [1973]; IV *CB Disarmament Negotiations, 1920-1970* [1971]; V *The Prevention of CBW* [1971]; and VI *Technical Aspects of Early Warning and Verification* [1973].

45. The scans are available on CD-ROM from SIPRI.

46. Summarized in Table 2A.1, SIPRI V, p 142.

There are similarities in the conclusions about problems that are presented by the potential for biological warfare in the reports by the Secretary-General, the WHO and the SIPRI six-volume series. These various publications provide an indication that there was a broad consensus on the issues during this period. Nevertheless, it should be noted that while there were many contributors to these three studies, they shared the same lead drafter, Julian Perry Robinson.

There have also been more traditional problem-oriented approaches that take a longer-term historical perspective. Two detailed histories of past biological warfare programmes and policies have been published. The first, dealing with the period up to the end of the Second World War was published in 1999.<sup>47</sup> The second, involving many of the contributing authors to the first volume, covering the post-war period was published in 2006.<sup>48</sup>

#### *Scientific developments approach*

One of the themes within the problem-oriented approaches is the study of the implications of scientific and technological developments related to the life sciences. As the life sciences develop, new challenges to the regime may result. Some of these were noted in chapter 1, (see page A-11). Some of the work in this area is focused on the potential of new activities, while some has examined misuse of current otherwise peaceful activities. An additional focus has been biosecurity issues. In most cases, work covers more than one of these aspects.

The scientific community, through learned societies and national academies, such as the Royal Society (UK),<sup>49</sup> the National Academies (US)<sup>50</sup> and the Koninklijke Nederlandse Academie van Wetenschappen (Royal Netherlands Academy of Arts and Sciences)<sup>51</sup> has

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47. Erhard Geissler and John Ellis van Courtland Moon, (eds.), 'Biological and Toxin Weapons: Research, Development and Use from the Middle Ages to 1945', *SIPRI Chemical & Biological Warfare Studies* [Scorpion Papers], no 18, Stockholm International Peace Research Institute, (1999), 276 + 15 pp.

48. Mark Wheelis, Lajos Rózsa and Malcolm Dando (eds.), *Deadly Cultures: Biological Weapons Since 1945*, (Cambridge MA: Harvard University Press, 2006) 479 pp.

49. See, for example, Royal Society, *New approaches to biological risk assessment*, RS policy document 08/09, July 2009, 17 pp.

50. See, for example, National Academy of Science, *Globalization, Biosecurity, and the Future of the Life Sciences*, February 2006, 300 pp.

51. See, for example, Koninklijke Nederlandse Academie van Wetenschappen (Royal Netherlands

carried out detailed work on these issues. The Inter Academy Panel for International Issues (IAP), of which all these societies are members, has performed a coordinating role. For example, the IAP appointed a working group on biosecurity in 2004 to develop a statement of principles to be used by member academies or other scientific bodies in developing their own biosecurity policies.

In terms of academic analysis, much of what has been published in the English language derives from work undertaken at the Bradford University School of Peace Studies and others associated with this research group.<sup>52</sup> Malcolm Dando of Bradford University presents his perspective in the following terms:

the historical process of misusing current biological and medical capabilities in offensive biological warfare program[s] continues. The genetic engineering techniques discovered in the early 1970s were misused in the former Soviet Union during the 1980s. But we are only in the initial stages of the revolution in biotechnology. The Human Genome Project — designed to uncover the full details of our genetic make-up by the early years of the twenty-first century — signifies how much further this scientific revolution and its applications have to run. There are undoubtedly dangers that the new knowledge might be misused, for example, to develop new biological weapons that could be targeted at specific genetic characteristics of different ethnic groups.<sup>53</sup>

Another Bradford scholar, Jim Whitman cautions:

There is a danger that the speed of scientific and technological advances will outpace our deliberative systems.<sup>54</sup>

While scientific and technological developments have not been fully examined within BWC processes in recent years, issues relating to biosecurity have been on the agenda in both the 2003-05 and 2007-10 inter-sessional processes (see Appendix I, pages **App I-9** and **App I-12** respectively). The WHO produced new or updated guidance on both biosafety<sup>55</sup> and

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Academy of Arts and Sciences), *A Code of Conduct for Biosecurity: Report by the Biosecurity Working Group*, Amsterdam, August 2007, 43 pp.

52. These others include Alexander Kelle, Kathryn Nixdorff and Brian Rappert.

53. Malcolm Dando, *The New Biological Weapons: Threat, Proliferation, and Control*, (London: Lynne Reiner, 2001), 181 + ix pp at p 11. See also: Malcolm R Dando, *Preventing Biological Warfare: The Failure of American Leadership*, (Basingstoke: Palgrave, 2002), 231 + xiv pp, and in particular chapter 4 of that volume 'Genomics and the New Biotechnology', pp 62-74.

54. Jim Whitman, 'Global Governance and Twenty-first Century Technology', in: Brian Rappert (ed.), *Technology and Security: Governing Threats in the New Millennium*, (Basingstoke: Palgrave, 2007), pp 89-110.

55. World Health Organization, *Laboratory Biosafety Manual* [third edition], document no WHO/CDS/CSR/LYO/2004.11, 2004September 15, 2010, 178 pp.

biosecurity.<sup>56</sup> There has been some academic analysis of this crossover between biosecurity and NACD activities.<sup>57</sup>

One scientific and technological development that is receiving particular attention in the literature is synthetic biology, which was described in an official US submission to one of the BWC Meetings of Experts in the following terms:

Synthetic biology refers to the design and construction of biological components and systems that do not already exist in the natural world, as well as the re-design of existing ones imparting novel biological functions. As an interdisciplinary domain that includes biologists, engineers, chemists, and computer modelers, and as an emerging field extending beyond the traditional genetic engineering, synthetic biology is poised to become the next significant transforming technology for the life sciences and beyond.<sup>58</sup>

The implications of synthetic biology have been the subject of academic study,<sup>59</sup> proposals in the specialized scientific media,<sup>60</sup> and Parliamentary inquiries,<sup>61</sup> yet there is not, thus far, an emerging consensus on what the impact of these developments will be in anything other than a short timeframe.

Assumptions that wholly technological answers are needed to respond to technological changes should be avoided, according to Joshua Lederberg, a Nobel Prize-winning biologist:

There is no technical solution to the problem of biological weapons. It needs an ethical, human and moral solution if it's going to happen at all. There is no other solution.<sup>62</sup>

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56. World Health Organization, *Biorisk management: Laboratory biosecurity guidance*, document no WHO/CDS/EPR/2006.6, September 2006, 33 pp.
  57. See, for example, James Revill and Malcolm Dando, 'The Rise of Biosecurity in International Arms Control', in: Brian Rappert and Chandré Gould (eds.), *Biosecurity: Origins, Transformations and Practices*, (Basingstoke: Palgrave, 2009), pp 41-59.
  58. United States of America, *Synthetic Biology: A Transforming Technology*, BWC/MSP/2008/MX/WP.4, dated 30 July 2008, 4 pp at p 1.
  59. See, for example, Alexander Kelle, 'Synthetic Biology & Biosecurity Awareness In Europe', *Bradford Science and Technology Report* [University of Bradford], no 9, (November 2007), 23 pp; and Jonathan B Tucker and Raymond A Zilinskas, 'The Promise and Perils of Synthetic Biology', *The New Atlantis*, (Spring 2006), pp 25-45.
  60. Hans Bügl, John P Danner, Robert J Molinari, John T Mulligan, Han-Oh Park, Bas Reichert, David A Roth, Ralf Wagner, Bruce Budowle, Robert M Scripp, Jenifer A L Smith, Scott J Steele, George Church & Drew Endy, 'DNA synthesis and biological security', *Nature Biotechnology*, vol 25, no 6, pp 627-29.
  61. See, for example, UK House of Commons Science and Technology Committee, *Bioengineering* [Seventh Report of Session 2009-10], HC 220, published 25 March 2010, 52 + 182 pp.
  62. Joshua Lederberg, [*\*GET full ref\**]

Indeed, a recent volume has attempted to bring together many of the scientific and technological development issues and examine them in an international security context, including some of the human aspects.<sup>63</sup>

### *Terrorism approach*

A notable theme within the problem-oriented approach has been prompted by the possibility of the use of biological weapons, or other WMD, as a terrorist or criminal act. Literature on possible terrorist use of WMD, or the materials and technologies that contribute to them, is often a study of perception of threat rather than an absolute assessment of threat. This is particularly applicable in relation to biological and chemical weapons. Press reporting has followed the issues of the potential of WMD terrorism, often taking a shrill tone.

When terrorists or criminals innovate and find new methods of carrying out attacks, perhaps it is not surprising that there may be subsequent assumptions that more deadly methods may be used next. The hypothesis that new forms of attack by those identified as terrorists — whether assassination in the 1930s,<sup>64</sup> multiple casualty events in the 1970s<sup>65</sup> or suicide bombings of buildings in the 1980s<sup>66</sup> — produce a peak in fears of use of biological or

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63. Brian Rappert and Cairiona McLeish (eds.), *A Web of Prevention: Biological Weapons, Life Sciences and the Governance of Research*, (London: Earthscan, 2007), 218 + xi pp.

64. The 1935 session of the International Conference for the Unification of Penal Law, held in Copenhagen, included the following as terrorist acts: 'ignition of asphyxiating or noxious substances', 'pollution, fouling, or deliberate poisoning of drinking water or staple foods' and 'causing or propagating contagious or epidemic diseases' – Thomas M Franck and Bert B Lockwood jr, 'Preliminary Thoughts Towards an International Convention on Terrorism', *American Journal of International Law*, vol 68, no 1 (January 1974), pp 69-90.

