BIOLOGICAL WEAPONS: A PLAGUE UPON ALL OUR HOUSES

STRENGTHENING THE 1972 BIOLOGICAL WEAPONS CONVENTION

by

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Abstract

Throughout history humanity has faced widespread suffering and death from the proliferation and use of various types of weapons. In an attempt to alleviate the threat to people and states from the global spread of these weapons, the international community has met in arms control negotiations countless times to restrain, reduce, or ban various weapons systems. In 1972, in recognition of the threat biological and toxin weapons posed humanity, the international community met in Geneva to sign the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction. However, this agreement has proven unable to prevent member states from possessing biological and toxin weapons. Serious inadequacies of the Convention include the ambiguous nature of the text of the Convention, the allowance of biological and toxin agents for research for defensive purposes, a lack of verification provisions and a lack of provisions in the text to regulate advances in the biotechnology field.

This thesis analyses the weaknesses of the Convention that have led to its inability to eliminate biological and toxin weapons. It offers suggestions on how to strengthen the Convention with the ultimate objective of creating an international norm against the possession and use of biological and toxin weapons that will halt both member and rogue states from pursuing biological and toxin weapons capabilities.
**Table of Contents**

Abstract ii

Approval iii

Table of Contents iv

Acknowledgement vii

Chapter One: Introduction 1

Arms Control: What is it? 3

Theory of Arms and Arms Control 6

Thesis Outline 11

Chapter Two: An Overview of Biological Weapons and the Convention 13

Introduction 13

What are Biological and Toxin Agents? 13

Biological and Toxin Agents as Weapons 15

The Historical Use of Biological Weapons 17

The Origins of the Biological Weapons Convention 20

Conclusion 25

Chapter Three: The Soviet and Iraqi Biological Weapons Programmes 27

Introduction 27

The History of the Soviet Biological Weapons Programme 27

Implications of the Soviet Biological Weapons Programme 31

The History of the Iraqi Biological Weapons Programme 32

Implications of the Iraqi Biological Weapons Programme 36

Conclusion 37
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Four</td>
<td>Problems with the Biological Weapons Convention</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Introduction</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Nature of the Convention</td>
<td>38</td>
</tr>
<tr>
<td></td>
<td>Research for Defensive Purposes</td>
<td>43</td>
</tr>
<tr>
<td></td>
<td>Lack of Verification and Monitoring of Compliance Provisions</td>
<td>46</td>
</tr>
<tr>
<td></td>
<td>Provisions for Advances in the Biotechnology Industry</td>
<td>49</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>51</td>
</tr>
<tr>
<td>Five</td>
<td>Efforts to Strengthen the Biological Weapons Convention</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>Introduction</td>
<td>52</td>
</tr>
<tr>
<td></td>
<td>The First Review Conference</td>
<td>53</td>
</tr>
<tr>
<td></td>
<td>The Second Review Conference</td>
<td>56</td>
</tr>
<tr>
<td></td>
<td>The Third Review Conference</td>
<td>61</td>
</tr>
<tr>
<td></td>
<td>The Fourth Review Conference</td>
<td>64</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>67</td>
</tr>
<tr>
<td>Six</td>
<td>Suggestions for Strengthening the Convention</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Introduction</td>
<td>69</td>
</tr>
<tr>
<td></td>
<td>Correcting the Ambiguities of the Text</td>
<td>71</td>
</tr>
<tr>
<td></td>
<td>Regulating Research for Defensive Purposes</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>Verification: Monitoring Compliance</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>Provisions to Regulate Advances in Biotechnology</td>
<td>79</td>
</tr>
<tr>
<td></td>
<td>Conclusion</td>
<td>80</td>
</tr>
<tr>
<td>Seven</td>
<td>Future Considerations</td>
<td>82</td>
</tr>
<tr>
<td>Works Cited</td>
<td></td>
<td>87</td>
</tr>
</tbody>
</table>
Appendix I: Ratifications to the Biological Weapons Convention  92
Appendix II: The Biological Weapons Convention  97
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I would like to dedicate this thesis to the memory of Dr. Geoffrey Weller. Thank you Dr. Weller for opening my eyes to the world of international security. Without you I would never have pursued my interest in weapons of mass destruction and would not have embarked on this wonderful journey of higher learning and discovery.

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Thank you to my Lord God, my shepherd and strength on this tumulus journey.

With God as your wings life takes flight.
Chapter One: Introduction

Throughout history humanity has faced widespread destruction and death from the proliferation and use of weapons and weapons systems. From the virus to the nuclear weapon, these arms have the potential to cause global suffering, threatening not only national but also global security. To alleviate the threat of global proliferation, the international community has met in negotiations countless times to restrain, reduce, or ban various weapons systems. National and global security and stability are continuously threatened in the Twenty First Century by the proliferation of weapons of mass destruction, including nuclear, radiological, chemical and biological weapons.

In 1972, in recognition of the threat biological and toxin agents posed to the international community, states from around the world met in Geneva to sign the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction (hereafter, referred to as the Biological Weapons Convention, the Convention, or the BWC). The aim of the Convention was to ban member states from developing, producing, stockpiling or otherwise acquiring or retaining biological and toxin weapons. However, this agreement has been unable to prevent states from possessing, let alone using, these deadly weapons. This failure is a result of many factors, including the ambiguous nature of the Convention, the allowance of biological and toxin weapons for research for defensive purposes, a lack of verification controls, and a lack of provisions in the text to regulate advances in the biotechnology industry.

The objectives of the Biological Weapons Convention have also not been met because of the very nature of the weapons themselves. Biological and toxin agents are
inexpensive, easy to make, and are capable of inflicting high numbers of death on target populations. States pursue offensive weapons programmes because biological and toxin agents are attractive weapons because of their killing capacity.

This thesis will examine the weaknesses of the biological weapons regime that have led to its inability to prevent member states from possessing biological and toxin agents and will offer suggestions for strengthening the Convention. In the Convention’s Preamble, which is not legally binding, the member states announced their desire to exclude completely the possibility of biological and toxin agents being used as weapons. However, the Convention’s text, which is legally binding, only bans member states from developing, producing, stockpiling, acquiring and retaining (hereafter referred to as possession) biological and toxin agents that have no justification for protective, prophylactic (measures to guard against or to prevent disease) or other peaceful purposes. It does not actually ban the use of such weapons. It is my belief that member states should ban both the possession and use of these deadly weapons.

Strengthening the Convention will not solve the problem of states possessing or desiring to possess these deadly weapons. Rather, through strengthening the Convention, a norm against the possession and use of biological and toxin agents could be created that will halt both member states and rogue states from pursuing biological and toxin weapons capabilities. A norm is a belief that is followed by all relevant actors in the international system. The process of norm building is an integral component of effective international regimes such as arms control agreements. If states come to the common belief that the possession and use of biological and toxin weapons is abhorrent in nature and that strict regulations need to be placed on state and non-state activity then in theory, a strengthened
norm on the ban of these weapons could be created. The definition of regime used in this thesis was taken from Young’s *The Effectiveness of International Environmental Regimes: Casual Connections and Behavioural Mechanisms*. According to Young, “regimes are social institutions consisting of agreed upon principles, norms, rules, procedures, and programs that govern the interactions of actors in specific issue areas” (Young 1). In an effort to address the issue of effectiveness of international regimes scholars and policy makers alike have attempted to define the criteria that make international agreements effective, although no single set of criteria has been agreed upon. An effective regime is one that channels behaviour in such a way as to ameliorate substantially the problem that led to its creation (Young 1). If member states strengthen the Biological Weapons Convention the regime can facilitate acceptance of the norm of non-possession and non-use for other states in the international system.

In order to review the Biological Weapons Convention at length, some key background on arms control should be discussed.

I. Arms Control: What Is It?

The efforts to control arms and the pursuit of disarmament have been inextricably linked to war and peace for hundreds of years. While international arms control and disarmament initiatives became part of the activities of states after the Peace of Westphalia in 1648, they have a long and rich history in both the national and international spheres. Historical records of the fifth century war between the Greek city-states of Sparta and Athens indicate that they entered into arms control negotiations to limit the number of fortifications erected in both cities. The Catholic Church, in the
Middle Ages, issued canons (edicts) proscribing violence against clerics and women, and attempted to ban deadly weapons such as the crossbow (Rattray 1). After the Peace of Westphalia in 1648, which is credited with the creation of the modern state system, arms control and disarmament initiatives became a central focus of international negotiations among states attempting to promote national, and subsequently, global security objectives. The Hague Conventions in 1899 and 1907, in recognition of the potential for devastation in the international system from war, attempted to mitigate the destructive capabilities of future wars by banning, among other deadly weapons, asphyxiating gases from the repertoire of permissible weapons (Rattray 1).

After the atrocities of the First World War, the 1925 Geneva Protocol to ban the use of chemical and biological weapons on the battlefield was created. However, as an international agreement it was a failure given states continued to pursue offensive chemical and biological weapons programs. In 1928, 63 countries signed the Kellogg-Briand Pact, which attempted to outlaw war as a tool of national defence policy (Kegley and Wittkopf 21). With the onset of the Second World War, the dropping of the atomic bomb on Hiroshima and Nagasaki by the United States, and the nuclear arms race of the Cold War, international efforts of arms control and disarmament became an issue of importance for the entire international community.

In *Arms Control and Disarmament and the Canadian Approach to Global Order*, Douglas A. Ross discusses four key functions of arms control initiatives. The first key function of arms control is to strengthen crisis stability by eliminating incentives for surprise attack and by reducing the risk of accidental or inadvertent warfare. The second factor discussed by Ross is that the arms control process builds confidence among states
by providing greater transparency in negotiations and establishing confidence building measures. Thirdly, Ross believes that arms race stability will be strengthened through reducing "the financial cost of military rivalry in peacetime through agreed cuts in weaponry and joint decisions to forego some areas of technical and scientific competition" (Ross 254). Finally, the arms control and disarmament process acts to constrain the level of violence that would occur in a war through reducing numbers and eliminating categories of weapons (Ross 254). As will be discussed throughout this thesis, these four key functions can be related to the international efforts to restrain, reduce and ban states from possessing biological and toxin weapons.

Major arms control initiatives have focused on the non-proliferation of a myriad of weapons and the constraining of the proliferation of weapons of mass destruction, with a special focus during the Cold War period on nuclear weapons because their killing capacity and potential for worldwide destruction is unparalleled. There are two types of proliferation: horizontal proliferation and vertical proliferation. Vertical proliferation occurs when states increase their existing arsenals. Horizontal proliferation occurs when there is an increase in the number of states that possess the specified weapon.

Arms control has been a difficult process. States maintain military capabilities because they want to be able to counter the weapons of enemy states. A state will pursue weapons development if it is militarily weaker than other states and wants to pull even, or if it is ahead of other states and wants to remain ahead. If states believe it is in their best interest to pursue a course of arms and weapons build-up, they may engage in weapons proliferation because they want to protect their national security or expand their influence. According to Barry Buzan, security is the "pursuit of freedom from threat and
the ability of states and societies to maintain their independent identity and their functional integrity against forces of change which they see as hostile. The bottom line of security is survival" (Buzan 238). Similarly, Kegley and Wittkopf write that national security is “a country’s psychological freedom from fear of foreign attack” (Kegley and Wittkopf 371). Consisting with these definitions, international security has traditionally been viewed as the security of states. For the purpose of this thesis, however, the term global security will be used because biological and toxin weapons affect not only states but also individuals and the international system as a whole. Global security is the preservation of individuals, states, and the international system from threat, hostile forces and attacks.

II. Theory of Arms and Arms Control

A common theme in international relations theorising is that the international system is anarchic in nature. According to Hedley Bull (1994), “whereas men within each state are subject to a common government, sovereign states in their mutual relations are not” (Bull 136). The international system is anarchic in the sense that there is no overarching body or world government that regulates the actions among states. The absence of a governing authority in the international system places the responsibility for national and global security on each state within the system. In a self-help system, states rely upon their military strength to protect them from attack by an aggressor state. Military might, or perceptions of military might, are indicators both of power and strength. Believing that the system is anarchic, states build up weaponry to protect their
national security. "Since military strength is the obvious measure of a nation's power, its demonstration serves to impress the others with that nation's power" (Morgenthau 90).

When states attempt to protect their national security or expand their influence through pursuing a course of arms build-up and weapons proliferation, other states can perceive these actions as potentially aggressive and as a threat to their own national security. Thus, the latter perceive a need to build up their own military capabilities. This security dilemma creates a vicious cycle when states believe that the only route to achieving national security is through an arms build-up. The security of one state ultimately leads to the insecurity of another state, resulting in an arms race.

Given the belief that the system is anarchic in nature, and given the belief that through pursuing a course of weapons build-up states can protect their national security from a threat or a perceived threat, even a state that does not have the intention of attacking other states will desire to maintain a military capability for defensive purposes. In addition to maintaining weapons for defensive purposes, a state may want also to preserve the ability to retaliate offensively against an attack from an aggressor state. Both a defensive capability and the ability to retaliate offensively against an attack by an enemy can serve to deter other states from aggressive action. Deterrence is "a preventive strategy designed to dissuade an adversary from doing what it would otherwise do" (Kegley and Wittkopf 600). Essentially, states will be deterred from using their weapons against another state by the threat of retaliation or successful defence. Proponents of this logic would argue that weapons systems, including weapons of mass destruction, act to ensure peace in the system or, in the event of war, to ensure stability. Arms control and
disarmament initiatives, on the other hand, are an attempt to control and/or reduce these weapons and weapons programmes to decrease the possibility of violence and war.

There are two classic opposing views on arms control. One belief, which is based on the realist perspective, asserts that weapons are integral to ensuring peace and stability in the international system. In summary, the basic tenets of realism are that (a) states are the most important actors in the international system; (b) the international system is anarchic in nature because there is no controlling or governing body that presides over the system; (c) the primary obligation of a state is to ensure its own national security and; (d) states are rational, unified actors. Thus, states need to arm themselves to deter would-be aggressors and to ensure their security. Realists therefore, oppose and are very cautious about the reduction of weapons from existing arsenals. The realist view on arms control is that it is conflicting interests, not weapons, which are the causes of war.

The opposing point of view, which can be called the idealist view, centres on the belief that the role of arms in the international system is basically negative. The tenets of idealism include the belief that international cooperation is an integral component in ensuring peace and security in the system. Furthermore, idealists believe that states are not the only important actors in the international system, but that individuals and coalitions of people can effect change in the system. If states have too many weapons and arms, then the system will become unstable because states will use the weapons against one another under the guise of protecting national security (Waltz 371). Proponents of this view would argue that arms and weapons systems should be controlled in order to reduce tensions, increase stability, and make less likely their use in times of conflict and war. The broader term, disarmament, is the process of controlling, reducing or
eliminating weapons and weapons systems either unilaterally or through multilateral agreements (Kegley and Wittkopf 600).

I would support the idealist view that if states have certain weapons then they will more likely be used as instruments of war. I also understand the realist assumption that it is conflicting interests, not weapons, which are the causes of war. Disarmament/arms control agreements help to create an international norm against the possession and use of weapons systems. Proponents of strengthening the Biological Weapons Convention do not subscribe to the belief that one’s possession of these weapons necessarily will deter others from their use. Biological and toxin weapons are becoming a greater threat because they are coming increasingly within the reach of rogue states and non-state terrorist organisations that could use them both for revenge and their own political causes. Rogue states and terrorist organisations may well hold a different vision of security than that held by most other actors. They may use biological and toxin agents to further their political agendas regardless of the threat posed to global security and regardless of the threat of retaliation. The more biological and toxin weapons that exist in the system, the greater likelihood that rogue states and terrorist groups will acquire and use them to inflict massive casualties and serve their particular objectives (Art 479).

