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**Ethical considerations surrounding  
Bio-weapons in the 21<sup>st</sup> Century**

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## **Abstract**

This paper examines the ethical considerations surrounding bio-weapons in the 21<sup>st</sup> century. It first establishes an ethical framework that is then used throughout in examining the impact of bio-weapons. It shows the evolution of the various laws, treaty and conventions related to bio-weapons over the last century. It also carefully examines the Soviet bio-weapons program of the Cold War and discusses the dangers associated with bio-research, whether illicit or intended for peaceful purposes.

The paper argues that while Canada was one of the original signatories of the 1972 Biological Weapons Convention, Canada has yet to implement domestic legislation to enforce the convention within its borders, and thus has failed its moral obligation to ensure the safety of its citizens against bio-weapons. The paper also argues that while Canada is prepared to respond to a biological attack within its borders, it has not adequately ensured the establishment of a properly structured international verification and enforcement mechanism that would reduce the threat of bio-weapons. Finally, it argues that Canada has a moral obligation to ensure its citizens' safety, and therefore it must assume a more prominent role in international efforts to strengthen the Biological Weapons Convention.

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## Introduction

Biological weapons or bio-weapons<sup>1</sup> are defined as:

Toxic materials produced from pathogenic organisms (usually microbes) or artificially manufactured toxic substances that are used to intentionally interfere with the biological processes of a host. These substances work to kill or incapacitate the host. Biological weapons may be used to target living organisms such as humans, animals or vegetation. They may also be used to contaminate nonliving substances such as air, water and soil.<sup>2</sup>

Bio-weapons are not new to humanity. In the 15<sup>th</sup> century, the Tartar army catapulted its own plague-ridden corpses over the walls of the besieged city of Kaffa in an attempt to kill the inhabitants and finally capture the city. A century later, a smallpox epidemic spread throughout Mexico and helped the Spaniards defeat the Inca Empire. Without the help of the deadly smallpox virus and other epidemics, the Europeans might not have so easily conquered the New World. During the French and Indian War in North America, in 1763, the British infected the Indians with smallpox by giving them blankets and handkerchiefs taken from infected patients. Approximately 95% of the Indians who were exposed died of the disease. . In World War I, German spies inoculated horses and cattle shipped from the United States to the Allies with disease-producing bacteria. During the Second World War, the Japanese dropped paper bags stuffed with plague-invested fleas over Chinese cities. In 1995, members of an apocalyptic cult released sarin in parts of the Tokyo subway. In 2001, only a few days

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<sup>1</sup> For constancy, the term *bio-weapons* will be used throughout this paper to designate biological and bacteriological weapons.

<sup>2</sup> About.com, The New York Times, *Biological Weapons*; available from: <http://biology.about.com/library/weekly/aa032703a.htm>; Internet; accessed 20 April 2009.

after the terrorist attacks of 9-11, anthrax-laced letters were sent to American senators and media outlets.<sup>3</sup>

Throughout the centuries, the use of bio-weapons has always been received with a certain amount of disgust. For over a century, laws and conventions have been put in place to try to eliminate these weapons. They are categorized as “repugnant to the conscience of mankind” and are classified as weapons of mass destruction.<sup>4</sup> What makes bio-weapons so disturbing? Why do they create so visceral a reaction? Quite simply, there are some ethical and moral implications in the use of Bio-weapons, and even more so as the biology and genetics fields of study have advanced at breakneck speed during the last few decades. This essay will demonstrate that the Canadian government has a moral and ethical duty to do all it can to protect Canadian citizens, including the members of the armed forces, against these repulsive weapons. It will show that while Canada has been active internationally and domestically in establishing safeguards against bio-weapons, it has a moral obligation to do more.

The first part of this paper will begin by establishing a moral and ethical framework that will then be used throughout to analyse the ethical considerations surrounding bio-weapons today. It will first define morality and ethics, and then follow with an in-depth description of four different ethics theories. It will first describe the teleological or consequence based ethical theory, with particular emphasis on the utilitarian paradigm. Following will be a description of the deontological ethical theory,

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<sup>3</sup> Nova Online, *History of Biowarfare*; available from: [http://www.pbs.org/wgbh/nova/bioterror/hist\\_nf.html](http://www.pbs.org/wgbh/nova/bioterror/hist_nf.html); Internet; accessed 20 April 2009.

<sup>4</sup> Office of the Judge Advocate General, “Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological) and Toxin Weapons and on their Destruction - 1972,” in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training (Ottawa: DND, 2005), 199.

which values the moral aspects of an action taken, rather than the consequences of that action. It will focus on Emmanuel Kant's formulation of what he calls 'categorical imperatives'. The third ethical theory addressed will be that of moral rights. A discussion of virtue ethics will then follow.

The section will then continue by showing how two important philosophers used these four ethical theories to develop the ethics and laws that structure the conduct of wars today. Specifically, it will describe how Augustine married Cicero's idea that a 'just war' is one fought for safety and honour, with his Christian belief that war can be just if it obeys God's will. It will then conclude by examining Hugo Grotius' influential work, *The Law of War and Peace*, which introduced the Just War concepts of *Jus ad Bellum* and *Jus in Bello*.

The second part of this paper will examine these two principles in detail and how they have been used in the formulation of laws, treaty and conventions that rule the conduct of war actions. It will explain the three main requirements of the *Jus ad Bellum* concept, which establishes that war should only be prosecuted by a competent authority, with the right intentions and for a just cause and only as a last resort. This will be followed by an explanation of the three criteria that form the principle of *Jus in Bello*. The concepts of military necessity, discrimination and proportionality as they apply during the conduct of a war will be explained.

A close look at the various international conventions related specifically to the use of bio-weapons will then follow. First to be described will be several important pre-World War I documents: The *Lieber Code* of 1863, which aimed at excluding the use of poison from modern warfare; the *St-Petersberg Declaration*, restricting the use of certain

weapons during an armed conflict; and the *Hague Declaration* of 1899, which prohibited the use of projectiles, the sole object of which was the diffusion of asphyxiating or deleterious gases. Next, the 1925 Geneva Protocol will be examined. This important protocol was the first international treaty related to the use of bacteriological methods of warfare. It will show how the ethical principles described herein are integral to the 1925 Geneva Protocol.

The rest of Part 2 will be dedicated to the 1972 Biological Weapons Convention (BWC). It will show that some of the wording used within the convention is directly related to specific moral and ethical principles. It will also demonstrate that no matter which of the ethical principles one uses, bio-weapons are immoral weapons. This will be followed by a look at the evolution of the BWC through the review conferences which take place every five years. The absence of a formalized verification vehicle, which would ensure that all of the signatories to the BWC comply with its provisions, will be addressed. It will show that the review conference process has not rectified this shortcoming of the BWC, and that Confidence Building Measures (CBMs), which were originally aimed at strengthening the BWC simply do not work. It will demonstrate that the CBMs, rather than strengthening the BWC, can in fact be used by malicious states to support their covert bio-weapons programs.

Part 3 of this paper will then focus on the largest bio-weapons program ever conducted; the Russian bio-weapons program. It will describe how the program started in 1928, barely three years after the fledgling Soviet government had signed the 1925 Geneva Convention banning the use of poison gas and bacteriological weapons, and how



it evolved to a point where two tonnes of weapons grade anthrax was produced every day in a process as reliable and efficient as producing Coca-Cola.<sup>5</sup>

Bio-weapons research is inherently dangerous. Accidents were quite common during the peak of the Soviet program, occurring almost weekly.<sup>6</sup> Two of those accidents will be looked at in detail. As well, the paper will illustrate that these accidents can also happen in legitimate, well-regulated laboratories. This part of the paper will conclude with an analysis of the ethical issues surrounding biological research, whether it is intended for weapons or for peaceful purposes.

The final part of the paper will be dedicated to Canada's response to the bio-weapons threat. It will first examine what Canada has done to date, towards implementing the provisions of the 1972 BWC. It will show that while Canada was one of the original signatories of the BWC, it has yet to turn those provisions into nationally enforceable laws. It will discuss how, after almost seven years through the parliamentary process, the Biological and Toxin Weapons Convention Implementation Act is still not in force. It will also show that the only law in Canada that applies specifically to the control of biological pathogens (i.e., the Human Pathogens Importation Regulation [HPIR]) is riddled with serious gaps. It will then illustrate how, from a moral rights perspective, Canada is failing to provide its citizens with as safe an environment as possible.

The paper will then show that, when it comes to the safety of Canadians whose responsibility is to respond to biological threats in the country or abroad (i.e., the national

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<sup>5</sup> Ken Alibek and Stephen Handelman, *Biohazard: The Chilling True Story of the Largest Covert Biological Weapons Program in the World – Told from the Inside by the Man Who Ran It* (New York: Random House, 1999), 106.

<sup>6</sup> *Ibid.*, 105.

emergency teams and members of the Canadian Forces), Canada is fulfilling its moral contract. The research related to all aspects of bio-safety conducted at the Defence Research & Development Canada (DRDC) facility in Suffield, Alberta is examined in detail.

Next, Canada's bioterrorism preparedness will be evaluated. Through an analysis of Canada's National Counter-Terrorism Plan and an examination of the Emergency Preparedness organization within Canada, it will be demonstrated that Canada is relatively well prepared to deal with a biological emergency within the country. It will be shown that ultimately, as prepared as the country can be, no measure can be completely effective until the threat is minimized at its source.

The last section of Part 4 will demonstrate the need for a revision of bio-weapons related international agreements. It will show that to deter or detect the emergence of military bio-weapons programs, the BWC must implement measures to allow on-site inspection of munitions production facilities, as well as provisions for on-site inspection of microbial growth facilities that could be diverted to BW agent production. It will conclude by describing one of the main efforts presently taking place, with the goal of creating a web of deterrence that could finally rid the world of bio-weapons. The conclusion argues that Canada must be an active member in these efforts, but that in order for Canada to have a credible voice at the various international tables, it must first set an example at home by bringing the Biological and Toxin Weapons Convention Implementation Act into force as soon as possible.

## Part 1 – Moral and Ethical Framework

### ***Ethics***

What is morality? What is ethics? The two words are often used interchangeably but in reality, they mean two different things. Moral, from the Latin *mores* refers specifically to the customary principles of rules of conduct that guide a society or that, at least, ought to guide it. Ethics, from the Greek *ethos* on the other hand, deals with the “systematic endeavour to understand moral concepts and justify moral principles and theories.”<sup>7</sup> Ethics concerns itself with concepts such as good and evil, right and wrong, within the greater context of morality.

While closely related to them, ethics is not the same as religion, laws or etiquette. Within religions, the religious authority establishes what is right and wrong. Inside a legal framework, a legislative body sets the rules of right and wrong. Finally, etiquette is framed around cultural lines.<sup>8</sup> In contrast to all of those, ethics is concerned with values.

The following section addresses the four domains of the ethical framework used throughout this essay. Specifically, it describes the teleological (consequence based), deontological (action based), moral rights based, and virtue or character based ethical theories.

### **Teleological Theories**

The word teleology is derived from the Greek word *telos*, which means *ends*. If one was to make a decision under the teleology school of thought, one would consider the

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<sup>7</sup> Louis P. Pojman, *Ethics: Discovering Right and Wrong* (Belmont, CA: Wadsworth Publishing Company, 1990), 2.

<sup>8</sup> *Ibid.*, 5.

ends, or the outcomes of the decision. Moral goodness is dependent upon non-moral values. The aim is to achieve the greatest balance of good over evil in the consequences of one's decision. This theory is concerned about the consequences of decisions, and because of that, it is also sometimes referred to as consequentialist. Teleological ethics is further subdivided into three categories: Ethical egoist – where one will do what will result in the best consequences for oneself; Altruist – where the best consequences for others are sought; and Utilitarianism – in which actions that will result in the greatest good for everyone is the aim.

Under the ethical egoism paradigm one's only moral obligation is to promote for oneself the greatest possible balance of good and evil. Good could mean happiness, pleasure, power, self-fulfillment, wealth or any other intangible that raises one's level of happiness. One particular strength of this paradigm is its alignment with human nature. It is human nature to be self-interested. Ethical egoism does not rule out unselfishness, helpfulness and sharing, as long as it brings enough good to oneself.

