TESTIMONY

Prepared Statement
Before the Senate Committee on Governmental Affairs
Subcommittee on International Security, Proliferation, and Federal Services
12 February 2002

Amy E. Smithson, Ph.D.
Director, Chemical and Biological Weapons Nonproliferation Project
Henry L. Stimson Center

In the aftermath of last fall's multiple terrorist attacks, much focus has been placed on taking the most immediate steps needed to protect this nation's safety and security in an era where terrorists seek to inflict widespread and indiscriminate harm on US citizens and interests. Emphasis has rightly been placed on strengthening intelligence capabilities so that future terrorist plots can be thwarted as well as on better training and equipping of the nation's emergency responders to contend with all manner of terrorist-caused calamities. Initiatives to stiffen airline and border security have also come to the fore in the past few months, among other proposals and programs.

Adjusting policies and programs to address the threat of terrorism is not easy. I would like to thank this committee for convening a hearing that looks beyond the obvious, a hearing that examines the utility of international treaties in helping to assure this nation's well being. Some tend to dismiss treaties out of habit or lack of understanding of the role they can and should play in an overall strategy for reducing security threats to this country. Critics deride accords that ban categories of weapons as weak tools that governments can break with impunity. Yet, arms control critics would hardly advocate that US laws against murder be scrapped, even if those laws are broken with disturbing frequency. Rather, they would call for better enforcement of those laws. As lawmakers, you can appreciate that even a good law is only as effective as its enforcement. Member governments are the custodians of international arms control treaties. The United States, arguably the world's most powerful nation and always self-described as a champion of nonproliferation, has a special responsibility to lead efforts to enforce these treaties.

One of the frequent refrains of the past few months has been how easy it is for terrorists to acquire and use chemical and biological weapons. This misleading claim has led many to believe that mass casualty unconventional terrorist attacks are imminent, if not inevitable. While it is true that technical advances have made some aspects of chemical and biological weapons proliferation easier, there are many technical obstacles to the acquisition of a mass casualty capability with these types of weapons. A case in point is Aum Shinrikyo, the Japanese cult that released the nerve agent sarin in the Tokyo subway system on 20 March 1995. Aum Shinrikyo's sizeable corps of scientists figured out how to make small quantities of several chemical agents, as one might expect given how long both the formulas and the ingredients for such agents have been readily available. However, what stymied Aum Shinrikyo was the cult's inability to "scale up" its production of agent from a small quantity to the large amounts needed to inflict massive casualties. Aum's chemical weaponeers were unable to do this despite the advantages of a $10 million state-of-the-art production facility, considerable scientific expertise, and years to work out the kinks in their program. As for Aum's biowarfare program, the cult's scientists never managed to get their hands on virulent biowarfare strains, and their efforts to disperse their concoctions were complete and total flops.

Perhaps for this reason, Aum Shinrikyo turned to the former Soviet chemical and biological institutes for assistance. Fortunately, the former Soviet weaponeers declined to help the cult with its chemical and biological weapons programs. Given Aum

Shinrikyo's considerable resources, it stands to reason that sub-national actors will be seriously challenged in any attempt to build from scratch a mass casualty unconventional weapons capability. This statement is not intended as a guarantee that terrorists cannot overcome the technical hurdles involved. Aum Shinrikyo, the individual(s) behind the anthrax letters sent to Capitol Hill and several media outlets, and other groups have indeed made noteworthy progress. Rather, my point is that terrorists are likely to encounter technical hurdles that trip them up if their intent is to cause mass casualties with these weapons. Therefore, terrorists could well seek out help from governments, which have such vast resources they can become truly proficient in chemical and biological weaponry. Accordingly, one key to keeping unconventional weapons out of the hands of terrorists is to tackle the proliferation problem at the nation-state level.