65. Take, for example, the following quote from a debate initiated in the UK House of Lords: 'One only has to think of the appalling [recent attacks] to realise that nowadays international terrorists will stop virtually at nothing. The chemical weapon is easily portable, cheaply made and easily used ... [We must] think seriously about the appalling danger that would be presented to international order and stability if international terrorists of the kind that carried out the shocking [attacks] were to decide to use, instead of the weapons that they used there, this kind of weapon of indiscriminate destruction' – Lord Chalfont, 7 June 1972, *Hansard* (Lords), vol 331, c 311-62. The attacks he refers to were at Lod Airport, Tel Aviv, on 30 May that year in which 3 Japanese Red Army terrorists, operating in conjunction with the Popular Front for the Liberation of Palestine (PFLP-GC), killed 24 people and injured over 70 more. Chalfont was a former Minister of State in the Foreign and Commonwealth Office and would have had access to earlier government assessments on these issues.

66. For example, one press article quoted an 'expert' as stating 'I believe there's certainly a will (on the part of terrorist groups) to use chemical weapons'. The article then went on to say: 'Frank Stunnenberg of the University of Amsterdam agreed, adding, "All that's needed is the knowledge, and I don't doubt that they can get it together.'" Dr. Stunnenberg said that it would take nothing more than 'a basic knowledge of chemistry and \$240' to make 60 pounds of

chemical weapons is outside the focus of this thesis, however the historical precedents should be borne in mind when considering the events of recent years. Nevertheless, fears of terrorist or criminal use of biological, chemical or nuclear materials were substantially enhanced by the 11 September 2001 attacks in the US and the anthrax letters posted later that year. One effect of these and other events<sup>67</sup> was a growing realisation of the vulnerabilities of modern societies to disruption. These fears had direct influence on policy making.

In 1995, Aum Shinrikyo dispersed the nerve gas Sarin on the Tokyo underground and subsequent investigation indicated that the group was certainly involved with research into biological agents, although its efforts to use any of these did not appear to lead to any casualties. This prompted much literature on the possibilities of use of biological weapons. The period 1995 through 2000 is characterised by Milton Leitenberg as being driven by spurious statistics (for example, hoaxes being counted as biological events), unknowable predictions, gross exaggeration of the feasibility of acquisition of usable weapons, apparent absence of a thorough threat assessment, and extravagant rhetoric.<sup>68</sup>

This period was described by RAND analyst Brian Jenkins as being dominated by ‘fact-free analysis’.<sup>69</sup> However there were some more analytically based pieces in this period.<sup>70</sup>

Leitenberg identified all of these trends continuing beyond 2001 and concluded:

For the past decade the risk and imminence of the use of biological agents by nonstate actors/terrorist organizations — ‘bioterrorism’ — has been systematically and deliberately exaggerated.<sup>71</sup>

Other analysts identified that claims of the level of terrorism threat in other areas were also exaggerated.<sup>72</sup> Elsewhere, Leitenberg noted that exaggerated claims can be

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mustard gas - enough to threaten the population of a medium-size city.’ – Gary Yerkey, ‘Experts study threat of chemical weapons in terrorists’ hands’, *Christian Science Monitor*, 29 August 1986, p 9.

67. For example, the fuel protests in the UK in 2000 which caused significant disruption.

68. Milton Leitenberg, *Assessing the Biological Weapons and Bioterrorism Threat*, Strategic Studies Institute, U.S. Army War College, (December 2005), 115 pp at p 45.

69. As cited by Leitenberg, [*GET original*]

70. See, for example, Jonathan Tucker, *Toxic Terror*, 2000

71. Milton Leitenberg, *Assessing the Biological Weapons and Bioterrorism Threat*, Strategic Studies Institute, U.S. Army War College, (December 2005), 115 pp at p 88.

72. John Mueller, ‘Simplicity and Spook: Terrorism and the Dynamics of Threat Exaggeration’, *International Studies Perspectives*, vol 6, no 2, (May 2005), pp 208–34.

counter-productive as they may end up stimulating interest in biological weapons in people previously not considering development or use of biological weapons.<sup>73</sup>

Whether exaggerated or not, threat perceptions were influential on elements of the regime to control biological weapons. In particular, the adoption of topics such as national implementation and security of pathogens in the first BWC inter-sessional process represented a refocusing of the regime onto the potential threats from non-state actors.

That the perceptions of threat were changed for many people is beyond doubt, but hard evidence for assessment of real threat levels was difficult to find. Some attempts were made at putting together a framework for threat assessment in relation to hostile uses of dual-use materials by non-state actors<sup>74</sup> and in identifying signs that might be observed if a group attempted to acquire dual-use materials for hostile purposes.<sup>75</sup>

Evidence-based policy making was lacking in some countries. Two key allegations were made during the decade, that ricin had been produced in London and that al-Qaeda cells working on biological terrorism had moved from Afghanistan to the Pankisi Gorge in Georgia. The Pankisi Gorge allegations were originally made by US Secretary of State Colin Powell before the UN Security Council in 2003, during the now-infamous briefing to the Council on Iraq's alleged WMD, and repeated by French Interior Minister Dominique de Villepin in 2005. Neither the London ricin claim nor the Pankisi Gorge allegations appear to be based on any substantive evidence.<sup>76</sup>

A number of exercises were carried out, most notably *Dark Winter* and *Atlantic Storm*. Both contained scenarios that were considered implausible by other experts.<sup>77</sup> However, these and other exercises influenced policy and perceptions.

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73. Milton Leitenberg, 'The self-fulfilling prophecy of bioterrorism', *Nonproliferation Review*, vol 16, no 1, (March 2009), pp 95-109.

74. See, for example, Lyle Makosky, Eric R Stephen, *Development of a Threat Assessment Framework Applicable to Dual Use Biotechnology*, Defence R&D Canada Contract Report, DRDC-CR-2007-003, April 2007, 58 pp.

75. T J Sullivan and W L Perry, 'Identifying Indicators of Chemical, Biological, Radiological, and Nuclear (CBRN) Weapons Development Activity in Sub-National Terrorist Groups', *Journal of the Operational Research Society*, vol 55, no 4, [Special Issue: 'OR in Defence'], (April 2004), pp 361-74.

76. Richard Guthrie, John Hart and Frida Kuhlau, 'Chemical and biological warfare developments and arms control', *SIPRI Yearbook 2006*, (Stockholm/Oxford: SIPRI/Oxford University Press, 2006), pp 707-31 at p 730.

77. David Ruppe, 'Experts question merit of recent smallpox exercise', *Global Security Newswire*, 9

Analysis in a more measured tone was produced by some authors.<sup>78</sup>

With widespread concerns that a new enthusiasm for suicide bombings indicated that terror groups would be unconcerned at the loss of life in an attack, and therefore such groups might have a greater interest in mass casualty WMD attacks, a notable approach was that of Adam Dolnik who examined neglected nuances of suicide terrorism. Dolnik noted:

the fact that some individuals are willing to sacrifice deliberately their lives for the 'greater good' does not necessarily translate into a self-destructive attitude among the rest of the group. Almost all suicide attacks to date have involved the death of individuals, carefully planned to sacrifice the lowest number of people necessary to carry out the operation. Even the September 11 attacks involved only the necessary minimum of personnel to overtake the airplanes and to complete the mission successfully.<sup>79</sup>

Responding to suggestions that a greater danger is posed by religious cults, especially those with apocalyptic ideology, Dolnik notes:

most suicide cults tend to direct their violence only inward, committing collective suicide without attacking others ... Apocalyptic cults that do kill non-members, on the other hand, surprisingly tend to be oriented toward survival. Even members of the Japanese cult Aum Shinrikyo ... demonstrated their desire to survive by adopting extensive safety measures and by emphasizing survival of Armageddon as the main benefit of being the group's member.<sup>80</sup>

### *Public health approach*

The understanding that the use of biological weapons – whether in warfare or as a terrorist or criminal act – is nothing more than the deliberate use of disease makes it apparent that there is much common ground in responses to outbreaks of disease, whether they stem from natural, deliberate or accidental (such as a laboratory incident) causes.

At the same time as the greater awareness was building of the vulnerability of modern societies to disruptions caused by deliberate actions, such as the 2001 anthrax letters, there

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March 2005.

78. See, for example, John Parachini, 'Putting WMD Terrorism into Perspective', *Washington Quarterly*, vol 26, no 4, (Autumn 2003), pp 37-50 and Jessica Stern, 'Dreaded Risks and the Control of Biological Weapons', *International Security*, vol 27, no 3, (Winter 2002/03), pp 89-123.

79. Adam Dolnik, 'Die and Let Die: Exploring Links between Suicide Terrorism and Terrorist Use of Chemical, Biological, Radiological, and Nuclear Weapons', *Studies in Conflict and Terrorism*, vol 26, no 1, (January-February 2003), pp 17-35 at p 32.

80. Adam Dolnik, 'Die and Let Die: Exploring Links between Suicide Terrorism and Terrorist Use of Chemical, Biological, Radiological, and Nuclear Weapons', *Studies in Conflict and Terrorism*, vol 26, no 1, (January-February 2003), pp 17-35 at p 32.

were increased concerns regarding the harm that could result from natural outbreaks of new diseases, such as the spread of Severe Acute Respiratory System (SARS) in 2003 or the possibilities of a Highly Pathogenic Avian Influenza (HPAI or 'bird flu') epidemic. This led to a new realization of the connections between health security and economic security, and the understanding that a significant impact on economic security that resulted from health issues could have a major impact on national security.

The World Health Organization is the inter-governmental body tasked with issues relating to public health. The 1970 WHO publication, *Health Aspects of Chemical and Biological Weapons*, was followed by a second edition in 2004, *Public health response to biological and chemical weapons: WHO guidance*. While this illustrates the involvement of the WHO within this subject area, there are particular issues that are of significance in relation to the interaction between health and security issues. This is probably best summed up by a concept known as the 'second diagnosis problem'.