Despite their relatively low profile, biological weapons are a threat that concerns many individuals outside the ranks of weapons experts and government agencies. A public opinion poll conducted for the Canadian Department of National Defence in 1999 shows that the second ranked concern of Canadians in regards to threats against national security was the spread of biological and chemical weapons (DND 21). Fully 65% of respondents were concerned or very concerned about the spread of biological and
chemical weapons, ranking it above other more topical issues such as terrorism, ethnic violence and religious extremists. ¹ At the Fifth Review Conference of the Biological Weapons Convention in 2001, it will be very important for the member states to strengthen the Convention in order to halt the growth of offensive weapons programmes and to limit the threat of biological attack from rogue states. While strengthening the Convention will not itself halt the proliferation of these weapons, it will help to create an international norm against the possession and use of biological and toxin agents as weapons.

States have legitimate concerns over national defence and security. According to E. H. Carr, “[e]very solution of the problem of political change, whether national or international, must be based on a compromise between morality and power” (Carr 209). Those who subscribe to the realist vision of international relations will have to make such a compromise in order to strengthen the Convention.

This thesis will thus be a policy analysis of the Biological Weapons Convention and will offer a set of proposals on how to strengthen the Convention. Even if it is unlikely that the Convention will be strengthened in the near future, it is essential that the international community move toward ensuring that biological and toxin weapons are not maintained or used as weapons of mass destruction.

¹ The close-ended question asked on the Department of National Defence survey was “I am going to read you a list of issues facing Canadians. On a scale of 1-5 (5 being very concerned and 1 being not concerned at all) can you tell me how serious a concern each issue is to the well being of Canada.”
If the Biological Weapons Convention is not strengthened, and restrictions are not placed on permissible activity, both member states and non-members will likely continue to produce and stockpile offensive biological and toxin weapons. Some may do this because they want to be able to use these weapons offensively. Others will do so because they want to be able to defend themselves or to retaliate in case of an attack against them using biological weapons. In a worst case scenario an attack with a biological or toxin agent may prompt a target state and allies into retaliatory action that could start a biological war with catastrophic results.

III. Thesis Outline

Chapter Two will provide an overview of biological weapons, discussing what biological and toxin agents are and why they are used as weapons. It will provide a brief history of their use as an instrument of war. It is important to understand the nature of these agents in order to understand why states pursue offensive biological and toxin weapons capabilities. This chapter will examine the pursuit of such capabilities by states up until 1972, looking specifically at the German, Japanese and American offensive weapons programmes. Chapter Two will also examine the international community’s attempts to prohibit the possession of biological and toxin weapons, looking specifically at the 1925 Geneva Protocol and the 1972 Biological Weapons Convention.

Chapter Three provides an overview of the contemporary Soviet and Iraqi offensive biological and toxin weapons programmes and examines the implications that the possession of offensive biological weapons by the Soviet Union and Iraq have for the
Biological Weapons Convention. These two case studies will show how member states have reneged upon their obligations not to pursue offensive weapons capabilities.

Chapter Four will look at the problems of the Biological Weapons Convention, looking specifically at the ambiguous nature of the Convention, the allowance of research for defensive purposes, the lack of verification controls in the text of the Convention and the lack of provisions in the text to regulate advances in biotechnology industry. This analysis of the weaknesses of the Convention will highlight what components of the Convention need to be strengthened in order to create an international norm against the possession and use of these deadly weapons.

Chapter Five examines international efforts to strengthen the Convention through discussing the four Review Conferences, held in 1981, 1986, 1991 and 1996. The inability of the biological weapons regime to ban possession of biological and toxin weapons is illustrative of the greater difficulties surrounding arms control agreements. Through revealing the efforts of the international community we can better understand the constraints on strengthening the Convention.

Chapter Six proceeds from the weaknesses of the Biological Weapons Convention examined in Chapter Five and provides suggestions for strengthening the BWC. These are proposals that might be considered by the international community and need to be evaluated. The concluding chapter will review the arguments made and will examine the future of the Convention.
Chapter 2: An Overview of Biological Weapons and the Convention

I. Introduction

What are biological and toxin agents? Why have they been used as instruments of war and terrorism? What have been the historical uses of biological and toxin weapons? What are some of the international efforts to control them? This chapter will answer these important questions. The history of the use of biological and toxin weapons demonstrates how they threaten global security and thus why they need to be controlled.

II. Biological and Toxin Agents

Biological, also known as bacteriological, weapons are derived from living organisms. The infectious nature of the living organisms can be manipulated and the organisms are used because they can multiply in plant, animal, and human organisms, causing sickness, injury and even death in target populations or species. Most biological agents are odourless and tasteless and can be easily disguised due to their similarity to the original bacteria from which they are derived. Moreover, the dual-use nature of the agents, and of the equipment and materials used to study them, makes it difficult to distinguish between weapons and non-weapons research. Duality can be defined as the agents, equipment and materials that can be used for both defensive and offensive programmes. The original biological pathogens are easily obtained, either from natural settings like soil, plants, animals and humans, or from medical research or pharmaceutical agencies. Since they are living micro-organisms, most biological agents have the ability to divide every twenty minutes, multiplying so quickly that a single bacterium can become over ten billion bacteria in less than ten hours, making them a
potent potential weapon (Cole 4). The biological agents that have been used in offensive weapons programmes can be placed into five groups: bacteria, viruses, ricketssiae, fungi and toxins. Examples of bacteria include Bacillus anthracis which causes anthrax, Shigella dysenteriae which causes bacillary dysentery and Brucella suis which causes brucellosis (Prescott, Harley and Klein 664). Examples of viruses include Rift Valley Fever, influenza and dengue fever (Norris and Fowler 4). Ricketssial diseases include Rickettsia prowazekii which causes epidemic typhus, Rickettsia rickettsii which causes Rocky Mountain spotted fever, and Coxiella burnetii which causes Q fever (Prescott, Harley and Klein 780). Fungi examples include Histoplasma capsulatum which causes histoplasmosis and Coccidiodes immitis which causes San Joaquin fever (Norris and Fowler 4).

Like biological weapons, toxin weapons are agents that disseminate poisonous substances derived from living organisms that can cause widespread sickness, injury and even death in animals and humans. However, unlike biological weapons, toxin weapons are inanimate and therefore can not multiply or reproduce in the target population. Toxin agents are generally more stable than biological agents because they are not living. Yet, once disseminated into a target population, they can cause severe sickness and death in a limited time frame anywhere from minutes to hours. The 1972 Biological Weapons Convention includes toxins under prohibited agents because the creation of toxin weapons requires facilities and equipment similar in nature to those required for the creation of biological weapons. Examples of toxins that can be used as weapons of mass destruction are Aspergillus flavus which causes Aflatoxins, Ricin and Shigatoxin which produces E. coli (Ferguson 89).
Biological and toxin weapons can be disseminated into target populations in several different ways. Technical means of delivery include the use of bombs, artillery shells, rockets and sprays. The use of large delivery systems, such as a bomb or rocket, increases the difficulty of a successful attack because the explosions involved may kill the living organism. Non-technical and cheaper modes of dissemination into the target population, usually through aerosol methods, include using animal vectors (e.g., fleas and mosquitoes), crop dusters used for agricultural spraying purposes, backpack sprayers and even purse-sized atomisers (Danzig and Berkowsky 10).

The success of the delivery of a biological agent, whether through the air, water, or other means, has also traditionally been dependent upon meteorological conditions. The virulence of a biological agent disseminated into the air, for example, is dependent upon wind intensity, heat, cold, rain and humidity, making the success rate an unknown variable. However, with the advent of biotechnology, an agent can be manipulated to ensure that successful delivery is less dependent upon meteorological conditions.

III. Biological Agents as Weapons

Biological and toxin weapons have been labelled as the poor man’s atom bomb because they are inexpensive weapons to create, in comparison to nuclear weapons and other types of weapons systems. Unlike other weapons of mass destruction biological and toxin agents are readily accessible. Strains of biological and toxin agents can be purchased from pharmaceutical companies and microbial culture supply companies under the guise of research. Unlike other weapons of mass destruction which require expensive and elaborate equipment and facilities to create, biological and toxin weapons can be
easily manufactured in almost any environment from a state of the art laboratory to a
basement of someone’s home. An individual with basic biology knowledge and simple
laboratory equipment, including a fermenter, a breathing apparatus, and protective
clothing, can create a biological weapon from a recipe available on the Internet. An
example of biological terrorism occurred in 1992. Four extremists from an American
organisation called the Minnesota Patriots Council extracted ricin (an extremely lethal
toxin agent) from castor oil beans. The extremists had conspired to assassinate law
officials but were arrested before they could use the toxin weapon (Tucker 297). In 1998,
three members of an American right wing secessionist group were arrested after they
conspired to “assassinate President Bill Clinton and other senior federal officials by using
a crude air-gun fashioned from a Bic lighter to fire cactus thorns coated with biological
agents causing anthrax, botulism, or rabies” (Tucker 298). Crude as the methods were,
the extremists’ attack could have been successful. In 1995, a Japanese extremist group
known as Aum Shinrikyo released sarin nerve gas in a Tokyo subway (Danzig and
Berkowsky 11). The Aum Shinrikyo cult had experimented with anthrax, botulism and
ebola, but had never achieved a successful delivery with any of its biological weapons.

Biological agents can be strategic weapons for states interested in developing
weapons of mass destruction capability. The development of a biological and toxin
offensive weapons programme would be attractive to states unable to develop or produce
nuclear weapons capabilities. The potentially large number of deaths that could result
from a single attack on a human population make biological weapons very appealing
weapons for some states in comparison to chemical weapons. A study conducted by the
Office of Technology Assessment in the United States estimated that 1000 kg of sarin
nerve gas, a chemical weapon, released from an aeroplane in the atmosphere could kill up to eight thousand people. A millionth of a gram of *Bacillus anthracis* (hereafter referred to as anthrax) can constitute a lethal dose for one human target. A release of 100 kg (two hundred and twenty pounds) of anthrax bacteria, a common biological weapon developed in both the Russian Federation and Iraq, could result in three million deaths (Cole 7).

As was discussed in Chapter One, actors in the international system retain biological weapons research capabilities for a variety of reasons. Due to advances in the biotechnology industry that allow for the genetic engineering of microorganisms, some states maintain research capabilities so that they can defend against an attack with a genetically engineered or novel agent (the term applied to newly developed or created agents). Through maintaining a weapons research programme states also preserve the ability to retaliate with biological weapons against such an attack. As well, states with defensive capabilities could easily transfer their programme into an offensive one with minimal effort.

**IV. The Historical Use of Biological Weapons**

Biological agents have been used as weapons of war for hundreds of years because of their potential to cause high casualty rates in target populations. Corpses contaminated with smallpox, the plague, and other lethal infections have often been used in war. Soldiers would throw diseased corpses over the walls of the city that they were attacking or defending. For example, in 1346, during the siege of Kaffa (Ukraine) by invading Tatar forces, the Kaffa soldiers threw corpses of their deceased over the walls of their city to infect the invading forces with a plague epidemic (Christopher et al. 18).
Many states around the world have pursued offensive biological weapons programmes, including the Soviet Union, Germany, France, the United Kingdom, the United States and Japan. In this section I will focus on only the German, Japanese and American programmes as examples of the enormous efforts many states undertook to pursue biological weapons programmes prior to signing of the 1972 Biological Weapons Convention. Information on their offensive weapons programmes is vast.

Biological and chemical agents were used during both world wars in the Twentieth Century. During the First World War both Germany and the United States utilised biological weapons to target animal populations. Germany is suspected of developing an extensive offensive biological weapons programme that included developing anthrax. The German programme featured covert operations “in neutral trading partners of the Allies to infect livestock and contaminate animal feed to be exported to Allied forces” (Christopher et al. 19). By infecting the livestock and animal feed with biological agents, it would be possible for Germany to gain a military advantage if the target populations became infected.

Interested in creating a biological weapon for use in warfare, Japanese forces conducted an extensive offensive biological weapons programme from 1932 until 1945 in occupied Manchuria (China). In Manchuria, the Japanese forces conducted research on anthrax, *Vibrio cholerae* (a bacteria causing cholera), *Yersinia pestis* (a bacterium that causes the Black Death and is carried by rodents and transmitted by fleas), salmonella, typhoid and paratyphoid fevers. Consisting of one hundred and fifty buildings, five satellite camps, and over 3,000 scientists and technicians, Unit 731 at Ping Fan was the centre of an extensive biological weapons programme (Norris and Fowler 29). The
Japanese scientists and soldiers used prisoners of war as experimental subjects, infecting them with biological agents to test dissemination patterns and times, infection rates and lethality. Research indicates that biological weapons manufactured in Unit 731, and other bases in Changchun and Nanking, were used against China during the Second World War. In the Ping Fan region of China, the Japanese forces were able to produce 500 million plague-infected fleas per year (Norris and Fowler 29).

In 1942, the United States began its offensive biological weapons programme under the War Reserve Service, which included research and development facilities at Fort Detrick in Maryland, testing sites at the Army's Dugway Proving Ground in Utah, and a large production facility at Pine Bluff, Arkansas (Wright 35). The aim of the American programme was to develop biological weapons for offensive purposes against enemy countries, as well as to defend against attacks from states, like Japan, with offensive biological weapons programmes. Like the Japanese counterpart, the American programme was developed during the Second World War and parallels the A-Bomb development. It is highly possible that the American forces knew of the Japanese offensive biological weapons programme and thus pursued an offensive weapons programme in an effort to protect American national security. American scientists experimented with and researched anthrax and undulant fever, analysing their use as weapons of mass destruction. During World War II, the offensive American biological weapons programme produced 5,000 bombs filled with the anthrax bacteria at Fort Detrick (Christopher et al. 22). While the Americans have never admitted that they have used biological agents in warfare, they were accused by the Soviet Union, the People's Republic of China, and North Korea of using biological agents against the North Koreans
during the Korean War from 1950-1953. However, enough evidence was never gathered to prove misconduct by the United States. American President Nixon, through an Executive Order in 1969, terminated the American offensive biological weapons programme (Kadlec et al. 98).

Up until 1972, other states, including the Soviet Union and the United Kingdom, pursued offensive biological weapons programmes unhindered. In recognition of the threat posed by the use of these weapons, and as part of a larger shift towards détente during this era, these states either agreed to destroy or convert their offensive biological weapons programmes into defensive ones through signing the 1972 Convention. Given that these offensive weapons programmes have existed, it is essential to look at the matter of control of these weapons.

V. The Origins of the Biological Weapons Convention

In recognition of the danger posed by biological agents, the international community has, for over a century, attempted to restrain, control, and halt the use of these deadly weapons. The need to create a prohibition against the possession and use of biological and toxin agents has become ever more urgent with the emergence of new infectious diseases, like ebola, marburg and hanta virus, and the re-emergence of old ones, including the bubonic and pneumonic plague, tuberculosis and influenza. The potential for rogue states to adapt these deadly biological agents for use in warfare exacerbates the threat.

The origins of the 1972 BWC can be traced back as far as 1899 and 1907 when the international community at the two Hague International Peace Conferences called for
the prohibition of the use of poisons during war time. The declarations signed by the states participating in the conferences were a recognition of the threat to combatants and non-combatants alike from the use of chemical and biological agents on the battlefield and are an example of the long-term efforts that have been undertaken to strengthen biological weapons control. During the First World War, however, warring forces used chlorine and mustard gases on the battlefield. In 1925 the Allied forces formalised the pre-war declarations signed at the two Hague International Peace Conferences in an attempt to strengthen the norm against the use of biological agents as weapons.

On 17 June 1925, the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare was signed in Geneva. As a biological weapons agreement, the 1925 Geneva Protocol was grossly inadequate. As per Ross's four key functions of arms control initiatives, the Protocol did not build confidence among states by providing greater transparency in negotiations, nor did it strengthen arms race stability or eliminate any types of weapons. Biological and toxin agents were not mentioned in the Preamble and were mentioned only briefly in the text of the Protocol. The states involved were more interested in controlling the use of chemical weapons. In part this was because in the First World War chemical agents, rather than biological and toxin agents, were used as weapons on the battlefield. The states that signed the Protocol also only agreed to prohibit the use of chemical and biological agents in time of war rather than to ban their possession (Kadlec et al. 97).