The committee has posed several questions that I will address in the passages that follow. First, I will discuss the differences between chemical and biological weapons proliferation and why the former category of weapons is somewhat easier to monitor than the latter. Then, I will discuss the impact that the Chemical Weapons Convention (CWC) and the Biological and Toxin Weapons Convention (BWC) can have on governments and sub-national actors. I will close my testimony with thoughts on the verification and enforcement of treaties and on the steps that the US government should take to enhance the utility of international treaties in the war against terrorism.

Distinguishing Features of Chemical and Biological Weapons Proliferation

Although chemical and biological weapons are often lumped into one category, they are distinct in several important ways. Chemical agents consist of man-made substances, namely the component chemicals known as precursors. The penultimate precursors for poison gas are often chemicals that are processed many steps beyond the basic chemical weapons building blocks of phosphorous, sulfur, and fluorine. Many precursor chemicals can have widespread and legitimate commercial uses. For example, thiodiglycol, a precursor for mustard gas, is used to make ballpoint pen ink. The quantities of precursor chemicals poured into the reactor equate roughly to the amount of agent that will result. In other words, three tons of precursor "X" mixed with one ton of precursor "Z" and one ton of precursor "Y" will make five tons of poison gas.

In contrast, biological agents originate in nature. Anthrax, for example, is a disease of herbivores including cattle, sheep, and goats. Many strains of anthrax exist, as is the case for *Clostridium botulinum*, the causative agent of botulinum toxin. To make the most effective biowarfare agent, one must know which strains are most deadly to man or to the crop or type of livestock that is the intended target. In the case of *Clostridium botulinum*, there are over 675 variants. Biowarfare agents are made by injecting a virulent seed culture into the appropriate growth media. With the appropriate growth media (e.g., peptone, glucose, casein, augmented animal feeds), the seed culture cells replicate into a much larger amount of the biowarfare agent. Depending upon whether the agent is to be dispersed in a wet slurry or dry formulation, the quantity of resulting agent will vary.

These fundamental differences between the way that chemical and biological agents are produced explain why the proliferation of biological agents is more difficult to track than the proliferation of chemical weapons. With considerable effort, the quantities of precursor chemicals being produced and traded can be monitored and inspections can ascertain whether facilities are using them to make commercial products. The production and sale of growth media and whether a particular pharmaceutical or biotechnology company is purchasing growth media appropriate for its product line(s) can also be watched. The monumental stumbling block in trying to hinder the spread of biological weapons is that an aspiring proliferator can acquire the seeds of destruction from a vast array of natural sources. Moreover, it would be extremely difficult, it not impossible, to catch smuggling of lethal seed cultures from country to country or from a government weapons program to terrorist groups. Lethal seed cultures can be found in an offensive bioweapons program, in biowarfare defense facilities, and in some five hundred registered culture collections in fifty-nine nations

that serve as huge repositories of strains to support legitimate scientific research. Only a tiny drop of a virulent seed culture is needed to jumpstart the fermentation of a biowarfare agent.

Of course, equipment is needed to produce chemical and biological weapons. Since the reactors and fermenters required for the task are employed to make everything from textile dyes, disinfectants, and toiletries to medications, yogurt, and beer, a proliferator can find these items for sale in the marketplace. Therefore, inspectors trying to identify illegal weapons production would have to look for telltale signs that a supposedly commercial plant was making chemical or biological agents on the sly. For example, use of Hastelloy reactors and glass-lined pipes would automatically catch the attention of chemical weapons inspectors if the plant were not making pesticides or another type of product that required corrosion-resistant equipment. An inspector looking to distinguish a genuine pharmaceutical plant from a covert biowarfare site might be tipped off by inappropriate levels of biosafety, an unusual set-up of production equipment or waste treatment facilities, or lack of post-production procedures suited for the product(s) purportedly being made at the site, among other factors.

Manufacturers of reactors, fermenters, and other equipment needed for weapons programs (e.g., filling equipment, large capacity freeze dryers and aerosol inhalation chambers) can be identified. For the purposes of hindering proliferation, sales of such equipment tracked. However, these efforts would not be definitive since equipment can be resold or manufactured in a hidden plant with the appropriate machine tools and craftsmen. Nonetheless, the Australia Group¾an export control cooperative among the countries home to the major equipment, chemical, and growth media manufacturers¾includes on its control lists a lengthy roster of items that could be used in chemical or biological weapons production.