Under the utilitarian paradigm, what is right and wrong is determined by the principle of utility, where utility is measured by the greatest balance of good over evil. What is good is established by non-moral consequences that are quantifiable. Good can have a variety of meanings, including pleasure, happiness, minimizing suffering, or improving health. The possibilities are almost endless. As varied as the goods can be, so are the ways to measure them. The measure of utility could be the greatest total benefits; it could be the greatest good for the greatest number; it could be the most equal distribution. There are two distinct frames of reference that can be used in making decisions from a utilitarian perspective. *Act* utilitarianism judges an action correct if it

produces the greatest balance of pleasure over pain for everyone. *Rule* utilitarianism sees an action as right if it conforms to a set of rules, the general acceptance of which would result in the greatest balance of pleasure over pain for everyone.

Utilitarianism is well suited in social settings because it focuses on overall good rather than individual gains. It is also well suited for a practical reasoning process. Utilitarianism can sometimes result in consequences that might seem immoral, such as a decision made by Churchill in 1941 during the German Bombing Offensive. At that time the British Intelligence Services, under the operation code named ULTRA, were able to read German signals coded with the 'Enigma' cipher machine. In essence, the Allies were able to read almost every German signal, unbeknownst to the Germans. This gave the Allies a tremendous advantage that Churchill wanted to protect, albeit at great cost. In fact, Churchill believed that holding the secrets of ULTRA would ultimately save hundreds of thousands of British and Allies' lives. Via ULTRA, he learned of the German planned attack of Coventry, an attractive Midlands city in the industrial heartland of England. Despite this terrible knowledge, Churchill had been unable to increase Coventry's defences or give warning, lest the Germans discovered that the Allies were able to decode their signals. Through a utilitarian calculation, Churchill decided that keeping the operation ULTRA secret would ultimately save more lives than would be lost at Coventry.<sup>9</sup>

## **Deontological Theories**

Under the deontological ethics theory, actions or rules are valuable in themselves, without any consideration of consequences. Rule deontological theories are very

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<sup>9</sup> Norman Longmate, *Air Raid* (London: Hutchison & Co, 1976), 258-260.

conducive to roles such as duties and obligations. Duties are viewed as self-evident truths. Rule deontological ethics is quite intuitive since many find it is easy to understand duties and obligations because they focus on the treatment of individuals. It is also well suited to a military construct. However, it is sometimes difficult to determine rightness, and at times rules will conflict and prioritisation will be required.

Emmanuel Kant is probably the best-known rule deontology theorist. To Kant there is a *categorical imperative* to act only on a rule that can be universally applied. Do not cheat! Do not lie! Do not steal! Not only would it be irrational to say that everyone can cheat, lie or steal, but it would also be inconsistent for someone to say it is acceptable for *me* to cheat, lie or steal, but not for *others*. According to Kant's principle, an action is morally right if, and only if, a person's reason for carrying out an action is a reason he/she would be willing to have other people act on, in a similar situation. In other words, it is to act in accordance with the "Golden Rule": "Do unto others as you would have them do unto you."<sup>10</sup> Kant's second formulation of his *categorical imperative* states that one should never treat others only as a means to an end. One must respect others as persons. It assumes that people are rational; that they have the capacity to act of their own free will, and that they are autonomous. Therefore treating people as a means is to ignore their autonomy as humans.

Kant's rule deontological approach is intuitively appealing. This approach works quite well in a setting where individuals need protection. Consequently, it tends to sacrifice the needs of large groups over those of individuals. This approach certainly

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<sup>10</sup> Manuel G. Velasquez, *Business Ethics – Concepts and Cases* 5<sup>th</sup> ed. (Upper Saddle River: Prentice Hall, 2002), 97.

does not work well for fanatics who do not care about living in a world of lying, cheating and deceiving. Terrorists are a good example of people who do not follow Kant's rule deontological approach. Terrorists, who victimize innocent people in order to obtain political advantage, treat their victims as a means to an end, thus acting against Kant's second formulation of the categorical imperative.

## **Moral Rights**

The next ethical theory is that of Moral Rights. Under this paradigm, one is to act towards others in such a way as accords with their rights, regardless of the consequences. The world of business offers a myriad of examples of how this paradigm is applied. Employers have the right to conduct business freely, to make decisions about hiring, firing, promotions and to protection from unfair competition. Employees have the right to organize and bargain collectively, to protection from discrimination, and to protection from hazardous conditions. Consumers have the right to product safety, environmental protection, and protection from misleading advertisements.

Moral rights do not necessarily equate to legal rights. A legal right only exists because there is a law that states it. A moral ethical framework can accept the validity of a law and, at the same time, actually judge that law as immoral. Laws related to the legalization of abortion are a good example of this quandary. In simple terms, legal rights could be unfair, harmful and even unjust. Moral rights should be none of those. Moral rights do need the backing or justification of some other moral principles, and they must be valid claims. There may be positive claims (for example, the right to education), as well as negative claims (for example, the right not to be harmed). Moral rights usually

pertain to important issues, such as life, freedom, respect for others, health, and education.

## **Virtue Ethics**

The last ethics theory to be addressed is that of virtue ethics. All of the other theories address the question: How ought I to act? Virtue ethics deals with the question: What kind of person should I be? In other words, teleological ethics focuses on consequences and deontological ethics centres on the nature of the act, while virtue ethics focuses on the motives underlying the actions. It deals with character traits such as integrity, benevolence, compassion, courage, courtesy, and dependability. It is not about what decision to make; it is about the motives of the person making the decision. Virtue ethics is about being a better person.

Virtue ethics is highly reflective of how one thinks about decisions. It also certainly reflects on the importance of relations with others at a moral level, considering such values as caring, sharing, trust, loyalty, and honesty. One of the main complaints from the other ethical paradigms about virtue ethics is that virtue ethics does not produce codefiable principles. Since virtue ethics is, in principle, unable to provide action-guidance it is practically impossible to measure. Yet, individuals applying the virtue ethics paradigm would counter with such action-guidance, as “Do what is honest/charitable”, or “Do not do what is dishonest/uncharitable”. There is one aspect of virtue ethics that most agree on, which is its difficulty in dealing with conflicting interests.

The decision frameworks offered by both teleological and deontological ethics theories are valuable when one needs to decide what is right. In contrast, virtue ethics



gives a better framework to help develop the personal character required to do right. The next section will show how important philosophers used the frameworks described hereto to develop the ethics and laws that structure the conduct of wars today.

### ***Western/Christian Influence***

These diverse theories can be applied to any situation in order to resolve practically any dilemma that one can face. All laws and rules that rule modern society have their roots within one of these moral theories. The next section will show how two of the architects of today's laws that govern the conduct of war have used these basic moral theories to help articulate how war is to be conducted.

### **Augustine**

Augustinian philosophy can be traced back to our earliest philosophers. The major works from Plato, Aristotle as well as Cicero greatly influenced Augustine's views on man's moral conduct in wars.<sup>11</sup> What sets Augustine's philosophy apart from that of earlier philosophers is the synthesis he achieved in joining the teaching of the classical philosophers with that of the Christian religion. He married Cicero's idea that a "Just War" is one fought for safety and honour with his Christian belief that "war is undoubtedly just which God Himself ordains."<sup>12</sup>

Based on this synthesis, Augustine described the important basic tenets upon which war can be morally waged. He espouses to the Roman Just War principles that require a just cause to go to war. Augustine believed that peace and justice are ideals to

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<sup>11</sup> Eleonore Stump, and Norman Kretzmann, editors, *The Cambridge Companion to Augustine* (Cambridge: Cambridge University Press, 2002), 136.

<sup>12</sup> Paul Christopher, *The Ethics of War and Peace – An Introduction to Legal and Moral Issues* 3<sup>rd</sup> ed. (Upper Saddle River, N.J.: Pearson/Prentice Hall, 2003), 37.

strive for and that these ideals can only be attained by a humanity organized into states. He also echoes the Roman beliefs that humans are not perfect and that some will commit evil acts and disturb the peace. However, the responsibility to restore the peace belongs to state rulers, and it is only those rulers who must declare and carry out wars to restore the peace. Finally, Augustine agrees with the Romans in that peace must always be the final objective of war.<sup>13</sup>

To those classical philosophy tenets, Augustine adds his Christian influence and states that soldiers should never fight for glory or fame, or when motivated by vengeance. He also states that one should always show mercy to the conquered. Finally, he ascertains that, while war is abominable, it is sometimes necessary for the sake of peace and justice. War is therefore a public act with a purpose, which must be waged with prescribed moral limits.<sup>14</sup>

It is these last two basic principles, the need for a just cause to go to war and the need for moral limits in waging that war, which form the basis of ‘The Father of International Law’, Hugo Grotius’ principles of Just War. It is to Grotius that this discussion will now turn.

## **Hugo Grotius**

Huig de Groot, more commonly known as Hugo Grotius, was born in Holland in 1583. He obtained his Doctor of Law degree at the astonishing age of sixteen from the University of Orléans. He wrote his most influential work, *The Law of War and Peace*, in 1625 at the age of forty-two. *The Law of War and Peace* is fundamental to the

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<sup>13</sup> Stump, *The Cambridge Companion to Augustine...*, 235-236.

<sup>14</sup> Christopher, *The Ethics of War and Peace...*, 42.

evolution of the laws of war, as we know them today. His document laid the foundations of our collective understanding of international agreements. These agreements define when it is right to go to war, the principle of *Jus ad Bellum*, as well as how to rightly wage that war, the principle of *Jus in Bello*. However, in order to grasp the nature of these principles, one must first understand the basic tenets on which Grotius based his principles.

At the center of *The Law of War and Peace* is the idea that “relations between states should always be governed by laws and the moral principles just as relations are between individuals.”<sup>15</sup> This contention is crucial because it sets limitations to the authority of both the Church and the rulers of sovereign states. It implies that there is a higher moral authority, which he calls Natural Law. To Grotius, human beings are social creatures who are naturally disposed to “sympathize with others, fulfill promises, to know and act in accordance with the general principles, use language, and a proclivity to inflict penalties on individuals in accordance with their just deserves.”<sup>16</sup> Therefore, life within a society is at the center of Natural Law, not self-preservation. Taking it one step further, Grotius concludes, “neither persons nor states have an absolute right to self-defence.” Even in self-defence, it is not right to impose unreasonable dangers on others in an effort to save oneself. This principle is equally true in relations between individuals as it is for relations between states.

Based on this fundamental tenet, Grotius attempted to establish a body of international laws that would, as objectively as possible, attempt to prevent war, but if

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<sup>15</sup> *Ibid.*, 67.

<sup>16</sup> *Ibid.*, 69.

that failed, his aim was to minimize the brutality of the war. He defined two separate principles. The first principle, *Jus ad Bellum*, or 'when' it is permissible to wage war, defines the rules to be applied in making the decision to revert to war or not and normally applies to state leaders. The second principle, *Jus in Bello*, sets the rules on 'how' to wage the war and applies predominantly to the soldiers waging the war. This essay will now examine these two principles in more detail.

## Part 2 - Just War Theory

### *Jus ad Bellum*

To Grotius, wars are not endeavours to be taken lightly. While war's aims are normally to create greater good in the end, their potential for generating evil as well warrant that they be scrupulously justified. One can see the utilitarian roots of this statement. *Jus ad Bellum* establishes that war should only be prosecuted by a competent authority, with the right intentions and for a just cause. Any other war would be morally wrong. A lone assassin cannot wage war. Nor can a self-proclaimed leader morally wage war. Only a competent authority recognized by the people over whom this authority is exercised can justly wage a war.

That competent authority must also ensure that war is waged with the right intentions. It would be morally wrong for a leader to wage a war if his only purpose was to seek to increase his personal wealth. Political leaders must be able to justify their decision to wage war on some moral grounds. As Douglas Lackey, a renowned moral philosopher puts it, "the evils of even a just war are sufficiently great that we can demand of leaders who initiate war that they understand the moral character of the results they seek."<sup>17</sup> Grotius' intentions have their roots in Augustine's thinking. In *Contra Faustum*, Augustine wrote, "the real evils in war are love and violence, vengeful cruelty, fierce and implacable enmity, wild resistance, lust for power, and the like."<sup>18</sup>

However, a recognized state leader armed with the right intentions, even displaying exemplary virtue ethics, but lacking a just cause cannot wage a morally

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<sup>17</sup> Douglas P. Lackey, *The Ethics of War and Peace* (New Jersey: Prentice Hall, 1989), 32.

<sup>18</sup> Augustine. *Contra Faustum*, XXII.75. As quoted by Douglas P. Lackey, *The Ethics of War and Peace...*, 32.

justifiable war. This need for a just cause is the most important requirement of *Jus ad Bellum*. It implies that a war can only be just when waged in self-defence or in order to impose a penalty *after* an injury has been received. This principle effectively renders wars of anticipation, or pre-emptive wars, morally wrong.<sup>19</sup> One can see the deontological ethics principles at the root of the just cause idea. One cannot launch an attack if one has not been attacked first or, as Kant would put it; you must ‘do onto others as you would have them do onto you’.