Other weaknesses of the Protocol included its failure to include provisions for monitoring and verifying state compliance. These allow for greater transparency and
provide member states with information on the activities of others. Effective verification involves a series of measures such as declarations of activities, visits to facilities, or other information that would yield accurate and unambiguous data about the nature of activities of potential concern (Kadlec et al. 100). The Geneva Protocol also failed to establish a consensus as to the range of toxic agents that should be covered by the Protocol. This absence of consensus allowed states to develop their own interpretations of their legal obligations under the Protocol, thereby allowing them to produce agents that they thought most useful. Momentum towards establishing an international prohibition against the possession and use of biological and toxin weapons tapered off after the signing of the Protocol and the advent of the Second World War. States continued to pursue offensive weapons capabilities without further promoting a ban on their possession under 1969 when the political climate changed, partly as a result of détente.

In 1969, a group of like-minded states, which included Canada and the United Kingdom, expressed support for a convention that would ban biological and toxin agents as weapons of mass destruction. In light of the technical and political difficulties involved in creating an arms control agreement that included both chemical and biological weapons (given they involve different types of agents and delivery systems), negotiations began for two separate arms control treaties. On 10 April 1972, in London, Moscow and Washington, the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction was signed. On 26 March 1975, it entered into force with 46 ratifications. By January 1, 2000, 144 states had ratified the Convention (SIPRI-Ratification to the BTWC 1) (See Appendix I).
The drafters of the 1972 Biological Weapons Convention recognised the limitations of the 1925 Geneva Protocol. They sought a new treaty to ban the possession of biological and toxin agents as weapons, although allowed work on such weapons for protective, prophylactic or other peaceful purposes. Member states agreed to “prohibit and prevent the development, production, stockpiling, acquisition or retention of biological or toxin weapons and the means to deliver them for hostile purposes” (Cole 11). The Convention became the first international arms control agreement since the Second World War to ban an entire class of offensive weapons (Kadlec et al. 99). The Preamble to the BWC promotes a norm of non-use of biological weapons, stating that the use of biological agents as weapons of war would be “repugnant to the conscience of mankind and that no effort should be spared to minimize this risk” (Wright 371).

However, the text of the Convention does not ban the actual use of these weapons.

The text of the Convention has fifteen Articles that set out the parameters of permissible state activity (See Appendix II). Article 1 of the Convention states that parties to the Convention:

undertake never in any circumstances to develop, produce, stockpile or otherwise acquire or retain: 1. Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes; 2. Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict (Wright 371).

The second Article commits each party to the Convention to undertake to destroy or to divert to peaceful purposes within nine months of entry into force of the Convention “all agents, toxins, weapons, equipment and means of delivery specified in Article I of the Convention, which are in its possession or under its jurisdiction or control” (Wright
Article III states that parties are not allowed to transfer or help other states in the manufacture or acquisition of any of the banned agents. Article IV discusses constitutional measures for national implementation of the Convention. Article V promotes consultation and cooperation among member states while Article VI makes special provisions for lodging complaints with the United Nations Security Council regarding any party suspected of breaching their obligations, and Article VII makes provisions for assistance for states exposed to danger from biological and toxin weapons. Article VIII simply states that the Convention shall not detract from the 1925 Geneva Protocol. Article IX makes special mention of chemical weapons: “Each State Party to this Convention affirms the recognized objective of prohibition of chemical weapons and, to this end, undertakes to continue negotiations in good faith…” (Wright 373). Article X promotes the sharing of equipment, materials, scientific and technological information for peaceful purposes. Article XI provides for amendments to the Convention and Article XII sets forth provisions for review conferences to be held every five years. Article XIII is the usual "exit clause" and provides the following:

Each State Party to this Convention shall in exercising its national sovereignty have the right to withdraw from the Convention if it decides that extraordinary events, related to the subject matter of the Convention, have jeopardized the supreme interests of its country (Wright 375).

Each member state that exercises this option must notify the United Nations Security Council three months in advance. Other articles (XIV and XV) discuss provisions for signature of states before and after entry into force, as well as accession and ratifications, and for copies of the Convention deposited in the archives of Depository Governments (countries where the Convention was signed) (Wright 376).
Since the 1972 Biological Weapons Convention entered into force, the harsh reality is that the number of states with offensive biological weapons programmes may have more than doubled, as expressed by the American point of view. “Overall the United States believes that twice as many countries now have or are actively pursuing offensive biological weapons capabilities as when the Convention went into force” (Pearson and Chevrier 113). While the list of states possessing biological weapons is disputed, mainly by the states accused of possessing them, it is generally believed that Egypt, Iran, Iraq, Libya, North Korea, Taiwan and the Soviet Union have illegal biological and toxin weapons (Chevrier and Smithson 74). American Secretary of Defense, William S. Cohen, concurs with Pearson and Chevrier and identifies North Korea, Libya, Syria, Iran and Iraq as possessing biological and toxin weapons (Cohen xi).

VI. Conclusion

This brief history of the creation and use of biological and toxin agents and weapons and discussion of what elements make these weapons appealing to states, demonstrates why biological and toxin weapons have been difficult to restrain, reduce and ban. After poisonous gases were used on the battlefield in the First World War the international community recognised the potential for devastation these weapons had. In the Second World War states actively pursued offensive biological weapons programmes, ultimately leading to an arms spiral. In 1972, states negotiated the Biological Weapons Convention in an attempt to ban the possession of biological and toxin agents that had no justification for peaceful, prophylactic or other protective purposes from states repertoires of weapons. The inability of the Biological Weapons Convention to meet its objectives is
illustrative of a greater problem in arms control. States are reluctant to conclude arms
control agreements that limit their military capabilities or spheres of action.

The next chapter will describe and analyse two cases where Convention member
states pursued offensive weapons programmes.
Chapter Three: The Soviet and Iraqi Biological Weapons Programmes

I. Introduction

This Chapter introduces two cases where states in the international system have pursued offensive biological weapons programmes and examines the impact the development of offensive biological and toxin weapons by the Soviet Union and Iraq has had on the Biological Weapons Convention. The importance of examining the Soviet and Iraqi programmes is that it demonstrates that states in the international system will engage in illegal weapons activity if they believe that such weapons development will protect their national security or will expand their influence.

II. The History of the Soviet Biological Weapons Programme

Since the early 1980s, the international community has suspected that the Soviet Union maintained an extensive offensive biological and toxin weapons programme during the 1970s and 1980s even though it was a proponent of the Biological Weapons Convention when it was signed in 1972. As a signatory the Soviet Union agreed not to produce, stockpile, acquire or retain biological and toxin agents other than for research for defensive purposes. During the first three Review Conferences (in 1981, 1986 and 1991), the Soviet Union hid its offensive weapons programme from the international community, claiming it was only conducting research for defensive purposes. Research is permitted under the terms of the BWC. "[T]he Convention neither proscribes biological weapons research nor the possession of quantities (not otherwise specified) of biological agents for prophylactic, protective or other peaceful purposes. This has been interpreted as allowing research for defensive studies" (King and Strauss 120). Permissible research includes activity that is undertaken to protect combatant troops and civilians from a
biological and toxin weapon attack. The relevant provisions of the BWC will be discussed at greater length in Chapter Four.

Even after Russian Federation President Boris Yeltsin quietly admitted in 1992 that the Soviet Union had conducted offensive weapons studies, other Russian officials denied this. In 1996, at the Fourth Review Conference, Grigory Berdennikov, head of the Russian delegation, stated that “Russia has … never developed, produced, accumulated, or stored biological weapons” (Alibek 257). Other leading officials in the Russian Federation have contradicted former President Yeltsin’s statement. However, as will be discussed in this chapter, proof of the illegal Soviet offensive weapons programme can be clearly found in the admission by Boris Yeltsin in 1992 that the Soviet Union had violated the Biological Weapons Convention by developing offensive biological weapons capabilities, scientific evidence from the anthrax accident in Sverdlovsk, and statements from high ranking senior defectors from the Soviet biological weapons programme.

Much information about the Soviet offensive biological weapons programme comes from a defector to the United States, Kanatjan Alibekov (Ken Alibek). From 1988-1992, Alibek was the First Deputy Chief of Biopreparat, the Soviet state pharmaceutical agency which was mandated with developing and producing biological and toxin weapons from the most lethal viruses, bacteria and toxins in the world. According to Alibek, the Soviet offensive biological weapons programme’s roots can be traced back to an epidemic of typhus which caused thousands of deaths in 1918-1921 during the Civil War (Alibek 32). After the Civil War ended in Russia in 1921 with a victory by the Communist Party, members of the state apparatus recognised the potential that existed in typhus to be harnessed as a biological weapon. The governing Revolutionary Military
Council signed a secret decree in 1928 that ordered the rickettsial disease typhus carried by louse and fleas be transformed into a weapon that could be used on the battlefield (Alibek 33).

After the first decree to study typhus was acted upon, the Soviet biological weapons programme expanded to include many other biological agents. During the Second World War the Soviet weapons programme conducted research on *Yersina pestis* (the bacterium causing the plague), *Francisella tularensis* (the bacterium causing tularaemia) and Q fever. In 1945, the Soviet forces captured the Japanese Unit 731 in occupied Manchuria, allowing them access to deadly illnesses studied by the Japanese during the Second World War, including anthrax and the ones causing dysentery and cholera (Alibek 36). After the death of Stalin in 1953, the offensive biological weapons programme came under the control of the Fifteenth Directorate of the Red Army, which quickly broadened its scope and size.

When the Soviet Union signed the 1972 Biological Weapons Convention it was in the process of modernising the existing biological weapons programme, experimenting with genetic engineering to create deadly pathogens that were not only more lethal, but also resistant to antibiotics and vaccines (Alibek 41). The Soviet biological weapons programme conducted studies in the 1970s and 1980s of anthrax, tularaemia and even hemorrhagic fevers including the deadly filoviruses ebola and marburg. It was not until 1979 that information on the extent of the Soviet biological weapons programme first came to light with the accidental release of anthrax in Sverdlovsk.

In late March or early April 1979 in Sverdlovsk, (the exact date is unknown), a worker at the secret anthrax drying plant at Compound 19 failed to replace a clogged
filter that he had removed from the drying machines' exhaust pipes. By the time that this error had been noticed, thousands of airborne microscopic anthrax spores had been released into the surrounding countryside. The incident resulted in an estimated 64 deaths and a total of close to a hundred infections (Guillemin ix). Anthrax, which is an acute bacterial disease affecting the skin, intestinal tract and pulmonary system, has three clinical manifestations in humans. These are cutaneous, gastrointestinal and inhalational (Chin 20). Anthrax can be spread by contact with the tissues of infected animals, a bite from flies that had fed on infected animals, aerosol inhalation from dried hides or by contact with contaminated soil (Chin 21). Authorities in Sverdlovsk claimed that the outbreak of the disease was the result of individuals eating contaminated meat. They argued that the infected individuals had gastrointestinal anthrax, but could not explain their lesions and skin irritations, of a sort that often appear on infected individuals from aerosol inhalation of anthrax (Meselson et al. 193). The Soviet authorities were at the time obviously very concerned about the truth of the Sverdlovsk accident being found out.

In 1992, Russian President Boris Yeltsin confirmed suspicions that the Soviet Union had participated in an offensive bio-weapons programme and admitted to world leaders that the incident in Sverdlovsk was the result of an accident at a military biological weapons facility (Kadlec et al. 104). Biopreparat employees and government officials have confirmed Yeltsin's statement and admitted that the Soviet Union had conducted an elaborate cover-up, hiding at least six research labs, five production facilities and fifteen thousand Biopreparat employees (Christopher et al. 31). After his
admission in 1992. President Yeltsin, through a Presidential Decree, ordered the dismantling of the Soviet offensive biological weapons programme (Tucker 304).

The status of the successor Russian Federation's biological weapons programme remains unknown. Governmental officials maintain that the offensive programme has been dismantled, while defectors, including Alibek, maintain that it is more likely that work on offensive weapons continues. The existence of the Soviet, and perhaps Russian, offensive biological weapons programme has serious implications for the 1972 Biological Weapons Convention.

III. Implications of the Soviet Biological Weapons Programme

Along with the United States and the United Kingdom, the Soviet Union was one of the initial proponents of the Biological Weapons Convention in 1972. However, the Soviet Union covertly pursued an offensive biological weapons programme even after it ratified the Convention. This violation is indicative of larger problems associated with arms control. Such agreements can be problematic because member states will pursue illegal activity, covertly if necessary, if they believe that it is in their best interest. As discussed in Chapter One, member states might pursue banned activity under the BWC in the interests of national security. In particular, states might retain offensive biological weapons capabilities so that they can retaliate if attacked with a biological weapon.

The pursuit of an offensive biological and toxin weapons programme by the Soviet Union after the entry into force of the Biological Weapons Convention shows the limitations of Article V. The Convention lacks verification controls. No one is responsible for monitoring compliance with the provisions. Even if parties to the
Convention believed that the Soviet Union had an offensive biological weapons programme, they lacked the ability to verify their suspicions. The difficulties associated with verifying the Biological Weapons Convention are representative of those with other arms control agreements negotiated throughout history. States are often reluctant to become parties to arms control agreements that would involve intrusive monitoring. Thus few arms control agreements provide for stringent verification controls, including the 1963 Partial Test Ban Treaty, the 1972 Anti-Ballistic Missile Treaty and the SALT I interim Agreement. An exception is the 1987 Intermediate Nuclear Forces (INF) Agreement. The INF, a bilateral agreement between the Soviet Union and the United States, bans a class of weapons and provides for the most stringent verification controls ever included in a superpower arms control agreement (Falk 254). The end of the Cold War has seen greater attention paid to verification measures in arms control agreements. It remains to be seen, however, if verification and monitoring of non-compliance by member states will become more important elements of the BWC. The issue of verification will be discussed at length further on in this thesis.

IV. The History of the Iraqi Biological Weapons Programme

Since the early 1980s Western intelligence agencies have believed that Iraq has had both chemical and biological weapons capabilities, and had even used chemical weapons against Iran during the Iran-Iraq War and against ethnic Kurds in Iraq. There was, however, no proof of an offensive biological weapons programme undertaken by Iraq. That changed in the 1990s. With the discovery of biological weapons and weapons facilities on Iraqi soil by the United Nations Special Commission (UNSCOM), and
through the statements of a high-ranking Iraqi military official who defected in 1995, suspicions were confirmed and the international community had proof of the Iraqi programme.

Iraq first began experimenting with biological and toxin agents in the early 1970s, but did not begin to aggressively pursue an offensive biological weapons programme until 1985 when it began research on anthrax at the Muthanna State Establishment, the principal Iraqi chemical weapons facility (Zilinskas 138). Iraq had already been studying chemical agents for use as weapons. In 1980, President Saddam Hussein invaded neighbouring Iran, and in 1982, reneging on international arms control obligations, first started using chemical weapons on not only Iranian forces, but also on ethnic Kurds in Iraq (Falk 243). In 1987, near the end of the Iran-Iraq War, Iraqi officials moved their biological weapons programme to Salman Park, a facility south of Baghdad that became the centre of a covert weapons programme (Christopher et al. 32).

At Salman Park the Iraqi forces experimented with a series of lethal agents, including anthrax, *Yersina pestis*, aflatoxin, ricin, camel pox, gas gangrene and *Clostridium botulinum*. They had received samples of both these agents from the United States and France in the 1980s. In July 1995, the Center for Disease Control in Atlanta reported that in the 1980s it had sent to Iraq upon request more than 80 agents and associated biological materials including *Yersinia pestis*, dengue fever and West Nile Virus antigens and antibodies. Between 1985 and 1989, the American Type Culture Collection sent biological and toxin materials to Iraq which included two strains of *Clostridium tetani*, three of anthrax and five of *Clostridium botulinum* (Cole 85). All three of the deadly agents sent from American Type Culture Collection are considered to
be potential biological warfare agents. The shipment of virus, bacteria and toxin cultures to countries around the world for scientific study is a common practice, and one even encouraged in Article X of the Biological Weapons Convention which promotes the transfer among member states of information and technology on biological and toxin agents, their precursors and the equipment necessary for their study. By simply requesting cultures of biological and toxin agents under the guise of scientific research, Iraq acquired the makings of a biological weapons programme that quickly became offensive.