The Australia Group had its origins in the mid-1980s, when supplier nations jointly recognized the need to harmonize export controls and share intelligence data on proliferation activities in order to cut off the supply of precursor chemicals to Iraq and Iran. Iraq not only used poison gas against Iranian troops during several battles in the Iran-Iraq War, Iraq also gassed its own Kurdish civilians in an infamous attack on the town of Halabja in mid-March 1988. Over the years, the Australia Group, which currently has 34 member states, expanded its control lists to include fifty-four precursor chemicals and numerous chemical and biological equipment items. On its core and warning lists, the Australia Group controls over one hundred human, plant, and animal viruses, bacteria, rickettsiae, toxins, fungi, and genetically modified microorganisms. Outside of classified reports, there is no way to know for certain how effective the Australia Group's export controls have been in frustrating the efforts of governments to acquire a chemical or a biological warfare capability. Arguably, any mechanism that makes the proliferation of weapons of mass destruction more expensive or cumbersome is well worthwhile.

Threat Reduction Via International Treaties

Of course, arms control treaties such as the BWC and the CWC apply first and foremost to nation states. According to the 2001 Nuclear Posture Review, some sixteen countries were thought to be harboring offensive chemical weapons programs and thirteen believed to possess biological weapons capabilities. For the foreseeable future, such government-run weapons programs are likely to present the most serious unconventional weapons threats to this nation. If the complete panoply of tools that these treaties embody (e.g., inspection, multilateral export controls) is utilized fully, effectively, and with determination, nations can be compelled, one by one, to abandon these weapons programs.

Moreover, it is important for the US government to push for full and effective implementation of these treaties because they can apply to sub-national actor security threats in several ways. First, the fewer governments that maintain chemical or biological weapons programs, the fewer places terrorists will have to turn for technical assistance in the form of weapons materials, cookbooks, or human expertise. Second, the CWC requires in Article VII that participating states pass legislation outlawing

offensive chemical weapons activities, an approach that Article IV of the BWC permits but does not require. The intent of these domestic laws is to hold individuals, not just governments, accountable for a variety of activities associated with offensive weapons production and use. The CWC approaches its fifth anniversary with 145 ratified members, all now under treaty obligation to have enacted penal laws to prosecute corporations or citizens who break the treaty's prohibitions.

A third important way that arms control treaties can block weapons proliferation is via the incorporation of export controls on proliferation-risk items. The BWC, negotiated in 1972, did not embrace such an approach. Rather, it was the CWC, completed in 1992, that trail-blazed the automatic imposition of export controls. Three years after the CWC was activated in late April 1997, participating states were barred from trading in fourteen so-called Schedule 2 chemicals with countries that had not joined the treaty. Schedule 2 chemicals are immediate weapons precursors that are not as widely used in commercial industry as the chemicals listed on Schedule 3. This fall, at the CWC Conference of States Parties, the CWC's members will weigh the application of automatic trade restrictions on Schedule 3 chemicals. Ideally, the CWC's member states will decide to impose full Schedule 3 export controls on CWC holdout states. US chemical industry experts have told me that should states remain outside a regime that included export controls on Schedule 3 chemicals, their chemical industries, which depend upon international trade, would suffer tremendous hardship. The intention of the CWC's gradually tightening export controls on precursors is to choke government-level weapons programs, thereby diminishing an avenue whereby terrorists might acquire the materials and/or expertise to make poison gas. This approach is quite sound since nations that do join must pass the aforementioned penal legislation and become subject to international inspections.