The next requirement for a just war under the *Jus ad bellum* principle is that of proportionality. It is imperative that a leader, in deciding to wage war, considers the evil that the war will cause. Proportionality then requires that the good to be achieved by the war be greater than the evil it will create. In Grotius’ words the “kings who measure up to the rule of wisdom take account not only of the nation which has been committed to them, but of the whole human race.”<sup>20</sup> For example, when the international community responded to Saddam Hussein’s invasion of Kuwait, the principle of proportionality required that they stop their operation after Kuwait had been liberated. For the coalition forces to continue to Bagdad and inflict more damage to the Iraqi forces violated the *Jus ad Bellum* principle of proportionality. This principle of proportionality derives from the teleological ethics framework. In the example discussed here, the required result was the liberation of Kuwait. To carry on fighting, towards Bagdad, actually increased the evil produced (more deaths on either sides), reducing the overall utility, contrary to the utilitarian approach.

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<sup>19</sup> Christopher, *The Ethics of War and Peace*..., 82.

<sup>20</sup> Hugo Grotius, *The Law of War and Peace*: quoted in Christopher, *The Ethics of War and Peace* ..., 83.

One last important requirement of *Jus ad Bellum* is that war must always be a last resort. Every other means of resolving inter-state affairs, whether it be political, economical, or even via a third party mediation, must be exhausted before reverting to war. Grotius was quite categorical in his belief that war is a heinous enterprise that should be avoided at considerable cost. Christopher quotes Grotius as saying that “a cause for engaging in war which either may not be passed over, or ought not to be, is exceptional.”<sup>21</sup>

Therefore, according to the principle of *Jus ad bellum*, the parameters that make a war justifiable are such that war should be a rare exception rather than the norm. However, even Grotius was a realist. He understood human nature to be such that, the possibility of war did exist and consequently so did the need to bind the conduct of those wars within a morally acceptable framework. His development of the *Jus in Bello* theory is a direct result of this understanding.

### ***Jus in Bello***

Most published works on *Jus in Bello* describe a variety of particular conditions that must be adhered to in the moral conduct of war. They can be grouped under three specific principles: necessity (do we need to attack?); discrimination (can we attack only legitimate combatants without harming innocents?); and proportionality (how much harm is justified to achieve the intended good?).

The first criterion is that of necessity. The principle of military necessity, as it is typically applied, stipulates that the destruction of property is only justifiable when "imperatively demanded" by the requirements of war actions. If a particular objective

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<sup>21</sup> *Ibid.*, 87.

makes an “effective contribution” to a military situation and the elimination of neutralization of that objective yields a “military advantage”, then there would be a military necessity and an attack would be justified.

Determining military necessity is not a clear-cut process. It requires from the actor to define the situation not only within the context of the actor’s intent but also within the context of the situation in which the action is to take place. For example, while it might be a military necessity to destroy a bridge connected to a large highway to stop an enemy’s advance, it is not militarily necessary to destroy a small pedestrian bridge used by local farmers to cross that same river. That second bridge does not make an “effective contribution” to a military situation and therefore does not need to be destroyed. A recent example of the non-respect of the principle of necessity occurred in 1999 during the NATO Operation Allied Force in former Yugoslavia. NATO bombs destroyed all the bridges over the Danube River connecting Novi Sad, Yugoslavia's second largest city at the time, with the Serb heartland in the south.<sup>22</sup> The entire civilian population was without a means of crossing the river, a result that went well beyond military necessity.

The second criterion is that of discrimination. Quite simply, discrimination requires that any military action should only target enemy military capabilities. It is immoral to target civilians or any facilities or capabilities that have no military value. In other words, waging a just war involves discriminating between combatants and non-combatants. This means that actively targeting, killing combatants is commensurate with

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<sup>22</sup> CNN.com, *NATO Bomb Destroy Danube River Bridge*, 26 April, 1999; available from: <http://www.cnn.com/WORLD/europe/9904/26/kosovo.02/index.html>; Internet; accessed 1 April 2009.



a just war while actively targeting, and killing non-combatants is not. For example, the trench warfare along the western front during WWI, being limited to army against army engaged in close combat, respected the criteria of discrimination while, the deliberate bombing of innocent civilians in German cities by allied bombers with no other aim but to terrify the populations, did not respect the discrimination criterion.<sup>23</sup> Similarly, during NATO Operation Allied Force over Kosovo, the NATO pilots conducted their bombing runs well above the lethal altitude of the Kosovo air defence umbrella in an attempt to minimize NATO pilot casualties. In doing so, the bombing was inaccurate and scores of innocent civilians were killed in the bombing raids.<sup>24</sup> In this case, the criterion of discrimination was not met. In fact, Article 3 of the Geneva Convention (I) of 1949 is in perfect accord with the criterion of discrimination and is quite explicit as it states that:

Persons taking no active part in the hostilities, including members of armed forces who have laid down their arms and those placed *hors the combat* by sickness, wounds, detention, or any other cause, shall in all circumstances be treated humanely.<sup>25</sup>

The other three Geneva Conventions of 1949, as well as the two Additional Protocols of 1977, describe at great length all of the agreed upon international rules related directly to *Jus in Bello* criteria of discrimination.

While humans engaged in conflict must be discriminate, it also follows that the weapons used in conflict, or any other means of destruction for that matter, must not violate this criteria. Hence, a rifle used by a soldier to kill another soldier is allowable,

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<sup>23</sup> Dudley Saward, *'Bomber' Harris*, (London: Cassell Ltd., 1984), 186.

<sup>24</sup> GlobalSecurity.org, *Operation Allied Force*; available from: [http://www.globalsecurity.org/military/ops/allied\\_force.htm](http://www.globalsecurity.org/military/ops/allied_force.htm); Internet; accessed 1 April 2009.

<sup>25</sup> Office of the Judge Advocate General, "Geneva Convention (I) For the Amelioration of the Conditions of the Wounded and Sick in Armed Forces in the Field – 1949," in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training (Ottawa: DND, 2005), 79.

but anti-personnel mines that cannot discriminate between an enemy soldier and an innocent child are not allowed. Nor are chemical, bacteriological or bio-weapons allowed because they too are indiscriminate. There is a large body of international agreements that deals specifically with chemical, bacteriological and bio-weapons; this will be addressed in detail throughout this paper.

The final criterion is that of proportionality. Proportionality suggests that the impact of one's actions in war must be proportional to the anticipated benefits. This is a very difficult criterion to measure since it almost always involves comparing incompatible things. How many lives is it morally right to risk in order to push the front line forward by one kilometre? Is it ten people killed? Is it ten thousand? How different is the answer if we look at one's own troop casualties vice the enemy's? In applying proportionality in the conduct of a war, one must remember that the damage (material, physical or to humans) should be proportional to the objective desired. As well, the extent and violence of the conduct of the war must be tempered to minimize destruction and casualties. This restriction on the means of warfare aims to protect all involved from unnecessary suffering. The intention is to safeguard human rights and to minimise as much as possible the amount of damage in the short and long-term, even after the hostilities have ended.

This is the reason why bio-weapons are so objectionable. They cause unnecessary suffering. They do not respect the innocent civilians' right to safety in war and the effects of bio-weapons can continue well after hostilities have ended.

## ***The International Conventions***

It is these principles of *Jus ad Bellum* and *Jus in Bello* that are at the root of the multitude of current laws and conventions dictating the conduct of war today. The following section will examine the use of the moral and ethical framework which has been established by international conventions that deal specifically with the use of bio-weapons.

### **Pre WWI Conventions**

Concerns with the use of inhumane weapons whether they are kinetic, chemical or biological is not new. In fact, U.S. President Lincoln issued the first legal document banning the use of specific weapons in 1863. His *General Order No. 100*, also known as the *Lieber Code*, wholly excludes the use of poison from modern warfare.<sup>26</sup> Five years later, the first international agreement related to the restrictions on the use of specific weapons during an armed conflict was conceived. The *St-Petersburg Declaration Renouncing the Use, in Time of War, of Certain Explosive Projectiles* of 1868 is the first international agreement that sets limits on the suffering that one army can afflict on another. This declaration rooted in the *Jus in Bello* principles of necessity and proportionality states “the only legitimate object which states should endeavour to accomplish during war is to weaken the military forces of the enemy” by disabling the greatest number of soldiers. It also emphasizes that this objective “would be exceeded by

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<sup>26</sup> Office of the Judge Advocate General, “The Lieber Code – Instructions for the Government of Armies of the United States in the Field - 1863,” in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training (Ottawa: DND, 2005), 5.

the employment of arms which uselessly aggravate the suffering of disabled men, or render their death inevitable.”<sup>27</sup> Specifically the treaty states that:

The contracting parties engaged mutually to renounce, in case of war among themselves, the employment by their military or naval troops of any projectiles of a weight below 400 grams, which is either explosive or charged with fulminating or inflammable substances.<sup>28</sup>

This treaty is particularly interesting in that it was initiated by the country that actually possessed the weapon to be banned. In 1863, Russia invented a bullet designed to explode when contacting a hard surface. Its primary purpose was to blow up ammunition wagons. Four years later, the Russians modified this bullet to explode when contacting a soft target. Seeing the obvious inhumane effect that such a projectile could have had on people, the Russian government did not want its own soldiers to use the bullet nor did it want other forces to use it on Russian soldiers. They then suggested banning the use of such a projectile via an international agreement. The St-Petersburg Declaration was eventually signed by nineteen states on December 11, 1868. While this treaty is still in effect today, its provisions were later incorporated within the 1907 Hague Convention on land warfare.<sup>29</sup>

Shortly thereafter, the international community ratified the first international agreement specifically banning chemical weapons. On July 29, 1899, the twenty-five signatories to the Hague Declaration 2 agreed to “abstain from the use of projectiles the

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<sup>27</sup> Office of the Judge Advocate General, “St-Petersburg Declaration Renouncing the Use, in Time of War, or Certain Explosive Projectiles - 1868,” in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training (Ottawa: DND, 2005), 10.

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

<sup>29</sup> Article 23(e) of the Hague Convention of 1907 especially forbids the use of *arms, projectiles, or material calculated to cause unnecessary suffering*. In essence, stating the same prohibition as the St-Petersburg Declaration.

sole object of which is the diffusion of asphyxiating or deleterious gases.”<sup>30</sup> This declaration had its origin within the context of the previous two treaties and tried to ensure that armies would refrain from unleashing unnecessary suffering upon one another with the use of poisonous gases. Again, the *Jus in Bello* principle of proportionality was used in defining acceptable weapons of war.

Yet, from a utilitarian ethical point of view, the use of poisonous gases might actually be justifiable. Remembering that the total utility gained because of an action serves to justify that action, one can make the argument that using poisonous gases against enemy troops would result in relatively the same number of enemy casualties as would have the use of kinetic weapons but with many fewer “friendly” casualties, hence an improvement in total utility. However, evaluating this situation using an ethical framework based on moral rights would give a completely different answer. Soldiers have a right not to suffer needlessly. The Hague Declaration signatories understood that particular moral right and put in place a set of rules aimed at, if not eliminating unnecessary suffering in combat, at least reducing it. The Hague declaration of 1899 was to lay the foundation for subsequent treaties prohibiting gas warfare.

Unfortunately, this declaration did not prevent the use of poisonous gases during the First World War. The use of chlorine gas by the Germans on the unsuspecting French troops at Ypres in 1915 is probably one of the best-known cases of a gas attack. The use of gas including chlorine, phosgene and mustard continued through the rest of the war such that, by the end of the war, asphyxiating gases had claimed over one million

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<sup>30</sup> Office of the Judge Advocate General, “Hague Declaration (IV,2) Concerning Asphyxiating Gases – 1899,” in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training (Ottawa: DND, 2005), 11.

casualties, close to one hundred thousand dead, the majority of whom suffered unspeakable agony before their passing.<sup>31</sup>

### **The 1925 Geneva Protocol**

The international community could not passively stand by and let the possibility of the immoral use of these kinds of weapons happen again. Therefore, at the end of WWI, a clause dealing specifically with chemical weapons was included within the Treaty of Versailles. Article 171 of the Treaty states that “the use of asphyxiating, poisonous or other gases and all analogous liquids, materials or devices being prohibited, their manufacture and importation are strictly forbidden in Germany.”<sup>32</sup> In an effort to further minimize the risk of such weapons being used again by Germany, Article 171 also stated that the same restriction applied “to materials specially intended for the manufacture, storage and use of the said products or devices.”<sup>33</sup>

After the state of post-war Germany had specifically been dealt with, the international community turned its efforts to ensuring that weapons inflicting unnecessary suffering were also banned outside Germany. The result was the *1925 Geneva Protocol for the Prohibition of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare*. The 1925 Geneva Protocol not only dealt with chemical weapons as had been done in the past, but it was also the first international treaty related to the use of bacteriological methods of warfare. This protocol establishes that the prohibition of chemical and bacteriological methods of warfare “has been justly

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<sup>31</sup> First World War.com, *Weapons of War: Poison Gas*; available from: <http://www.firstworldwar.com/weaponry/gas.htm>; Internet; accessed 08 February 2009.