A mutual cease-fire in August 1988 ended the war between Iran and Iraq, but tensions quickly escalated in the region when Iraqi forces invaded neighbouring Kuwait in August 1990 after demands of oil restitution from Kuwait were ignored. The international community quickly mobilised forces to support Kuwait, and in 1991, Operation Desert Storm ended the Iraqi occupation. It was determined that Iraq acted illegally in invading neighbouring Kuwait and the United Nations Security Council placed economic and military sanctions on Iraq. On 3 April 1991, United Nations Resolution 687 created a United Nations Special Commission (UNSCOM). Some examples of the duties UNSCOM was mandated to undertake include the following:

carry out immediate on-site inspections of Iraq’s biological, chemical and missile capabilities; to take possession for destruction, removal or rendering harmless of all chemical and biological weapons and all stocks of agents and all related sub-systems and components and all research, development, support and manufacturing facilities; to supervise the destruction by Iraq of all its ballistic missiles with a range greater than 150 km and related major parts, and repair and production facilities; and to monitor and verify Iraq’s compliance with its undertaking not to use, develop, consult or acquire any of the items specified above (United Nations 2).
Iraq agreed to the mandate of UNSCOM and agreed to allow the inspection teams unrestricted freedom of entry into Iraq, unrestricted freedom of movement on Iraqi soil and the unrestricted right of access to any Iraqi facility for the purpose of an on-site inspection. The creation of UNSCOM started what would be a stream of denials by Iraq. Specifically, Iraq continually denied the existence of an offensive biological weapons programme.

One of the first sites that UNSCOM inspected for biological and toxin weapons was the heart of the Iraqi offensive biological weapons programme, Salman Park. The area had been bulldozed and levelled to the ground by Iraqi forces and all documents and materials were either missing or burnt beyond recognition. However, at Salman Park the UNSCOM team found evidence that indicated that there had been "fermentation, production, aerosol testing, and storage equipment on-site" (Cole 142). This blatant destruction of evidence of illegal activity by the Iraqi Government, and the subsequent denials of the existence of a covert weapons programme, characterised the first four years of UNSCOM’s inspections.

Proof of the offensive biological weapons programme came after 1995 when General Hussein al Kamal, President Saddam Hussein’s brother-in-law, defected, bringing with him intimate knowledge of the Iraqi biological weapons programme. UNSCOM utilised this knowledge and uncovered hidden weapons munitions and facilities. By December 1998, UNSCOM had completed more than 250 inspections and had destroyed biological and chemical weapons and weapons facilities (United Nations 4). However, in August 1998, communications between UNSCOM leader Richard Butler and Iraqi officials broke down when Iraq alleged that the United States engineered the
inspections in an effort to oust the Iraqi regime. In December 1998, after Iraqi officials refused UNSCOM teams access to suspected weapons facilities, the United States and the United Kingdom began a small air assault campaign on Iraq called Operation Desert Fox which targeted suspected weapons facilities. Operation Desert Fox received criticism from many members of the international community, including France and China. In December 1999, the United Nations Security Council created the United Nations Monitoring, Verification and Inspection Commission (UNMOVIC) to replace UNSCOM.

While the current status of Iraq’s offensive biological and toxin weapons capabilities remains unknown, UNSCOM was able to identify and find specific components of Iraq’s programme. The Iraqi non-conventional weapons programme contained 8,400 litres of anthrax, 19,000 litres of botulinum toxin, 2,200 litres of aflatoxin and 10 litres of ricin. In terms of biological weapons delivery systems, Iraq had 25 Scud missile warheads, 157 aerial bombs, 4 aerial dispensers, an unknown quantity of 155-mm artillery shells, artillery rockets and MiG-21 drones. As of February 1998 UNSCOM had destroyed 8 types of delivery systems, the al-Hakam biological weapons facility, 480,000 litres of chemical and biological weapons munitions and 480,000 litres of chemical and biological agents (Floden et al. 12-13).

V. Implications of Iraq’s Biological Warfare Programme

Like the Soviet Union, Iraq was a signatory to the 1925 Geneva Protocol and in 1972 signed the Biological Weapons Convention. While Iraq did not ratify the Biological Weapons Convention until 1991, its blatant disregard of the 1925 Geneva Protocol when it illegally used chemical weapons on Iranian forces and ethnic Kurds has threatened
peace in the Persian Gulf and the Middle East. It has been estimated that a workforce of more than 200 people who staffed Iraq's biological weapons facilities is largely intact. Iraq's civilian biotechnology industry remains undiminished after Operation Desert Fox, and because of the dual-use nature of the biotechnology industry, it would take only months for Iraq to re-start its offensive weapons programmes, if it is not already underway (Zilinskas 153). The experience with Iraq show's how difficult it is to ensure that member states do not renge upon Convention commitments. If other states in the Middle East, including Iran, Libya and Syria, believe that Iraq's offensive biological weapons programme has been initiated, they may perceive Iraq's actions as a threat and may pursue a course of biological and toxin weapons proliferation.

VI. Conclusion

The examples of the Soviet and Iraqi offensive biological weapons programmes illustrate the strategic importance and value some states place on these weapons of mass destruction. These two case studies also demonstrate that signatories have pursued offensive biological weapons programmes. If other such efforts are to be prevented, and an international norm against the possession and use of biological and toxin agents is to be established, member states at the BWC Fifth Review Conference in 2001 will have to address the weaknesses of the Convention.
Chapter Four: Problems With the Biological Weapons Convention

I. Introduction

The history of the Soviet and Iraqi biological weapons programmes makes clear that the BWC has placed very few constraints on states determined to develop offensive weapons programmes. This chapter will examine the weaknesses of the text of the Biological Weapons Convention that allow member states to possess biological and toxin weapons. The following sections outline the key features of the text of the Convention and the problems with them. The key weaknesses include the ambiguous nature of the Convention, the allowance of biological and toxin agents for research for defensive purposes, a lack of verification controls and a lack of provisions in the text to regulate advances in the biotechnology industry.

II. Ambiguous Nature of the Convention

At first glance, the text of the Biological Weapons Convention would appear very firm in its desire to ban an entire category of weapons. However, it is obvious that many of the main clauses of the Convention are subject to broad interpretation. Article I of the Convention reads as follows:

Each State Party to the Convention undertakes never in any circumstance to develop, produce, stockpile or otherwise acquire or retain:
(1) Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;
(2) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict (Wright 371).

While Article I does set out specific rules to ban member states from possessing biological and toxin agents that have “no justification for protective, prophylactic and
other peaceful purposes” (Wright 371), as well as to ban future technical development of weapons, it does not adequately regulate the complex nature of biological weapons. In the Preamble of the Convention, which is not legally binding, a statement is made that, for the sake of humankind, the parties to the Convention are determined to exclude all possibility of biological and toxin agents being used as weapons. However, only the possession, and not the use, of biological and toxin weapons is regulated.

First, the meaning of “prophylactic, protective or other peaceful purposes” is unclear and a very troublesome loophole is thus created. It allows for the development, production and stockpiling of potentially very dangerous, militarily relevant, biological agents under the auspices of research for defensive purposes. It is difficult to discern what “peaceful” applications actually are, therefore the term is subject to state interpretation. The United States, for example, has interpreted Article I as allowing military research for the isolation and preparation of toxins and pathogenic agents in order to protect civilian populations (Lappé 83). As will be discussed later in this chapter, it is suspicious of member states to conduct isolation research and experiments on biological and toxin agents because creating vaccines that protect against genetically manipulated agents is very difficult. It is possible that the United States and other member states engage in this type of research because it is easy to transfer the information into an offensive weapons programme. If these member states engage in biological and toxin weapons research, they have the ability to transfer their defensive weapons programme into an offensive one, for whatever purpose. Peaceful applications work can be distinguished from potential military applications in the production stage.
because the production of biological agents for weapons purposes typically requires more equipment than that needed for research alone.

Article I does not provide a specific list of agents or equipment prohibited or banned under the Convention. Because the Convention does not provide for a listing of agents, equipment and materials, states can continue to possess dual-use equipment, like fermenters capable of cultivating pathogenic organisms and cross-flow filtration equipment. Dual-use equipment is equipment that can be used for both defensive and offensive programmes.

A second weakness in the text of the Convention lies in the wording of Article II. Article II of the Convention includes the following statement:

Each State Party to this Convention undertakes to destroy or to divert to peaceful purposes, as soon as possible but not later than nine months after entry into force of the Convention, all agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, which are in its possession or under its jurisdiction or control (Wright 371-372).

Stipulating that member states have the option either to destroy or divert to peaceful purposes stockpiles of biological and toxin agents leads to the question as to what “peaceful purposes” entail. Pursuant to the objections raised over the wording of Article I, it should be noted once again that by allowing biological and toxin agents to be researched for defensive purposes, the Convention is exempting member states from destroying stockpiles of agents that have the potential to be used for military purposes. Furthermore, the Convention does not specify the amount of stockpiles that are allowed for peaceful purposes. In all probability, member states would be more likely to “divert to peaceful purposes” their facilities, equipment and stockpiles of agents than to destroy them. Doing so would allow them to continue research that may be utilised for an
offensive biological weapons programme without violating the accord. The diversion to peaceful purposes of stockpiles, while permissible, does not eliminate biological and toxin agents.

Article IV of the Convention is also vague with respect to state implementation.

Article IV of the Convention includes the following:

Each State Party to this Convention shall, in accordance with its constitutional processes, take any necessary measures to prohibit the development, production, stockpiling, acquisition, or retention of the agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere (Wright 372).

This wording raises the question of what “constitutional processes” are. The text of this Article does not specify the national and constitutional measures states should follow, therefore allowing parties to interpret the required constitutional processes based on their own foreign policy and national interest.

While compliance and verification measures will be discussed further along in this chapter, the inadequacies of the wording of Article VI, which covers these provisions should be briefly mentioned. Article VI provides that any member state suspecting another state of violating provisions of the Convention may lodge a complaint with the United Nations Security Council. However, the five permanent members of the Security Council (the United States, Great Britain, France, China and the Russian Federation) all have the power to veto any Council resolutions. All five permanent members of the Security Council also have or have had in the past defensive or offensive biological and toxin weapons programmes. Allowing the Security Council to handle and veto any
allegations of non-compliance with the provisions of the Biological Weapons Convention diminishes the likelihood of complaints being registered against offending states.

Further weaknesses of the text of the Convention can be found in Article X, which requires the “exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes” (Wright 373-374). Despite proposals from developing states that are parties to the Convention, Article X has never been implemented (Chevrier and Smithson 215). It is highly probable that unless this article is enforced, or that a compromise is made between developed and developing states, some non-signatories, including Algeria, Angola, Eritrea, Kazakstan and Tajikstan, will not become member states. They believe that developed parties have an unfair technological advantage (SIPRI-Non-Signatories to the BTWC 1-2). This debate under the BWC reflects a standard North-South issue in most multilateral negotiations. Many developed countries have resisted making assistance to developing countries mandatory because they believe doing so will limit their potential to make a profit from the sale of the information and technologies. An exchange of information and technology is very important because it increases transparency among member states. However, the activities of member states would have to be monitored to ensure that developing states receiving information and technology from the developed states do not use it to create offensive weapons capabilities.
III. Research for Defensive Purposes

While Article I and Article II of the 1972 Biological Weapons Convention ban the use and possession of biological and toxin agents except for peaceful, protective and prophylactic uses, the Convention clearly allows for research on biological and toxin agents for defensive measures to protect combatants and non-combatant populations from a biological warfare attack from an enemy state or terrorist. According to Marc Lappe, three distinctly different kinds of biological research can be identified. The first type is research that directly aids an offensive biological weapons programme. The second is research that simultaneously creates an offensive and defensive capability. The final type is research the ends of which are purely defensive in nature (Lappe 80). Purely defensive research includes the production of vaccines and anti-serums from existing viruses, bacteria and toxins, and the development of protective clothing, breathing apparatuses, etc. to protect combatants and civilian populations from an attack with a biological or toxin weapon.

The first type of research is banned under the provisions of the Biological Weapons Convention. However, the second and third types of research can be part of, or contribute to, a broader offensive weapons effort that has military significance. A fine line separates research with ends that are purely defensive in nature from research that contains offensive aspects, but is for defensive purposes. Many states engage in the latter type of research because they believe that it may allow them to protect combatants and civilian populations from biological attack.

The regulation of biological and toxin agents for research and defence is very difficult. When a new weapon is developed, efforts will be made to produce a
counterweapon or a defence against it (Morgenthau 287). However, what makes one state secure can make another state insecure, and eventually efforts of one can lead to an arms spiral. It should be noted that because of advances in biotechnology and genetic engineering, it is virtually impossible to have an effective defence that would protect military and civilian populations from any sort of biological attack. This is because the agent used for an attack can be genetically altered to so that it will be resistant to known vaccinations and anti-serums (Novick and Shulman 117).

To explore further what research for defensive purposes entails for parties to the Convention that are ardently pursing extensive defensive programmes it is useful to consider six general areas of biological warfare research. These include: (1) isolation of preparation of toxins and pathogenic organisms; (2) prophylactic measures, which include using vaccines and other diseases preventative measures; (3) therapeutic measures, which include using antibiotics, antiviral drugs and antidotes; (4) protective clothing and equipment, which include respirators and protective suits; (5) monitoring and detection devices; and (6) methods of decontamination (Lappe 82). Components of all six types of research can also be used for offensive purposes. For example, member states that use protective clothing and equipment for defensive research can also use them to protect scientists in the creation of offensive weapons or soldiers mounting such an attack.

The United States has argued that all six areas of research are fundamentally important to defensive research programmes because, in order to defend against a possible attack from biological and toxin weapons, an agent must be isolated and analysed so that a vaccine can be developed that counteracts its use. However, because of
the nature of biological and toxin agents, the same research can also be used for an
offensive weapons programme. The creation and maintenance of a defensive biological
weapons programme necessarily entails a comprehensive study of biological and toxin
agents, including the generation and growth of these agents, and the infective nature,
pathogenic capacity and resistance to meteorological conditions of agents. Such research
requires also the creation of a research facility that contains all necessary protective
clothing and equipment (King and Strauss 123).

Among the by-products of a defensive weapons research programme are
capabilities and technical know-how required for transferring a defensive research
programme into an offensive one. Defensive research programmes can thus be a front for
offensive programmes. Advances in biotechnology increase the ability to transfer
defensive weapons knowledge into offensive weapons programmes, as well as allowing
for large amounts of militarily useful agents to be created in a short time, thus making
stockpiling less important and reducing the chances of potential detection.

It is difficult to distinguish defensive from offensive weapons programmes
because they use similar equipment and micro-organisms, the dual-use phenomenon.

[O]ffensive and defensive biological warfare research programmes,
particularly defensive programs that focus on the properties of specific
BW agents, share the same components. One has to rely on the stated
intent of the program to distinguish between offensive and defensive
efforts. Thus a program aimed at defences against BW agents may easily
be misconstrued by adversary nations and is provocative in character
(King and Strauss 125).

For example, in the early 1990s, the United States accused Iran of pursuing an
offensive weapons programme. In 1988 and 1989, Iran attempted to purchase mycotoxins
(toxic substances produced by fungi growing on grain, seed or food) from both Canada
and the Netherlands. However, the United States admitted that, while the Iranian programme was suspect, it was also possible that the mycotoxins could have been used as part of a defensive programme (Spiers 37).

One of the methods used to distinguish between a defensive research programme and an offensive one is to look at the size of the programme. It is likely that an offensive biological weapons programme will have larger stockpiles, more equipment and more staff than a defensive programme. Such evaluation, however, requires a certain level of information.