The second diagnosis problem was first highlighted by Robin Coupland of the International Committee of the Red Cross. Coupland noted that the identification of a disease in any particular circumstance might be known as the 'first diagnosis'. However, if there was an allegation that a disease had been deliberately induced, this would require a 'second diagnosis' to resolve the situation — to identify how this deliberate act had been carried out and who had perpetrated the act. But who should make this second diagnosis and how long might this take? Coupland and colleagues recognized dangers of presuming health or humanitarian organizations should make the second diagnosis.<sup>81</sup>

Individual authors have focused on particular aspects of these problems, such as dual-use issues or the interaction of the regime and public health issues. Some authors have suggested that one of the best ways to reduce the impact of any use of deliberate disease is to reduce the general impact of natural disease. One suggestion has been for a 'vaccines for peace' programme.<sup>82</sup>

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81. Robin Coupland and Dominique Loye, 'International assistance for victims of use of nuclear, radiological, biological and chemical weapons: time for a reality check?', *International Review of the Red Cross*, vol 91, no 874, (June 2009), pp 329-40.

82. Erhard Geissler and John P Woodall (eds.), 'Control of Dual-Threat Agents: The Vaccines for

Amongst the developed countries, there is a notable US–Europe divergence, based mostly on different attitudes to health provision. In most of Europe public health, and healthcare in general, is seen as an activity for which it is correct that government should be involved with. In the USA, healthcare is seen as essentially a contract between a patient and a provider and the ‘legitimate’ role of government in health issues is the subject of much debate.

There is a particular overlap in the public health area with civil protection considerations and with terrorism issues. This has had great influence on the nature and tenor of public debate on the subject.

An influence that needs noting is the sponsorship of events and of literature by those that might benefit from decisions to follow particular policies. A simple example of this would be a meeting and report organized by the New Defence Agenda and the Chemical and Biological Arms Control Institute entitled ‘Countering Bioterrorism: How can Europe and the United States work together?’. The meeting was held in Brussels on 25 April 2005 and produced a series of recommendations. One proposed recommendation related to vaccine procurement. By coincidence, the meeting and report were made possible with the support of Acambis and Agilent Technologies, both of which are involved with vaccine production.<sup>83</sup>

A further example was the presentation by a representative of Emergent BioSolutions Inc. (an anthrax vaccine manufacturer) at a side event of the 2009 Meeting of Experts in which it was stated that the casualty effects of a one megaton nuclear weapon can be reproduced with only 6.5 kg of anthrax, without citing a specific source.<sup>84</sup> However, this figure derives from a 1995 paper<sup>85</sup> that suggested this number as an minimum requirement in near perfect conditions with high levels of technical expertise to achieve 100 per cent aerosolization in use against a totally unprotected population, noting that urban populations would gain some protection from the buildings they were in, thus requiring more material to be used. Indeed,

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Peace Programme’, *SIPRI Chemical & Biological Warfare Studies* [Scorpion Papers], no 15, Stockholm International Peace Research Institute, (1994), 265 + xvii pp.

83. Full disclosure: the author of this thesis was present at this meeting.

84. Richard Guthrie, ‘The Final Day: closure and reflections’, *MX report no 6*, BioWeapons Prevention Project, 31 August 2009, p 2.

85. Karl Lowe, Graham Pearson and Victor Utgoff, ‘Potential Values of a Simple BW Protective Mask’, Institute for Defense Analyses Paper P-3077, September 1995.

the paper illustrated that with basic protective measures the quantity of anthrax required to have the same casualty effects as a one megaton nuclear weapon would be raised ten-thousand fold to some 65,000 kg. The irony of the use of the minimum estimate from the 1995 paper is that these suggested basic protective measures did not include vaccination.

### ***Methodological approaches***

In addition to the thematic, problem-oriented, approaches outlined above, there are a number of methodological approaches that are of notable significance.

#### *The events approach*

One method for analysing a regime as complex as that to control biological weapons is to break down developments into discrete but inter-related events and present them in a chronological sequence.

This is one of the approaches used by HSP and quarterly chronologies are published in its *CBW Conventions Bulletin*.<sup>86</sup> Examples of events in the HSP dataset include:

- the presentation of official speeches, announcements, declarations or documents;
- the gathering of individuals at a particular location, including committees and conferences;
- the movement of individuals, either singly or as a group;
- the publication of papers, articles and books; and
- the births and deaths of individuals;

Clearly, the significance of any event, or what it might mean in relation to other events, is subject to interpretation and this interpretation may vary according to the experiences, assumptions and prejudices, or indeed the theoretical perspective, being brought to bear by the individual who is doing the interpreting.

A key characteristic of an event is that its validity can be determined, such that it can be established that a particular policy document was released or an article was published. It must

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86. Copies of the *CBW Conventions Bulletin* are available from the Harvard Sussex Program website at <<http://www.sussex.ac.uk/Units/spru/hsp/pdfbulletin.html>>.

be noted, however, that even if an event is considered to be valid, this does not mean that all data embodied within the event is automatically assumed to be accurate.

However, the collation of events in a logical sequence with appropriate cross referencing provides a particularly rich research resource.

A further publication that followed a not entirely dissimilar methodology was *Arms Control Reporter*, published from 1982 to 2007.

### *Critical period approach*

A further approach is to examine a particular period in the lifetime of the regime and to examine it in detail. This approach combines elements of International Relations, Political Studies and Contemporary History. Two particular examples of this approach have dealt with events within the past decade and a half in the regime to control biological weapons.

The first of these, by Jez Littlewood,<sup>87</sup> is a detailed examination of the negotiations of the protocol for the BWC, their cessation in 2001 and the implications of this cessation. The second, by Guy Roberts,<sup>88</sup> also examines the events of 2001 and provides thoughts on how the international scene was leading to new forms of international effort to control biological weapons.

Each of these authors base their writings on their own experiences within the regime — Littlewood was a member of the Secretariat supporting the Ad Hoc Group and other BWC meetings, while Roberts was a senior member of the US delegation at BWC meetings.

Although other authors have written about the same period,<sup>89</sup> the particular experiences and background knowledge that these authors bring to the subject matter provides a more rounded and nuanced perspective.

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87. Jez Littlewood, *The Biological Weapons Convention: A Failed Revolution*, (Aldershot: Ashgate Publishers, 2005), 250 + ix pp.

88. Guy B Roberts, 'Arms Control without Arms Control: The Failure of the Biological Weapons Convention Protocol and a New Paradigm for Fighting the Threat of Biological Weapons', *INSS Occasional Paper*, 49, Institute for National Security Studies [United States Air Force], (March 2003), 111 + xii pp.

89. See, for example, Ken Ward, 'The BWC Protocol: Mandate for Failure', *Nonproliferation Review*, vol 11, no 2, (Summer 2004), pp 183-99; and Malcolm R Dando, *Preventing Biological Warfare: The Failure of American Leadership*, (Basingstoke: Palgrave, 2002), 231 + xiv pp.

There have been other notable analyses of critical periods. For example, Nicholas Sims examined the first decade after the entry into force of the BWC.<sup>90</sup> There have been a number of articles and papers that focus on the state of the regime after particular Review Conferences, for example.<sup>91</sup>

### *The sectoral approach*

Nicholas Sims produced a book in 2001 that took a different perspective on the evolution of the regime to control biological weapons. Unlike his earlier book, noted above, which took an essentially chronological approach to the developments, this later volume took a sectoral approach.<sup>92</sup> This latter book is focused on the BWC rather than the broader regime. The author notes 'The treaty regime was defined and developed by a process of cumulative diplomacy and accretion; each review conference built on its predecessor'.<sup>93</sup>

The three sectors, which Sims describes as 'regimes', identified by the author are a regime of compliance; a regime of development; and a regime of permanence. Sims described his regime of compliance as composed of the elements of the BWC, such as the complaints procedure, 'that served as functional substitutes for verification' together with confidence-building measures and negotiations for a protocol that were still continuing at the time. His regime of development is described as 'a set of principles and norms that lead to practical economic and social benefits' and the regime of permanence as the 'legal and diplomatic elements which reinforce the permanent character of the BTWC and render it more irreversible'.<sup>94</sup>

Sims concluded that, of the three, the regime of compliance had evolved the furthest, notwithstanding that 'Every element in the regime of compliance remains underdeveloped, and each can be strengthened'.<sup>95</sup>

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90. Nicholas A Sims, *The Diplomacy of Biological Disarmament: Vicissitudes of a Treaty in Force, 1975-85*, (London: Macmillan; New York: St Martin's Press, 1988), 356 + xv pp.

91. One such monograph is: Una Becker, 'Light at the End of the Tunnel? The Sixth Review Conference of the Biological Weapons Convention', *PRIF Reports*, 79, (2007), 41 pp.

92. Nicholas A Sims, 'The Evolution of Biological Disarmament', *SIPRI Chemical & Biological Warfare Studies* [Scorpion Papers] no 19, Stockholm International Peace Research Institute, (2002), 200 pp.

93. *Ibid.*, p 18

94. All quotes in this paragraph are from *ibid.*, pp 1 & 2.

95. *Ibid.*, p 171.

In bringing these three regimes together, Sims identifies two lacunae. The first of these is a regime relating to research as research is not a prohibited activity under the BWC. As research is not a prohibited activity then, Sims argues, it does not fall with the general purpose criterion. The second identified lacuna is the lack of an institutional core to the Convention.

Sims concludes a need for ‘a balanced approach to the evolution of the BWC treaty regime in each of its sectors’.<sup>96</sup>

In a later book,<sup>97</sup> Sims continues to focus on countering institutional deficit, but focuses on accountability framework issues rather than research issues.

### **Chapter conclusions**

There are a number of conclusions and judgements regarding previous understandings that are relevant to the work of this thesis. The most fundamental of which is that understanding the problems presented by the issue of biological weapons and the possible solutions there may be is a truly multidisciplinary effort that spans the natural and social sciences. This thesis therefore goes beyond standard political sciences and international relations literature.

There is a need to separate biological weapons from the other ‘weapons of mass destruction’ for a number of types of analysis. While there is significant common ground between biological and chemical weapons there are also important differences. Biological weapons should only be compared and contrasted with the other types of WMD where appropriate.