<sup>32</sup> First World War.com, *The Treaty of Versailles*; available from: <http://www.firstworldwar.com/source/versailles.htm>; Internet; accessed 08 February 2009.

<sup>33</sup> *Ibid.*

condemned by the general opinion of the civilized world” and that this prohibition “shall be universally accepted as a part of International Law, binding alike the conscience and the practice of nations.”<sup>34</sup>

The statement, “binding alike the *conscience* and the *practice* of nations” is a direct attempt at justifying the prohibition of chemical and bacteriological methods of warfare on ethical grounds. War is to be governed, not only by a set of strictly practical rules as laid out in previous treaties and conventions, but also by a higher moral framework. Gentlemanly rules of chivalry are not enough to frame the conduct of humans in battle anymore. Wars need to be conducted with conscience. The moral rights of not being needlessly harmed have their place in warfare. Moreover, rule utilitarians now have a precise decree to follow.

The group of thirty-six countries that originally signed the document on June 17, 1925, has grown to 135 countries today. Although Canada was one of the original signatories, some reservations were expressed during the original signing. These reservations were finally removed by Canada in 1991.<sup>35</sup>

## **The 1972 Biological Weapons Convention**

The next few decades saw the emergence of several new treaties and conventions, which dealt with the conduct of armies in war. However, it was not until 1972 that a new treaty dealing specifically with chemical and bio-weapons emerged. The 1972

*Convention on the Prohibition of the Development, Production and Stockpiling of*

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<sup>34</sup> Office of the Judge Advocate General, “Geneva Protocol for the Prohibiting of the Use of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare – 1925,” in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training (Ottawa: DND, 2005), 55.

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

*Bacteriological (Biological) and Toxin Weapons and on their Destruction*, also known as the *Biological Weapons Convention* (BWC) was the first international treaty to prohibit an entire grouping of weapons.<sup>36</sup> In order to stop the proliferation of this type of weapons of mass destruction the treaty effectively prohibits the development, production, acquisition, transfer, retention, stockpiling and use of biological and toxin weapons. The following table lists the major provisions of the BWC.

**Table 1- Key Provisions of the Biological Weapons Convention**

Article	Provision
Article I	Never under any circumstances to acquire or retain biological weapons
Article II	To destroy or divert to peaceful purposes biological weapons and associated resources prior to joining
Article III	Not to transfer, or in any way assist, encourage or induce anyone else to acquire or retain biological weapons
Article IV	To take any national measures necessary to implement the provisions of the BWC domestically
Article V	To consult bilaterally and multilaterally to solve any problems with the implementation of the BWC
Article VI	To request the UN Security Council to investigate alleged breaches of the BWC and to comply with its subsequent decisions
Article VII	To assist States which have been exposed to a danger as a result of a violation of the BWC
Article X	To do all of the above in a way that encourages the peaceful uses of biological science and technology

Source: United Nations Office in Geneva Web Site. *The Biological Weapons Convention*.

The text of the BWC is relatively short, comprising only the preamble and 15 articles. The moral imperative at the root of the BWC is enounced categorically in the last two paragraphs of the preamble. Specifically, the States Parties to the BWC affirm that they are “determined, for the sake of all mankind, to exclude completely the possibility of bacteriological (biological) agents and toxins being used as weapons”, and

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<sup>36</sup> Office of the Judge Advocate General, “Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological)..., 199.



that they are “convinced that such use would be repugnant to the conscience of mankind and that no effort should be spared to minimize the risk.”<sup>37</sup>

Again, the international community, through this treaty, reaffirms the repugnance of bio-weapons. From a just war perspective, the use of such indiscriminate weapons cannot be tolerated any longer. The treaty in fact, in the first paragraph of the preamble, classifies bio-weapons as weapons of mass destruction; the most indiscriminate of all weapons. Therefore bio-weapons violate one of the three tenets of *Jus in Bello*, that of discrimination. Ethically, the strong wording within the treaty is testament to the moral revulsion that these weapons bring.

These conventions and more specifically the BWC can all be justified using many of the moral and ethical principles described earlier. From an act utilitarian’s perspective the indiscriminate nature of bio-weapons serves to lower to overall utility by creating more damage, casualties in this case, than good. This perspective would state that alternative weapons could be used to achieve the same tactical advantage, while reducing the amount of damage inflicted. Of course, rule utilitarian would never use bio-weapons since there are now rules against it.

Looking at bio-weapons from a deontological perspective also tells us of the immorality of their use. Using Kant’s first categorical imperative, which tells us that we should not do unto others what we would not want done unto ourselves, one can see the impossibility of using bio-weapons. It is highly unlikely that anyone in his or her right mind would certify their willingness to have bio-weapons used against them, as a justification to use those weapons against others.

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<sup>37</sup> *Ibid.*

The framework of moral rights leads one to the conclusion that bio-weapons, by their indiscriminate nature, go against the rights of innocent bystanders, or non-combatants, to not be harmed during a conflict. Equally, bio-weapons negate the right of combatants to humane treatment.

Finally, no virtuous person would use bio-weapons since they are the weapons of cowards. Any individual possessing a minimum of compassion for another human being would never use a weapon that unleashes such unnecessary suffering.

### **BWC Review Conferences**

The BWC is not cast in stone; it is a living document. Over the years, it has been supplemented by a series of additional understandings reached at subsequent Review Conferences, held every five years. This has ensured that the BWC remains relevant and encompasses new technology as it evolves. A very large number of amplifications to the original BWC have been agreed to during the last six review conferences but there are a few important ones that warrant particular attention.

One glaring addition was made following the Sixth Review Conference held in 2006. The Review Conference asserted that the provisions of the BWC are not only binding to the States Parties, but also to terrorists. The additional text asserts the States Parties' conviction that "terrorism in all its forms and manifestations and whatever its motivation, is abhorrent and unacceptable to the international community" and that:

*terrorists* must be prevented from developing, producing, stockpiling, or otherwise acquiring or retaining, and using under any circumstances,

biological agents and toxins, equipment, or means of delivery of agents or toxins, for nonpeaceful purposes.<sup>38</sup>

The final conference document also reemphasizes the all-encompassing intent of the BWC to “exclude completely and forever the possibility of [using bio-weapons]” by specifying that:

all naturally or artificially created or altered microbial and other biological agents and toxins, as well as their components, regardless of their origin and method of production and whether they affect humans, animals or plants, of types and in quantities that have no justification for prophylactic, protective or other peaceful purposes, are unequivocally covered by Article I.<sup>39</sup>

These two statements alone are meant to ensure that nobody, whether state sponsored or not, is to engage in any type of biological research and development that is not specifically related to a peaceful purpose. It is categorically clear.

Unfortunately, there is still no formalized verification vehicle to ensure that all of the signatories to the BWC play by the rules. This is probably the BWC’s Achilles’ heel. Unlike the Chemical Weapons Convention (CWC), which includes very detailed declaration, verification and non-compliance consequences schemes, article IV of the BWC simply leaves it to the individual signatories to adopt their own legislative processes to ensure the BWC is implemented domestically.<sup>40</sup> None of the subsequent review conferences have improved on this except to reaffirm that the States Parties need to enact and implement the required internal measures to ensure that the effectiveness of

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<sup>38</sup> United Nations, *Sixth Review Conference Of The States Parties To The Convention On The Prohibition Of The Development, Production And Stockpiling Of Bacteriological (Biological) And Toxin Weapons And On Their Destruction*, (Geneva: UN, 2006), 8; available from: <http://daccessdds.un.org/doc/UNDOC/GEN/G07/600/30/PDF/G0760030.pdf?OpenElement>; Internet; accessed 3 March 2009.

<sup>39</sup> *Ibid.*, 9.

<sup>40</sup> Office of the Judge Advocate General, “Convention on the Prohibition of the Development, Production and Stockpiling of Bacteriological (Biological)...”, 199.

the BWC is strengthened.<sup>41</sup> Several States Parties that have signed the original convention in 1972 have yet to fully comply with Article IV and Canada is one of them. This situation will be addressed in detail in Part 4. The only provision within the BWC related to non-conformity is article V. Here the BWC states that if any signatory to the convention finds another signatory acting in breach of any provision of the convention they *may* lodge a complaint with the United Nations Security Council. The only emphasis the review conferences have added to this article is to “invite the Security Council to consider immediately any complaint lodged under this Article and to initiate any measures it considers necessary for the investigation of the complaint in accordance with the Charter.”<sup>42</sup> This remains ineffective when dealing with terrorist groups not sponsored by any specific state and who operate across state borders.

In essence, the BWC leaves it to the individual countries to police themselves and, while the convention does provide a means for another state to complain about a perceived incompliant state, it gives the complaining state no real mechanism to officially investigate the problem. The fox is guarding the chicken coop and the guard dog can only look over the fence.

One could argue that, from a moral rights perspective, a sovereign state certainly has a right to manage its own internal affairs. Yet, as a utilitarian would point out, this results in the possibility of a scenario where a few unscrupulous rogue states could have the potential to threaten the rest of the world with bio-weapons. The total utility

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<sup>41</sup> United Nations, *Sixth Review Conference...*, 10.

<sup>42</sup> *Ibid.*, 13.

arithmetic leads one to conclude that there is a need for a stronger deterrence and verification mechanism.

As it is, there is no real way to stop a rogue country from developing weapons under the guise of medical research. We have no way to know. In addition, there is no mechanism in place with any real power to do anything about it.

It is somewhat ironic that bio-weapons have the weakest control system despite the fact that they are the easiest weapons of mass destruction to produce.<sup>43</sup> In a study conducted in 1999, the British Medical Association stated that bio-weapons would only become outdated when they are subject to a “global prohibition regime.”<sup>44</sup> The following table, compiled by the British study, shows that, when it comes to deterrence, the BWC lags all other major weapons prohibition conventions.

**Table 2 Attributes of Weapon Control Treaty**

Treaty	Attributes					
	Take Actions	Refer Disputes	Establish Organization	Verify	Provide for Solutions	Require National Measures
Biological Weapons Convention of 1972	✓	✓				
Nuclear Non-Proliferation Agreement of 1972	✓	✓	✓	✓	✓	
Intermediate Range Nuclear Force Agreement of 1972	✓		✓	✓		
Strategic Arms Reduction Treaty of 1991	✓		✓	✓		

<sup>43</sup> British Medical Association, Board of Science and Education. *Biotechnology Weapons and Humanity* (Amsterdam, The Netherlands: Harwood Academic Publishers, 1999), 73.

<sup>44</sup> *Ibid.*

Treaty	Attributes					
	Take Actions	Refer Disputes	Establish Organization	Verify	Provide for Solutions	Require National Measures
Chemical Weapons Convention of 1993	✓	✓	✓	✓	✓	✓

Source: British Medical Association, Board of Science and Education. *Biotechnology Weapons and Humanity*. (Amsterdam, The Netherlands: Harwood Academic Publishers, 1999), 74.

The only real effort to strengthen the BWC occurred in 1991, at the third Review Conference; the assembled group agreed to the implementation of Confidence Building Measures (CBM) proposed four years earlier at the second review conference. The aim of these CBMs was to prevent or reduce the occurrence of ambiguities, doubts and suspicions, and to improve international co-operation in the field of peaceful biological activities. These measures, listed in Table 3, take the form of a voluntary annual data exchange.

**Table 3 Description of CBMs**

CBM	Description
A	Part 1: Exchange of data on research centres and laboratories; Part 2: 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

CBM	Description
G	Declaration of vaccine production facilities.

Source: United Nations Office of Geneva Website. *Disarmament – Confidence Building Measures*.