IV. Lack of Verification and Monitoring of Compliance Provisions

The inability to verify compliance with an arms control agreement severely limits its effectiveness. Verification can involve the monitoring of the activities banned by the agreement and the assessment of compliance with treaty provisions (Pilat 81). When the Biological Weapons Convention was signed in 1972, it severely lacked such verification and monitoring provisions. During negotiation of the Convention both France and Sweden argued that the Convention needed strong verification provisions. However, opposition from other states led to weak provisions to address the issue of non-compliance. Article V of the Convention includes the following statement:

The States Parties to this Convention undertake to consult one another and to cooperate in solving any problems which may arise in relation to the objective of, or in the application of the provisions of, the Convention. Consultation and cooperation pursuant to this article may also be undertaken through appropriate international procedures within the framework of the United Nations and in accordance with its Charter (Wright 372).

Article VI of the Convention includes the following provisions:
(1) Any State Party to this Convention which finds that any other State Party is acting in breach of obligations deriving from the provisions of the Convention may lodge a complaint with the Security Council of the United Nations. Such a complaint should include all possible evidence confirming its validity, as well as a request for its consideration by the Security Council.

(2) Each State Party to this Convention undertakes to cooperate in carrying out any investigation which the Security Council may initiate, in accordance with the provisions of the Charter of the United Nations, on the basis of the complaint received by the Council. The Security Council shall inform the States Parties to the Convention of the results of the investigation (Wright 372-373).

Article V of the Convention thus provides for an informal consultation and cooperation process that is voluntary unless pursued within the framework of the United Nations. Article VI of the Convention, which is the only formal complaint process provided for in the Convention, has been ineffectual (Chevrier and Smithson 212). By the end of the Fourth Review Conference no complaints of illegal activity had been made to the Security Council. And, as noted, any permanent member of the Security Council could veto any investigation into non-compliance. It is highly unlikely that any of the permanent five members of the Security Council would permit an investigation if they themselves were accused of inappropriate behaviour, or one of their strategic allies were accused of non-compliance.

Critics have argued that the Biological Weapons Convention needs to provide for more effective verification. Verification measures could, in theory, prevent horizontal and vertical proliferation and could deter signatories from non-compliance activities, which might include creating novel biological and toxin agents for military purposes, as well as manipulating an existing biological or toxin agent for non-research purposes.
Examples of the sorts of verification provisions that could be applied to the BWC include the following examples:

(1) cooperative measures, which include the voluntary exchange and declaration of activities and information on research and defence, as well as on all activities in Bio-level Four laboratories (where the micro-organisms are studied that have no cure) and human vaccine production facilities, the monitoring of weapons and delivery systems through agreed upon checkpoints and the non-interference of member states from inspection of facilities and verification means (Calogero et al. 4);

(2) national technical means (NTM), which include non-intrusive technical surveillance from satellites in outer space and radar and optical surveillance from locations outside the state that is being inspected/monitored (Calogero et al. 4);

(3) the use of technical monitoring devices that are covertly or openly placed at or near research and defence sites and suspected offensive weapons sites (Calogero et al. 4);

(4) on-site inspections which may be previously agreed upon, or may be surprise or challenge inspections that use visual inspection to assess compliance as well as biological sampling (Calogero et al. 4). An example of on-site and challenge inspections are the activities undertaken by the UNSCOM team in Iraq;

(5) national intelligence gathering, including the utilisation of agents/operatives, statement and confessions from defectors, communication intercepts and information leaks (Calogero et al. 4).
IV. Provisions for Advances in the Biotechnology Industry

In 1972, when the Biological Weapons Convention was signed, genetic engineering and other new biotechnologies, such as nucleus transfers, had not been developed. Biotechnology is a broad term and can be loosely defined as the “production of innovative products, devices and organisms by exploitation of biological processes” (Dando 100). Deoxyribonucleic acids (DNA) and ribonucleic acids (RNA) are the chemical substances of genes, serving the dual function of hereditary transmission and of programming the cell to perform its biological functions (Novick and Shulman 107). In the early 1980s, through using recombinant DNA and RNA genetic manipulation tools, scientists discovered that they could also manipulate the physical properties of viruses and bacteria that are disease and virus causing organisms. The ability to manipulate a micro-organism or toxin agent with relative ease and safety has made the biotechnology revolution a threat to the effectiveness of the 1972 Biological Weapons Convention because the original text of the Convention had no provisions to regulate advances in the biotechnology industry.

The biotechnology revolution has had an enormous impact on the study and production of biological and toxin agents, whether for legal defensive purposes, or for offensive ones. Malcom Dando provides a list of seven new scientific technologies that have changed the nature of germ warfare. These seven technologies are recombinant DNA (genetic engineering), protein engineering, computer-aided orthomolecular drug design, fermentation engineering, mammalian cell culture, peptide synthesis, and biophysics of cell membranes (Dando 132).
Through the use of these seven biotechnologies, scientists have revolutionised the industry that studies micro-organisms and toxin agents. Scientists can manipulate previously harmless organisms, as well as create novel ones, which makes biological and toxin agents even more appealing weapons to some states and groups. Through genetic engineering, scientists can increase the virulence, lethality and stability of an agent, as well as circumvent a human’s or animal’s immunity and defences against micro-organisms. Perhaps the most alarming result of biotechnologies is the potential to engineer agents that can attack specific racial or ethnic groups, for example, humans with sickle cell anaemia. Sickle cell anaemia is prevalent among people of African ancestry.

Typically, the use and dissemination of biological and toxin agents depends upon meteorological and environmental conditions. With advances in genetic engineering, scientists can manipulate the properties of a biological agent, making it more hardy, and therefore less reliant upon meteorological and environmental conditions. As well, the physical properties of an agent can be manipulated so that the intense heat and force generated by its launching in artillery and rocket shells will not kill the agent, making the agent more effective for use on the battlefield and therefore a threat to global security.

Advances in biotechnology that enable scientists to manipulate the genetic properties of a virus make it more difficult for a state to defend against an attack with an engineered agent because the physical properties of the agent may be different from its known form. These factors, coupled with the ability of the attacking state to protect combatants and non-combatants with vaccines against the virus, are the driving forces behind the motivation for many states and terrorist organisations to use biological and toxin agents as weapons. In short, biotechnology has revolutionised the spectrum of
biological warfare, threatening national and global security through the potential creation of more hardy, lethal and novel agents.

VI. Conclusion

This chapter demonstrates the weaknesses of the Biological Weapons Convention that have compromised its inability to prevent member states from possessing biological and toxin agents for offensive purposes. The purpose of the Biological Weapons Convention was to ban member states from possessing biological and toxin agents that did not have justification for peaceful, prophylactic and other protective purposes. It is necessary to identify these weaknesses before making suggestions on how to strengthen the regime and how to create an international norm against the possession and use of biological and toxin weapons. These weaknesses reflect arms control dilemmas and debates that have been prevalent throughout history, as identified in Chapter Two, and as reflected in the realist and idealist schools of thought.

The next chapter will discuss the international efforts that have been taken to strengthen the weaknesses of the Biological Weapons Convention, looking specifically at the four Review Conferences that have been held by member states in an effort to address the weaknesses of the Convention.
Chapter Five: Efforts to Strengthen the Biological Weapons Convention

I. Introduction

Since the Biological Weapons Convention entered into force on 26 March 1975, member states have held four review conferences, in 1981, 1986, 1991 and 1996. Article XII of the Convention provides that parties to the Convention must hold a review conference within five years to “review the operation of the Convention, with a view to “ensuring” that the purposes of the preamble and the provisions of the Convention, including the provisions concerning negotiations on chemical weapons, are being realized” (Wright 374). Parties have attempted to address the weaknesses of the Convention and in some cases have tried to modify major provisions, but have only had incremental success. By consensus among member states at the review conferences a modified interpretation of the Convention is adopted in the Final Declaration. The modifications expressed in the Final Declaration are legally binding, even though, curiously, the actual text of the Convention is not amended. While member states have attended the four review conferences since 1972, the broader international community beyond the review table has also been very involved in the movement to ban biological weapons as weapons of mass destruction. Many non-governmental organisations and scholars of international relations have been integrally involved in this arms control effort. In some cases they have made a significant impact on inter-state negotiations at the review conferences. Some of these organisations include the Australia Group, the Federation of American Scientists, the Stockholm Peace Research Institute and the University of Bradford. These groups have been involved in the incremental strengthening process but their role will not be analysed here. This chapter will discuss
the outcomes of the four review conferences and the modifications made to the Biological Weapons Convention. It will not, indeed cannot, provide a full account or explanation of the proceedings of these conferences because the relevant transcripts have not been released. Suffice it to say, the incremental progress made at the review conferences is illustrative of the broader dilemmas of arms control. The end of the Cold War did not result in significant changes in the BWC because some member states still subscribe to the realist rhetoric that legitimises a narrow definition of security centred almost entirely on the efficacy of weapons to protect states from security threats. However, even the incremental modifications achieved at the four review conferences may help in the creation of an international norm against the possession and use of biological and toxin weapons.

II. The First Review Conference

When the First Review Conference was held in Geneva in March 1981, member states were meeting out of obligation rather than out of urgency to strengthen the Convention. During the late 1970s and early 1980s, there was little concern over the threat of biological weapons being used in warfare. Advances in biotechnology were not significant enough to pose a problem to the Convention or to the security of states, and most observers believed that the development of novel pathogenic microorganisms and toxins was a task of insurmountable complexity (Wright 54). Proof of the Soviet and Iraqi bio-weapons programme and the accident at Sverdlosk had not come to light, allowing signatory states to believe that the creation and maintenance of offensive weapons programmes was not an immediate threat to either the Convention or global
security. The conclusion of the First Review Conference, not surprisingly, failed to result in any significant changes to the Convention.

On the Preamble of the Final Declaration of the First Review Conference, the member states reaffirmed their strong determination to ban eventually the possession and use of biological and toxin weapons. To help achieve their goal, they made minor changes to Articles II, IV, V and X. Article II of the Convention was modified to include a statement on voluntary declarations by member states, concerning their programmes, recognising that a few parties had made voluntary declarations to the effect that they did not possess biological and toxin agents and/or the equipment and means necessary for delivering them. Pursuant to voluntary declarations, Article II further states that “The Conference believes that such voluntary declarations contribute to increased confidence in the Convention and believes that States not having made such voluntary declarations should do so” (SIPRI-First Review Conference 2).

A second small change to the Convention can be found in Article IV, which states that “The Conference invites States Parties which have found it necessary to enact specific legislation or take other regulatory measures relevant to this Article to make available the appropriate texts to the United Nations Centre for Disarmament, for the purpose of consultation” (SIPRI-First Review Conference 2). Requiring member states to provide the United Nations Centre for Disarmament with annual declarations of legislative activities allows both member states and international organisations to assess a component of compliance by the members.

One of the more important political agreements at the 1981 Review Conference relates to Article V of the Convention. While the changes made are only minimal, it is
important to note that member states at least recognised in the early 1980s that the verification and compliance monitoring mechanisms in the Convention were inadequate. Member states agreed that interested parties should:

use various international procedures which would make it possible to ensure effectively and adequately the implementation of the Convention provisions taking into account the concern expressed by the Conference participants to this effect. These procedures include *inter alia*, the right of any State Party subsequently to request that a consultative meeting open to all States Parties be convened at expert level (SIPRI-First Review Conference 3).

These small changes make the consultation and cooperation process less informal and set the stage for future development of the article. One of Ross’s four key functions of arms control agreements, mentioned in Chapter One, is building confidence among member states by providing greater transparency in negotiations and improving confidence building measures. These changes begin to move the BWC toward that end.

Article X of the Final Declaration of the First Review Conference called upon the developed states to provide economic and social assistance to developing countries. This assistance would include help in the disarmament process, as well as with the scientific and technical use of biological and toxin agents for peaceful purposes. Although the idea of cooperation between the developed and developing world was mentioned, no concrete guidelines or rules for this cooperation were set out, leaving any such cooperation both vague and voluntary. In order to strengthen the Convention more concrete guidelines will have to be negotiated and implemented.
II. The Second Review Conference

After the First Review Conference was concluded in 1981, a series of events set the stage for the Second Review Conference, held in Geneva in September 1986. These events, and the failure of the First Review Conference to result in any significant changes to the 1972 Biological Weapons Convention, coupled with advances in the scientific community and biotechnology industry that could potentially change the nature of germ warfare, led the member states to confirm that they had a common interest in strengthening the “authority and effectiveness of the Convention” (SIPRI-Second Review Conference 1). While the progress made in the Second Review Conference was only minor, in relation to the First, it can be described as successful in providing momentum and support for strengthening the biological and toxin weapons regime.

Throughout the Second Review Conference, parties made a variety of proposals and submitted position papers on how to strengthen the weak Convention. Member states made proposals on strengthening Article V and Article X, promoting international cooperation among scientists and research facilities in order to bridge the divide between the ‘North’ and the ‘South’ (Sims 269). One of the more surprising proposals on how to make the Convention more effective came on September 15, from the Soviet delegation leader, who proposed that a subsequent negotiation take place on a supplementary protocol that “would institute stronger procedures for verifying compliance with the Convention” (Sims 270). As was discussed in Chapter Three, the Soviet Union had covertly pursued an aggressive offensive biological and toxin weapons programme during the 1970s and 1980s. During the mid to late 1980s, Soviet President Mikhail Gorbachev was instituting his policies of openness to the West. It can be surmised that
when the Soviet delegation proposed verification negotiations, it was either attempting to demonstrate a desire to cooperate with other member states or knew that its proposal would be defeated by the rival superpower, the United States. Although the verification proposal was indeed defeated, the member states were able to agree to modifications affecting the interpretation of Articles I, III, IV, V and X.

At the First Review Conference little attention was paid to Article I of the Convention which allows biological and toxin agents for "prophylactic, protective or other peaceful purposes." However, with the advent of biotechnology and the potential to engineer harmless micro-organisms and toxins into deadly, virulent weapons, the member states at the Second Review Conference made minor revisions to Article I. They agreed that "the Convention unequivocally applies to all natural or artificially created microbial or other biological agents or toxins whatever their origin or method of production" (SIPRI- Second Review Conference 2). The member states thus affirmed that the use of genetic engineering to make biological weapons would not be permitted, while ensuring that the prophylactic, protective or peaceful purposes of the new technologies were allowed, therefore placing little restriction upon the scientific and technology industry. To guarantee that these technologies were not used to create deadly biological and toxin weapons, it would have been prudent of the member states in Article I to define the parameters of research for defensive purposes with biological and toxin weapons, as well as to create a list of biological and toxin agents that were not permitted for research.

In an attempt to ensure that member states did not assist or in any way encourage another state to develop a biological and toxin weapons programme, in 1972 the parties
to the Convention created Article III. Article III of the Convention includes the following:

Each State Party to this Convention undertakes not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist, encourage, or induce any State, group of States or international organizations to manufacture or otherwise acquire any of the agents, toxins, weapons, equipment or means of delivery specified in Article I of this Convention (Wright 372).

At the Second Review Conference the parties agreed to modify Article III, and added the statement “The Conference notes that the provisions of this Article should not be used to impose restrictions and/or limitations on the transfer for purposes consistent with the objectives and the provisions of the Convention of scientific knowledge, technology, equipment and materials to States Parties” (SIPRI-Second Review Conference 3). Article III was thus modified to ensure that it did not detract from Article X and restrict the transfer of technology and information between the developed and developing states. While this new addition ensured that restrictions were not placed on member states that could hamper international cooperation, it also posed a threat to the goal of banning states from possessing biological and toxin weapons.

Another change to the Convention during the Second Review Conference related to Article IV, which discusses the implementation of national measures. The First Review Conference made only a minor adjustment to Article IV by mentioning that if parties found it necessary to enact specific legislation they should make available the appropriate texts to the United Nations Centre for Disarmament. The Second Review Conference built on these adjustments and added a statement noting the importance of legislative, administrative and other measures that parties undertake to guarantee compliance with
the provisions of the Convention. In order to help prevent unauthorised access to and removal or theft of pathogenic and toxin material, Article IV now allows member states to enact legislation for the physical protection of laboratories and facilities. As well, Article IV promotes the inclusion of information on the Biological Weapons Convention in textbooks and medical, scientific and military education programmes (SIPRI-Second Review Conference 3). Although the legislative provisions that were discussed in Article IV were voluntary only, the institution of voluntary reporting systems and national implementation measures further promotes compliance with the provisions of the Convention.