The nuances of the differences between the NACD concepts are important, notwithstanding that there are sufficient overlaps so that it is worth considering all of these as one grouping for a number of purposes. For the purposes of this thesis, it will be important to draw out some of the differences when attempting to understand expectations of the different types of regime and therefore be able to evaluate effectiveness at reaching those expectations.

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96. Nicholas A Sims, ‘Midpoint Between Review Conferences: Next Steps to Strengthen the BWC’, *Disarmament Diplomacy*, 91, (Summer 2009), <<http://www.acronym.org.uk/dd/dd91/91bwc.htm>>.

97. Nicholas A Sims, *The Future of Biological Disarmament: Strengthening the treaty ban on weapons*, (Abingdon/New York: Routledge, 2009), 216 + xvii pp.

Combining elements from this chapter and chapter 2, the disconnect between what happens under the aegis of the regime to control biological weapons and earlier writings on regime effectiveness becomes more apparent. For example, if no unambiguous assessment of the threat from non-state actors is possible, this is a significant hindrance to a simple numeric assessment of regime effectiveness as might be sought under a methodology such as the Oslo-Potsdam solution. However, imprecision is only a partial hindrance to accuracy.

As might be expected, when viewing issues relating to the regime to control biological weapons through different lenses, different emphases are brought forth. In the approaches outlined in this chapter there are no inherently contradictory understandings. However, policy perspectives and the choices that follow from them have implications for each other. Perhaps the clearest example of this is the tension between a need for controls on materials and technologies to prevent hostile uses of them while at the same time as there is a need for these to be accessible for peaceful purposes.

The shrill tone of much that is written about the possibility of terrorist use of biological weapons has had a dominant influence on much public debate and discourse. While, this has not drowned out the more analytical commentators on the subject matter, it has meant that analysts reaching measured conclusions have had some difficulties having their voice heard.

It is apparent from the variety of problem-oriented approaches that each of these might be used as background for an evaluation of success, failure and other measures of effectiveness of the regime to control biological weapons, but it is clear that no one measure would encompass all of these approaches. Hence, in the work of this thesis, more than one axis of assessment of effectiveness should be explored, as anticipated in a sub-question, RQ1a, of the first Research Question.

This section is an appropriate point to draw some further conclusions about what has gone before.

One aspect is the gap that exists between theory as outlined within academia and what really happens in policy terms. In some situations this gap is simply a manifestation of theory having to follow developments that are affected by many influences.

In 1997, Nancy Gallagher posed herself the rhetorical question ‘is arms control immune from the theory/policy gap?’<sup>98</sup> She identified two groups — ‘international relations theorists’ and ‘foreign policy practitioners’ — which she described as both ‘struggling with similar problems’ in the post-Cold War world. She noted:

The world does not look significantly different from the ivory tower than it does from the trenches where policy battles are fought. Scholars are more apt to critique than applaud current policy, yet their criticisms reflect a range of worldviews and often amplify debates already occurring in closed-door policy meetings.

Gallagher concluded:

Despite these commonalities, ‘thinkers’ and ‘doers’ often operate in such divergent ways that they fail to hear each other, or even recognize that the other group has something interesting to say. The results are wasted effort, unnecessary duplication, and frustration both for practitioners who lack the time and detachment needed for long-term planning, and for scholars who wonder whether their research really matters.

Highlighting situations where such a theory/policy gap manifests itself is one method by which an attempt can be made to diminish the gap. The same highlighting can be useful where there is a gap between declaratory policy and implementation activities. While it is beyond the scope of the thesis to identify solutions in all cases where these gaps occur, such highlighting can serve to help others identify solutions or to learn lessons.

Other commentators have noted that there are particular contemporary reasons to take note of theory/policy gaps:

IR need not be irrelevant to policy making. The lack of relevance is expressed in the deepening disdain with which policy makers approach research and advice proffered by academics. For policy makers, the ready-made substitute for scholarly advice is at hand in the Information Age ... If academic IR does not perform this role, if the debates become too esoteric or impossible to understand, the sanctions (often too subtle to be regarded as such) will come into play: funding for professors and job opportunities for graduates will flow elsewhere, and the status and the profile of the profession will be lowered. The franchise will be taken over by whoever else is capable of performing the relevant tasks: print media, television commentators, and journalists.<sup>99</sup>

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98. Nancy W. Gallagher, ‘Bridging the Gaps on Arms Control’, *Contemporary Security Policy* (Special Issue — Nancy W. Gallagher (ed.), ‘Arms Control. New Approaches to Theory and Policy’), vol 18, no 2, August 1997, pp 7-13.

99. Vendulka Kubalkova, ‘Reconstructing the Discipline’, in: Vendulka Kubalkova, Nicholas Onuf and Paul Kowert (eds.), *International Relations in a Constructed World*, (Armonk, NY: ME Sharpe, 1998), p 198.

### ***Further notes on methodology***

In a thesis, the convention after such a review of earlier understandings would be to position the author in the context of the existing literature. However, in this case, it is not such a straightforward proposition. In relation to the problem-oriented approaches identified above, all of the main strands have to be taken into account.

The critical period approach that has been outlined above is the foremost relevant approach to be used within this thesis. Elements of the events approach, which can help to identify critical junctures, will be used where appropriate. However, these methods on their own will not be sufficient.

The key element in attempting to understand what has taken place within the regime to control biological weapons and to identify how certain perceptions, including those of effectiveness, influenced choices is to recognise that there are usually multiple causes in each decision or critical juncture that is relevant to the narrative.

In order to identify such multiple causes, a number of additional research methods will have to be drawn upon to provide data, or methods of interpreting data, that will contribute to the research results. These will not only draw upon general social sciences methods but also related areas such as legal studies.

The first of these is contextual. It may be argued that officials and diplomats involved in international issues form a community which operates within its own sets of rules and social conventions. To understand the context in which decisions within the scope of this thesis are discussed and adopted requires approaches derived from ethnographic methods. It should be emphasized that this thesis is not a true ethnographic study, but simply a study that draws on ethnographic understandings and methods in circumstances that are relevant to its scope.

Ethnography has been defined in the following terms:

The study of people in naturally occurring settings or 'fields' by methods of data collection which capture their social meanings and ordinary activities, involving the researcher participating directly in the setting, if not also in the activities, in order to collect data in a systematic manner but without meaning being imposed on them externally.<sup>100</sup>

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100. J D Brewer, *Ethnography*, (Milton Keynes: Open University Press, 2000), at p 6. [*as quoted by Bell, get original\**]

The term ‘naturally occurring’ is used to encompass circumstances that have not been designed or arranged by the researcher and will often include structures or arrangements that are human creations or constructs by the community that is being studied.

The relevance of ethnographic understandings and methods to the subject matter of this thesis can be simply summarised:

There is an emphasis within ethnographic methodology on the importance of understanding events in *context*. *Out of context* the nature of what has occurred may be misunderstood.<sup>101</sup> [emphasis in original]

A number of lessons of ethnographic research need to be heeded. Not least that the researcher, in interacting with the community being researched, has to be aware of their own preconceptions and assumptions about activities and events within that community.

In the case of this thesis, the author has been involved with this community for a number of years and has contributed materials that have influenced understandings within the community.<sup>102</sup> However, the interactive nature of this relationship need not cast doubt upon any research results. Moreover, this interaction falls short of the type of activity that would be considered Action Research.

The need for groundrules during ethnographic research has been clearly stated. Much literature has been produced relating to ethnographic research where the cultures of the researched and the researcher are significantly different. However, in the research carried out for this thesis this does not necessarily apply. In the field of research into education — circumstances where the cultural differences are not so stark — there has been much writing on groundrules in ethnographic research. For example:

It is undoubtedly necessary for every ethnographer to establish some type of ‘contract’ with the society to be studied. Such a ‘contract’ may include specifications about what records may or may not be examined; where the ethnographer may or may not go, when, and under what circumstances; which meetings may be attended and which are closed; how long the researcher will stay in the field; who (if anyone) has access to field notes, and who has the right to review and/or approve the ethnography and its analysis

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101. Martyn Hammersley, *What’s Wrong with Ethnography?*, (London: Routledge, 1992), 230 + ix pp at p 23.

102. In terms of the BWC meetings, the biggest contribution has been the Daily Reports produced by the author at each of the formal Meetings of Experts and Meetings of States Parties since 2006 which can be found at <<http://www.bwpp.org/reports.html>>.

prior to publication, or under what circumstances they may or may not be published at all.<sup>103</sup>

Within meetings relating to the regime — whether formal meetings of the BWC, workshops or seminars by groups of individuals interested in issues related to the regime, or within individual governments (or groups of governments) — there are issues of political sensitivity. The development of new policies or the elaboration of new means by which to enhance the regime can sometimes require exploration of issues behind closed doors. There are times in these circumstances where novel ideas are being explored and it is important to be able to distinguish between those in which officials are representing the considered views of their governments and those in which ideas are being presented and discussed on a personal level.

Other issues have a different form of sensitivity. Indeed, in understanding the utility of certain technologies for the potential contributions they might make within a programme to develop biological weapons, a by-product of such research can be the accumulation of information that itself becomes proliferation sensitive. The level of expertise of some of the participants means that it is important to avoid disclosure of proliferation-sensitive information in reporting their activities or views. Fortunately, it has been possible to draw up this thesis without reference to proliferation-sensitive information.

A further social sciences research method that will be drawn upon is that which has become known as grounded theory. Despite the name, grounded theory is not a theory in itself but represents an underlying approach to generate data from source material. Grounded theory techniques have particular implications for the overall research process:

Most grounded theory researchers will begin with research questions but they do not start with a hypothesis, nor do they begin their investigation with a thorough review of the literature relating to their topic. They build up theory from their data and they do not wait until all data are collected before they begin their analysis stage. Instead analysis takes place as the data are collected.<sup>104</sup>

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103. Frank W Lutz, 'Ethnography: the holistic approach to understanding schooling', in Martyn Hammersley, *Controversies in Classroom Research*, (Buckingham: Open University Press, 1986), pp 107-19 at p 114.