Unfortunately, there is little incentive for signatories to provide the voluntary information such that, according to the latest CBM Submission Summary, only a small minority of the signatories have provided their input on a regular basis.<sup>45</sup> The CBM Submission Summary report shows that Iraq, Iran, Libya and India, all countries that the US Office of the Secretary of Defense has identified as maintaining “various levels of offensive biological warfare capabilities”,<sup>46</sup> have seldom provided their inputs to the CBMs, and in the case of North Korea, Syria and Pakistan not at all.<sup>47</sup>

This has prompted the States Parties present at the Fifth Review Conference to establish an ‘Implementation Support Unit’ whose responsibility it is to facilitate the implementation of the CBM process. Furthermore, at the Sixth Review Conference, the members noted the need to enhance further the participation of States Parties. Regrettably, all they agreed on was a series of minor procedural enhancements that did very little, if anything, to stop the proliferation of bio-weapons. On a positive note, the Conference agreed to further review the implementation of the CBMs at their next review conference scheduled for 2010.<sup>48</sup>

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<sup>45</sup> United Nations Office of Geneva Website, *CBM Returns*; available from: [http://www.unog.ch/80256EDD006B8954/\(httpAssets\)/41BF3B57E2CB6ED7C12572DD00361BA4/\\$file/CBM\\_Submissions\\_by\\_Form.pdf](http://www.unog.ch/80256EDD006B8954/(httpAssets)/41BF3B57E2CB6ED7C12572DD00361BA4/$file/CBM_Submissions_by_Form.pdf); Internet; accessed 24 March 2009.

<sup>46</sup> Jim A. Davis, and Barry R. Schneider, editors, *The Gathering Biological Warfare Storm* (Westport, Conn: Praeger, 2004), 175.

<sup>47</sup> *Ibid.*

<sup>48</sup> United Nations, *Sixth Review Conference...*, 22.

There is, unfortunately, one glaring problem with the CBMs. It is conceivable that representatives from within a rogue state could conduct weapons research under the guise of medical research, not provide their input into the CBM database and then use that same CBM database to further their own illegal research. For example, in its CBM report for the year 2007, Australia reported that they do not possess a stockpile of anthrax vaccine for humans.<sup>49</sup> They explain that Australia has never had an outbreak of anthrax in humans. In fact, they list only one case of a human contracting anthrax in the last seven years. Consequently, they do not manufacture an anthrax vaccine. If a rogue state wanted to know which pathogen to use in a bio-attack against a major Australian urban center, a simple Google search, as the author did, would give them the answer in less than five minutes.

While the efforts of the review conference to strengthen the BWC are commendable, they will not be sufficient to ensure the elimination of bio-weapons. The British Medical Association concluded in their report that strategies to deter biological warfare can be divided in three categories: terrorist or criminal use; covert use; and military programs. According to the British study, the best way to deter terrorist or criminal use is via aggressive encouragement of States Parties to enact and enforce strong legislations implementing Article V of the BWC. This has certainly been the approach taken by the States Parties at the various review conferences, yet very few States Parties have actually done so. Only twenty of the 163 States Parties to the BWC have reported

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<sup>49</sup> The Biological and Toxin Weapons Convention Website, *Annual CBM Declarations – Australia 2007*; available from: [http://www.opbw.org/cbms/annual\\_cbms/australia\\_cbm\\_2007.pdf](http://www.opbw.org/cbms/annual_cbms/australia_cbm_2007.pdf); Internet; accessed 24 March 2009.



information on national approaches to biosafety and biosecurity as required by Article of the conventions.<sup>50</sup>

The international community has already very clearly stated their repugnance for these weapons. The world simply cannot continue to make it easy for unscrupulous leaders to bypass the BWC and engage in the development of these repulsive weapons. As will be shown next, illicit bio-weapons program have the potential to become an almost unimaginable threat.

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<sup>50</sup> The Biological and Toxin Weapons Convention Website, *BWC Compendium of National Approaches to Biosafety & Biosecurity*; available from: [http://www.unog.ch/unog/website/disarmament.nsf/\(httpPages\)/fd59a71fc0b3faf8c12574780052f81a?OpenDocument#\\_Section11](http://www.unog.ch/unog/website/disarmament.nsf/(httpPages)/fd59a71fc0b3faf8c12574780052f81a?OpenDocument#_Section11); Internet; accessed 24 March 2009.

## Part 3 - Bio-Weapons

The intent of the BWC was to stop the development of these ‘repugnant’ weapons. Unfortunately, it did not stop one of the most powerful nations during the Cold War from doing just that. The Russian biological R&D program was by far the largest ever conducted. Amazingly enough, it was also conducted in complete secrecy from the rest of the world until Ken Alibek,<sup>51</sup> the man who ran the Soviet bio-weapon program during the Cold War, chose to lift the veil of secrecy.

### *The Soviet Program*

In contrast to nuclear weapons that completely annihilate everything at ground zero, bio-weapons leave buildings, transportation systems and a city’s infrastructure intact. Ken Alibek suggests that bio-weapons should be called “mass casualty weapons” rather than “weapons of mass destruction”.<sup>52</sup> In fact, Alibek suggests that we must continue our quest to eliminate bio-weapons because:

One of the principal advantages of biological agents is that they are almost impossible to detect, which complicates the task of tracing the author of a biological attack. This makes them as suitable for terrorism and crime as for strategic warfare.<sup>53</sup>

The work that Alibek did in Russia is by far the most extensive bio-weapon research program ever conducted and is worthy of close examination. The Soviet bio-weapons program has its roots even before the Second World War. In 1928, barely three years after the fledgling Soviet government had signed the 1925 Geneva Convention banning the use of poison gas and bacteriological weapons, the GPU (predecessor to the

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<sup>51</sup> His real name is Kanatjan Alibekov, but he changed it to Ken Alibek after immigrating to the United States. The vast majority of literature about the man and the biological weapons program he ran refer to him by his Americanized name and the same custom is used throughout this paper.

<sup>52</sup> Alibek, *Biohazard*..., 22.

<sup>53</sup> *Ibid.*, 176.

better known KGB) began their bio-weapons development program. Although details of the program are sketchy, Alibek asserts that by 1938 the Soviets had an operational bio-weapon ready to spread typhus on the battlefield.<sup>54</sup> He also suggests that the cause of the great tularaemia outbreak suffered by German panzer troops as they advanced on Stalingrad in 1942 was most likely the use of a bio-weapon by the Soviets. The outbreak that affected a considerable number of German troops greatly weakened them and was certainly a contributing factor in the German defeat at Stalingrad.<sup>55</sup> One year after the end of the hostilities in Europe, the Soviets received a boost in their biological development program when Soviet troops overtook the Japanese military unit called Unit 731 in Manchuria. Unit 731 was Japan's secret germ warfare center.

The Japanese operated a clandestine biological warfare research laboratory in Hardin, Manchuria from 1936-1945. It was, at the time, the world's largest bio-weapons research complex. Unit 731 is the facility that produced some of the pathogens released by the Japanese during 1940 to 1942, killing thousands of Chinese civilians. The Japanese attacked hundreds of heavily populated communities and remote regions with germ bombs. Japanese planes dropped plague-infected fleas over Ningbo in eastern China and over Changde. Japanese troops also dropped cholera and typhoid cultures in wells and ponds in north-central China. In all, tens of thousands and perhaps as many as 200,000 Chinese died of bubonic plague, cholera, anthrax and other diseases.<sup>56</sup> The top-secret Japanese laboratory conducted barbaric experiments to test biological agents on

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<sup>54</sup> *Ibid.*, 33-34.

<sup>55</sup> *Ibid.*, 29-30.

<sup>56</sup> Josefina Cole, *Unit 731: Japan's WWII Atrocity, America's Cover-up*; available from: [http://www.associatedcontent.com/article/318248/unit\\_731\\_japans\\_wwii\\_atrocity\\_americas.html?cat=37](http://www.associatedcontent.com/article/318248/unit_731_japans_wwii_atrocity_americas.html?cat=37); Internet; accessed 9 March 2009.

tens of thousands of Chinese, Russian, Koreans, and after 1943 on Americans and British prisoners of war, not unlike those perpetrated by Josef Mengele at Auschwitz-Birkenau concentration camp.<sup>57</sup>

By 1945, the Japanese program had stockpiled 400 kilograms of anthrax to be used in a specially designed fragmentation bomb. Studies continued there until 1945, when the Unit 731 complex was destroyed, but not before the Soviets were able to obtain the Japanese blueprints for the facility.

The Soviets used the captured Japanese blueprints to build a new biological research complex in Sverdlovsk, and the stolen research data greatly contributed to accelerate their weapons development program.<sup>58</sup> During the early 1970s, the Soviets began to explore the potential of genetically altered pathogens. They quickly understood that these newly ‘designed’ pathogens resistant to antibiotics and vaccines could become powerful bio-weapons. They then launched a bio-weapons research program that became the largest Soviet weapons development program after the hydrogen bomb. It ran under the cover of Biopreparat.<sup>59</sup>

By 1987 the Soviets had built the world’s first, and only, industrial-scale bio-weapons factory at Stepnogorsk. The facility could produce two tons of Anthrax 836 (the most potent form of Anthrax at the time) per day “in a process as reliable and efficient as producing tanks, trucks, cars, or Coca-Cola.”<sup>60</sup> The size of the Soviet program dwarfs all

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<sup>57</sup> Peter Williams, and David Wallace, *Unit 731 – The Japanese Army’s Secret of Secrets* (New York: Free Press, 1989), Chapter 4.

<sup>58</sup> Alibek, *Biohazard...*, 37.

<sup>59</sup> *Ibid.*, 40-41.

<sup>60</sup> *Ibid.*, 105-106.

other bio-weapons program. Other major bio-weapons programs at the time included the Japanese and the Americans, who produced a total of 400 kilograms each, as well as the British-Canadian program which, at its peak, in 1942, produced anthrax spores at the rate of about 150 pounds (70 kg) per month. This program was housed at a secluded location on Grosse Ile, a St. Lawrence seaway island near Quebec.<sup>61</sup>

### ***The Dangers of Bio-Research***

Biological agent research is extremely dangerous and therefore, the risks associated with accidents are also very high. In fact, accidents were quite common during the peak of the Soviet program, occurring almost weekly.<sup>62</sup> Two of those accidents merit further scrutiny. The first one took place at Sverdlovsk on 30 March 1979. On that day, a series of small oversights by several technicians led to the exhaustion of unfiltered Anthrax laden air into the night. It was several hours before maintenance personnel fixed the problem and, during that time, Anthrax was carried by the wind to factories and houses downwind from the production facility. The next day, all the workers on the night shift of a plant close to the laboratory fell sick and within a week, most had died. The last case of Anthrax in the local population was reported almost two months later and in the end, it is estimated that between sixty six and one hundred and five residents of Sverdlovsk died from the Anthrax infection.<sup>63</sup>

Even the most reliable and safe research laboratories are not immune to danger. An example of such an accident took place in 2008 in Newark, New Jersey at the Public

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<sup>61</sup> H.P. Albarelli Jr., *The Secret History of Anthrax*, WorldNetDaily.com; available from: [http://www.worldnetdaily.com/news/article.asp?ARTICLE\\_ID=25220](http://www.worldnetdaily.com/news/article.asp?ARTICLE_ID=25220); Internet; accessed 29 March 2009.

<sup>62</sup> Alibek, *Biohazard...*, 105.

<sup>63</sup> *Ibid.*, 75.

Health Research Institute (PHRI), a University of Medicine and Dentistry of New Jersey (UMDNJ) facility, which is a leading center for research on infectious diseases. The facility has a Level 3 biocontainment lab that works with infectious diseases including bubonic plague, pneumonic plague, West Nile virus and typhoid fever.<sup>64</sup> As recently as February 2009, the UMDNJ announced that in December 2008, the PHRI had lost the frozen remains of two mice injected with the bacteria *Yersinia pestis* (the bacteria that causes the plague). This is not the first time that such an incident took place at that particular UMDNJ facility. In 2004, three bubonic plague infected mice disappeared from their cages, never to be found. It is believed that a public infection was avoided because the mice probably died in their hiding places before they could infect any humans.<sup>65</sup>

In a prepared statement in response to the latest incidents, university officials stated that “although the mice in the missing bag were used in vaccine experiments... [We] have no reason to believe that this situation poses a risk to the safety or health of

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<sup>64</sup> There are four levels of safety measures required for laboratories conducting biological work: **Biosafety Level 1:** This level is suitable for work involving well-characterized agents not known to consistently cause disease in healthy adult humans, and of minimal potential hazard to laboratory personnel and the environment. It includes agents such as E-Coli, Canine Hepatitis, etc. **Biosafety Level 2:** This level is similar to Biosafety Level 1 and is suitable for work involving agents of moderate potential hazard to personnel and the environment. It includes various bacteria and viruses that cause only mild disease to humans, or are difficult to contract via aerosol in a lab setting, such as C. Diff, Influenza, Lyme disease, Mumps, Measles, etc. **Biosafety Level 3:** This level is applicable to clinical, diagnostic, teaching, research, or production facilities in which work is done with indigenous or exotic agents which may cause serious or potentially lethal disease after inhalation. It includes various bacteria and viruses that can cause severe to fatal disease in humans, but for which vaccines or other treatment exist, such as Anthrax, West Nile virus, Tuberculosis, Yellow Fever, etc. **Biosafety Level 4:** This level is required for work with dangerous and exotic agents that pose a high individual risk of aerosol-transmitted laboratory infections, agents which cause severe to fatal disease in humans for which vaccines or other treatments are *not* available, such as Marburg, Ebola, and other various hemorrhagic diseases. Available from: [http://en.wikipedia.org/wiki/Biosafety\\_level](http://en.wikipedia.org/wiki/Biosafety_level); Internet; accessed 9 March 2009.