At the Second Review Conference the member states also added four voluntary confidence building measures under the auspices of Article V that were intended to promote transparency, cooperation and confidence among parties to the Convention. In this way the BWC process reflected one of Ross’s four key functions of arms control, confidence building measures to increase transparency among member states. Addition of the confidence building measures reflected a concern over the possibility that member states could pursue an offensive biological weapons programme under the guise of defensive research. The four voluntary confidence building measures were as follows:

(a) the exchange of data on biological research centres and laboratories that meet very high national and international safety standards;
(b) the exchange of information on all irregular outbreaks of diseases and toxins;
(c) the encouragement of publications of results of biological research directly related to the Convention; and
(d) the active promotion of contacts between scientists engaged in biological
research directly related to the Convention, including the exchanges of joint research on a mutually agreed basis (SIPRI-Second Review Conference 4-5).

Even though the confidence building measures added at the Second Review Conference were voluntary only, they did set the stage for future negotiations on such measures.

As was the case with the First Review Conference, most of the attention during the Second focused on Article X, which discusses the transfer and exchange of information and technologies between the developed and developing countries that are member states. Throughout the negotiations in September many proposals were made regarding the notion of cooperation among parties to the Convention. Additions to Article X included a statement promoting the transfer and exchange of information concerning research programmes in bio-sciences among member states, the long-term transfer and exchange of information, materials and equipment among parties, the active promotion of contacts between scientists and technical personnel in states, and the promotion of regional and national programmes in relevant biological fields among member states (SIPRI-Second Review Conference 6-7).

The Second Review Conference agreed to hold an ad hoc meeting of scientific and technical experts to finalize the modalities for the exchange of information and data. The ad hoc meeting was held in Geneva from March 15 until April 15 1987. The results of the Second Review Conference, along with the ad hoc group meeting in 1987, paved the way for the Third Review Conference of member states.
III. The Third Review Conference

The Third Review Conference on the Biological Weapons Convention was held in Geneva in September 1991. In the Preamble of the Final Declaration the member states reaffirmed their conviction that universal adherence to the Convention would enhance international peace and security. Pursuant to the goal to ban biological and toxin agents as weapons of mass destruction, the Third Review Conference focussed mainly on Article V and Article X, while minor modifications were added to Article I and Article IX.

Article I of the Final Declaration emphasised the vital importance of full implementation of all the provisions set out in the Convention by member states because non-compliance could severely undermine confidence in the Convention. However, Article I did not fully address the issue of non-compliance as it did not include a list of measures or remedial actions that result when non-compliance with the Convention's provisions occurs.

Perhaps the most interesting and important modifications to Article I during the Third Review Conference centred on the inclusion of a provision banning experimentation involving the open-air release of pathogens or toxins harmful to man, animals, or plants that had no justification for prophylactic, protective or other peaceful purposes (research and defence) (SIPRI-Third Review Conference 2). This addition showed that member states recognised the threat biological and toxin agents posed to humans and the environment and showed that member states were willing to place more restrictions on permissible state activity, thereby reducing the likelihood of an accidental release of a biological or toxin agent. This action related directly to the anthrax accident
in Sverdlovsk in 1979 as the Soviet scientists were experimenting with an aerosol form of anthrax. While the Convention does still allow for experimentation involving the open-air release of biological and toxin agents (for the creation of vaccines and protection equipment including breathing apparatuses and protection suits), recognition of the threat posed to the human and natural environment from the open-air release of pathogens was important.

Expanding on the four confidence building measures agreed upon at the Second Review Conference, the ad hoc group which met in 1987 elaborated on several issues from Article V, encouraging voluntary declarations by member states in relation to the confidence building measures. However, when the Third Review Conference met in Geneva in 1991, concern was raised over the lack of actual declarations of activities, prompting the inclusion of several more confidence building measures in the Convention.

At the Third Review Conference, seven mandatory confidence building measures were included in Article V. These included the following: (a) exchange of data on research centres and laboratories and the exchange of information on national biological defence research and development programmes; (b) exchange of information on outbreaks of infectious diseases and similar occurrences caused by toxins; (c) encouragement of publication of results and promotion of use of knowledge; (d) active promotion of contacts; (e) declaration of legislation, regulations and other measures; (f) declaration of past activities in offensive and/or defensive biological research and development programmes; (g) declaration of vaccine production facilities (SIPRI-Third Review Conference 5).
It should be noted that while measures one to five above are very important, measures six and seven are integral to the analysis of the capabilities of member states weapons programmes. To further strengthen Article V, the text of the Convention was further modified at the review Conference. Parties to the Convention were to be required to submit reports on confidence building measures to the United Nations Department for Disarmament Affairs before April 15 every year. In a change to Article V the parties established an ad hoc Group of Governmental Experts open to all member states, known as VEREX, to identify and examine potential verification measures that could be applied to the Biological Weapons Convention from a scientific and technical standpoint. The findings of VEREX will be discussed briefly in the section on the Fourth Review Conference.

During the negotiations of the Third Review Conference, states once again noted the increasing gap between the developed and developing countries in biotechnology and genetic engineering. The key issue separating the ‘North’ from the ‘South’ was the proposal that developed states should transfer information and technology on biological and toxin agents and new biotechnologies to the developing states so that the technology gaps could be bridged (Dando 78). An ongoing debate over Article X on the cooperation among developed and developing states marked all four of the review conferences.

The Final Draft of the Third Review Conference recognised that the provisions of Article X were not being followed by member states. Article X notes the increasing gap between the developed and developing countries in the field of biotechnology, genetic engineering and microbiology, and proposes that states party to the Convention take specific measures for the promotion of international cooperation. These measures
included “increased technical cooperation and assistance, including training programmes to developing countries in the use of bio-sciences and genetic engineering for peaceful purposes through active association with United Nations institutions” (SIPRI- Third Review Conference 11), and the establishment of a world data bank under the supervision of the United Nations.

The Third Review Conference held in 1991 thus achieved a small success by adding confidence building measures to increase transparency among member states. Transparency is an important factor in eliciting compliance in cases where states have incentives or desires to violate provisions of the arms control agreement (Young 276).

V. The Fourth Review Conference

The Fourth Review Conference, held in Geneva from 25 November to 13 December 1996, was an effort to strengthen the BWC, and perhaps for some member states, to prevent its strengthening. During the Conference, member states negotiated a series of important issues, including the continuing question of how to achieve greater transparency through confidence building measures. The results were, however, disappointing.

During the negotiations Iran proposed that a formal amendment be made to include the word “use” in the title of the BWC, to make it the Convention on the Prohibition of the Development, Production, Stockpiling and Use of Bacteriological (Biological) and Toxin Weapons and on Their Destruction. Reference to banning use would also appear in Article I. While the Convention currently does not allow member states to possess offensive biological and toxin weapons, there is no prohibition of the
actual use of the weapon by signatory states. The addition of the word “use” to the title of the BWC and amendment to Article I would broaden the spectrum of banned activities in the Convention. Unfortunately, the Iranian proposal was opposed by other member states and the title of the Convention and Article I were not amended (The University of Bradford 5). However, other changes were instituted to Articles I, V, IX and X.

During the negotiations of the First, Second and Third Review Conferences, some states party to the Convention recognised the inherent weakness of Article V with respect to ensuring verification and monitoring of compliance with the provisions set out under the Convention. Throughout the first three review conferences incremental progress was made towards strengthening Article V. According to Pearson and Chevrier, by 1996, just over half of the states party to the Convention had made only a single voluntary declaration of compliance, and only eleven parties had made annual declarations. The Final Declaration of the Fourth Review Conference recognised that participation in the confidence building measures was not universal. The Conference once again reiterated the legal requirement for parties to report annual declarations of activities.

The Final Declaration of the ad hoc group meeting of Verification Experts (VEREX) was published in 1994. VEREX had been mandated by the Third Review Conference to identify, examine and evaluate possible verification measures that could be applied to the Biological Weapons Convention from a technical and scientific standpoint. The VEREX meetings produced a consensus report that stated that potential verification measures could be useful in varying degrees in enhancing confidence through increased transparency and that reliance could not be placed on any single confidence building measure by itself to differentiate conclusively between legal and illegal activity (Kadlec
et al. 103). The reports of VEREX and possible verification measures for the BWC were discussed at the Fourth Review Conference but nothing concrete was ever agreed upon. The inability of the Fourth Conference to add recommendations on verification measures to the text of the Convention illustrates the slow progress, at best, that has marked all four review conferences and the inability of the Convention to encourage movement towards the elimination of biological and toxin weapons.

On 13 January 1993, the Chemical Weapons Convention (CWC) was opened for signature in Paris. In the Final Declaration of the Fourth Review Conference of the Biological Weapons Convention, under Article IX, the states party to the Convention acknowledged their support for this Convention and mentioned the importance of having parties to the BWC become parties to the CWC. Chapter Six will identify aspects of the latter that might be used to strengthen the Biological Weapons Convention.

The Fourth Review Conference once again emphasised the importance of the provisions of Article X. In an effort to promote scientific and technical cooperation among member states, parties to the Convention agreed on the following:

The Conference recalls that the States Parties have a legal obligation to facilitate and have the right to participate in the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological (biological) agents and toxins for peaceful purposes and not to hamper the economic and technological development of States Parties (University of Bradford 10).

Furthermore, the parties to the Convention agreed that international efforts to establish a system of global monitoring of disease were very important. Parties were encouraged to cooperate with one another to strengthen the capabilities of national programmes for the early notification, surveillance, control and response. The technologies used in this
surveillance and monitoring could also be used in the detection of biological and toxin agents. It was decided that a Fifth Review Conference would be held in Geneva in 2001. A Special Conference is slated to be held before the Fifth Review Conference at which an ad hoc group will analyse the report issued by VEREX and will submit a report on potential verification measures that can be added in the Biological Weapons Convention.

VI. Conclusion

The four review conferences demonstrate two points. First, the progress achieved by the member states in strengthening the Convention has been minute only and the key weaknesses noted in Chapter Four have not been corrected. The lack of progress is a reflection of the inherent difficulties of dealing with biological weapons. As mentioned in Chapter Two, states pursue weapons programmes because they believe that these weapons will protect their national security. The development of a strong biological arms control agreement will require a fundamental shift by those opposed to strengthening the current Convention. Having said that, there is, nevertheless, some merit in examining how to strengthen the Convention with the view towards creating an international norm against possession and use.

The second lesson of the review conferences is that when key issues like verification and non-compliance are negotiated, the play of power politics affects the outcome. Some member states are reluctant to strengthen verification provisions even if they are not pursuing an offensive biological and toxin weapons programme.

The dilemmas associated with arms control agreements notwithstanding, the key weaknesses of the text of the Convention should be addressed at the next Review
An increase in horizontal proliferation threatens national and global security through the creation of an arms spiral. The possibility that a rogue state or terrorist group will acquire a biological or toxin weapon and could use it in an attack, possibly prompting retaliation against the attacker, heightens the need to ban the possession and use of biological and toxin weapons.
Chapter Six: Suggestions for Strengthening the Convention

I. Introduction

When the Biological Weapons Convention was signed in 1972, it was the first international arms control agreement since 1925 to ban an entire class of weapons. The states party to the Convention undertook never under any circumstance to develop, produce, stockpile or otherwise acquire or retain biological and toxin agents and the weapons, equipment and means used for their delivery that had no justification for prophylactic, protective or other peaceful purposes. Pursuant to their objective to ban states from possessing biological and toxin agents as weapons of war, the member states agreed to 15 articles that set out provisions and guidelines needed for the implementation of the Convention.

The 1972 Biological Weapons Convention is an example of an arms control agreement that aims at prohibiting possession of weapons in order to enhance security in the international community. The Convention also attempts to reduce the financial costs of military rivalry in peacetime through Article X which promotes technological cooperation among member states. Proponents of a strengthened Biological Weapons Convention seek to “impose some kind of restraint or regulation on the qualitative design, quantitative production, method of deployment, protection, control, transfer, and planned, threatened or actual use of military forces and weapons” (Dougherty and Pfaltzgraff, Jr. 413). Parties should agree to strengthen the Convention if they believe that the benefits of doing so will outweigh the costs of a weak and therefore ineffective regime. The benefits of a strengthened BWC include possible universal acceptance and the promotion of an international norm banning both possession and use of biological and toxin weapons.
However, if member states' perceptions of self-interest dictate that the costs outweigh the benefits (for example through losing possible first-use capability or retaliatory capabilities), they will oppose a strengthened Convention and negotiations at the Fifth Review Conference will suffer. Thus, it should be emphasised, a significant strengthening of the Convention may well be difficult, even impossible, to achieve in the near future.

This chapter will, nevertheless, offer proposals to address the weaknesses of the Convention, in the order that they were addressed in Chapter Four. It is important to note that some of the issues discussed in Chapter Four are more important than others. I believe that the issue of the inclusion of the term “use” in the title of the Convention, the regulation of research for defensive purposes, and the inclusion of verification controls in the text are the most important ones for the Fifth Review Conference because they are the largest loopholes in the Convention through which dangerous and illegal activity can be undertaken. However, the issue of ambiguity of the text and the regulation of the biotechnology industry are also important to the overall strengthening of the Convention. The parties at the Fifth Review Conference need to address all the weaknesses of the Convention. I understand that strengthening the regime will not be easy. Some member states believe that it is in their best interest to have biological and toxin weapons and the ready capability to defend against them. I believe that the strengthening of the biological weapons regime will help create an international norm against the possession and use of biological and toxin weapons. This norm could promote universal adherence to the provisions of the Convention through influencing the behaviour of actors in the international community. The reality is that universal adherence to the provisions has not
occurred and rogue states and terrorist organisations could develop and use these weapons.

II. Correcting the Ambiguities of the Text

The ambiguous nature of the text of the Biological Weapons Convention has been one of the key factors undermining its effectiveness. In order to strengthen the Convention, member states should adapt components from the 1993 Chemical Weapons Convention (CWC) which is the strictest arms control agreement ever negotiated (Robinson et al. 705). One of the elements in the CWC that lends specification to the text is a strong general purpose criterion where "not the objects themselves, but certain purposes to which they may be employed, are prohibited" (Rotfeld 6). To do this the Convention provides definitions of key terms in the text to limit the ambiguity of the main provisions, including agreed upon definitions of "chemical weapons", "toxic chemical", "precursor" and "purposes not prohibited under this Convention". In order to strengthen the general purpose criterion set out in Article I of the Biological Weapons Convention, biological or toxin agents or precursors intended for offensive purposes should be prohibited, as well as munitions, devices or equipment specifically designed to be used with them. As well, the Convention should prohibit any future agent or technology that is discovered or created that does not have justification for peaceful applications to ensure that novel agents and technologies are banned for possession as weapons. Agreed upon definitions of "bacteriological/biological agents", "toxin agents", "precursors", "protective", "prophylactic" and "other peaceful purposes" should be included to close some of the existing loopholes of the BWC.
According to Rotfeld, the key advantage in having a general purpose criterion that defines the scope of legal and illegal activities and agents is that the Convention would not be restricted to compounds that are explicitly listed in it. Rather, the discovery of a new potential biological warfare agent will not undermine the effectiveness of the Convention because such an agent will be automatically banned if it has no justifiable peaceful, prophylactic or protective purpose (Rotfeld 6). This would ensure that novel agents in this category created by genetic engineering or those biological or toxin agents that are genetically altered to be more lethal or hardy to environmental conditions will be automatically banned.

Pursuant to eliminating the ambiguities of the text of the Biological Weapons Convention, the word “use” should be inserted into the title of the Convention and Article I should be amended. Furthermore, a new provision should be added to Article I that specifically bans all use of biological and toxin weapons. All use of these weapons would include both first use and retaliatory use.