A final comment on the utility of export controls concerns how the CWC has amplified the concept of multilateral chemical precursor export controls first introduced by the Australia Group. The fifty-four control items on the Australia Group list are individual chemicals, including twenty chemicals that are not on the CWC's lists of chemicals to be monitored. At first glance, the CWC would appear to be a less aggressive export control mechanism, since its three Schedules contain only forty-three items. However, the CWC actually monitors *hundreds* of chemicals because some of the items on its control lists are families of chemicals. Moreover, at present, almost five times the number of Australia Group countries are enforcing export controls via their CWC membership. To make the CWC even more effective at starving illicit chemical weapons programs, this fall the US government should advocate expansion of the treaty's export controls to include Schedule 3 chemicals.

Improving the Track Record of CWC Verification and Enforcement

The two treaties in question¾the CWC and the BWC¾are in very divergent circumstances when it comes to verification and enforcement. The BWC was negotiated in the early 1970s, when on-site arms control inspections were just a pipe dream. Instead of establishing a permanent inspector corps, the BWC's architects relied on national technical means of verification and provided for the United Nations (UN) Security Council to investigate allegations of cheating. The shortcomings of this approach were two-fold. First, remote reconnaissance methods were ill suited to detect the subtle signs of a covert bioweapons program, which can be masked amidst pharmaceutical and biotechnology facilities. Second, the permanent five members of the Security Council each carry a veto vote, which meant that it would be difficult to get a challenge inspection off the ground. Not surprisingly, this weak verification set-up emboldened cheaters. No BWC inspectors were ever mustered to gather confirmatory evidence of the USSR's biowarfare program. The former Soviet Union redefined the horizons of biological weaponry by putting over 65,000 scientists and technicians to work weaponizing over fifty biological agents, including smallpox, plague, anthrax, and the hemorrhagic fever Marburg. Inspections conducted by the UN Special Commission on Iraq in the aftermath of the Gulf War also revealed that Iraq, a BWC signatory, violated the treaty.

In 1996, the international community inaugurated negotiations to attempt to strengthen

the BWC by adding a monitoring protocol. The Bush administration announced last year that it would reject the draft BWC protocol that those negotiations produced, a decision with which I agree. My position on this matter is based upon technical advice from thirty-five experts from the US pharmaceutical and biotechnology industries, research institutes, universities, defense contractors, and veterans of the two US trial BWC inspections. The Stimson Center convened these technical specialists, each a top expert in their respective discipline, to examine the technical feasibility of monitoring the BWC. Their views are presented fully in the May 2001 Stimson Center report entitled *House of Cards: The Pivotal Importance of a Technically Sound BWC Monitoring Protocol*. Briefly, the technical experts believed that the draft BWC protocol contained most of the appropriate monitoring tools, such as visual observation, documentation review, interviews, and sampling and analysis. The experts from industry and academia proposed monitoring strategies that had much in common with what is known in arms control circles as "managed access" inspections, wherein inspectors and host officials work out compromises on the spot to satisfy inspection and host site needs.

On several important inspection parameters, the academic and industry experts differed with the draft BWC protocol's provisions. For example, the industry and academic experts believed that inspections must have sufficient manpower and time to be able to unravel the complexities that would undoubtedly be encountered in the field. The protocol's non-challenge inspection terms would deploy four inspectors for two days. Dr. Steven J. Projan, Director of Antibacterial Research at Wyeth-Ayerst Research, summed up his assessment of the draft BWC protocol's terms with the following words: "Four inspectors in two days couldn't even get through to all of the bathrooms at my facility." All of the experts were unanimous in their view that inspection terms must provide ways to differentiate between the good guys and the bad guys, not leave question marks hanging over all facilities. In the view of the industry and academic experts, such inspection terms were possible, but significant revisions of some of the draft protocol's technical nuts and bolts were in order.

All of the experts that participated in the Stimson Center's brainstorming series advocated additional technical research and field trials. Such BWC monitoring field trials, which are required by public law 106-113, could stimulate technical improvements in a draft protocol and augment political support from governments and the private sector. The Pharmaceutical Research and Manufacturers of America long ago offered expert technical assistance, but there have been no industry field trials of prospective monitoring procedures. Given the importance of crafting sound monitoring procedures for this treaty, it is incumbent upon both US industry and the US government to mount good faith efforts to test fully the assorted permutations of BWC monitoring technologies and strategies. Accordingly, Congress should insist that the Bush administration fulfill the requirements of public law 106-113 and conduct monitoring trials at various sites.