104. Judith Bell, *Doing Your Research Project*, (Milton Keynes: Open University Press, 2005 [fourth edition]), 267 + xv pp at p 19.

*Issues relating to documentary evidence*

Previous work by the present author identified six methods by which consensus can be achieved in a negotiated text — agree to disagree, persuasion, bargaining, deferral, deletion and ambiguity.<sup>105</sup> A seventh method has been subsequently identified following further conversations with practitioners — that of limiting who it is that is able to participate in the negotiations.<sup>106</sup>

Working with documentary histories has to take into account the limitations that are inherent in any documentary record. In addition to general contextual concerns — identifying why a particular document might have been written, who might have been the intended audience and were there any particular messages the author(s) might have been meaning to convey or to divert attention from — the issues of consensus by deletion and consensus through limited participation have to be taken into account as these processes do not always leave clearly visible traces in the public record.

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105. Richard Guthrie, 'Tackling ambiguities: lessons for the Review Conference from the Chemical Weapons Convention negotiations', discussion paper, 28th Workshop of the Pugwash Study Group on the Implementation of the CBW Conventions, 'The Second CWC Review Conference and After', Noordwijk, the Netherlands, 5-6 April 2008, 4 pp.

106. The present author is indebted to Christopher Park of the US State Department for the identification of this method.

## **Chapter 4**

### **Success and failure ('effectiveness') in NACD regimes**

This chapter develops understandings of aspects of success or failure within the regime which might contribute to or diminish regime effectiveness, including examining whether more than one axis of success/failure should be considered. Identified potential benchmarks or criteria used within assessment of regime effectiveness are examined in relation to principles, norms and rules (i.e., obligations) within the regime to control biological weapons.

Interactions between regimes and other governance systems examines how policy is developed within governance systems and how regimes can interact with such systems. This chapter is primarily based on observations and experiences of the author. An understanding of these interactions allows for a more informed understanding of how regimes may be considered to be effective. These understandings also form a benchmark against which the activities of the EU institutions and Member States can be compared.

*Progress as of transfer date:*

- *Four axes/dimensions for evaluation of regime effectiveness identified*
- *Arguments in support of each of the four are in preparation and chapter structure outlined with about 75% of sections having most text in*

## **Chapter 5**

### **The EU and the regime to control biological weapons**

This chapter examines the activities under the umbrella of the EU in the regime to control biological weapons. The chapter starts with a brief overview of the development of policy at a high political level within the EU focusing in particular on the development of the WMD Strategy in the context of the EU's Common Foreign and Security Policy. The chapter examines the impact of overarching political influences, such as the EU WMD Strategy, on perceptions of and interactions with the regime to control biological weapons. The EU institutions and Member States had to translate broad policy guidance into detailed actions, this chapter examines what decision making mechanisms were used and how these took into account any aspects of perceived effectiveness of the regime to control biological weapons.

*Progress as of transfer date:*

- *Large number of relevant documents identified, collated and catalogued*
- *Relevant officials identified*

## Chapter 6 Conclusions

This chapter draws together the themes developed within the thesis. A key issue examined in this chapter is whether the results of evaluations can be related to the *disaggregated regime* — that is the co-operative elements of the overall regime without including contributions to the overall regime that would have taken place if the regime had not existed — as well as the *overall regime*, including all national, sub-national, multinational and supranational contributions, irrespective of the motivation or derivation of the contributions?

*Progress as of transfer date:*

- *Little work done other than to have identified a few particular points*

# **Appendix I**

## **Background to significant elements of the regime to control biological weapons**

This appendix is designed to supplement the information on the regime to control biological weapons that is provided in Chapter 3.

*Progress as of transfer date:*

- *This Appendix is mostly complete but has not been submitted as part of the transfer package as it is not required. However, members of the transfer panel are welcome to a copy on request.*

## Bibliography

- Holger Anders, 'Norm Evolution Dynamics: The Case of Arms Brokering Controls', Paper presented at the annual meeting of the International Studies Association 48th Annual Convention, Hilton Chicago, USA, 28 February 2007, [http://www.allacademic.com/meta/p179860\\_index.html](http://www.allacademic.com/meta/p179860_index.html).
- Emily Bailey, Richard Guthrie, Darryl Howlett and John Simpson, 'Volume I: The Evolution of the Nuclear Non-Proliferation Regime' (Sixth Edition), *PPNN Briefing Book*, Programme for Promoting Nuclear Non-Proliferation, March 2000, 66 pp.
- Laura Barnett, *Canada's Approach to the Treaty-making Process*, Parliamentary Information and Research Service of the Library of Parliament, Canada, PRB 08-45E, 24 November 2008, 11 pp at p 2, fn 3.
- Michael Barnett and Raymond Duvall, 'Power in International Politics', *International Organization*, vol 59, no 1, (Winter 2005), pp 39-75.
- Michael Barnett and Martha Finnemore, *Rules for the World: International Organizations in Global Politics*, (Ithaca, NY: Cornell University Press, 2004), 226 + xi pp.
- Una Becker, 'Light at the End of the Tunnel? The Sixth Review Conference of the Biological Weapons Convention', *PRIF Reports*, 79, (2007), 41 pp.
- Thomas Bernauer, *The chemistry of regime formation*, United Nations Institute for Disarmament Research/Dartmouth Publishing, (1993), 480 pp.
- Barry Buzan, 'From International System to International Society: Structural Realism and Regime Theory Meet the English School', *International Organization*, vol 47, no 3, (Summer 1993), pp. 327-52.
- Barry Buzan, 'The English School: an underexploited resource in IR', *Review of International Studies*, vol 27, no 3, (July 2001), pp. 471-88.
- Hans Bügl, John P Danner, Robert J Molinari, John T Mulligan, Han-Oh Park, Bas Reichert, David A Roth, Ralf Wagner, Bruce Budowle, Robert M Scripp, Jenifer A L Smith, Scott J Steele, George Church & Drew Endy, 'DNA synthesis and biological security', *Nature Biotechnology*, vol 25, no 6, pp 627-29.
- W Seth Carus, 'Defining "Weapons of Mass Destruction"', *Occasional Paper 4*, Center for the Study of Weapons of Mass Destruction, National Defense University [Washington, D.C.], pp 49 + xii.
- Inis L Claude jr, 'Collective Legitimization as a Political Function of the United Nations', *International Organization*, vol 20, no 3 (Summer 1966), pp 367-79.
- Benjamin V Cohen, The Impact of the United Nations on United States Foreign Policy, *International Organization*, vol 5, no 2 (May 1951), pp 274-81.
- Wesley M Cohen and Daniel A Levinthal, 'Absorptive capacity: A new perspective on learning and innovation', *Administrative Science Quarterly*, vol 35, no 1, [Special Issue: Technology, Organizations, and Innovation], (March 1990), pp 128-52.
- Robin Coupland and Dominique Loyer, 'International assistance for victims of use of nuclear, radiological, biological and chemical weapons: time for a reality check?', *International Review of the Red Cross*, vol 91, no 874, (June 2009), pp 329-40.
- Robin Cowan and Dominique Foray, 'The Economics of Codification and the Diffusion of Knowledge', *Industrial & Corporate Change*, vol 6, no 3, (September 1997), pp 595-622.
- Malcolm Dando, *The New Biological Weapons: Threat, Proliferation, and Control*, (London: Lynne Reiner, 2001), 181 + ix pp.
- Malcolm R Dando, *Preventing Biological Warfare: The Failure of American Leadership*, (Basingstoke: Palgrave, 2002), 231 + xiv pp.
- Radoslav S Dimitrov, Detlef F Sprinz, Gerald M DiGiusto and Alexander Kelle, 'International Nonregimes: A Research Agenda', *International Studies Review*, vol 9, (2007), pp. 230-58.
- Adam Dolnik, 'Die and Let Die: Exploring Links between Suicide Terrorism and Terrorist Use of Chemical, Biological, Radiological, and Nuclear Weapons', *Studies in Conflict and Terrorism*, vol 26, no 1, (January-February 2003), pp 17-35.
- Martin David Dubin, 'Transgovernmental Processes in the League of Nations', *International Organization*, vol 37, no 3 (Summer, 1983), pp 469-93.
- Daniel Feakes, Brian Rappert and Caitriona McLeish, 'Introduction: A Web of Prevention?', in: Brian Rappert and Caitriona McLeish (eds.), *A Web of Prevention: Biological Weapons, Life Sciences and the Governance of Research*, (London: Earthscan, 2007), pp 1-13.
- Martha Finnemore and Kathryn Sikkink (1998), 'International Norm Dynamics and Political Change', *International Organization*, vol 52, no 4 (Autumn 1998), pp 887-917.
- Thomas M Franck and Bert B Lockwood jr, 'Preliminary Thoughts Towards an International Convention on Terrorism', *American Journal of International Law*, vol 68, no 1 (January 1974), pp 69-90.