III. Regulating Research for Defensive Purposes

The 1972 Biological Weapons Convention bans member states from possessing biological and toxin agents except for research for defensive purposes. Article I and Article II of the Convention provide the legal loophole that permits research by member states on biological and toxin agents in order to defend against a possible attack with a biological weapon. Since the Biological Weapons Convention was signed in 1972, many member states have pursued biological and toxin research that could be used for both offensive or defensive purposes, including the United States, the Soviet Union, the
United Kingdom, France and Iraq. The Soviet Union created an advanced offensive weapons programme under the guise of a defensive research programme, experimenting with biological and toxin agents to make them resistant to known vaccines.

It would be almost impossible to ban completely research on biological and toxin agents for defensive purposes because doing so would limit the ability of member states to defend themselves against attack with a biological or toxin weapon. However, at the Fifth Review Conference to be held in 2001, it would be prudent of the member states of the Convention to add measures to the text to regulate the use of biological and toxin agents for defensive research. In order to do so, the terms “protective”, “prophylactic”, and “other peaceful purposes” need to be narrowly defined in Article I and Article II of the Convention to restrict the scope of activity permitted under the guise of defensive research. Through restricting the scope of permissible activity, it may be more difficult for member states to pursue defensive research that could be converted into offensive weapons development.

To regulate research the parties should incorporate into Article I a comprehensive list of restricted agents, including all bacteria, virus and toxins that have the potential to be used for offensive weapons programmes. As well, a list of all restricted dual-use equipment should be included to broaden the scope of the Convention. Examples of dual-use equipment that could be restricted for import/export control include fermentors with a capacity greater than 300 litres, cross-flow filtration equipment equal to or greater than 5 square metres and capable of in-situ sterilisation and aerosol inhalation chambers with a capacity greater than 1 cubic metre (Australia Group 1-2). If the general purpose criterion in Article I were to be expanded to include definitions and a listing of all restricted
agents, resources and equipment used in the creation of offensive biological weapons, then the spectrum of activity prohibited by the Convention would be clarified.

Furthermore, member states should create import/export controls to monitor restricted agents and equipment. This would regulate defensive research and therefore strengthen the Convention.

To further limit the possibility of member states pursuing illegal activity under the guise of research for defensive purposes, a variety of verification measures should be added to the text. These will be discussed at greater length further on in this chapter under verification. A review process relating to defensive activities should also be added to the Convention. The review process would include yearly reports of all activities undertaken at the research facilities, as well as a list of all biological and toxin agents which parties are conducting research on. Pursuant to the declarations, civilian and military biological centres should submit monthly reports on what biological agents were sold, or were to be sold, to what facilities. This would allow the tracking and monitoring of lethal micro-organisms, at least to member states of the Convention. Finally, annual inspections of all declared civilian and military research facilities should be undertaken.

In the next section under verification, a proposal for the creation of an Executive Committee to oversee the implementation of all verification controls will be discussed, as well as of a Technical Secretariat, which will be in charge of all inspections.

IV. Verification: Monitoring Compliance

Throughout the four review conferences that have been held since the entry into force of the Biological Weapons Convention, member states have discussed how to
strengthen the verification provisions Article V and Article VI. The lack of strong verification provisions in the BWC have been one of the factors undermining the effectiveness of the Convention. If the BWC does not provide verification measures to monitor compliance of the member states with its provisions, it is unlikely that states will be deterred from pursuing illegal activity, including the creation of offensive biological weapons programmes.

In order to envisage a body that can oversee the verification measures of the Biological Weapons Convention, the 1993 Chemical Weapons Convention provides a model. The CWC mandated that a Technical Secretariat under the auspices of an Executive Council be created representative of the five regional blocs (Africa, Asia, Eastern Europe, Latin America and the Caribbean, Western European and other States). The main responsibilities of the Technical Secretariat are to organise and co-ordinate verification activities through a team of inspectors staffed by nationals of member states (Rotfeld 11).

In order to implement verification provisions in the Biological Weapons Convention, parties should similarly create an Executive Council of member states, which will oversee a Technical Secretariat. The Executive Council will take the place of the Security Council to oversee the cooperation of parties and to act upon all complaints of non-compliance. Under the direction of the Executive Council, the Technical Secretariat will implement the verification measures agreed upon by member states and will monitor compliance with these provisions. Inspectors from member states will staff the Technical Secretariat. Because of the intrusive nature of verifying compliance, the
selected number of individuals comprising the inspection team will be representative of the membership and will serve for five years.

In order to help deter parties from pursuing illegal activity, a comprehensive set of verification provisions needs to be added to the text of the Convention in the near future. Verification of compliance requires the monitoring of all parties' activities involving biological agents and of the possession of any amount of such agents (Rosenburg and Burck 304). Verification alone will not stop member states from pursuing offensive biological weapons programmes, but it has proven effective in other regimes, such as the Intermediate Nuclear Forces Agreement (INF).

In order to monitor all activities involving biological and toxin agents, the following measures should be added to the Convention at the Fifth Review Conference:

1. Member states should make annual declarations to the Technical Secretariat on their progress with the destruction of existing stockpiles to ensure compliance with Article II.

2. Member states should make annual declarations to the Technical Secretariat of activities of all facilities that work with delivery systems, disease vectors, vaccine creation and all civilian and military facilities with Bio-Level 3 and 4 facilities including biotechnology firms and pharmaceutical companies.

3. All imports and exports of dual-use equipment by parties to the Convention through national export controls should be monitored. Parties will submit monthly statements to the Technical Secretariat on all dual-use commodities that they imported or exported.

4. All sales and transfers of all biological and toxin cultures and the precursors
should be monitored. Member states, working in tandem with civilian firms, will submit monthly statements on all biological and toxin cultures and their precursors that they imported or exported to the Technical Secretariat.

(5) Exchange visits of scientific and military personnel to defensive facilities to increase transparency among member states should be promoted.

(6) Compliance of member states should be monitored through the use of national technical means, including surveillance by aircraft and satellite.

(7) The activities at defensive facilities should be monitored with on-site instruments including cameras and radar equipment which would be put in place by the Technical Secretariat.

(8) Yearly on-site inspections of all facilities should take place. Permissible activities at on-site inspections would include visual inspections, interviewing personnel, auditing of files and documents, and the sampling and identification of all agents.

(9) Challenge inspections with due cause should be sanctioned. Permissible activities during challenge on-site inspections would include visual inspections, interviewing personnel, auditing of files and documents and the sampling and identification of all agents.

The implementation of verification provisions are instrumental to the effectiveness of the biological weapons regime because effective verification deters parties from pursuing illegal activity, including the creation of offensive biological and toxin weapons programmes.

It has been suggested by Scharf that enforcement of the provisions of the Biological Weapons Convention should be undertaken by the Security Council, which
may call upon United Nations members to impose sanctions or threaten the use of force to ensure compliance with the Convention. Along with measures taken by the Security Council, offenders should be prosecuted before international criminal tribunals (Scharf 485). I believe, however, that enforcement of the provisions of the Biological Weapons Convention should be under the auspices of an Executive Council. Within the Executive Council, member states could decide collectively on enforcement measures. Member states could agree within the Executive Council to sanction offenders or to other methods of reprisal. The use of remedial action against parties guilty of illegally pursuing biological weapons programmes will act to enforce compliance with the provisions of the Biological Weapons Convention through fear of reprisal. The addition of verification provisions to the text of the Convention and the threat of reprisal against illegal action may deter states from pursuing offensive biological and toxin weapons programmes. If member states nevertheless pursue such weapons programmes, the inevitable dilemma arises as to whether it is better to have the offending party a member of the Convention, or if it is better to expel it. If member states continue to pursue offensive biological and toxin weapons capabilities, they should not be removed from the Convention. If they are outside of the BWC they will be able to pursue offensive weapons capabilities unhindered. However, if they remain parties to the Convention, the Executive Council and member states can more easily attempt to constrain their illegal activity.
V. Provisions to Regulate Advances in Biotechnology

Advances in biotechnology since the early 1980s have allowed scientists to genetically alter existing biological and toxin agents to make them more lethal, hardy to environmental conditions and resistant to known vaccines and anti-serums. As well, these advances have allowed the creation of novel agents that can overcome all existing human and target immuno-defences. After the conclusion of the First Review Conference, member states recognised the potential threat to the effectiveness of the Convention from biotechnology. However, by the conclusion of the Fourth Review Conference in 1996, only minor changes had been made to the BWC to regulate the biotechnology industry. While it will be difficult to regulate this industry without restricting the economic and technological communities of member states, such regulation is necessary to strengthen the Convention.

Amendments to the general purpose criterion should be made to prohibit the use of any new technologies for offensive weapons purposes. The addition of a list of dual-use equipment that should be monitored will further help regulate the biotechnology industry, with import and export controls and, assuming verification provisions are instituted, the Technical Secretariat will be able to monitor all transfers of dual-use equipment. This process will help to control illegal activity.

The creation of all new biological and toxin agents will have to be prohibited under the Convention unless they have justification for protective, prophylactic and other protective purposes. Member states should submit a report to the Technical Secretariat describing their research with the new agent. This process will help ensure that member states do not create novel agents for defensive purposes with the intention of using them
for illegal activity. Pursuant to the implementation of the verification provisions, both the military and civilian biotechnology industries should be required to submit annual reports to the Technical Secretariat of all their activities with existing biological and toxin agents, their precursors, novel agents and all dual-use equipment. As well, annual declarations of activities of all facilities that work with delivery systems, disease vectors, vaccine creation and all civilian and military facilities with Bio-Level 3 and 4 labs, including pharmaceutical companies should be made to the Technical Secretariat on an annual basis. If parties do not comply with these measures, the Executive Council may take remedial action to enforce compliance, including sanctions and the threat of force.

VI. Conclusion

A considerable obstacle facing proponents of a strengthened Convention at the Fifth Review Conference is the predominance of realist power politics. Some states in the international community still subscribe to the doctrines of deterrence and security through armament. They do not believe that the weapons of war contribute to its occurrence. In order for these states to accept a strengthened Convention, other member states must lead through action. Ideally, these states eventually will realise that the existence of biological and toxin weapons is a common problem and that cooperation is imperative to halt states and terrorist organisations from possessing and using these deadly weapons.

The success of the Chemical Weapons Convention in 1993 has shown that states in the international community are willing to cooperate to ban weapons of mass destruction. Many of the states that are parties to the CWC are also parties to the
Biological Weapons Convention. It is hoped that these parties will recognise the urgency that is needed to address the proliferation of biological and toxin weapons and will make the changes necessary at the Fifth Review Conference. In order to strengthen the BWC, member states should consider the sort of additions to the Convention proposed here.
Chapter Seven: Future Considerations

For hundreds of years biological and toxin agents have been used as weapons on the battlefield and as instruments of terrorism. In modern times they have been classified as weapons of mass destruction for their capability to inflict high casualties in human and animal targets. The presence of biological and toxin agents in arsenals around the world now threatens humanity. Coupled with the threat of these deadly agents being used in warfare is the potential for them to be used as tools of terrorism. Exacerbating this threat is the very nature of the weapon. Biological and toxin agents are easy and inexpensive weapons to create and use in comparison to conventional weapons. They are easy to disguise and in small amounts can kill thousands of people and animals.

Recognising the threat that these agents pose, states from around the world in 1972 signed the Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction in an effort to ban possession of biological and toxin agents. In fact, the Convention does not prevent the developing, producing and stockpiling of biological and toxin weapons. This failure is the result of many factors, including the ambiguous nature of the Convention, the allowance of biological and toxin weapons for research for defensive purposes, a lack of verification controls and a lack of provisions in the text to regulate advances in the biotechnology industry. Many states seem to believe that it is in their best interest to pursue offensive or defensive weapons programmes.

The future of the Biological Weapons Convention thus is uncertain. More states than ever possess the technology and scientific know how to create offensive biological
and toxin agents. Heading into the Fifth Review Conference in 2001, the member states can either agree to make modest changes to the Convention or can initiate major reforms with the objective of strengthening the Convention. The first choice that member states have is to continue on with the slow and piecemeal negotiations that have characterised the first four review conferences. Eventually member states may arrive at some agreement on the implementation of verification and other measures. More than likely, if negotiations continue on at the same slow pace, both member states and non-member states will pursue offensive biological weapons programmes, forcing an arms spiral which will ultimately see the failure of the Convention and the effort to ban biological and toxin agents as weapons. If horizontal and vertical proliferation continues, the Convention may fall into disuse because it will be grossly ineffectual, or, in a worst case scenario, the Convention will be suspended in a state of war.

A second option facing member states at the Fifth Review Conference and beyond is to agree to implement major reforms to the Convention to make it as comprehensive and as strict as possible. As argued in the previous chapter, at the Fifth Review Conference parties should include “use” in the title and a new provision in Article I; should define key terminology, including “protective”, “prophylactic” and “other peaceful purposes”; should incorporate lists of restricted agents and dual-use equipment into the text of the Convention; should restrict defensive research; should regulate, control and monitor the biotechnology industry; and should institute a series of comprehensive verification controls. While there are no guarantees that a strengthened Convention will be successful in banning biological and toxin weapons, it should help
create an international norm that will change states' conceptions of permissible biological and toxin weapons activity.

It is impossible to deny that even with a strengthened Biological Weapons Convention the potential for illegal activity still exists. If states and other actors believe it is in their best interest to pursue offensive biological and toxin weapons programmes in direct contravention to the Convention, the threat of discovery and potential remedial action by other member states may not be a sufficient threat to deter them from this illegal activity. Furthermore, member states may pursue defensive capabilities so that they retain the ability to retaliate offensively against an attack with a biological or toxin weapon. Even if member states comply with the provisions outlined in the Biological Weapons Convention, a threat to global security exists from rogue states that have not become parties to the Convention and from terrorist organisations.

The aim of this thesis was to demonstrate that the existing Biological Weapons Convention has not been successful in reaching its goals to ban biological and toxin weapons. Member states of the Convention, including Iraq and the Russian Federation, have developed and stockpiled offensive biological and toxin weapons. Terrorist organisations have used or developed biological and toxin weapons, including the Aum Shinrikyo in Japan, which also studied the properties of ebola for use as a weapon. Through offering suggestions on how to strengthen the Convention, my goal has been to demonstrate that there are options available to states to make amendments to the Convention to ban these deadly weapons.

The theoretical value of this thesis is that it demonstrates that a change in the status quo of the Biological Weapons Convention must be achieved if the regime is to be
strengthened. An international norm that bans the possession and use of biological weapons will challenge the realist notion of state dominance in the international system. If the realist vision of security is challenged, the idealist paradigm, which supports the proposition that the role of arms in the international system is basically negative, could achieve greater dominance in international affairs and the importance of controlling arms and weapons systems could be further recognised.

The Biological Weapons Convention was negotiated during the Cold War when states in the international system subscribed to the belief that deterrence and the build-up of armaments would protect national security. Due to the political climate of the Cold War, that decreed that states relied upon their own military capabilities and those of their allies to defend against an attack, the few multilateral arms control agreements that were negotiated were riddled with loopholes to ensure no restriction in the development or use of weapons. The end of the Cold War has not shown a marked change in power politics among states. Many states in the international system still subscribe to the principle of security through arms and believe that weapons of mass destruction are needed to deter potential aggressors from attacking. This said, the successes of the 1987 Intermediate Nuclear Forces Treaty and the 1993 Chemical Weapons Convention demonstrate that states are willing to create strict arms control agreements.

Proponents of a strengthened BWC assume that if states have these weapons of war, they may use them and set off a catastrophic chain of events that, in a worst case scenario, could start a Third World War. In order to help stop states and terrorist organisations from possessing these deadly weapons, an international norm that bans possession and use of these weapons should be created that, like the norm against the use
of nuclear weapons, creates a belief that it is not only irrational but also abhorrent to use biological and toxin weapons. The process of norm building is an integral component of effective international arms control agreements. If states come to the common belief that the possession and use of biological and toxin weapons is abhorrent in nature and that strict regulations need to be placed on state and non-state activity then, in theory, a strengthened agreement on the ban of these weapons can and will be created. The harsh truth is that if member states do not strengthen the Biological Weapons Convention, the pervasive threat of an attack with a biological or toxin weapon may more easily become a reality.
Works Cited


Appendix 1

Ratifications to the BTWC

The Biological and Toxin Weapons Convention was signed at London, Moscow and Washington DC, 10 April 1972 and entered into force 26 March 1975. Total number of ratifications and accessions: 144
There are 18 signatories which have yet to ratify the Convention.