In November 2001, the Bush administration proposed several alternatives to the draft BWC protocol. In all candor, some of the administration's initiatives are puzzling. For instance, the Bush administration proposed putting "investigations" or challenge inspections of suspicious disease outbreaks and/or alleged biowarfare incidents in the hands of the UN Secretary General. This proposal suffers from the same handicap as the formulation currently in place, namely the possible politicization of a challenge inspection. To have a chance of being effective, challenge inspections must be technical, evidence collection exercises, structured to be as automatic and as distanced as possible from politics. The approach taken by the CWC, lodging inspections with an independent inspector corps, would probably garner more success.

Another baffling Bush administration proposal would have non-challenge "visits," to use the vernacular of BWC protocol negotiations, conducted on a voluntary basis. This concept of voluntary visits, a carryover from the Clinton administration's negotiating strategy, is bewildering. One has to wonder why a BWC violator would ask inspectors into its midst unless it had taken extreme care to clean up any and all evidence of

cheating prior to issuing the invitation. Moreover, one could ask what purpose such voluntary visits would serve elsewhere, save to be a nuisance to host facilities. If trial inspections show that meaningful monitoring results can be achieved and the monitoring costs are bearable, then regular or random non-challenge inspections at facilities that have dual-purpose capabilities would be far preferable to this cock-eyed approach.

In addition, the US government suggested that the security of access to pathogenic microorganisms be strengthened, that governments oversee high-risk experiments with pathogens, that professional scientific codes of conduct be established for those working with dangerous pathogens, and that disease surveillance be improved. Furthermore, the US government proposed that BWC members be required to pass legislation criminalizing offensive bioweapons activities. The Bush administration intended for this initiative to close a legal loophole in the BWC so that law enforcement authorities could hold individuals accountable for their actions. While each of these proposals has significant merit, their common downfall is that the US government left it to each of the BWC's 141 members to set its own domestic standard. To wit, country "A" could enact a criminalization law with slap-on-the-wrist penalties and country "B" a stiff penal code. Both nations could thereafter claim they had done their part by the international nonproliferation effort. Adding a strict penalty "floor" to the criminalization proposal would foster a stronger web of domestic laws against offensive biological weapons activities. Likewise, the other US initiatives could benefit from the suggestion of strong standards that make improvements on disease surveillance and the rest of the proposals reasonably uniform, not hit or miss.

Judging by the CWC's original inspection provisions, the chemical weapons ban is in a much better position that its sister accord to enable verification of treaty compliance. The CWC incorporates routine inspections of the full range of industrial and military and sites. Moreover, Article IX of the treaty obligates each state to accept a challenge inspection at any location on its territory if another CWC member suspects that cheating is taking place there. As 2002 began, the CWC's international inspectorate, the Technical Secretariat located in The Hague, the Netherlands, had conducted in excess of 1,000 routine inspections, including over 220 inspections at more than sixty former chemical weapons production facilities in eleven countries. The CWC's inspectors have over 300 inspections of commercial plants under their belts, with nary a complaint from industry facilities in the United States or elsewhere that these inspections resulted in the compromise of sensitive business data.

By this account, the CWC has enjoyed a relatively strong launch, due largely to how rapidly nations joined the treaty. Upon closer examination, however, it becomes clear that the CWC could be working better. One need only ask a US official or discretely circulate among the cognoscenti in The Hague to hear whispers of incomplete data declarations and other unaddressed compliance problems. Yet, no challenge inspections have been requested to pursue these lingering compliance concerns. The reason for these circumstances lies largely in how the United States has chosen to implement the CWC.