<sup>65</sup> Fox News.com, *2 Mice Carrying Plague Disappear from New Jersey Lab, FBI Says No Public Health Risk*; available from: [http://www.foxnews.com/printer\\_friendly\\_story/0,3566,489595.00.html](http://www.foxnews.com/printer_friendly_story/0,3566,489595.00.html); Internet; accessed 8 February, 2009.

[our] staff or the community at large.”<sup>66</sup> The FBI has also established that “there was no nexus to terrorism or risk to public health.”<sup>67</sup> Safeguards have now been implemented at the PHRI to ensure that such incidents do not happen again.<sup>68</sup>

Even for legitimate peaceful research conducted in a first class laboratory, the dangers of bioresearch can sometimes be surprising. In 1999, in Melbourne Australia, scientists were attempting to sterilize rodents by using a virus to trigger an antibody attack against mouse egg proteins. When the researchers attempted to strengthen this virus by adding a particular immune system hormone to the virus’ genetic make-up, the virus turned into a killer, wiping out all of the test animals. Even the mice that had previously been inoculated against the unmodified virus died. The director of the Australian Co-operative Research Center for the Biological Control of Pest Animal, Bob Seamark, confirmed that “this is the public’s worst fear about GMOs [genetically modified organisms] come true.” Annabelle Duncan, a former head of the UN team of inspectors in Iraq and senior scientist at the Commonwealth Scientific and Industrial Research Organization, further emphasized the dangers of legitimate bioresearch when she stated, “this shows that something we had thought was hard [increasing the pathogenicity of a virus] is easy.”<sup>69</sup> The Australian scientists warned that these events should serve as a warning to all of the potentially harmful consequences of legitimate

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<sup>66</sup> Public Health Research Institute Center web site; available from: <http://www.phri.org/index.asp>; Internet; accessed 22 February, 2009.

<sup>67</sup> Ted Sherman and Josh Margolin, “UMDNJ concedes it lost 2 dead mice infected with plague,” *The Star-Ledger*, 7 February, 2009; available from: <http://www.nj.com/starledger/stories/index.ssf?/base/news-12/123398465742360.xml&coll=1>; Internet; accessed 22 February, 2009.

<sup>68</sup> *Ibid.*

<sup>69</sup> Elizabeth Finkel, “Engineered Mouse Virus Spurs Bioweapon Fears,” *Science* Vol. 291, Issue 5504 (26 January 2001): 585.

scientific research, and emphasized the need for strong measures to combat the threat of bio-weapons.

These incidents at renowned research facilities which pride themselves for their “spirit of innovation” and for their long history of “research excellence”<sup>70</sup> makes one wonder what can happen at a clandestine facility that is not hindered by enforceable standards, nor under the media glare.

The second major Soviet accident, and one that raises other important ethical issues, occurred at Koltsovo in Siberia in April 1988. Nikolai Ustinov, one of the lead scientists at the facility was working with the Marburg virus. Marburg is a hemorrhagic fever virus very similar to Ebola. While Ustinov was attempting to inject Marburg into guinea pigs, his hand slipped and he punctured his thumb. The wound was no more than a pinprick and only a minute amount of liquid Marburg entered his body, but it was enough. For the next fifteen days, Ustinov’s colleagues watched him get sicker and sicker. Even the antiserum flown in a week after the accident and every other antiviral drug tried on Ustinov failed. He eventually died on 30 April 1988.<sup>71</sup>

The significant impact of these events is not only limited to Ustinov’s premature death. Most viruses cultivated in laboratories are likely to increase their potency or virulence when incubated in a live animal or a human, and this case was no different. Samples of the Marburg virus taken from Ustinov’s organs after his death proved to be much more powerful and stable than the strain he initially injected. Orders were then

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<sup>70</sup> Public Health Research Institute Center web site; available from: <http://www.phri.org/index.asp>; Internet; accessed 22 February, 2009.

<sup>71</sup> Alibek, *Biohazard*..., 128-130.



given to replace the old strain with the virus taken from Ustinov and two years later, the Marburg Variant U virus was ready for large-scale production.<sup>72</sup>

### ***Ethical Issues***

These events raise several important moral issues. What should be done if such an accident took place in a legitimate laboratory conducting important research related to a cure for AIDS for example? Would it be morally right to use a dying scientist to advance the research? A utilitarian would probably concede (as the Soviets did) that it would make perfect sense. Since Ustinov was going to die anyway, there was much more utility to gain by using him as an incubation agent. The resulting virus was more potent than what could have been produced otherwise. Using Ustinov's body resulted in increased utility; therefore, it was morally right. Another camp of utilitarians could also propose that, as opposed to Ustinov, whose research was aimed at weapons development, AIDS research will result in helping the world eradicate a serious disease. Consequently, they would argue that using the body of an infected scientist, who is going to die anyway, is morally acceptable.

Even Kant's supporters could argue that a large number of people would be ready to have their bodies used for science and therefore should not object to using someone else's body to conduct science. This does adhere to the "Golden Rule". Even if one were to analyse these events from the point of view of Kant's second formulation of the categorical imperative, it would still prove to be morally right. Kant, on the other hand, stated that one should never treat others as a means to an end. In this case, Ustinov agreed, of his own free will, to be used as a test subject and therefore his own actions

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<sup>72</sup> *Ibid.*, 132-133.

were morally right. There are no easy answers to this moral dilemma. It is very similar to the human embryonic stem cell research debate that rages presently around the world.

The Soviet program was still fully engaged in the production of bio-weapons in August 1991 when the coup which eventually prompted the demise of the Soviet Union took place. It was not until April of the next year that the new Russian president, Boris Yeltsin signed a decree finally banning all offensive biological warfare research in Russia. Unfortunately, several of the major research and production facilities were located outside Russia and remained in operation well past this decree. In June 1992, Alibek (originally from Kazakhstan) received an offer from the new Kazakh deputy minister of Defence: the opportunity to head Kazakhstan's medical-biological directorate. Alibek refused. Then Alibek, knowing too much and fearing reprisal, chose to quietly move his family to the United States and offer his services to the U.S. Department of Defence.<sup>73</sup> Coincidentally, he arrived in New York barely one month after Russia, the United States and Great Britain signed an agreement in October 1992, putting an end to the Russian bio-weapons program.<sup>74</sup>

There is ample evidence that despite this agreement, the Russian bio-research program continued for many years. As late as 1997, Major General Anatoly Khorechko, director of one of the major Russian bio-research facilities, stated that Russia is "restoring what was destroyed between 1986 and 1989."<sup>75</sup> Moreover, around the same time the

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<sup>73</sup> *Ibid.*, 241-252.

<sup>74</sup> *Ibid.*, 257.

<sup>75</sup> *Ibid.*, 263.

Vice Governor of the Penza region declared that they “will soon have biological weapons.”<sup>76</sup>

Since then, the knowledge and expertise gained by the Soviet scientists has been available to the highest bidder. Alibek himself received an offer from South Korea.<sup>77</sup> Alibek, who fully understands the value of the scientists he led while in Russia, states that:

The services of an ex-Biopreparat scientist would be a bargain at any price. The information he could provide would save months, perhaps years, of costly scientific research for any nation interested in developing, or improving, a biological warfare program.<sup>78</sup>

Alibek knows of several scientists who went to Iraq, North Korea and Iran. In 1997, Russia was negotiating with Iran for the sale of bio-research equipment perfectly suited for a bio-weapons development program.<sup>79</sup> The threat is real. The expertise and the money to acquire it is available. The international community must ensure that the BWC includes verification and enforcement measures to ensure that the threat of bio-weapons is eliminated.

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<sup>76</sup> *Ibid.*

<sup>77</sup> *Ibid.*, 270.

<sup>78</sup> *Ibid.*, 271.

<sup>79</sup> *Ibid.*, 277-278.

## Part 4 – Canada’s Response

### *Implementation of the BWC*

As mentioned earlier, the BWC was signed and ratified by Canada in 1972 and entered into force in 1975. While Canada was one of the original signatories to this convention, she did not enact a domestic law to implement the provisions of the BWC nationally until almost thirty years after the adoption of the BWC. It was not until 2002 that the Biological and Toxin Weapons Convention Implementation Act (BTWCI) was first introduced in the House.<sup>80</sup>

The BTWCI is quite comprehensive, stating Canada’s commitment to completely prohibit the development, production, retention, stockpiling, or any other forms of acquisition, possession, use or transfer of any microbial and bio-weapons and agents not designated specifically for peaceful purposes. The act also sets import and export limits on biological agents, provides for inspection and enforcement mechanisms and establishes the punishment for violation of the act. The highest possible penalty for such a violation is one million dollars and ten years in prison. At first glance, the BTWCI appears to be a solid act that should prevent any illicit bio-weapons activity within Canada. Unfortunately, it is not quite so.<sup>81</sup>

After two years in the parliamentary process, the BTWCI did receive royal assent on 6 May 2004. Yet, for reasons that are not clear to the author, today, almost five years

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<sup>80</sup> Office of the Judge Advocate General, “Biological and Toxin Weapons Convention Implementation Act,” in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training (Ottawa: DND, 2005), 350-352.

<sup>81</sup> *Ibid.*

later the Act is still not in force.<sup>82</sup> Until this law is put into force, its deterrence impact is non-existent. Until the law enforcement agencies in this country have the tool to arrest and prosecute the people engaged in non-peaceful biological related activities, the danger remains.

At this point, the only law in Canada that applies specifically to the control of biological pathogens in the country is the Human Pathogens Importation Regulation (HPIR).<sup>83</sup> While this regulation does provide some level of control over pathogens entering the country, it is riddled with serious gaps. First, as its name implies, it only covers the importation of pathogens. It does not provide oversight of “domestically acquired” pathogens. Second, it does not stipulate any requirement for the maintenance of an inventory of the pathogens that an institution holds. It is therefore possible for a disgruntled scientist in a fit of rage to steal small amounts of a deadly virus and terrorize the population; a situation uncannily similar to what happened in the U.S. when anthrax-laced letters were mailed in late 2001.<sup>84</sup> Another problem with the HPIR is that it does not identify the requirement for the reporting of inadvertent release of pathogens, or of production or laboratory acquired infections. As demonstrated earlier with the Russian accident at Sverdlovsk, an inadvertent release of pathogens can have a devastating impact on surrounding communities. Emergency response agencies must have early knowledge of such accidents in order to minimize their effects. Finally, in case of non-compliance,

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<sup>82</sup> Department of Justice, *Biological and Toxin Weapons Convention Implementation Act*; available from: <http://laws.justice.gc.ca/en/B-5.3/index.html>; Internet; accessed 29 March 2009.

<sup>83</sup> Public Health Agency of Canada, *Human Pathogens Importation Regulations*; available from: <http://laws.justice.gc.ca/en/ShowDoc/cr/SOR-94-558//en?page=1&isprinting=true>; Internet; accessed 24 March 2009.

<sup>84</sup> This event will be discussed in more details in a latter part of this paper.

the HPIR provides for a maximum fine of two hundred dollars and a maximum jail term of only three months.<sup>85</sup>

To address the gaps in the present regulation, The Human Pathogens and Toxins Act (Bill C-11), originally tabled as Bill C-54 in April of 2008, has been re-introduced into the present parliament.<sup>86</sup> The proposed Act corrects the major problems with the HPIR. It covers imported and domestically acquired pathogens; it requires rigorous inventory management; it establishes a firm accident-reporting framework; and it provides for fines of up to one million dollars and ten years imprisonment. This proposed legislation is certainly a step in the right direction. One has to hope that its coming into effect will be swifter than the glacial pace at which the BTWCI Act has been subjected so far.