- Nancy W Gallagher, 'Bridging the Gaps on Arms Control', *Contemporary Security Policy* (Special Issue — Nancy W. Gallagher (ed.), 'Arms Control. New Approaches to Theory and Policy'), vol 18, no 2, August 1997, pp 7-13.
- Erhard Geissler, *Biological and Toxin Weapons Today*, (Stockholm/Oxford: SIPRI/OUP, 1986), 207 pp.
- Erhard Geissler, 'Strengthening the Biological Weapons Convention by Confidence-Building Measures', *SIPRI Chemical & Biological Warfare Studies* [Scorpion Papers], no 10, Stockholm International Peace Research Institute, (1990), 206 pp.
- Erhard Geissler and John Ellis van Courtland Moon, (eds.), 'Biological and Toxin Weapons: Research, Development and Use from the Middle Ages to 1945', *SIPRI Chemical & Biological Warfare Studies* [Scorpion Papers], no 18, Stockholm International Peace Research Institute, (1999), 276 + 15 pp.
- Erhard Geissler and John P Woodall (eds.), 'Control of Dual-Threat Agents: The Vaccines for Peace Programme', *SIPRI Chemical & Biological Warfare Studies* [Scorpion Papers], no 15, Stockholm International Peace Research Institute, (1994), 265 + xvii pp.
- Charles L Glaser, 'Realists as Optimists: Cooperation as Self-Help', *International Security*, vol 19, no 3 (Winter, 1994-1995), pp 50-90.
- Richard Guthrie, 'The Chemical Weapons Convention: a guide', in J.B. Poole and R. Guthrie (eds.) *Verification 1993: Peacekeeping, Arms Control and The Environment*, VERTIC, 1993, pp. 25-32.
- Richard Guthrie, *Preventing Nuclear Proliferation: the NPT and its extension in 1995*, published collectively by the British American Security Information Council, the Defence FAX Organisation, the International Security Information Service and the Verification Technology Information Centre, 1993
- Richard Guthrie, 'Significant Multilateral NACD Agreements: the scope and challenge of implementation', in J. Marshall Beier and Steven Mataija, *Cyberspace and Outer Space: Transitional Challenges for Multilateral Verification in the 21st Century*, York Centre for International and Security Studies, 1997, pp. 41-52.
- Richard Guthrie, 'Could a New Security Assurance Enhance WMD Norms?', in Richard Guthrie (ed.), *Verification 1997: the VERTIC Yearbook*, (London/Boulder: VERTIC/Westview Press), 1997, pp 11-22.
- Richard Guthrie, 'Technological Aspects of Verification: declarations, managed access and confidential proprietary information', in Malcolm Dando and Graham Pearson (eds.), *Verification of the Biological and Toxin Weapons Convention*, Kluwer Academic Publishers, 2000, pp 151-60.
- Richard Guthrie, 'Technological Aspects of Verification: investigation of alleged use of biological weapons', in Malcolm Dando and Graham Pearson (eds.), *Verification of the Biological and Toxin Weapons Convention*, Kluwer Academic Publishers, 2000, pp 161-70.
- Richard Guthrie, 'The United Nations Secretary-General's mechanism to investigate alleged use of biological and chemical warfare', A briefing paper prepared by the Stockholm International Peace Research Institute (SIPRI) for the Swedish Ministry of Foreign Affairs, May 2006 [submitted by the Swedish Government to the United Nations study *Verification in All Its Aspects*].
- Richard Guthrie, 'Rising Out of the Doldrums: Report on the BWC Review Conference', *Disarmament Diplomacy*, Spring 2007.
- Richard Guthrie, 'A New Lease of Life: The 6th Review Conference of the BTWC and Beyond', *BWPP Occasional Paper no 3*, (December 2007).
- Richard Guthrie, 'Tackling ambiguities: lessons for the Review Conference from the Chemical Weapons Convention negotiations', discussion paper, 28th Workshop of the Pugwash Study Group on the Implementation of the CBW Conventions, 'The Second CWC Review Conference and After', Noordwijk, the Netherlands, 5-6 April 2008, 4 pp.
- Richard Guthrie, 'The evolution of EU policy on non-proliferation of WMD', *CFSP Forum*, vol 7, no 4, July 2009, pp 18-24.
- Richard Guthrie, John Hart, Frida Kuhlau and Jean Pascal Zanders, 'Non-Compliance with the Chemical Weapons Convention: Lessons from and for Iraq', SIPRI Policy Paper No. 5, October 2003.
- Richard Guthrie, John Hart, Frida Kuhlau and Jacqueline Simon, 'Chemical and biological warfare developments and arms control', *SIPRI Yearbook 2004*, (Stockholm/Oxford: SIPRI/Oxford University Press, 2004), pp 659-96.
- Richard Guthrie, John Hart and Frida Kuhlau, 'Chemical and biological warfare developments and arms control', *SIPRI Yearbook 2005*, (Stockholm/Oxford: SIPRI/Oxford University Press, 2005), pp 603-28.
- Richard Guthrie, John Hart and Frida Kuhlau, 'Chemical and biological warfare developments and arms control', *SIPRI Yearbook 2006*, (Stockholm/Oxford: SIPRI/Oxford University Press, 2006), pp 707-31.

- Richard Guthrie and John Simpson, 'L'avenir des régimes de contrôle des exportations NBC: Un point de vue britannique', in Camille Grand (ed.) *Les régimes multilatéraux de contrôle des exportations de technologies sensibles*, Institut français des relations internationales (IFRI), December 2000, pp. 25–61.
- Ernst B Haas, *The uniting of Europe: Political, Social, and Economic Forces, 1950-1957* [third edition], (Notre Dame: Notre Dame Press, 2004) [this edition contains the original 1958 text as published by Stanford University Press together with updated prefaces from 1968 and 2003], 552 + xl + \*lvi pp.
- Ernst B Haas, 'Is there a Hole in the Whole? Knowledge, Technology, Interdependence, and the Construction of International Regimes', *International Organization*, vol 29, no 3, (Summer 1975), [special edition: *International Responses to Technology*], pp 827-76.
- Ernst Haas, 'Words Can Hurt You: Or Who Said What to Whom About Regimes' in Stephen D Krasner (ed.), *International Regimes*, (Ithaca, NY: Cornell University Press, 1983).
- Stephan Haggard and Beth A Simmons, 'Theories of International Regimes', *International Organization*, vol 41, no 3, (Summer 1987), pp 491-517.
- Morton H. Halperin and Priscilla A. Clapp with Arnold Kanter, *Bureaucratic Politics and Foreign Policy*, (Washington DC: Brookings Institution Press, 2006; 2nd edition), 400 pp.
- Henry L. Hamman, 'Remodelling International Relations', in: Vendulka Kubalkova, Nicholas Onuf and Paul Kowert (eds.), *International Relations in a Constructed World*, (Armonk, NY: ME Sharpe, 1998), pp 173-92.
- Peter M Hammond and Gradon B Carter, *From Biological Warfare to Healthcare, Porton Down, 1940-2000*, (Basingstoke: Palgrave, 2002), 280 pp.
- Andreas Hasenclever, Peter Mayer and Volker Rittberger, 'Interests, Power, Knowledge: the Study of International Regimes', *Mershon International Studies Review*, vol 40, no 2, October 1996, pp 177–228.
- Andreas Hasenclever, Peter Mayer and Volker Rittberger, 'Theories of International Regimes', *Cambridge Studies in International Relations*, (Cambridge: CUP, 1997), 248 + x pp.
- Carsten Helm and Detlef Sprinz, 'Measuring the Effectiveness of International Environmental Regimes', *Journal of Conflict Resolution*, vol 44, no 5, October 2000, pp 630-52.
- Simon Hix, *The Political System of the European Union*, (Basingstoke: Palgrave, 1999), 427 + xx pp.
- Raymond F Hopkins, 'The International Role of "Domestic" Bureaucracy', *International Organization*, vol 30, no 3 (Summer 1976), pp 405-32.
- Jon Hovi, Detlef F Sprinz and Arild Underdal, 'The Oslo-Potsdam Solution to Measuring Regime Effectiveness: Critique, Response, and the Road Ahead', *Global Environmental Politics*, vol 3, no 3, August 2003, pp 74-96.
- Fred Charles Iklé, 'After Detection — What?', *Foreign Affairs*, January 1961, pp 208–20.
- Beate Jahn, *The Cultural Construction of International Relations: The Invention of the State of Nature*, (Basingstoke: Palgrave, 2000), 182 + xviii.
- Carsten Ströby Jensen, 'Neo-functionalism', in: Michelle Cini and Nieves Pérez-Solórzano Borragán, *European Union Politics* [third edition], (Oxford: OUP, 2010), pp 71-85 at p 74.
- Steven Johnson, *Where Good Ideas Come From: The Natural History of Innovation*, (London: Allen Lane/Penguin, 2010), 336 pp.
- Ian Johnstone, 'Security Council Deliberations: The Power of the Better Argument', *European Journal of International Law*, vol 14, no 3 (2003), pp 437–80.
- Robert Kagan, 'Power and Weakness', *Policy Review*, no 113, (June 2002), <<http://www.hoover.org/publications/policy-review/article/7107>>
- Stuart Kauffman and Lee Smolin, 'A possible solution to the problem of time in quantum cosmology', *Santa Fe Institute Working Paper no 97-03-020*, 5 March 1997, 15 pp.
- Alexander Kelle, 'Strengthening the effectiveness of the BTW control regime — feasibility and options', *Contemporary Security Policy*, vol 24, no 2, (August 2003), pp 95–132.
- Alexander Kelle, 'Synthetic Biology & Biosecurity Awareness In Europe', *Bradford Science and Technology Report* [University of Bradford], no 9, (November 2007), 23 pp.
- Alexander Kelle, Kathryn Nixdorff and Malcolm Dando, *Controlling Biochemical Weapons: Adapting Multilateral Arms Control for the 21st Century*, (Basingstoke: Palgrave Macmillan, 2006), 208 + vii pp.
- Alexander Kelle, Kathryn Nixdorff and Malcolm Dando, 'A paradigm shift in the CBW proliferation problem: devising effective restraint on the evolving biochemical threat', *DSF-Forschung no 12*, Deutsche Stiftung Friedensforschung, 2008, 68 pp.
- Robert O Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy*, (Princeton: Princeton University Press, 1984), 290 pp.
- Philippe Kirsch and John T Holmes, 'The Rome Conference on an International Criminal Court: The Negotiating Process', *American Journal of International Law*, vol 93, no 2, January 1999, pp 2-12.
- Harold Hongju Koh, 'Why do Nations Obey International Law?', *Yale Law Journal*, vol 106, no 8, (June 1997), pp 2599–2659.