In the spring of 1997 when the Senate gave its advice and consent to ratification and Congress passed the treaty's implementing legislation, S. Exec. Res. 75 and H.R. 4328 were spiked with treaty-weakening exemptions. One would allow the President to refuse a challenge inspection on the grounds that it may threaten US national security. A second exemption specifies that no samples collected during an inspection can leave US territory for analysis. A third measure narrows the number of industry facilities that declare activities involving mixtures or solutions that contain proliferation-risk chemicals. Other nations will not stand by idly and allow the United States to create for itself a less rigorous verification regime. Rather, they will emulate the US policies and block challenge inspections, deny inspectors permission to send chemical samples abroad for detailed analysis at independent laboratories, and decrease considerably the number of industry facilities worldwide that are declared and subsequently opened to routine inspection. I should note that officials from several nations, including Russia

and China, have privately told me that their countries would not hesitate to cite the US exemptions to hold inspectors at bay.

As if these circumstances were not bad enough, US escorts have also refused to allow inspectors to use approved inspection equipment (e.g., weighing equipment) during inspections of some military facilities. This poor behavior has been particularly regrettable, because it gives the appearance that the United States has something to hide. To the contrary, President George H.W. Bush and US military leaders have foresworn future use of chemical weapons and a 1985 law requires the Army to destroy the US chemical arsenal. The United States is getting out of the chemical weapons business, meeting the treaty's requirements to eliminate its chemical weapons stockpile. Some damage, however, has already been done. Russia, India, and South Korea are among the countries to mimic poor US behavior in receiving inspections, impinging upon the ability of the CWC's inspectors to do an effective job overseas.

Under Secretary of State for Arms Control and International Security John Bolton has said publicly on several occasions that arms control is all about compliance. In a 24 January 2002 speech in Geneva, Mr. Bolton even warned CWC violators that they would not get away with breaches of treaty obligations. Like previous administrations, the Bush administration expects treaty members to abide by their obligations. However, the Bush administration and Congress need to recognize that unless the United States reverses the challenge inspection and sampling analysis exemptions, it will have deprived the CWC's inspectorate of its two strongest tools to pursue compliance problems. Until US policy makers overturn these exemptions, the Technical Secretariat's inspectors will not really have a fighting chance to catch violators. Moreover, US rhetoric about unpunished cheating will sound rather empty. The route to collective international action against a treaty violator is through an evidentiary case that the Technical Secretariat's inspectors build, a task that they will be unlikely to accomplish without challenge inspections and sampling analysis in their toolkit.

Of course, challenge inspections and sampling are not guarantees that cheaters will be caught red-handed, although arms control inspectors have on occasion come up with such smoking guns (e.g., North Korea's nuclear facilities, Iraqi weapons of mass destruction programs). At a minimum, inspections reveal more about a suspect site than was previously known, and they also force a cheater to take more elaborate and expensive steps to maintain an illegal weapons capability. Such outcomes would impinge upon proliferators more than a treaty regime where the strongest inspection tools remain unemployed.

Some nations of proliferation concern are still CWC holdouts (e.g., North Korea, Syria, Egypt), but others have already joined or reportedly will soon do so (e.g., Iran, China, Libya). As originally envisioned, the CWC's ever tightening export controls would make holdouts pay a hefty economic price and the challenge inspections and sampling provisions would put inspectors in a strong position to police compliance. If US policy makers want this treaty to be an effective threat reduction mechanism, in 2002 they must push for adding Schedule 3 chemicals to the export control list and restore full powers to the CWC's inspectors by reversing the aforementioned exemptions. Otherwise, the United States will have no one to blame but itself for this treaty's weakened status.

In this day and age, it should be considered foolhardy to neglect of any viable mechanism that can reduce the threat of weapons of mass destruction. Given America's singular status in the international community, custodianship of the CWC and the BWC begins here, in Washington, DC. Therefore, I ask that Congress and the Bush administration waste no time in taking the appropriate steps to see that the CWC is fully and effectively implemented and that all reasonable efforts are made to strengthen the BWC with a full panoply of monitoring tools.

Committee Members | Subcommittees | Hearings | Key Legislation | Jurisdiction
Press Statements | Current Issues | Video of Select Hearings | Sites of Interest