From a moral rights perspective, Canada is failing to provide its citizens with as safe an environment as possible. The dangers of bio-terrorism are real and they do not only come from abroad, but can also easily be home-grown. What if what happened in Oklahoma in 1995 was to happen here, but this time using a bomb laden with a virus? Alternatively, what if the “Toronto Group” of suspected terrorists arrested in the summer of 2007 had been planning to distribute deadly viruses in the water supply of major Canadian cities, instead of planning to build conventional bombs? The Canadian Security Intelligence Service (CSIS) confirms in its 2007/2008 annual report that “Certain terrorist organizations such as - but not limited to - Al Qaeda or its affiliated groups continue to

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<sup>85</sup> Public Health Agency of Canada, *Human Pathogens Importation Regulations...*, Article 19.

<sup>86</sup> House of Commons of Canada, *Second Session; Fortieth Parliament - Bill C-11*; available from: <http://www2.parl.gc.ca/HousePublications/Publication.aspx?Docid=3658282&file=4>; Internet; accessed 20 April 2009.

explore ways of obtaining and using [CBRN weapons] as part of their terrorist campaigns.”<sup>87</sup> It is morally wrong for Canada not to ensure that the laws of this country are a real deterrent for criminal activities, and until the BTWCI Act and Bill C-11 become enforceable laws, Canada will not have provided its citizens with the security they are owed.

The laws and proposed legislations discussed so far are aimed at protecting the Canadian population within our borders. From a military context or even from a wider emergency response context, there is a need to protect those who will have to put their lives at risk in the process of identifying the outbreak of a pathogen and its eventual decontamination. The next section describes the activities related to the biological threat that the Canadian Forces are engaged in.

### ***Canadian Forces’ Biological Research***

The Canadian Forces (CF) leadership understands the moral contract it has with its soldiers. Jonathan Shaw, a psychologist who has worked with hundreds of Vietnam veterans suffering from PTSD, explains this contract in vivid prose when he states, “the mortal dependence of the modern soldier on the military organization for everything he needs to survive is as great as that of a small child on his or her parents.”<sup>88</sup> The CF has a moral obligation to ensure that its soldiers, sailors and air personnel have the best possible protection against the harm they will face, including protection against bio-weapons. The CF leadership is aware of this responsibility and is dedicating substantial resources to fulfill it.

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<sup>87</sup> Canadian Security Intelligence Service, *CSIS Public Report 2007 – 2008* (Ottawa: PWGSC, 2008), 16.

<sup>88</sup> Jonathan Shay, *Achilles in Vietnam – Combat Trauma and the Undoing of Character* (New York: Atheneum, 1994), 5.

Defence Research & Development Canada (DRDC) is the national agency that conducts defence related R&D. Of the seven research facilities DRDC operates in Canada, the one located in Suffield, Alberta, is responsible for R&D related to all aspects of the biological threat. Within their 'Personnel Protection' R&D sector they are engaged in several bio-defence activities. Of note is the development of the Cipro® Plus Inhaler against anthrax. DRDC Suffield developed this device as a hand-held inhaler that provides immediate therapy against a variety of inhaled pathogens including anthrax.<sup>89</sup> The next important research project at Suffield is centered on medical countermeasures against ricin, a deadly poison. This project will produce antibodies for the treatment against ricin poisoning, packaged in a kit similar to an antiserum snake-venom kit that a doctor might use to treat snakebites.<sup>90</sup> At the leading edge of research, DRDC Suffield is working on a technology demonstration program to develop a nucleic acid-based drug to provide "long-lasting, broad spectrum protective immune responses" to several hemorrhagic fever viruses, such as Ebola and Marburg.<sup>91</sup> Finally DRDC Suffield is developing next-to-skin chemical vapour protection undergarment for aircrews.<sup>92</sup>

While DRDC Suffield conducts mainly defence-related R&D, its expertise is also used for civilian purposes. The 'Suffield Urgent Response Team for Collection of

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<sup>89</sup> DRDC Suffield Website, *Cipro® Plus Inhaler (CPI) Against Anthrax*; available from: [http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2004\\_06/index\\_eng.html](http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2004_06/index_eng.html); Internet; accessed 24 March 2009.

<sup>90</sup> DRDC Suffield Website, *Medical Countermeasures Against Ricin*; available from: [http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2004-04/index\\_eng.html](http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2004-04/index_eng.html); Internet; accessed 24 March 2009.

<sup>91</sup> DRDC Suffield Website, *Nucleic Acids-Based Anti-Viral (NaVirCept) Technology Demonstration Project (TDP)*; available from: [http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2007\\_01/index\\_eng.html](http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2007_01/index_eng.html); Internet; accessed 24 March 2009.

<sup>92</sup> DRDC Suffield Website, *DRDC Suffield Next-To-Skin (NTS) Chemical Vapour Protection Undergarment and Aircrew Hood*; available from: [http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2001\\_5/index\\_eng.html](http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2001_5/index_eng.html); Internet; accessed 24 March 2009.



Biological Aerosol Threats' has been called upon to help the U.S. Center for Disease Control (CDC) analyse the contamination of U.S. postal facilities following the anthrax attack in 2001. In Canada, the response team was able to identify the origin of the Avian Flu outbreak in Abbotsford, BC in 2004, and was instrumental in confirming the presence of the SARS virus in a Toronto hospital. This is the only known successful aerosol sampling of the SARS virus.<sup>93</sup>

The CF has taken its moral responsibility seriously and continues to provide the best protection available for its members against bio-threats. Yet, as mentioned earlier, bio-weapons are indiscriminate and will not only affect military and emergency response personnel, but also the population at large. There too, the Canadian government has a moral obligation to protect.

### ***Canada's Bioterrorism Preparedness***

In the summer of 2000, the Solicitor General of Canada<sup>94</sup> published Canada's National Counter-Terrorism Plan (NCTP).<sup>95</sup> The NCTP establishes the RCMP as the lead agency in responding to any terrorist incidents, including those involving a biological agent, within Canada and gives the Department of National Defence the responsibility to maintain an "immediate response capability to any terrorist incident in

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<sup>93</sup> DRDC Suffield Website, *Suffield Urgent Response Team for Biological Aerosol Sampling*; available from: [http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2004\\_10/index\\_eng.html](http://www.suffield.drdc-rddc.gc.ca/Research-recherche/Products-produits/CB/RD2004_10/index_eng.html); Internet; accessed 24 March 2009.

<sup>94</sup> The Solicitor General of Canada is the lead federal minister responsible for coordinating Canada's response to terrorist incidents in Canada.

<sup>95</sup> The NCTP is a classified document. Public Safety Canada provides an unclassified overview of the plan which, without delving in the details of the plan, provides the main context. This overview will be used in this paper as the main reference for the NCTP. Public Safety Canada, *An Overview of Canada's Counter-Terrorism Arrangements*; available from: [http://ww2.ps-sp.gc.ca/publications/national\\_security/terrorism\\_arrangements\\_e.asp](http://ww2.ps-sp.gc.ca/publications/national_security/terrorism_arrangements_e.asp); Internet; accessed 12 April 2009.

Canada, in support of the civil authority.”<sup>96</sup> In other words, the Canadian Forces would only be called upon to provide assistance if the incident surpasses the capacity of the regional, provincial and national emergency response agencies, including the RCMP, to deal with it. More specifically, the NCTP gives DND the responsibility to provide “nuclear, biological and chemical technical assistance”.<sup>97</sup>

A few years later, Public Safety and Emergency Preparedness Canada (PSEPC) was designated the national agency responsible to develop the policies related to CBRN incidents response within Canada. In 2005, PSEPC published the *Chemical, Biological, Radiological and Nuclear Strategy of the Government of Canada*, which outlines the government policy concerning CBRN. It is interesting to note that bio-weapon threats are addressed within the larger chemical, radiological and nuclear realm rather than being dealt with separately. The policy defines CBRN incidents as:

The CBRN Strategy focuses on terrorist-related CBRN incidents... an intentional CBRN incident will, for the purposes of this CBRN Strategy, be considered a terrorist act (as defined in the *Criminal Code of Canada* and the *Security Offences Act*)... an **intentional** CBRN incident in Canadian jurisdiction is a criminal act... The overall approach to dealing with the consequences of a terrorist CBRN incident may be similar to an accidental CBRN incident. However, CBRN terrorism incidents differ because there are unique implications relating to... public safety, public confidence, national security and international relations. The CBRN Strategy is developed based on a CBRN terrorist incident, but could also be relevant and applied to accidental CBRN incidents.<sup>98</sup>

Therefore, a bioterrorism threat is viewed primarily as a criminal or defence threat, rather than a health hazard. The policy is aimed at protecting “Canada and

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<sup>96</sup> *Ibid.*

<sup>97</sup> *Ibid.*

<sup>98</sup> Public Safety and Emergency Preparedness Canada, *Chemical, Biological, Radiological and Nuclear Strategy of the Government of Canada* (Ottawa: PWGSC, 2005), 2.

Canadians by taking all possible measures to prevent, mitigate and respond effectively to a potential CBRN incident” within Canada. It does not address activities on the international scene that would help reduce the threat of bioterrorism on a global scale. In essence, the policy does nothing to reduce the likelihood of a bio-weapon attack on Canada; it only sets the guidelines under which the responders will operate once the biological attack has occurred.

It was in response to NCTP that the CF established the Joint Nuclear, Biological and Chemical Defence Company (JNBCD Coy) in 2002. In February 2006, in alignment with the more recent CBRN strategy, this unit became part of Canadian Special Operations Forces Command (CANSOFCOM) and its name was changed to the Canadian Joint Immediate Response Unit (CJIRT). The unit, in its early stages of development, focuses on three key mandates. The unit’s first responsibility is to respond to CBRN incidents in cooperation with other elements of the National CBRN Response Team including, mainly the RCMP and Health Canada. The second mandate is to provide an “agile integral part of the CANSOFCOM Immediate Reaction Task Force”. Lastly, the unit will provide force generation, planning, and advisory capability to future CF expeditionary operations.<sup>99</sup>

One other important and critical part of Canada’s overall bioterrorism preparedness infrastructure is the National Microbiology Laboratory (NML). Located within the Canadian Science Center for Human and Animal Health in Winnipeg, Manitoba, the NML is operated by the Public Health Agency of Canada. It is Canada’s

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<sup>99</sup> CANSOFCOM Website, *Canadian Joint Incident Response Unit – CBRN*; available from: <http://www.cansofcom.forces.gc.ca/cji-iii/index-eng.asp>; Internet; accessed 12 April 2009.

only Level 4 bio-containment laboratory and, of the fifteen Level 4 laboratories in the world, it is the only one specifically designed to accommodate both animal and human pathogens to the highest level of bio-containment.<sup>100</sup> The laboratory officially opened in the summer of 1999 and it houses over 100 scientists. This laboratory is a critical part of Canada's biological emergency response system. It is the only laboratory in Canada that provides diagnostic capabilities, in less than twenty-four hours, for any known disease agent that may be brought into the country.<sup>101</sup> It also enables research into these deadly diseases, including the Ebola, Marburg and Nipah viruses, to identify just a few. This facility also allows scientists to work safely with new agents prior to their biosafety classification.

Yet, as prepared as Canada is to react to a bio-weapon attack within its soil, experience has shown that it only takes a relatively small attack to rapidly overwhelm a country's biological emergency response system. In late 2001, Bruce Edwards Ivins,<sup>102</sup> a scientist at the U.S. biodefence laboratory at Fort Detrick in Maryland, mailed seven anthrax-laced letters to U.S. senators and major news outlets in Florida, New York and Washington DC.<sup>103</sup> In the following three months, five people died and another eighteen people contracted some form of the disease, but survived after successful treatment. Estimates suggest that another 50,000 people took antibiotics, and many more acquired

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<sup>100</sup> Public Health Agency of Canada, *National Microbiology Laboratory*; available from: <http://www.nml-lnm.gc.ca/overview-apercu-eng.htm>; Internet; accessed 12 Apr 2009.

<sup>101</sup> *Ibid.*

<sup>102</sup> The FBI amassed a vast quantity of evidence pointing to Bruce Edwards Ivins, a scientist at the U.S. biodefence labs in Fort Detrick, as the person who mailed the anthrax laced letters. Unfortunately, Ivins committed suicide before he could face trial and his culpability was never proven in court. Other persons of interest included Dr. Phillip Zack, another scientist from Fort Detrick.