Alphabetical order:
- Afghanistan signed 10-04-72 and ratified 26-03-75
- Albania acceded 03-06-92
- Argentina signed 01-08-72 and ratified 27-11-79
- Armenia acceded 07-06-94
- Australia signed 10-04-72 and ratified 05-10-77
- Austria signed 10-04-72 and ratified 10-08-73
- Bahamas acceded 26-11-86
- Bahrain acceded 28-10-88
- Bangladesh acceded 11-03-85
- Barbados signed 16-02-73 and ratified 16-02-73
- Belarus signed 10-04-72 and ratified 26-03-75
- Belgium signed 10-04-72 and ratified 15-03-79
- Belize acceded 20-10-86
- Benin signed 10-04-72 and ratified 25-04-75
- Bhutan acceded 08-06-78
- Bolivia signed 10-04-72 and ratified 30-10-75
- Bosnia and Herzegovina acceded 15-08-94
- Botswana signed 10-04-72 and ratified 05-02-92
- Brazil signed 10-04-72 and ratified 27-02-73
- Brunei Darussalam acceded 31-01-91
- Bulgaria signed 10-04-72 and ratified 02-08-72
- Burkina Faso acceded 17-04-91
- Cambodia signed 10-04-72 and ratified 09-03-83
- Canada signed 10-04-72 and ratified 18-09-72
- Cape Verde acceded 20-10-77
- Chile signed 10-04-72 and ratified 22-04-80
- China acceded 15-11-84
- Colombia signed 10-04-72 and ratified 19-12-83
- Congo (Brazzaville) acceded 23-10-78
• Congo (Democratic Republic of the, formerly Zaire) signed 10-04-72 and ratified 16-09-75
• Costa Rica signed 10-04-72 and ratified 17-12-73
• Croatia acceded 28-04-93
• Cuba signed 10-04-72 and ratified 21-04-76
• Cyprus signed 10-04-72 and ratified 06-11-73
• Czech Republic acceded 05-04-93
• Denmark signed 10-04-72 and ratified 01-03-73
• Dominica acceded 08-11-78
• Dominican Republic signed 10-04-72 and ratified 23-02-73
• Ecuador signed 14-06-72 and ratified 21-03-75
• El Salvador signed 10-04-72 and ratified 31-12-91
• Equatorial Guinea acceded 16-01-89
• Estonia acceded 21-06-93
• Ethiopia signed 10-04-72 and ratified 26-05-75
• Fiji signed 22-02-73 and ratified 04-09-73
• Finland signed 10-04-72 and ratified 04-02-74
• France acceded 27-09-84
• Gambia signed 02-06-72 and ratified 21-11-91
• Georgia acceded 22-05-96
• Germany signed 10-04-72 and ratified 28-11-72
• Ghana signed 10-04-72 and ratified 06-06-75
• Greece signed 10-04-72 and ratified 10-12-75
• Grenada acceded 22-10-86
• Guatemala signed 09-05-72 and ratified 19-09-73
• Guinea-Bissau acceded 20-08-76
• Honduras signed 10-04-72 and ratified 14-03-79
• Hungary signed 10-04-72 and ratified 27-12-72
• Iceland signed 10-04-72 and ratified 15-02-73
• India signed 15-01-73 and ratified 15-07-74
• Indonesia signed 20-06-72 and ratified 19-02-92
• Iran signed 10-04-72 and ratified 22-08-73
• Iraq signed 11-05-72 and ratified 19-06-91
• Ireland signed 10-04-72 and ratified 27-10-72
• Italy signed 10-04-72 and ratified 30-05-75
• Jamaica acceded 13-08-75
• Japan signed 10-04-72 and ratified 08-06-82
• Jordan signed 10-04-72 and ratified 30-05-75
• Kenya acceded 07-01-76
• Korea, Democratic People's Republic of (North Korea) acceded 13-03-87
• Korea, Republic of (South Korea) signed 10-04-72 and ratified 25-06-87
• Kuwait signed 14-04-72 and ratified 18-07-72

• Lao People's Democratic Republic signed 10-04-72 and ratified 20-03-73
• Latvia acceded 06-02-97
• Lebanon signed 10-04-72 and ratified 26-03-75
• Lesotho signed 10-04-72 and ratified 06-09-77
• Libya acceded 19-01-82
• Liechtenstein acceded 30-05-91
• Lithuania acceded 10-02-98
• Luxembourg signed 10-04-72 and ratified 23-03-76

• Macedonia (Former Yugoslav Republic of) acceded 24-12-96
• Malaysia signed 10-04-72 and ratified 06-09-91
• Maldives acceded 02-08-93
• Malta signed 11-09-72 and ratified 07-04-75
• Mauritius signed 10-04-72 and ratified 07-08-72
• Mexico signed 10-04-72 and ratified 08-04-74
• Monaco acceded 30-04-99
• Mongolia signed 10-04-72 and ratified 05-09-72

• Netherlands signed 10-04-72 and ratified 22-06-81
• New Zealand signed 10-04-72 and ratified 13-12-72
• Nicaragua signed 10-04-72 and ratified 07-08-75
• Niger signed 21-04-72 and ratified 23-06-72
• Nigeria signed 03-07-72 and ratified 03-07-73
• Norway signed 10-04-72 and ratified 01-08-73

• Oman acceded 31-03-92

• Pakistan signed 10-04-72 and ratified 25-09-74
• Panama signed 02-05-72 and ratified 20-03-74
• Papua New Guinea acceded 27-10-80
• Paraguay acceded 09-06-76
• Peru signed 10-04-72 and ratified 05-06-85
• Philippines signed 10-04-72 and ratified 21-05-73
• Poland signed 10-04-72 and ratified 25-01-73
• Portugal signed 29-06-72 and ratified 15-05-75
• Qatar signed 14-11-72 and ratified 17-04-75
• Romania signed 10-04-72 and ratified 25-07-79
• Russian Federation signed 10-04-72 and ratified 26-03-75
• Rwanda signed 10-04-72 and ratified 20-05-75
• Saint Kitts (Christopher) and Nevis acceded 02-04-91
• Saint Lucia acceded 26-11-86
• Saint Vincent and the Grenadines acceded 13-05-99
• San Marino signed 12-09-72 and ratified 11-03-75
• Sao Tome and Principe acceded 24-08-79
• Saudi Arabia signed 12-04-72 and ratified 24-05-72
• Senegal signed 10-04-72 and ratified 26-03-75
• Serbia and Montenegro signed 10-04-72 and ratified 25-10-73
• Seychelles acceded 11-10-79
• Sierra Leone signed 07-11-72 and ratified 29-06-76
• Singapore signed 19-06-72 and ratified 02-12-75
• Slovakia acceded 17-05-93
• Slovenia acceded 07-04-92
• Solomon Islands acceded 17-06-81
• South Africa signed 10-04-72 and ratified 03-11-75
• Spain signed 10-04-72 and ratified 20-06-79
• Sri Lanka signed 10-04-72 and ratified 18-11-86
• Suriname acceded 06-01-93
• Swaziland acceded 18-06-91
• Sweden signed 27-02-75 and ratified 05-02-76
• Switzerland signed 10-04-72 and ratified 04-05-76
• Taiwan (not officially recognised as an independent state by the United Nations) signed 10-04-72 and ratified 09-02-73
• Thailand signed 17-01-73 and ratified 28-05-75
• Togo signed 10-04-72 and ratified 10-11-76
• Tonga acceded 28-09-76
• Tunisia 10-04-72 and ratified 18-05-73
• Turkey 10-04-72 and ratified 25-10-74
• Turkmenistan acceded 11-01-96
• Uganda acceded 12-05-92
• Ukraine signed 10-04-72 and ratified 26-03-75
• United Kingdom of Great Britain and Northern Ireland signed 10-04-72 and ratified 26-03-75
• United States of America signed 10-04-72 and ratified 26-03-75
• Uruguay acceded 06-04-81
• Uzbekistan acceded 11-01-96

• Vanuatu acceded 12-10-90
• Venezuela signed 10-04-72 and ratified 18-10-78
• Viet Nam acceded 20-06-80

• Yemen signed 26-04-72 and ratified 01-06-79

• Zimbabwe acceded 05-11-90

Appendix II

Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on Their Destruction.
Entered into force on 26 March 1975
The States Parties to this Convention,

Determined to act with a view to achieving effective progress towards general and complete disarmament, including the prohibition and elimination of all types of weapons of mass destruction, and convinced that the prohibition of the development, production and stockpiling of chemical and bacteriological (biological) weapons and their elimination, through effective measures, will facilitate the achievement of general and complete disarmament under strict and effective international control,
Recognizing the important significance of the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, signed at Geneva on June 17, 1925, and conscious also of the contribution which the said Protocol has already made, and continues to make, to mitigating the horrors of war,
Reaffirming their adherence to the principles and objectives of that Protocol and calling upon all States to comply strictly with them,
Recalling that the General Assembly of the United Nations has repeatedly condemned all actions contrary to the principles and objectives of the Geneva Protocol of June 17, 1925,
Desiring to contribute to the strengthening of confidence between peoples and the general improvement of the international atmosphere,
Desiring also to contribute to the realization of the purposes and principles of the United Nations,
Convinced of the importance and urgency of eliminating from the arsenals of States, through effective measures, such dangerous weapons of mass destruction as those using chemical or bacteriological (biological) agents,
Recognizing that an agreement on the prohibition of bacteriological (biological) and toxin weapons represents a first possible step towards the achievement of agreement on effective measures also for the prohibition of the development, production and stockpiling of chemical weapons, and determined to continue negotiations to that end,
Determined for the sake of all mankind, to exclude completely the possibility of bacteriological (biological) agents and toxins being used as weapons,
Convinced that such use would be repugnant to the conscience of mankind and that no effort should be spared to minimize this risk,
Have agreed as follows:
Article I
Each State Party to this Convention undertakes never in any circumstances to develop, produce, stockpile or otherwise acquire or retain:
(1) Microbial or other biological agents, or toxins whatever their origin or method of production, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes;
(2) Weapons, equipment or means of delivery designed to use such agents or toxins for hostile purposes or in armed conflict.

Article II
Each State Party to this Convention undertakes to destroy, or to divert to peaceful purposes, as soon as possible but not later than nine months after entry into force of the Convention, all agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, which are in its possession or under its jurisdiction or control. In implementing the provisions of this article all necessary safety precautions shall be observed to protect populations and the environment.

Article III
Each State Party to this Convention undertakes not to transfer to any recipient whatsoever, directly or indirectly, and not in any way to assist, encourage, or induce any State, group of States or international organizations to manufacture or otherwise acquire any of the agents, toxins, weapons, equipment or means of delivery specified in article I of this Convention.

Article IV
Each State Party to this Convention shall, in accordance with its constitutional processes, take any necessary measures to prohibit and prevent the development, production, stockpiling, acquisition, or retention of the agents, toxins, weapons, equipment and means of delivery specified in article I of the Convention, within the territory of such State, under its jurisdiction or under its control anywhere.

Article V
The States Parties to this Convention undertake to consult one another and to cooperate in solving any problems which may arise in relation to the objective of, or in the application of the provisions of, the Convention. Consultation and Cooperation pursuant to this article may also be undertaken through appropriate international procedures within the framework of the United Nations and in accordance with its Charter.

Article VI
(1) Any State Party to this convention which finds that any other State Party is acting in breach of obligations deriving from the provisions of the Convention may lodge a complaint with the Security Council of the United Nations. Such a complaint should include all possible evidence confirming its validity, as well as a request for its consideration by the Security Council.
(2) Each State Party to this Convention undertakes to cooperate in carrying out any investigation which the Security Council may initiate, in accordance with the provisions
of the Charter of the United Nations, on the basis of the complaint received by the Council. The Security Council shall inform the States Parties to the Convention of the results of the investigation.

**Article VII**

Each State Party to this Convention undertakes to provide or support assistance, in accordance with the United Nations Charter, to any Party to the Convention which so requests, if the Security Council decides that such Party has been exposed to danger as a result of violation of the Convention.

**Article VIII**

Nothing in this Convention shall be interpreted as in any way limiting or detracting from the obligations assumed by any State under the Protocol for the Prohibition of the Use in War of Asphyxiating, Poisons or Other Gases, and of Bacteriological Methods of Warfare, signed at Geneva on June 17, 1925.

**Article IX**

Each State Party to this Convention affirms the recognized objective of effective prohibition of chemical weapons and, to this end, undertakes to continue negotiations in good faith with a view to reaching early agreement on effective measures for the prohibition of their development, production and stockpiling and for their destruction, and on appropriate measures concerning equipment and means of delivery specifically designed for the production or use of chemical agents for weapons purposes.

**Article X**

(1) The States Parties to this Convention undertake to facilitate, and have the right to participate in, the fullest possible exchange of equipment, materials and scientific and technological information for the use of bacteriological(biological) agents and toxins for peaceful purposes. Parties to the Convention in a position to do so shall also cooperate in contributing individually or together with other States or international organizations to the further development and application of scientific discoveries in the field of bacteriology(biology) for prevention of disease, or for other peaceful purposes.

2) This Convention shall be implemented in a manner designed to avoid hampering the economic or technological development of States Parties to the Convention or international cooperation in the field of peaceful bacteriological (biological) activities, including the international exchange of bacteriological (biological) agents and toxins and equipment for the processing, use or production of bacteriological(biological) agents and toxins for peaceful purposes in accordance with the provisions of the Convention.

**Article XI**

Any State Party may propose amendments to this Convention. Amendments shall enter into force for each State Party accepting the amendments upon their acceptance by a majority of the States Parties to the Convention and there after for each remaining State Party on the date of acceptance by it.
Article XII
Five years after the entry into force of this Convention, or earlier if it is requested by a majority of Parties to the Convention by submitting a proposal to this effect to the Depositary Governments, a conference of States Parties to the Convention shall be held at Geneva, Switzerland, to review the operation of the Convention, with a view to assuring that the purposes of the preamble and the provisions of the Convention, including the provisions concerning negotiations on chemical weapons, are being realized. Such review shall take into account any new scientific and technological developments relevant to the Convention.

Article XIII
(1) This Convention shall be of unlimited duration.
(2) Each State Party to this Convention shall in exercising its national sovereignty have the right to withdraw from the Convention if it decides that extraordinary events, related to the subject matter of the Convention, have jeopardized the supreme interests of its country. It shall give notice of such withdrawal to all other States Parties to the Convention and to the United Nations Security Council three months in advance. Such notice shall include a statement of the extraordinary events it regards as having jeopardized its supreme interests.

Article XIV
(1) This Convention shall be open to all States for signature. Any State which does not sign the Convention before its entry into force in accordance with paragraph (3) of this Article may accede to it at any time.
(2) This Convention shall be subject to ratification by signatory States. Instruments of ratification and instruments of accession shall be deposited with the Governments of the United States of America, the United Kingdom of Great Britain and Northern Ireland and the Union of Soviet Socialist Republics, which are hereby designated the Depositary Governments.
(3) This Convention shall enter into force after the deposit of instruments of ratification by twenty-two Governments, including the Governments designated as Depositaries of the Convention.
(4) For States whose instruments of ratification or accession are deposited subsequent to the entry into force of this Convention, it shall enter into force on the date of the deposit of their instruments of ratification or accession.
(5) The Depositary Governments shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit or each instrument of ratification or of accession and the date of entry into force of this Convention, and of the receipt of other notices.
(6) This Convention shall be registered by the Depositary Governments pursuant to Article 102 of the Charter of the United Nations.
Article XV
This Convention, the English, Russian, French, Spanish and Chinese texts of which are equally authentic, shall be deposited in the archives of the Depositary Governments. Duly certified copies of the Convention shall be transmitted by the Depositary Governments to the Governments of the signatory and acceding states.