- Stephen D Krasner (ed.), *International Regimes*, (Ithaca, NY: Cornell University Press, 1983), 372 + x pp.
- Allan S. Krass, 'Nuclear verification in the post-Cold War era', in J. B. Poole & R. Guthrie (eds.), *Verification 1993*, VERTIC/Brassey's, 1993, pp. 69–76.
- Frida Kuhlau, 'Countering Bio-threats: EU Instruments for Managing Biological Materials, Technology and Knowledge', *Policy Paper No. 19*, Stockholm International Peace Research Institute, August 2007, 38 pp.
- Vendulka Kubalkova, 'Reconstructing the Discipline', in: Vendulka Kubalkova, Nicholas Onuf and Paul Kowert (eds.), *International Relations in a Constructed World*, (Armonk, NY: ME Sharpe, 1998), pp 193–201.
- Victor Lefebure, *Scientific Disarmament: A Treatment Based on the Facts of Armament*, (London: Victor Gollancz, 1931), 320 pp.
- Jeffrey W. Legro, 'Which Norms Matter? Revisiting the 'Failure' of Internationalism', *International Organization*, vol 51, no 1 (Winter 1997), pp 31–63.
- Milton Leitenberg, *Assessing the Biological Weapons and Bioterrorism Threat*, Strategic Studies Institute, U.S. Army War College, (December 2005), 115 pp at p 45.
- Milton Leitenberg, 'The self-fulfilling prophecy of bioterrorism', *Nonproliferation Review*, vol 16, no 1, (March 2009), pp 95–109.
- Jez Littlewood, *The Biological Weapons Convention: A Failed Revolution*, (Aldershot: Ashgate Publishers, 2005), 250 + ix pp.
- Sverre Lodgaard, 'The building of confidence and security at the negotiations in Stockholm and Vienna', *World Armaments and Disarmament: SIPRI Yearbook 1986* (Stockholm International Peace Research Institute/Oxford University Press: Oxford, 1986), pp 423–46.
- Karl Lowe, Graham Pearson and Victor Utgoff, 'Potential Values of a Simple BW Protective Mask', Institute for Defense Analyses Paper P-3077, September 1995.
- Douglas J MacEachin, 'Routine and Challenge: Two Pillars of Verification', *The CBW Conventions Bulletin*, 39, March 1998, pp 1-3.
- Lyle Makosky, Eric R Stephen, *Development of a Threat Assessment Framework Applicable to Dual Use Biotechnology*, Defence R&D Canada Contract Report, DRDC-CR-2007-003, April 2007, 58 pp.
- Ian Manners, 'Normative Power Europe: A Contradiction in Terms?', *Journal of Common Market Studies*, vol 40, no 2, pp 235–58.
- Ian Manners, 'The Normative Ethics of the European Union', *International Affairs*, vol 84, no 1 (2008), pp 45–60.
- Lisa L. Martin and Beth A. Simmons, 'Theories and Empirical Studies of International Institutions', *International Organization*, vol 52, no 4, (Autumn, 1998) [special edition: *International Organization at Fifty: Exploration and Contestation in the Study of World Politics*], pp 729–57.
- Robert J Mathews, 'Chemical and Biological Weapons Export Controls and the "Web of Prevention": A Practitioner's Perspective', in: Brian Rappert and Caitríona McLeish (eds.), *A Web of Prevention: Biological Weapons, Life Sciences and the Governance of Research*, (London: Earthscan, 2007), pp 163–71.
- John J Mearsheimer, 'The False Promise of International Institutions', *International Security*, vol 19, no 3 (Winter 1994–1995), pp 5–49.
- Matthew Meselson, 'Averting the hostile exploitation of biotechnology', *The CBW Conventions Bulletin*, no 48, June 2000, pp 16–19. [A slightly edited version of this article also appears as: Matthew Meselson, 'The problem of biological weapons', *Pugwash Occasional Papers*, vol 2, no 3, (September 2001), [collection of papers from the 50th Pugwash Conference, 'Eliminating the Causes of War', Cambridge, UK, August 2000], pp 147–56.]
- Benjamin Miller, 'Explaining Great Power Cooperation in Conflict Management', *World Politics*, vol 45, no 1, (October 1992), pp 1–46.
- Alan Milward, *The European Rescue of the Nation-State* [second edition], (London: Routledge, 2000), [this edition contains the original 1992 text with an additional preface], 466 + xvi pp.
- Andrew Moravcsik, *The Choice for Europe: Social Purpose and State Power from Messina to Maastricht*, (London: Routledge, 1999), 514 + xii pp. [Note: this book was initially published by Cornell University Press in 1998.]
- John Mueller, 'Simplicity and Spook: Terrorism and the Dynamics of Threat Exaggeration', *International Studies Perspectives*, vol 6, no 2, (May 2005), pp 208–34.
- Harald Müller, David Fischer and Wolfgang Kötter, *Nuclear Non-Proliferation and Global Order*, (Stockholm/Oxford: SIPRI/OUP, 1994), 258 pp.
- Harald Müller, 'Regime Robustness, Regime Attractivity and Arms Control Regimes in Europe', *Cooperation and Conflict*, vol 30, no 3, 1995, pp 287–97.
- Ethan A. Nadelmann, 'Global Prohibition Regimes: The Evolution of Norms in International Society', *International Organization*, vol 44, no 4 (Autumn 1990), pp 479–526.

- Robert Neild, 'Cheating in a Disarmed World', *Disarmament and Arms Control: An International Quarterly Journal*, vol I, no 2, Autumn 1963.
- Robert Neild, *What Has Happened to Disarmament?*, David Davies Memorial Institute of International Studies Annual Memorial Lecture, April 1968.
- Joseph S Nye Jr and Robert O Keohane, 'Transnational Relations and World Politics: An Introduction', *International Organization*, vol 25, no 3 (Summer 1971), pp 329-49.
- Joseph S Nye Jr and Robert O Keohane, 'Transnational Relations and World Politics: A Conclusion', *International Organization*, vol 25, no 3 (Summer 1971), pp 721-48.
- John Parachini, 'Putting WMD Terrorism into Perspective', *Washington Quarterly*, vol 26, no 4, (Autumn 2003), pp 37-50.
- Graham S Pearson, 'The Central Importance of Legally Binding Measures for the Strengthening of the Biological and Toxin Weapons Convention (BTWC)', *WMDC Paper no 28*, Weapons of Mass Destruction Commission, (January 2005) 59 pp.
- Mark A Pollack, 'Theorizing EU Policy-Making', in: Helen Wallace, Mark A Pollack and Alasdair R Young (eds.), *Policy Making in the European Union* [sixth edition], (Oxford: OUP, 2010), pp 15-44 at 17.
- George Poste and Julian Perry Robinson, 'International Control Measures: The Biological Weapons Convention and its Projected Protocol', in: *Measures for Controlling the Threat from Biological Weapons*, Royal Society, (2000), pp 9-14.
- Brian Rappert (ed.), *Technology and Security: Governing Threats in the New Millennium*, (Basingstoke: Palgrave, 2007), 223 + xii pp.
- Brian Rappert and Chandré Gould (eds.), *Biosecurity: Origins, Transformations and Practices*, (Basingstoke: Palgrave, 2009), 250 + x pp.
- Brian Rappert and Cairiona McLeish (eds.), *A Web of Prevention: Biological Weapons, Life Sciences and the Governance of Research*, (London: Earthscan, 2007), 218 + xi pp.
- Gregory A Raymond, 'Problems and Prospects in the Study of International Norms', *Mershon International Studies Review*, vol 41, no 2, (November 1997), pp 205-45.
- Dick Richardson, *The Evolution of British Disarmament Policy in the 1920s*, (London: Pinter, 1989), 265 + vi pp.
- Guy B Roberts, 'Arms Control without Arms Control: The Failure of the Biological Weapons Convention Protocol and a New Paradigm for Fighting the Threat of Biological Weapons', *INSS Occasional Paper*, 49, Institute for National Security Studies [United States Air Force], (March 2003), 111 + xii pp.
- Julian Perry Robinson, 'Chemical Warfare Arms Control: A framework for Considering Policy Alternatives', *SIPRI Chemical & Biological Warfare Studies* [Scorpion Papers] no 2, Stockholm International Peace Research Institute, (1985), 116 pp.
- John Gerard Ruggie, 'International Responses to Technology: Concepts and Trends', *International Organization*, vol 29, no 3, [special edition on: *International Responses to Technology* (Summer 1975), pp 557-83.
- Frank Schimmelfennig, 'Arms Control Regimes and the Dissolution of the Soviet Union: Realism, Institutionalism and Regime Robustness', *Cooperation and Conflict*, vol 29, no 2, 1994, pp 115-48.
- Nicholas A Sims, *The Diplomacy of Biological Disarmament: Vicissitudes of a Treaty in Force, 1975-85*, (London: Macmillan; New York: St Martin's Press, 1988), 356 + xv pp.
- Nicholas A Sims, 'The BTWC in Historical Perspective: From Review and Strengthening Processes to an Integrated Treaty Regime', *Disarmament Forum*, no 4, December 2000, pp 19-26.
- Nicholas A Sims, 'The Evolution of Biological Disarmament', *SIPRI Chemical & Biological Warfare Studies* [Scorpion Papers] no 19, Stockholm International Peace Research Institute, (2002), 200 pp.
- Nicholas A Sims, *The Future of Biological Disarmament: Strengthening the treaty ban on weapons*, (Abingdon/New York: Routledge, 2009), 216 + xvii pp.
- Nicholas A Sims, 'Midpoint Between Review Conferences: Next Steps to Strengthen the BWC', *Disarmament Diplomacy*, 91, (Summer 2009), <<http://www.acronym.org.uk/dd/dd91/91bwc.htm>>.
- Stockholm International Peace Research Institute, *The Problem of Chemical and Biological Warfare*, [six volume series], (Stockholm: SIPRI, 1971).
- T J Sullivan and W L Perry, 'Identifying Indicators of Chemical, Biological, Radiological, and Nuclear (CBRN) Weapons Development Activity in Sub-National Terrorist Groups', *Journal of the Operational Research Society*, vol 55, no 4, [Special Issue: 'OR in Defence'], (April 2004), pp 361-74.
- Claire Turenne Sjolander and Wayne S Cox, *Beyond Positivism: Critical Reflections on International Relations*, Boulder and London: Lynne Rienner, 1994), 203 pp.