<sup>103</sup> Associated Press, "Ivins Case Reignites Debate on Anthrax." *Los Angeles Times*, 3 August 2005; available from: <http://www.latimes.com/bal-te.anthrax03aug03.0,3970920.story>; Internet; accessed 24 March 2009.

antibiotics for future use.<sup>104</sup> The attack created an “Anthrax anxiety” of such proportion that hundreds of thousands of the “worried well” completely overwhelmed the medical care system.<sup>105</sup> In the end, the FBI estimates the cost of this relatively small and contained attack, including the investigation and the contaminated buildings clean-up, at over one billion dollars.<sup>106</sup>

In terms of the global bio-weapon threat, this attack was a minor one. The anthrax used in this attack was a well-known strain, non-contagious, and a ready supply of antibiotics existed. One can only imagine what a genetically engineered pathogen, highly contagious and released in substantial quantity could do. This possibility is not remote. Scientists have now decoded the entire DNA of the smallpox genome.<sup>107</sup> Ken Alibek knows that Russian scientists were working on genetic modification of the smallpox virus as early as the mid 1990s; it is easily possible that these same scientists could now be working for an illegal biological laboratory.<sup>108</sup>

Smallpox was eradicated from the world’s population in 1980. Samples of the disease are still kept in two laboratories, in the Centers for Disease Control and Prevention (CDC) in the United States and the State Research Center of Virology and Biotechnology VECTOR in Koltsovo, Russia, to be used in the production of vaccines if the disease reappears. There is no way to determine without the shadow of a doubt that, during the disbandment of the Russian program, a sample of the smallpox virus was not

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<sup>104</sup> Davis, *The Gathering Biological Warfare Storm...*, 174.

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

<sup>106</sup> Allan Lengel, “Little Progress in FBI Probe of Anthrax Attacks,” *Washington Post*, 16 September 2005; available from: [http://www.washingtonpost.com/wp-dyn/content/article/2005/09/15/AR2005091502456\\_pf.html](http://www.washingtonpost.com/wp-dyn/content/article/2005/09/15/AR2005091502456_pf.html); Internet; accessed 24 March 2009.

<sup>107</sup> Davis, *The Gathering Biological Warfare Storm...*, 175.

<sup>108</sup> Alibek, *Biohazard...*, 260.

taken and is being used now for hostile activities. Today, the release of the original smallpox virus (let alone a genetically modified one) into the population would certainly affect millions of people and represent an epidemic of biblical proportion. All of the best health care systems in the world would be greatly challenged to handle such an attack.

The efforts that Canada has deployed and continues to deploy within the country are substantial. They will be that much more effective once the proposed legislation mentioned previously are in force. Regrettably, this only addresses one side of the problem. The proliferation of illegal bio-weapon research continues around the world. Until the BWC's provisions are strengthened to provide increased deterrence, the threat will remain and Canada will be hard-pressed to ensure its citizens complete security from these weapons. It is therefore imperative that such a threat be minimized at its source.

### ***Canada's Input in New or Revised International Agreements***

To deter or detect covert use of bio-weapons, the British study referred to earlier suggests that the BWC will need to include measures to allow on-site investigation of suspicious outbreaks of infectious disease or intoxication, as well as any credible allegations of their use. Furthermore, there is a necessity for measures to enhance epidemiological and disease control capabilities of States Parties. To deter or detect the emergence of military bio-weapons programs the BWC must implement measures to allow on-site inspection of munitions production facilities, as well as provisions for on-site inspection of microbial growth facilities that could be diverted to BW agent production.<sup>109</sup> Quite simply, as has been done with the Chemical Weapons Convention,

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<sup>109</sup> British Medical Association, Board of Science and Education, *Biotechnology Weapons...*, 83.

measures have to be put in place to create a “web of deterrence”.<sup>110</sup> This web must include “comprehensive, verifiable, and global [bio-weapons] control to create a risk of detection and a climate of political unacceptability for these weapons.”<sup>111</sup>

As mentioned earlier both the NCTP and the National CBRN Policy do nothing to reduce the likelihood of a bio-weapon attack on Canada. To reduce this threat coming from outside Canada’s border, it is imperative that Canada work alongside the international community to strengthen the 1925 Geneva Protocol, as well as the 1972 BWC. The BWC is in desperate need of a proper and effective verification protocol, as well as appropriate measures to promote compliance with the convention.

The present CBMs do not go far enough. A good model to follow could be the measures that have been implemented by the 1993 *Paris Convention on the Prohibition of the Development, Production, Stockpiling and use of Chemical Weapons and on their Destruction*, also known as the Chemical Weapons Convention (CWC). As opposed to the BWC, which is quite brief and imprecise, the CWC describes in minute detail a verification and sanction framework. The CWC establishes the *Organisation for the Prohibition of Chemical Weapons* (Organization), whose sole purpose is to verify that all States Parties follow the convention. The CWC also establishes the framework within which the Organization operates and, in cases of non-compliance, it establishes the authority given to the Organization. In particular, article XII of the CWC gives authority to the Organization to recommend to the UN General Assembly or directly to the UN

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<sup>110</sup> *Ibid.*, 81.

<sup>111</sup> *Ibid.*

Security Council to levy sanctions on the offending party.<sup>112</sup> The verification and compliance measures integral to the CWC have greatly helped make the elimination of chemical weapons a reality. Similar measures must be included within the BWC if we are to reduce the threat posed by bio-weapons.

More recently, at the Sixth Review Conference of the BWC in November 2006, David Heyman and Gerald Epstein of the Washington based Center for Strategic and International Studies have presented a new approach to biological threat reduction. Their presentation, titled *Governance for Biological Threat Reduction*, calls for a “comprehensive, international, interdisciplinary approach” to reduce the threat.<sup>113</sup> The authors explain that when it comes to the bio-weapons threat, “all nations’ fates are intertwined.”<sup>114</sup> Quite simply, one group based in a particular nation can acquire biological agents from a second country to terrorise a third. Such a situation requires international policies for international implementation. Their proposed “Biological Threat Reduction (BTR)” framework centers on what they describe as “The Four D’s”.<sup>115</sup> The required international deterrence framework to be put in place must:

*Dissuade* malicious actors from pursuing biological weapons; *Deny* them materials, equipment, and expertise; *Detect* covert weapons programs; and

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<sup>112</sup> Office of the Judge Advocate General, “Paris Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and on Their Destruction – 1993,” in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training, (Ottawa: DND, 2005), 239.

<sup>113</sup> Center for Strategic and International Studies, *Sixth Review Conference of the BWC in Geneva*; available from: [http://www.csis.org/component/option,com\\_csis\\_events/task,view/id,1161/](http://www.csis.org/component/option,com_csis_events/task,view/id,1161/); Internet; accessed 12 April 2009.

<sup>114</sup> Center for Strategic and International Studies presentation to the Sixth Review Conference of the BWC in Geneva; available from: [http://www.csis.org/media/csis/events/061130\\_btr\\_brief.pdf](http://www.csis.org/media/csis/events/061130_btr_brief.pdf); Internet; accessed 12 April 2009

<sup>115</sup> *Ibid.*



*Defend* against biological attack with effective consequence management and attribution.<sup>116</sup>

A consortium of over fourteen international players has been assembled, with members from a variety of disciplines, ranging from international law to biological research and national emergency response organizations. The BTR Consortium also has representatives acting as liaison officers with Interpol, the World Health Organization and the World Federation of Public Health Administrators. Presently the only representative from Canada within the BTR consortium is Mr. Peter Singer from the University of Toronto Center for Bioethics. At this point, the BTR consortium has built up the initial elements of its organization. It has established its framework (The Four D's); it has launched the BTR Forum; and it has developed a governance model. The next phase is to "Build Out". The focus is to engage a broader range of potential members to the consortium within all related fields, to adopt BTR framework and internalize threat reduction as part of its mission. The group's ultimate objective is to improve:

The ability of members of relevant professional communities all over the world to develop and improve governance options that are appropriate to the rapidly evolving, distributed, diverse and interconnected set of issues associated with biological risks.<sup>117</sup>

The consortium has established partnerships with the U.S. Center for Strategic and International Studies and the Institute of Peace and Conflict Studies, two organizations that are certain to increase the group's international status. These two

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<sup>116</sup> *Ibid.*

<sup>117</sup> Institute for Peace and Conflict Studies, *Governance for Biological Threat Reduction – Conference Report*. Held in New Delhi, 8 January 2008; available from: [http://www.ipcs.org/pdf\\_file/issue/1738925223ConferenceReport-BiologicalThreatReduction.pdf](http://www.ipcs.org/pdf_file/issue/1738925223ConferenceReport-BiologicalThreatReduction.pdf); Internet; accessed 20 April 2009.

organizations were the main sponsors of the last BTR Forum held in New Delhi. The concluding remarks included in the report of the last forum summarise clearly the reality the world faces when it comes to bio-weapons:

The biological weapons threat is imminent and adequate measures for addressing this issue are required... We must devise measures to deter terrorists from using biological weapons. All the relevant communities and nations should understand that there is a threat, and there is a need for a common platform to address this issue.<sup>118</sup>

The BTR Forum is that platform and Canada needs to be at the table. Canada's experience in establishing the Mine Ban Treaty<sup>119</sup>, also known as the Ottawa Treaty, demonstrates what can be achieved when a consortium of like-minded states unite to rid the world of immoral weaponry. The efforts of the BTR Consortium have the potential to achieve similar results with respect to bio-weapons. Here again, Canada has an opportunity to take an active part in making the world a safer place. Canada must fully engage with the BTR process.

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<sup>118</sup> *Ibid.*

<sup>119</sup> Office of the Judge Advocate General, "Convention on the Prohibition of the use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on their Destruction – 1997" in *Collection of Documents on the Law of Armed Conflict*, 2005 ed., ed. Directorate of Law Training (Ottawa: DND, 2005), 297-302.

## Conclusion

From plague-laden corpses being catapulted over the walls of a besieged city to the mailing of anthrax-laced letters to news media outlets, bio-weapons have been with us for centuries. Within the last century the immoral aspects of bio-weapons were recognized and several laws, treaties and conventions have been written in attempts to eliminate these weapons. Unfortunately, the threat of bio-weapons is still present today. In fact, the biological and genetic advances of the past few decades have only increased the devastating potential of these weapons.

Whether it is conducted within the confines of an illicit laboratory or one that is in full compliance of the most modern safeguards, biological pathogen research is inherently dangerous. The accidents that occurred within the Soviet bio-weapons development program of the Cold War, and those at the research laboratories in the United States and in Australia are a testament to those dangers.

The threat of bio-weapons is real and cannot be ignored. The Canadian Security Intelligence Service confirms in its 2007/2008 annual report that several terrorist organizations, including Al Qaeda, continue to explore ways of obtaining and using weapons of mass destruction, including bio-weapons, as part of their terrorist campaigns.<sup>120</sup> The establishment of the Canadian Joint Immediate Response Unit, along with the research and development work conducted in Suffield, demonstrate that the Canadian Forces take this threat seriously.

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<sup>120</sup> Canadian Security Intelligence Service, *CSIS Public Report 2007 – 2008* (Ottawa: PWGSC, 2008), 16.

While the possibility of a bio-weapon attack against Canada could be considered remote, Canada's government cannot ignore the consequences of such an attack. The costs associated with a terrorist release of a genetically modified virus in one of Canada's major cities, or even an accident at one of Canada's bio-research laboratories, would be far greater than the costs of establishing a solid infrastructure that includes a robust and agile emergency response system, supported by an enforceable and comprehensive legal framework. Canada meets its moral obligations in the former, but falls short in the latter. The national Counter-Terrorism Plan identifies which Canadian agencies would have a part to play in the event of a biological emergency, and establishes their respective roles and responsibilities. While the system has never been tested by a real bio-weapon attack, the response system is in place. Unfortunately, the legal tools necessary to reduce the risk of an attack occurring in the first place, are not yet in place. The BTWCI Act, after working its way through the legislative process for more than seven years is still not in force, and Bill C-11 has only started its journey through the governmental maze. Canada has a moral obligation to ensure the safety of its citizens and these two documents are crucial to the fulfillment of this obligation. The BTWCI Act and Bill C-11 must be implemented as soon as possible.

On the international scene, the BWC falls short, and its major weakness is well known. Until the BWC can provide real deterrence, via a structured verification and enforcement mechanism, it will remain ineffective in reducing the threat of bio-weapons. Canada must take a lead role, as it did in the implementation of the personnel land mines treaty, to ensure the BWC is strengthened. The efforts of the BTR Consortium are promising, and Canada must become an active contributor to this international initiative.

Bio-weapons are repugnant. They have no place on the modern battlefield, nor should they threaten Canada's citizens. Only when Canada has done all it can at home and abroad to eliminate bio-weapons will Canada have fully met its moral obligations. Canada's citizens and indeed the rest of the world have a moral right to live without the fear of bio-weapons.

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