- Detlef F Sprinz and Carsten Helm, 'The Effect of Global Environmental Regimes: A Measurement Concept', *International Political Science Review*, vol 20, no 4, October 1999, pp 359-69.
- Ronald Stamper, Kecheng Liu, Mark Hafkamp and Yasser Ades, 'Understanding the Roles of Signs and Norms in Organisations - A semiotic approach to information systems design', *Journal of Behaviour & Information Technology*, vol 19 no 1 (2000), pp 15-27.
- Richard H Steinberg and Jonathan M Zasloff, 'Power and International Law', *American Journal of International Law*, vol 100, no 1, (January 2006), pp 64-87.
- Jessica Stern, Dreaded Risks and the Control of Biological Weapons, *International Security*, vol 27, no 3, (Winter 2002/03), pp 89-123
- Jonathan B Tucker and Raymond A Zilinskas, 'The Promise and Perils of Synthetic Biology', *The New Atlantis*, (Spring 2006), pp 25-45.
- Arild Underdal, 'The Concept of Regime "Effectiveness"', *Cooperation and Conflict*, vol 27, no 3, 1992, pp 227-40.
- VERTIC, 'A new strategy: strengthening the biological weapons regime through modular mechanisms', *VERTIC Research Reports*, no 6, (October 2006), 88 pp.
- William Walker, 'Weapons of Mass Destruction and International Order', *Adelphi Paper 370*, International Institute for Strategic Studies, (2004), 90 pp.
- Kenneth N Waltz, *Theory of International Politics*, (New York: Random House, 1979).
- Kenneth N Waltz, Letter to the Editor, *International Organization*, vol 36, no 3, (Summer 1982), pp 679-81.
- Ken Ward, 'The BWC Protocol: Mandate for Failure', *Nonproliferation Review*, vol 11, no 2, (Summer 2004), pp 183-99.
- Alexander E Wendt, 'The Agent-Structure Problem in International Relations Theory', *International Organization*, vol 41, no 3, (Summer 1987), pp 335-70.
- Mark Wheelis and Malcolm Dando, 'On the brink: biodefence, biotechnology and the future of weapons control', *The CBW Conventions Bulletin*, no 58, December 2002, pp 3-19.
- Mark Wheelis, Lajos Rózsa and Malcolm Dando (eds.), *Deadly Cultures: Biological Weapons Since 1945*, (Cambridge MA: Harvard University Press, 2006) 479 pp.
- Francis Wheen, *How Mumbo-Jumbo Conquered the World: A Short History of Modern Delusions*, (London: Harper Perennial, 2004), 338 pp.
- Jerome B. Wiesner, 'Inspection for disarmament', in Louis Henkin (ed.), *Arms Control, Issues for the Public*, Columbia University/Prentice Hall, 1961, pp. 112-40.
- Jerome B. Wiesner, 'Comprehensive arms-limitation systems' in Donald G. Brennan (ed.), *Arms Control, Disarmament, and National Security*, George Braziller, 1961, pp. 198-233.
- Mason Willrich, *Non-Proliferation Treaty: Framework for Arms Control*, The Michie Company, 1969.
- Sir Michael Wright GCMG, *Disarm and Verify: An Explanation of the Central Difficulties and of National Positions*, Chatto & Windus, 1964.
- Oran R Young, *The Effectiveness of International Environmental Regimes: Causal Connections and Behavioural Mechanisms*, (Cambridge, MA: MIT Press, 1999), 326 + xiv pp.

## Abbreviations, Glossary

**Acquis communautaire [EU]** (Sometimes simply *Acquis*) — a term used to encompass the obligations agreed within EU processes; this is wider than simply legal texts and includes principles, policies, laws, practices and objectives that have been agreed.

**AHG** Ad Hoc Group — the BWC States Parties agreed at a Special Conference in 1994 to establish the ‘Ad Hoc Group’ to negotiate a legally binding protocol to the Convention that would have included certain measures to strengthen it, including verification measures. The negotiations were brought to a standstill in the middle of 2001 when the United States announced that they would not be able to accept any product that would result from the negotiations.

**BTWC** *see BWC*

**BWC** The *Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological and Toxin Weapons and their Destruction* is commonly known by two names: the Biological Weapons Convention (BWC) and the Biological and Toxin Weapons Convention (BTWC). The Convention was opened for signature on 10 April 1972 and it entered into force on 26 March 1975.

**CBM** Confidence-Building Measure

**CBW** Chemical and biological warfare

**CFSP** Common Foreign and Security Policy [EU]

**CODUN** The EU Working Group on negotiation of international standards in multilateral forums relating to disarmament [see also CONOP] [*\*get decision establishing CODUN\**]

**CoE** Council of Europe

**Competence [EU]** Authorized capability of an EU institution to undertake specific activities in any specific policy area. Many debates within the EU focus on which institution has competence in any particular area.

**CONOP** The EU Working Group on non-proliferation issues, established by Coreper on 21 December 1995. The decision which established it reads:

1. The present areas of competence of the CONOC (non-proliferation of chemical and biological weapons) and CONUC (non-proliferation of nuclear weapons) Working Groups should be entrusted to a “merged” group, to be called the “Non-Proliferation Working Group”, with the acronym CONOP. Its agenda would be so structured as to distinguish between items pertaining to the non-proliferation of nuclear weapons and those pertaining to the non-proliferation of chemical and biological weapons.

2. The area of competence of the CODUN Working Group (negotiation of international standards in multilateral fora [*sic*]) would remain unchanged, but it would meet more frequently so that all items on its agenda, including those relating to chemical and biological weapons, could be dealt with exhaustively.

The Presidency and the Secretariat would endeavour to organize meetings of the CODUN Working Group back to back with those of the Non Proliferation Working Group.

3. This reorganization would come into effect at the end of the first half of 1996.<sup>1</sup>

**Consultation [EU]** A procedure which requires the Council to consult the European Parliament before voting on a proposal by the Commission.

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1. council doc. 0939/95, as quoted in 10898/08

**Council of Ministers** Sometimes simply ‘Council’ — the primary routine decision-making institution of the EU, not to be confused with the ‘European Council’ (see below). The Council Secretariat supports the meetings of the Council. Ministers from the Member States with relevant policy responsibilities will meet together. See also General Affairs and External Relations Council and the Economic and Financial Affairs Council. Council meetings are chaired by the rotating Presidency, except, with the introduction of the Lisbon Treaty, those meetings dealing with foreign affairs issues. The precise delimitation of what is or is not foreign affairs continues to be the subject of discussion. Working Groups and COREPER feed into the Council decision-making arrangements.

**CTBT** Comprehensive Test Ban Treaty

**CWC** The *Convention on the Prohibition of the Development, Production, Stockpiling and use of Chemical Weapons and on Their Destruction*, is commonly known as the Chemical Weapons Convention or CWC. The Convention was opened for signature on 13 January 1992 and it entered into force on 29 April 1997.

### **Economic and Financial Affairs Council**

**ECSC** European Coal and Steel Community

**EEC** European Economic Community

**ESDP** European Security and Defence Policy — A policy intended to strengthen the EU’s capability to undertake humanitarian and peacekeeping tasks for crisis management, known as the ‘St Peterberg tasks’.

**EU** European Union

**Euratom** European Atomic Energy Community

**European Council** (Not to be confused with the Council of Ministers, see above) these have more recently been popularly referred to as EU Summits. These are held twice during each six-monthly Presidency, either in Brussels or a location chosen by the Presidency. The European Council consists of the head of state or government and the foreign minister of each Member State together with the President of the Commission. The European Council normally focuses on strategic issues and agrees ‘Conclusions’ as its policy statements in given areas. Since the coming into force of the Lisbon Treaty, the meetings are chaired by the President of the European Council.

**FAO** Food and Agriculture Organization

**GAERC** General Affairs and External Relations Council

**HPAI** Highly Pathogenic Avian Influenza, commonly known as ‘bird flu’

**HSP** Harvard Sussex Program

**IAEA** International Atomic Energy Agency

**IAP** Inter Academy Panel for International Issues

**ICRC** International Committee of the Red Cross

**ISU** Implementation Support Unit — established by the Sixth BWC Review Conference

**JACKSNNZ** An informal grouping within the BWC (pronounced ‘jacksons’ and sometimes referred to as the Jackson-7) that first appeared in this form at the Sixth Review Conference in 2006 comprising Japan, Australia, Canada, South Korea, Switzerland, Norway and New Zealand.

**LRTAP** Long-Range Transboundary Air Pollution [Convention]

**NACD** non-proliferation, arms control and disarmament

**NPT** The *Treaty on the Non-Proliferation of Nuclear Weapons* is commonly known as the Non-Proliferation Treaty or NPT. Treaty was opened for signature on 1 July 1968 and it entered into force on 5 March 1970

**OIE** World Organization for Animal Health (original title Office Internationale des Épizooties)

**OPCW** Organization for the Prohibition of Chemical Weapons [a body established by the Chemical Weapons Convention]

**Presidency [EU]** Traditionally, this was the Member State chairing meetings of the Council of Ministers and the European Council, but now the European Council has its own appointed President. The Presidency rotates amongst the Member States so each holds it for a period of six months. The Presidency during the periods of greatest relevance to this thesis was held as follows:

2001 — Sweden, Belgium

2002 — Spain, Denmark

2003 — Greece, Italy

2004 — Ireland, the Netherlands

2005 — Luxembourg, United Kingdom

2006 — Austria, Finland

2007 — Germany, Portugal

2008 — Slovenia, France

2009 — Czech Republic, Sweden

2010 — Spain, Belgium

2011 — Hungary, Poland

**PSI** Proliferation Security Initiative

**SALT** Strategic Arms Limitation Talks

**SARS** Severe Acute Respiratory Syndrome

**SIPRI** Stockholm International Peace Research Institute

**Verex**

**VERTIC** Verification Research, Training and Information Centre [previously the Verification Technology Information Centre until 1998]

**WHO** World Health Organization

**WMD** Weapons of Mass Destruction

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